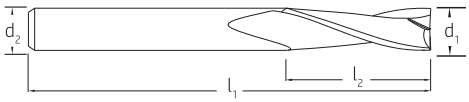
# UNIVERSAL

## 2 Flute 30° Helix Square Endmills

EMS 230

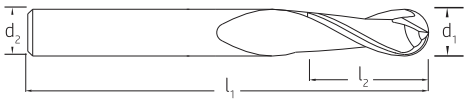




*Technical Info. Page No.* ***148***

| Steels | Stainless Steels | Cast Irons | Hardened Steels | Titaniums | Super Alloys | Aluminiums |
|---|---|---|---|---|---|---|
| <45 HRC | <900 N/mm² | <300 HB | - | <900 N/mm² | <900 N/mm² | - |

| $d_1$ | $d_1$ | $d_2$ | $d_3$ | $l_2$ | $l_3$ | $l_1$ | z | EDP No. HA | EDP No. HB |
|---|---|---|---|---|---|---|---|---|---|
| | *tol.* | *h6* | *-0.1* | *±0.50* | *±0.50* | *±0.80* | | AlCrN | AlCrN |
| 1.0 | -0.010 | 3 | | 4.0 | | 38 | 2 | EMSA 2300M 0100 | |
| 1.5 | -0.020 | 3 | | 4.5 | | 38 | 2 | EMSA 2300M 0150 | |
| 2.0 | -0.020 | 3 | | 6.0 | | 38 | 2 | EMSA 2300M 0200 | |
| 2.5 | -0.025 | 3 | | 9.5 | | 38 | 2 | EMSA 2300M 0250 | |
| 3.0 | -0.025 | 3 | | 12.0 | | 38 | 2 | EMSA 2300M 0300 | |
| 3.5 | -0.025 | 4 | | 12.0 | | 50 | 2 | EMSA 2300M 0350 | |
| 4.0 | -0.025 | 4 | | 14.0 | | 50 | 2 | EMSA 2300M 0400 | |
| 4.5 | -0.025 | 6 | | 16.0 | | 50 | 2 | EMSA 2300M 0450 | EMSA 2301M 0450 |
| 5.0 | -0.025 | 6 | | 16.0 | | 50 | 2 | EMSA 2300M 0500 | EMSA 2301M 0500 |
| 6.0 | -0.025 | 6 | | 19.0 | | 50 | 2 | EMSA 2300M 0600 | EMSA 2301M 0600 |
| 7.0 | -0.025 | 8 | | 19.0 | | 63 | 2 | EMSA 2300M 0700 | EMSA 2301M 0700 |
| 8.0 | -0.025 | 8 | | 20.0 | | 63 | 2 | EMSA 2300M 0800 | EMSA 2301M 0800 |
| 9.0 | -0.035 | 10 | | 22.0 | | 75 | 2 | EMSA 2300M 0900 | EMSA 2301M 0900 |
| 10.0 | -0.035 | 10 | | 22.0 | | 75 | 2 | EMSA 2300M 1000 | EMSA 2301M 1000 |
| 11.0 | -0.035 | 12 | | 25.0 | | 75 | 2 | EMSA 2300M 1100 | EMSA 2301M 1100 |
| 12.0 | -0.035 | 12 | | 25.0 | | 75 | 2 | EMSA 2300M 1200 | EMSA 2301M 1200 |
| 14.0 | -0.035 | 14 | | 32.0 | | 89 | 2 | EMSA 2300M 1400 | EMSA 2301M 1400 |
| 16.0 | -0.035 | 16 | | 32.0 | | 89 | 2 | EMSA 2300M 1600 | EMSA 2301M 1600 |
| 18.0 | -0.035 | 18 | | 38.0 | | 100 | 2 | EMSA 2300M 1800 | EMSA 2301M 1800 |
| 20.0 | -0.035 | 20 | | 38.0 | | 100 | 2 | EMSA 2300M 2000 | EMSA 2301M 2000 |





*Technical Info. Page No.* ***148***

| Steels | Stainless Steels | Cast Irons | Hardened Steels | Titaniums | Super Alloys | Aluminiums |
|---|---|---|---|---|---|---|
| <45 HRC | <900 N/mm² | <300 HB | - | <900 N/mm² | <900 N/mm² | - |

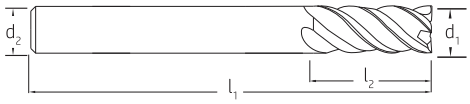
| $d_1$ | $d_1$ | $d_2$ | $d_3$ | $l_2$ | $l_3$ | $l_1$ | z | EDP No. HA | EDP No. HB |
|---|---|---|---|---|---|---|---|---|---|
| | *tol.* | *h6* | *-0.1* | *±0.50* | *±0.50* | *±0.80* | | AlCrN | AlCrN |
| 1.0 | -0.010 | 3 | | 4.0 | | 38 | 2 | EMBA 2300M 0100 | |
| 1.5 | -0.020 | 3 | | 4.5 | | 38 | 2 | EMBA 2300M 0150 | |
| 2.0 | -0.020 | 3 | | 6.0 | | 38 | 2 | EMBA 2300M 0200 | |
| 2.5 | -0.025 | 3 | | 9.5 | | 38 | 2 | EMBA 2300M 0250 | |
| 3.0 | -0.025 | 3 | | 12.0 | | 38 | 2 | EMBA 2300M 0300 | |
| 3.5 | -0.025 | 4 | | 12.0 | | 50 | 2 | EMBA 2300M 0350 | |
| 4.0 | -0.025 | 4 | | 14.0 | | 50 | 2 | EMBA 2300M 0400 | |
| 4.5 | -0.025 | 6 | | 16.0 | | 50 | 2 | EMBA 2300M 0450 | EMBA 2301M 0450 |
| 5.0 | -0.025 | 6 | | 16.0 | | 50 | 2 | EMBA 2300M 0500 | EMBA 2301M 0500 |
| 6.0 | -0.025 | 6 | | 19.0 | | 50 | 2 | EMBA 2300M 0600 | EMBA 2301M 0600 |
| 7.0 | -0.025 | 8 | | 19.0 | | 63 | 2 | EMBA 2300M 0700 | EMBA 2301M 0700 |
| 8.0 | -0.025 | 8 | | 20.0 | | 63 | 2 | EMBA 2300M 0800 | EMBA 2301M 0800 |
| 9.0 | -0.035 | 10 | | 22.0 | | 75 | 2 | EMBA 2300M 0900 | EMBA 2301M 0900 |
| 10.0 | -0.035 | 10 | | 22.0 | | 75 | 2 | EMBA 2300M 1000 | EMBA 2301M 1000 |
| 11.0 | -0.035 | 12 | | 25.0 | | 75 | 2 | EMBA 2300M 1100 | EMBA 2301M 1100 |
| 12.0 | -0.035 | 12 | | 25.0 | | 75 | 2 | EMBA 2300M 1200 | EMBA 2301M 1200 |
| 14.0 | -0.035 | 14 | | 32.0 | | 89 | 2 | EMBA 2300M 1400 | EMBA 2301M 1400 |
| 16.0 | -0.035 | 16 | | 32.0 | | 89 | 2 | EMBA 2300M 1600 | EMBA 2301M 1600 |
| 18.0 | -0.035 | 18 | | 38.0 | | 100 | 2 | EMBA 2300M 1800 | EMBA 2301M 1800 |
| 20.0 | -0.035 | 20 | | 38.0 | | 100 | 2 | EMBA 2300M 2000 | EMBA 2301M 2000 |

# UNIVERSAL

**4 Flute 30° Helix Square Endmills**

EMS 430



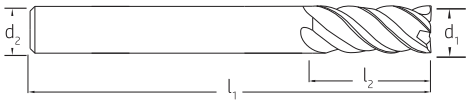




*Technical Info. Page No.* ***148***

| Steels | Stainless Steels | Cast Irons | Hardened Steels | Titaniums | Super Alloys | Aluminiums |
|---|---|---|---|---|---|---|
| <45 HRC | <900 N/mm² | <300 HB | - | <900 N/mm² | <900 N/mm² | |

| $d_1$ | $d_1$ | $d_2$ | $d_3$ | $l_2$ | $l_3$ | $l_1$ | z | EDP No. HA | EDP No. HB |
|---|---|---|---|---|---|---|---|---|---|
| | *tol.* | *h6* | *-0.1* | *±0.50* | *±0.50* | *±0.80* | | AlCrN | AlCrN |
| 1.0 | -0.010 | 3 | | 4.0 | | 38 | 4 | EMSA 4300M 0100 | |
| 1.5 | -0.020 | 3 | | 4.5 | | 38 | 4 | EMSA 4300M 0150 | |
| 2.0 | -0.020 | 3 | | 6.0 | | 38 | 4 | EMSA 4300M 0200 | |
| 2.5 | -0.025 | 3 | | 9.5 | | 38 | 4 | EMSA 4300M 0250 | |
| 3.0 | -0.025 | 3 | | 12.0 | | 38 | 4 | EMSA 4300M 0300 | |
| 3.5 | -0.025 | 4 | | 12.0 | | 50 | 4 | EMSA 4300M 0350 | |
| 4.0 | -0.025 | 4 | | 14.0 | | 50 | 4 | EMSA 4300M 0400 | |
| 4.5 | -0.025 | 6 | | 16.0 | | 50 | 4 | EMSA 4300M 0450 | EMSA 4301M 0450 |
| 5.0 | -0.025 | 6 | | 16.0 | | 50 | 4 | EMSA 4300M 0500 | EMSA 4301M 0500 |
| 6.0 | -0.025 | 6 | | 19.0 | | 50 | 4 | EMSA 4300M 0600 | EMSA 4301M 0600 |
| 7.0 | -0.025 | 8 | | 19.0 | | 63 | 4 | EMSA 4300M 0700 | EMSA 4301M 0700 |
| 8.0 | -0.025 | 8 | | 20.0 | | 63 | 4 | EMSA 4300M 0800 | EMSA 4301M 0800 |
| 9.0 | -0.035 | 10 | | 22.0 | | 75 | 4 | EMSA 4300M 0900 | EMSA 4301M 0900 |
| 10.0 | -0.035 | 10 | | 22.0 | | 75 | 4 | EMSA 4300M 1000 | EMSA 4301M 1000 |
| 11.0 | -0.035 | 12 | | 25.0 | | 75 | 4 | EMSA 4300M 1100 | EMSA 4301M 1100 |
| 12.0 | -0.035 | 12 | | 25.0 | | 75 | 4 | EMSA 4300M 1200 | EMSA 4301M 1200 |
| 14.0 | -0.035 | 14 | | 32.0 | | 89 | 4 | EMSA 4300M 1400 | EMSA 4301M 1400 |
| 16.0 | -0.035 | 16 | | 32.0 | | 89 | 4 | EMSA 4300M 1600 | EMSA 4301M 1600 |
| 18.0 | -0.035 | 18 | | 38.0 | | 100 | 4 | EMSA 4300M 1800 | EMSA 4301M 1800 |
| 20.0 | -0.035 | 20 | | 38.0 | | 100 | 4 | EMSA 4300M 2000 | EMSA 4301M 2000 |
| 25.0 | -0.035 | 25 | | 45.0 | | 100 | 4 | EMSA 4300M 2500 | EMSA 4301M 2500 |

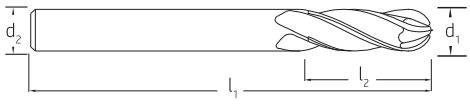




*Technical Info. Page No.* ***148***

| Steels | Stainless Steels | Cast Irons | Hardened Steels | Titaniums | Super Alloys | Aluminiums |
|---|---|---|---|---|---|---|
| <45 HRC | <900 N/mm² | <300 HB | - | <900 N/mm² | <900 N/mm² | |

| $d_1$ | $d_1$ | $d_2$ | $d_3$ | $l_2$ | $l_3$ | $l_1$ | z | EDP No. HA | EDP No. HB |
|---|---|---|---|---|---|---|---|---|---|
| | *tol.* | *h6* | *-0.1* | *±0.50* | *±0.50* | *±0.80* | | AlCrN | AlCrN |
| 2.0 | -0.020 | 4 | | 9.0 | | 75 | 4 | EMSA 4310L 0200 | |
| 3.0 | -0.025 | 4 | | 12.0 | | 75 | 4 | EMSA 4310L 0300 | |
| 4.0 | -0.025 | 4 | | 16.0 | | 75 | 4 | EMSA 4310L 0400 | |
| 5.0 | -0.025 | 6 | | 20.0 | | 75 | 4 | EMSA 4310L 0500 | EMSA 4311L 0500 |
| 6.0 | -0.025 | 6 | | 20.0 | | 75 | 4 | EMSA 4310L 0600 | EMSA 4311L 0600 |
| 8.0 | -0.025 | 8 | | 20.0 | | 100 | 4 | EMSA 4310L 0800 | EMSA 4311L 0800 |
| 10.0 | -0.035 | 10 | | 25.0 | | 100 | 4 | EMSA 4310L 1000 | EMSA 4311L 1000 |
| 12.0 | -0.035 | 12 | | 30.0 | | 100 | 4 | EMSA 4310L 1200 | EMSA 4311L 1200 |
| 16.0 | -0.035 | 16 | | 75.0 | | 150 | 4 | EMSA 4310L 1600 | EMSA 4311L 1600 |
| 20.0 | -0.035 | 20 | | 75.0 | | 150 | 4 | EMSA 4310L 2000 | EMSA 4311L 2000 |
| | | | | | | | | | |
| 2.0 | -0.020 | 4 | | 9.0 | | 100 | 4 | EMSA 4310X 0200 | |
| 3.0 | -0.025 | 4 | | 12.0 | | 100 | 4 | EMSA 4310X 0300 | |
| 4.0 | -0.025 | 4 | | 16.0 | | 100 | 4 | EMSA 4310X 0400 | |
| 5.0 | -0.025 | 6 | | 20.0 | | 100 | 4 | EMSA 4310X 0500 | EMSA 4311X 0500 |
| 6.0 | -0.025 | 6 | | 20.0 | | 100 | 4 | EMSA 4310X 0600 | EMSA 4311X 0600 |
| 8.0 | -0.025 | 8 | | 20.0 | | 120 | 4 | EMSA 4310X 0800 | EMSA 4311X 0800 |
| 10.0 | -0.035 | 10 | | 25.0 | | 120 | 4 | EMSA 4310X 1000 | EMSA 4311X 1000 |
| 12.0 | -0.035 | 12 | | 30.0 | | 120 | 4 | EMSA 4310X 1200 | EMSA 4311X 1200 |
| | | | | | | | | | |
| 3.0 | -0.025 | 3 | | 40.0 | | 100 | 4 | EMSA 4300X 0300 | |
| 4.0 | -0.025 | 4 | | 40.0 | | 100 | 4 | EMSA 4300X 0400 | |
| 5.0 | -0.025 | 5 | | 40.0 | | 100 | 4 | EMSA 4300X 0500 | |
| 6.0 | -0.025 | 6 | | 50.0 | | 100 | 4 | EMSA 4300X 0600 | EMSA 4301X 0600 |
| 8.0 | -0.025 | 8 | | 50.0 | | 100 | 4 | EMSA 4300X 0800 | EMSA 4301X 0800 |
| 10.0 | -0.035 | 10 | | 75.0 | | 150 | 4 | EMSA 4300X 1000 | EMSA 4301X 1000 |
| 12.0 | -0.035 | 12 | | 75.0 | | 150 | 4 | EMSA 4300X 1200 | EMSA 4301X 1200 |

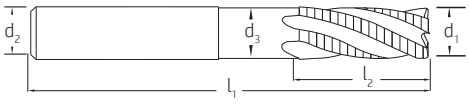




*Technical Info. Page No.* ***148***

| Steels | Stainless Steels | Cast Irons | Hardened Steels | Titaniums | Super Alloys | Aluminiums |
|---|---|---|---|---|---|---|
| <45 HRC | <900 N/mm² | <300 HB | - | <900 N/mm² | <900 N/mm² | - |

| $d_1$ | $d_1$ | $d_2$ | $d_3$ | $l_2$ | $l_3$ | $l_1$ | z | EDP No. HA | EDP No. HB |
|---|---|---|---|---|---|---|---|---|---|
| | *tol.* | *h6* | *-0.1* | *±0.50* | *±0.50* | *±0.80* | | AlCrN | AlCrN |
| 1.0 | -0.010 | 3 | | 4.0 | | 38 | 4 | EMBA 4300M 0100 | |
| 1.5 | -0.020 | 3 | | 4.5 | | 38 | 4 | EMBA 4300M 0150 | |
| 2.0 | -0.020 | 3 | | 6.0 | | 38 | 4 | EMBA 4300M 0200 | |
| 2.5 | -0.025 | 3 | | 9.5 | | 38 | 4 | EMBA 4300M 0250 | |
| 3.0 | -0.025 | 3 | | 12.0 | | 38 | 4 | EMBA 4300M 0300 | |
| 3.5 | -0.025 | 4 | | 12.0 | | 50 | 4 | EMBA 4300M 0350 | |
| 4.0 | -0.025 | 4 | | 14.0 | | 50 | 4 | EMBA 4300M 0400 | |
| 4.5 | -0.025 | 6 | | 16.0 | | 50 | 4 | EMBA 4300M 0450 | EMBA 4301M 0450 |
| 5.0 | -0.025 | 6 | | 16.0 | | 50 | 4 | EMBA 4300M 0500 | EMBA 4301M 0500 |
| 6.0 | -0.025 | 6 | | 19.0 | | 50 | 4 | EMBA 4300M 0600 | EMBA 4301M 0600 |
| 7.0 | -0.025 | 8 | | 19.0 | | 63 | 4 | EMBA 4300M 0700 | EMBA 4301M 0700 |
| 8.0 | -0.025 | 8 | | 20.0 | | 63 | 4 | EMBA 4300M 0800 | EMBA 4301M 0800 |
| 9.0 | -0.035 | 10 | | 22.0 | | 75 | 4 | EMBA 4300M 0900 | EMBA 4301M 0900 |
| 10.0 | -0.035 | 10 | | 22.0 | | 75 | 4 | EMBA 4300M 1000 | EMBA 4301M 1000 |
| 11.0 | -0.035 | 12 | | 25.0 | | 75 | 4 | EMBA 4300M 1100 | EMBA 4301M 1100 |
| 12.0 | -0.035 | 12 | | 25.0 | | 75 | 4 | EMBA 4300M 1200 | EMBA 4301M 1200 |
| 14.0 | -0.035 | 14 | | 32.0 | | 89 | 4 | EMBA 4300M 1400 | EMBA 4301M 1400 |
| 16.0 | -0.035 | 16 | | 32.0 | | 89 | 4 | EMBA 4300M 1600 | EMBA 4301M 1600 |
| 18.0 | -0.035 | 18 | | 38.0 | | 100 | 4 | EMBA 4300M 1800 | EMBA 4301M 1800 |
| 20.0 | -0.035 | 20 | | 38.0 | | 100 | 4 | EMBA 4300M 2000 | EMBA 4301M 2000 |
| 25.0 | -0.035 | 25 | | 38.0 | | 100 | 4 | EMBA 4300M 2500 | EMBA 4301M 2500 |





*Technical Info. Page No.* ***149***

| Steels | Stainless Steels | Cast Irons | Hardened Steels | Titaniums | Super Alloys | Aluminiums |
|---|---|---|---|---|---|---|
| <45 HRC | <900 N/mm² | <300 HB | - | <900 N/mm² | <900 N/mm² | - |

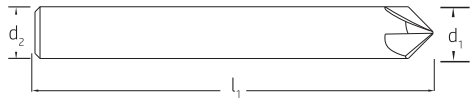
| $d_1$ | $d_1$ | $d_2$ | $d_3$ | $l_2$ | $l_3$ | $l_1$ | CCx45° | z | EDP No. HA | EDP No. HB |
|---|---|---|---|---|---|---|---|---|---|---|
| | *tol.* | *h6* | *-0.1* | *±0.50* | *±0.50* | *±0.80* | *-0.05* | | AlCrN | AlCrN |
| 3.0 | -0.025 | 6 | 2.8 | 8.0 | 15 | 57 | 0.10 | 3 | EMCA 7800M 0300 | EMCA 7801M 0300 |
| 4.0 | -0.025 | 6 | 3.8 | 11.0 | 17 | 57 | 0.15 | 4 | EMCA 7800M 0400 | EMCA 7801M 0400 |
| 5.0 | -0.025 | 6 | 4.8 | 13.0 | 19 | 57 | 0.15 | 4 | EMCA 7800M 0500 | EMCA 7801M 0500 |
| 6.0 | -0.025 | 6 | 5.8 | 13.0 | 21 | 57 | 0.20 | 4 | EMCA 7800M 0600 | EMCA 7801M 0600 |
| 8.0 | -0.025 | 8 | 7.6 | 19.0 | 27 | 63 | 0.20 | 4 | EMCA 7800M 0800 | EMCA 7801M 0800 |
| 10.0 | -0.035 | 10 | 9.5 | 22.0 | 32 | 72 | 0.30 | 4 | EMCA 7800M 1000 | EMCA 7801M 1000 |
| 12.0 | -0.035 | 12 | 11.5 | 26.0 | 38 | 83 | 0.35 | 4 | EMCA 7800M 1200 | EMCA 7801M 1200 |
| 16.0 | -0.035 | 16 | 15.5 | 32.0 | 44 | 92 | 040 | 5 | EMCA 7800M 1600 | EMCA 7801M 1600 |
| 20.0 | -0.035 | 20 | 19.5 | 38.0 | 54 | 104 | 0.50 | 6 | EMCA 7800M 2000 | EMCA 7801M 2000 |
| 25.0 | -0.035 | 25 | 24.5 | 45.0 | 65 | 121 | 0.60 | 8 | EMCA 7800M 2500 | EMCA 7801M 2500 |

# CHAMFER MILL

**60°/90°/120° Chamfer Endmills**

EMD 060
EMD 090
EMD 120







*Technical Info. Page No.* ***148***

| Steels | Stainless Steels | Cast Irons | Hardened Steels | Titaniums | Super Alloys | Aluminiums |
|---|---|---|---|---|---|---|
| <45 HRC | <900 N/mm² | <300 HB | - | <900 N/mm² | <900 N/mm² | - |

| $d_1$ | $d_1$ | $d_2$ | $l_2$ | $l_1$ | Point | z | EDP No. HA | EDP No. HB |
|---|---|---|---|---|---|---|---|---|
| | *tol.* | *h6* | *±0.50* | *±0.80* | | | AlCrN | AlCrN |
| 3.0 | -0.025 | 3 | - | 38 | 60° | 4 | EMDA 0602 0300 | |
| 4.0 | -0.025 | 4 | - | 54 | 60° | 4 | EMDA 0602 0400 | |
| 6.0 | -0.025 | 6 | - | 57 | 60° | 4 | EMDA 0602 0600 | EMDA 0612 0600 |
| 8.0 | -0.025 | 8 | - | 63 | 60° | 4 | EMDA 0602 0800 | EMDA 0612 0800 |
| 10.0 | -0.035 | 10 | - | 72 | 60° | 4 | EMDA 0602 1000 | EMDA 0612 1000 |
| 12.0 | -0.035 | 12 | - | 83 | 60° | 4 | EMDA 0602 1200 | EMDA 0612 1200 |
| 16.0 | -0.035 | 16 | - | 92 | 60° | 4 | EMDA 0602 1600 | EMDA 0612 1600 |
| 20.0 | -0.035 | 20 | - | 104 | 60° | 4 | EMDA 0602 2000 | EMDA 0612 2000 |
| 1.0 | -0.025 | 3 | - | 38 | 90° | 3 | EMDA 0902 0100 | |
| 2.0 | -0.025 | 3 | - | 38 | 90° | 3 | EMDA 0902 0200 | |
| 3.0 | -0.025 | 3 | - | 38 | 90° | 4 | EMDA 0902 0300 | |
| 4.0 | -0.025 | 4 | - | 54 | 90° | 4 | EMDA 0902 0400 | |
| 6.0 | -0.025 | 6 | - | 57 | 90° | 4 | EMDA 0902 0600 | EMDA 0912 0600 |
| 8.0 | -0.025 | 8 | - | 63 | 90° | 4 | EMDA 0902 0800 | EMDA 0912 0800 |
| 10.0 | -0.035 | 10 | - | 72 | 90° | 4 | EMDA 0902 1000 | EMDA 0912 1000 |
| 12.0 | -0.035 | 12 | - | 83 | 90° | 4 | EMDA 0902 1200 | EMDA 0912 1200 |
| 16.0 | -0.035 | 16 | - | 92 | 90° | 4 | EMDA 0902 1600 | EMDA 0912 1600 |
| 20.0 | -0.035 | 20 | - | 104 | 90° | 4 | EMDA 0902 2000 | EMDA 0912 2000 |
| 3.0 | -0.025 | 3 | - | 38 | 120° | 4 | EMDA 1202 0300 | |
| 4.0 | -0.025 | 4 | - | 54 | 120° | 4 | EMDA 1202 0400 | |
| 6.0 | -0.025 | 6 | - | 57 | 120° | 4 | EMDA 1202 0600 | EMDA 1212 0600 |
| 8.0 | -0.025 | 8 | - | 63 | 120° | 4 | EMDA 1202 0800 | EMDA 1212 0800 |
| 10.0 | -0.035 | 10 | - | 72 | 120° | 4 | EMDA 1202 1000 | EMDA 1212 1000 |
| 12.0 | -0.035 | 12 | - | 83 | 120° | 4 | EMDA 1202 1200 | EMDA 1212 1200 |
| 16.0 | -0.035 | 16 | - | 92 | 120° | 4 | EMDA 1202 1600 | EMDA 1212 1600 |
| 20.0 | -0.035 | 20 | - | 104 | 120° | 4 | EMDA 1202 2000 | EMDA 1212 2000 |

# DURONTO MICRO FX

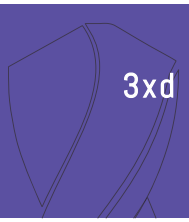
3xd to 25xd Micro drills with and without
Internal Coolant holes - Universal application

P M K S N

www.nmctools.com

# DURONTO-MICRO FX

**3xd Without Internal Spiral Coolant Holes**








140°±1°

SM

M <35HRC | M <1100 N/mm² | K <300 HB | S <1100 N/mm²

*Technical Info. Page No.* ***150***

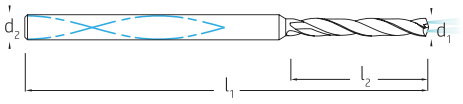
| $d_1$ | $d_2$ | $l_2$ | $l_1$ | EDP No. HA |
|---|---|---|---|---|
| *(m7)* | *(h6)* | *±0.50* | *±0.80* | PX |
| 1.00 | 3 | 7.0 | 35 | DFMP 0310 0100 |
| 1.10 | 3 | 7.0 | 35 | DFMP 0310 0110 |
| 1.20 | 3 | 8.0 | 35 | DFMP 0310 0120 |
| 1.30 | 3 | 8.0 | 35 | DFMP 0310 0130 |
| 140 | 3 | 9.0 | 35 | DFMP 0310 0140 |
| 1.50 | 3 | 9.0 | 40 | DFMP 0310 0150 |
| 1.60 | 3 | 10.0 | 40 | DFMP 0310 0160 |
| 1.70 | 3 | 10.0 | 40 | DFMP 0310 0170 |
| 1.80 | 3 | 11.0 | 40 | DFMP 0310 0180 |
| 1.90 | 3 | 11.0 | 40 | DFMP 0310 0190 |

| $d_1$ | $d_2$ | $l_2$ | $l_1$ | EDP No. HA |
|---|---|---|---|---|
| *(m7)* | *(h6)* | *±0.50* | *±0.80* | PX |
| 2.00 | 3 | 13.0 | 45 | DFMP 0310 0200 |
| 2.10 | 3 | 13.0 | 45 | DFMP 0310 0210 |
| 2.20 | 3 | 13.0 | 45 | DFMP 0310 0220 |
| 2.30 | 3 | 13.0 | 45 | DFMP 0310 0230 |
| 240 | 3 | 15.0 | 45 | DFMP 0310 0240 |
| 2.50 | 3 | 15.0 | 50 | DFMP 0310 0250 |
| 2.60 | 3 | 15.0 | 50 | DFMP 0310 0260 |
| 2.70 | 3 | 17.0 | 50 | DFMP 0310 0270 |
| 2.80 | 3 | 17.0 | 50 | DFMP 0310 0280 |
| 2.90 | 3 | 17.0 | 50 | DFMP 0310 0290 |

# DURONTO-MICRO FX

**3xd With Internal Spiral Coolant Holes**







140°±1°

SM

M <35HRC | M <1100 N/mm² | K <300 HB | S <1100 N/mm²

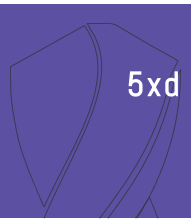
*Technical Info. Page No.* ***150***

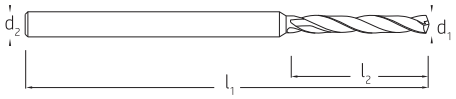
| $d_1$ | $d_2$ | $l_2$ | $l_1$ | EDP No. HA |
|---|---|---|---|---|
| *(m7)* | *(h6)* | *±0.50* | *±0.80* | PX |
| 2.20 | 3 | 8.6 | 55 | DFMP 0320 0220 |
| 2.25 | 3 | 8.8 | 55 | DFMP 0320 0225 |
| 2.30 | 3 | 9.0 | 55 | DFMP 0320 0230 |
| 2.35 | 3 | 9.2 | 55 | DFMP 0320 0235 |
| 240 | 3 | 94 | 55 | DFMP 0320 0240 |
| 245 | 3 | 9.6 | 55 | DFMP 0320 0245 |
| 2.50 | 3 | 9.8 | 55 | DFMP 0320 0250 |
| 2.55 | 3 | 10.0 | 55 | DFMP 0320 0255 |

| $d_1$ | $d_2$ | $l_2$ | $l_1$ | EDP No. HA |
|---|---|---|---|---|
| *(m7)* | *(h6)* | *±0.50* | *±0.80* | PX |
| 2.60 | 3 | 10.2 | 55 | DFMP 0320 0260 |
| 2.65 | 3 | 104 | 55 | DFMP 0320 0265 |
| 2.70 | 3 | 10.6 | 55 | DFMP 0320 0270 |
| 2.75 | 3 | 10.8 | 55 | DFMP 0320 0275 |
| 2.80 | 3 | 11.0 | 55 | DFMP 0320 0280 |
| 2.85 | 3 | 11.2 | 55 | DFMP 0320 0285 |
| 2.90 | 3 | 114 | 55 | DFMP 0320 0290 |

# DURONTO-MICRO FX

## 3xd Without Internal Spiral Coolant Holes





140°±1°

SM

| M | M | K | S |
|---|---|---|---|
| <35HRC | <1100 N/mm² | <300 HB | <1100 N/mm² |

*Technical Info. Page No.* ***150***

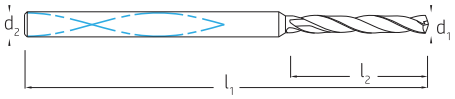
| $d_1$ | $d_2$ | $l_2$ | $l_1$ | EDP No. HA |
|---|---|---|---|---|
| *(m7)* | *(h6)* | *±0.50* | *±0.80* | PX |
| 040 | 3 | 3.6 | 38 | DFMP 0510 0040 |
| 045 | 3 | 3.8 | 38 | DFMP 0510 0045 |
| 0.50 | 3 | 4.0 | 38 | DFMP 0510 0050 |
| 0.55 | 3 | 4.6 | 38 | DFMP 0510 0055 |
| 0.60 | 3 | 4.8 | 38 | DFMP 0510 0060 |
| 0.65 | 3 | 5.0 | 38 | DFMP 0510 0065 |
| 0.70 | 3 | 6.0 | 38 | DFMP 0510 0070 |
| 0.75 | 3 | 6.2 | 38 | DFMP 0510 0075 |
| 0.80 | 3 | 64 | 38 | DFMP 0510 0080 |
| 0.85 | 3 | 6.7 | 38 | DFMP 0510 0085 |
| 0.90 | 3 | 7.0 | 38 | DFMP 0510 0090 |
| 0.95 | 3 | 7.3 | 38 | DFMP 0510 0095 |
| 1.00 | 3 | 7.5 | 38 | DFMP 0510 0100 |
| 1.05 | 3 | 7.8 | 38 | DFMP 0510 0105 |
| 1.10 | 3 | 8.0 | 38 | DFMP 0510 0110 |
| 1.15 | 3 | 8.3 | 38 | DFMP 0510 0115 |
| 1.20 | 3 | 8.5 | 38 | DFMP 0510 0120 |
| 1.25 | 3 | 8.8 | 38 | DFMP 0510 0125 |
| 1.30 | 3 | 9.0 | 38 | DFMP 0510 0130 |
| 1.35 | 3 | 9.5 | 38 | DFMP 0510 0135 |
| 140 | 3 | 10.0 | 38 | DFMP 0510 0140 |
| 145 | 3 | 10.5 | 38 | DFMP 0510 0145 |
| 1.50 | 3 | 11.0 | 38 | DFMP 0510 0150 |
| 1.55 | 3 | 11.3 | 38 | DFMP 0510 0155 |
| 1.60 | 3 | 11.5 | 38 | DFMP 0510 0160 |
| 1.65 | 3 | 11.8 | 38 | DFMP 0510 0165 |

| $d_1$ | $d_2$ | $l_2$ | $l_1$ | EDP No. HA |
|---|---|---|---|---|
| *(m7)* | *(h6)* | *±0.50* | *±0.80* | PX |
| 1.70 | 3 | 12.0 | 38 | DFMP 0510 0170 |
| 1.75 | 3 | 12.3 | 38 | DFMP 0510 0175 |
| 1.80 | 3 | 12.5 | 38 | DFMP 0510 0180 |
| 1.85 | 3 | 12.8 | 38 | DFMP 0510 0185 |
| 1.90 | 3 | 13.0 | 38 | DFMP 0510 0190 |
| 1.95 | 3 | 13.5 | 38 | DFMP 0510 0195 |
| 2.00 | 3 | 14.0 | 46 | DFMP 0510 0200 |
| 2.05 | 3 | 14.5 | 46 | DFMP 0510 0205 |
| 2.10 | 3 | 15.0 | 46 | DFMP 0510 0210 |
| 2.15 | 3 | 15.5 | 46 | DFMP 0510 0215 |
| 2.20 | 3 | 16.0 | 46 | DFMP 0510 0220 |
| 2.25 | 3 | 16.5 | 46 | DFMP 0510 0225 |
| 2.30 | 3 | 17.0 | 46 | DFMP 0510 0230 |
| 2.35 | 3 | 17.5 | 46 | DFMP 0510 0235 |
| 240 | 3 | 18.0 | 46 | DFMP 0510 0240 |
| 245 | 3 | 18.5 | 46 | DFMP 0510 0245 |
| 2.50 | 3 | 19.0 | 46 | DFMP 0510 0250 |
| 2.55 | 3 | 19.5 | 50 | DFMP 0510 0255 |
| 2.60 | 3 | 20.0 | 50 | DFMP 0510 0260 |
| 2.65 | 3 | 20.5 | 50 | DFMP 0510 0265 |
| 2.70 | 3 | 21.0 | 50 | DFMP 0510 0270 |
| 2.75 | 3 | 21.5 | 50 | DFMP 0510 0275 |
| 2.80 | 3 | 22.0 | 50 | DFMP 0510 0280 |
| 2.85 | 3 | 22.5 | 50 | DFMP 0510 0285 |
| 2.90 | 3 | 23.0 | 50 | DFMP 0510 0290 |

# DURONTO-MICRO FX

**5xd With Internal Spiral Coolant Holes**







140°±1°

SM

| M | M | K | S |
|---|---|---|---|
| <35HRC | <1100 N/mm² | <300 HB | <1100 N/mm² |

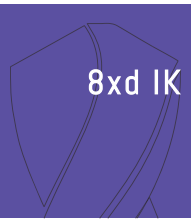
*Technical Info. Page No.* ***150***

| $d_1$ | $d_2$ | $l_2$ | $l_1$ | EDP No. HA |
|---|---|---|---|---|
| *(m7)* | *(h6)* | *±0.50* | *±0.80* | PX |
| 2.20 | 3 | 14.3 | 55 | DFMP 0520 0220 |
| 2.25 | 3 | 14.6 | 55 | DFMP 0520 0225 |
| 2.30 | 3 | 15.0 | 55 | DFMP 0520 0230 |
| 2.35 | 3 | 15.3 | 55 | DFMP 0520 0235 |
| 240 | 3 | 15.6 | 55 | DFMP 0520 0240 |
| 245 | 3 | 15.9 | 55 | DFMP 0520 0245 |
| 2.50 | 3 | 16.3 | 55 | DFMP 0520 0250 |
| 2.55 | 3 | 16.6 | 55 | DFMP 0520 0255 |

| $d_1$ | $d_2$ | $l_2$ | $l_1$ | EDP No. HA |
|---|---|---|---|---|
| *(m7)* | *(h6)* | *±0.50* | *±0.80* | PX |
| 2.60 | 3 | 16.9 | 55 | DFMP 0520 0260 |
| 2.65 | 3 | 17.2 | 55 | DFMP 0520 0265 |
| 2.70 | 3 | 17.6 | 55 | DFMP 0520 0270 |
| 2.75 | 3 | 17.9 | 55 | DFMP 0520 0275 |
| 2.80 | 3 | 18.2 | 55 | DFMP 0520 0280 |
| 2.85 | 3 | 18.5 | 55 | DFMP 0520 0285 |
| 2.90 | 3 | 18.9 | 55 | DFMP 0520 0290 |
| 2.95 | 3 | 19.2 | 55 | DFMP 0520 0295 |

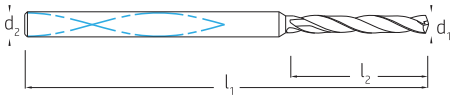
# DURONTO-MICRO FX

## 8xd With Internal Spiral Coolant Holes



8xd IK







140°±1°

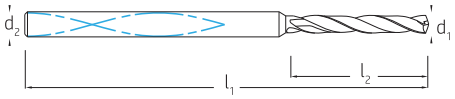
SM

M <35HRC
M <1100 N/mm²
K <300 HB
S <1100 N/mm²

*Technical Info. Page No.* ***150***

| $d_1$ | $d_2$ | $l_2$ | $l_1$ | EDP No. HA |
|---|---|---|---|---|
| *(m7)* | *(h6)* | *±0.50* | *±0.80* | PX |
| 2.20 | 3 | 20.9 | 60 | DFMP 0820 0220 |
| 2.25 | 3 | 21.4 | 60 | DFMP 0820 0225 |
| 2.30 | 3 | 21.9 | 60 | DFMP 0820 0230 |
| 2.35 | 3 | 22.3 | 60 | DFMP 0820 0235 |
| 240 | 3 | 22.8 | 60 | DFMP 0820 0240 |
| 245 | 3 | 23.3 | 60 | DFMP 0820 0245 |
| 2.50 | 3 | 23.8 | 60 | DFMP 0820 0250 |
| 2.55 | 3 | 24.2 | 60 | DFMP 0820 0255 |

| $d_1$ | $d_2$ | $l_2$ | $l_1$ | EDP No. HA |
|---|---|---|---|---|
| *(m7)* | *(h6)* | *±0.50* | *±0.80* | PX |
| 2.60 | 3 | 24.7 | 60 | DFMP 0820 0260 |
| 2.65 | 3 | 25.2 | 60 | DFMP 0820 0265 |
| 2.70 | 3 | 25.7 | 60 | DFMP 0820 0270 |
| 2.75 | 3 | 26.1 | 60 | DFMP 0820 0275 |
| 2.80 | 3 | 26.6 | 60 | DFMP 0820 0280 |
| 2.85 | 3 | 27.1 | 60 | DFMP 0820 0285 |
| 2.90 | 3 | 27.6 | 60 | DFMP 0820 0290 |
| 2.95 | 3 | 28.0 | 60 | DFMP 0820 0295 |





| M | M | K | S |
|---|---|---|---|
| <35HRC | <1100 N/mm² | <300 HB | <1100 N/mm² |

*Technical Info. Page No.* ***150***

| $d_1$ | $d_2$ | $l_2$ | $l_1$ | EDP No. HA |
|---|---|---|---|---|
| *(m7)* | *(h6)* | *±0.50* | *±0.80* | PX |
| 2.20 | 3 | 29.7 | 65 | DFMP 1220 0220 |
| 2.25 | 3 | 304 | 65 | DFMP 1220 0225 |
| 2.30 | 3 | 31.1 | 65 | DFMP 1220 0230 |
| 2.35 | 3 | 31.7 | 75 | DFMP 1220 0235 |
| 240 | 3 | 324 | 75 | DFMP 1220 0240 |
| 245 | 3 | 33.1 | 75 | DFMP 1220 0245 |
| 2.50 | 3 | 33.8 | 75 | DFMP 1220 0250 |
| 2.55 | 3 | 344 | 75 | DFMP 1220 0255 |

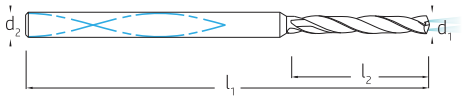
| $d_1$ | $d_2$ | $l_2$ | $l_1$ | EDP No. HA |
|---|---|---|---|---|
| *(m7)* | *(h6)* | *±0.50* | *±0.80* | PX |
| 2.60 | 3 | 35.1 | 75 | DFMP 1220 0260 |
| 2.65 | 3 | 35.8 | 75 | DFMP 1220 0265 |
| 2.70 | 3 | 36.5 | 75 | DFMP 1220 0270 |
| 2.75 | 3 | 37.1 | 75 | DFMP 1220 0275 |
| 2.80 | 3 | 37.8 | 75 | DFMP 1220 0280 |
| 2.85 | 3 | 38.5 | 75 | DFMP 1220 0285 |
| 2.90 | 3 | 39.2 | 75 | DFMP 1220 0290 |

# DURONTO-MICRO FX

## 20xd Withou Internal Spiral Coolant Holes

20xd IK







140°±1°

SM

M <35HRC | M <1100 N/mm² | K <300 HB | S <1100 N/mm²

*Technical Info. Page No.* ***150***

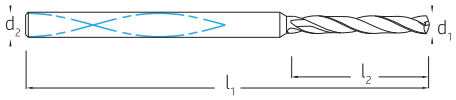
| $d_1$ | $d_2$ | $l_2$ | $l_1$ | EDP No. HA |
|---|---|---|---|---|
| *(m7)* | *(h6)* | *±0.50* | *±0.80* | PX |
| 2.20 | 3 | 50.6 | 90 | DFMP 2020 0220 |
| 2.30 | 3 | 52.9 | 92 | DFMP 2020 0230 |
| 240 | 3 | 55.2 | 94 | DFMP 2020 0240 |
| 2.50 | 3 | 57.5 | 96 | DFMP 2020 0250 |

| $d_1$ | $d_2$ | $l_2$ | $l_1$ | EDP No. HA |
|---|---|---|---|---|
| *(m7)* | *(h6)* | *±0.50* | *±0.80* | PX |
| 2.60 | 3 | 59.8 | 99 | DFMP 2020 0260 |
| 2.70 | 3 | 62.1 | 101 | DFMP 2020 0270 |
| 2.80 | 3 | 644 | 103 | DFMP 2020 0280 |
| 2.90 | 3 | 66.7 | 105 | DFMP 2020 0290 |

# DURONTO-MICRO FX

**25xd With Internal Spiral Coolant Holes**






RH

140°±1°

SM

| M | M | K | S |
|---|---|---|---|
| <35HRC | <1100 N/mm² | <300 HB | <1100 N/mm² |

*Technical Info. Page No.* ***150***

| $d_1$ | $d_2$ | $l_2$ | $l_1$ | EDP No. HA |
|---|---|---|---|---|
| *(m7)* | *(h6)* | *±0.50* | *±0.80* | PX |
| 2.20 | 3 | 72.6 | 112 | DFMP 2520 0220 |
| 2.30 | 3 | 75.9 | 115 | DFMP 2520 0230 |
| 240 | 3 | 79.2 | 118 | DFMP 2520 0240 |
| 2.50 | 3 | 82.5 | 121 | DFMP 2520 0250 |

| $d_1$ | $d_2$ | $l_2$ | $l_1$ | EDP No. HA |
|---|---|---|---|---|
| *(m7)* | *(h6)* | *±0.50* | *±0.80* | PX |
| 2.60 | 3 | 85.8 | 125 | DFMP 2520 0260 |
| 2.70 | 3 | 89.1 | 128 | DFMP 2520 0270 |
| 2.80 | 3 | 924 | 131 | DFMP 2520 0280 |
| 2.90 | 3 | 95.7 | 134 | DFMP 2520 0290 |

NMC TOOLS

# DURONTO DRILLS

3xd and 5xd with and without Internal Coolant Holes for Steels and Cast Irons

P K

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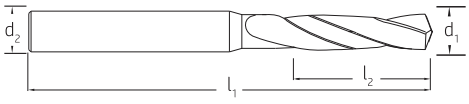
# DURONTO

## 3xd Without Internal Spiral Coolant Holes




RH

140°±1°

SM

M <45HRC

K <390 HB

*Technical Info. Page No.* ***151***

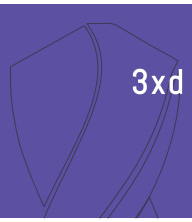
| $d_1$ | $d_2$ | $l_2$ | $l_1$ | EDP No. HA |
|---|---|---|---|---|
| *(m7)* | *(h6)* | *±0.50* | *±0.80* | AlCrN |
| 3.00 | 6 | 20 | 62 | DDDA 0310 0300 |
| 3.10 | 6 | 20 | 62 | DDDA 0310 0310 |
| 3.20 | 6 | 20 | 62 | DDDA 0310 0320 |
| 3.30 | 6 | 20 | 62 | DDDA 0310 0330 |
| 340 | 6 | 20 | 62 | DDDA 0310 0340 |
| 3.50 | 6 | 20 | 62 | DDDA 0310 0350 |
| 3.60 | 6 | 20 | 62 | DDDA 0310 0360 |
| 3.70 | 6 | 20 | 62 | DDDA 0310 0370 |
| 3.80 | 6 | 24 | 66 | DDDA 0310 0380 |
| 3.90 | 6 | 24 | 66 | DDDA 0310 0390 |
| 4.00 | 6 | 24 | 66 | DDDA 0310 0400 |
| 4.10 | 6 | 24 | 66 | DDDA 0310 0410 |
| 4.20 | 6 | 24 | 66 | DDDA 0310 0420 |
| 4.30 | 6 | 24 | 66 | DDDA 0310 0430 |
| 440 | 6 | 24 | 66 | DDDA 0310 0440 |
| 4.50 | 6 | 24 | 66 | DDDA 0310 0450 |
| 4.60 | 6 | 24 | 66 | DDDA 0310 0460 |
| 4.70 | 6 | 24 | 66 | DDDA 0310 0470 |
| 4.80 | 6 | 28 | 66 | DDDA 0310 0480 |
| 4.90 | 6 | 28 | 66 | DDDA 0310 0490 |
| 5.00 | 6 | 28 | 66 | DDDA 0310 0500 |
| 5.10 | 6 | 28 | 66 | DDDA 0310 0510 |
| 5.20 | 6 | 28 | 66 | DDDA 0310 0520 |
| 5.30 | 6 | 28 | 66 | DDDA 0310 0530 |
| 540 | 6 | 28 | 66 | DDDA 0310 0540 |
| 5.50 | 6 | 28 | 66 | DDDA 0310 0550 |
| 5.60 | 6 | 28 | 66 | DDDA 0310 0560 |

| $d_1$ | $d_2$ | $l_2$ | $l_1$ | EDP No. HA |
|---|---|---|---|---|
| *(m7)* | *(h6)* | *±0.50* | *±0.80* | AlCrN |
| 5.70 | 6 | 28 | 66 | DDDA 0310 0570 |
| 5.80 | 6 | 28 | 66 | DDDA 0310 0580 |
| 5.90 | 6 | 28 | 66 | DDDA 0310 0590 |
| 6.00 | 6 | 28 | 66 | DDDA 0310 0600 |
| 6.10 | 8 | 34 | 79 | DDDA 0310 0610 |
| 6.20 | 8 | 34 | 79 | DDDA 0310 0620 |
| 6.30 | 8 | 34 | 79 | DDDA 0310 0630 |
| 640 | 8 | 34 | 79 | DDDA 0310 0640 |
| 6.50 | 8 | 34 | 79 | DDDA 0310 0650 |
| 6.60 | 8 | 34 | 79 | DDDA 0310 0660 |
| 6.70 | 8 | 34 | 79 | DDDA 0310 0670 |
| 6.80 | 8 | 34 | 79 | DDDA 0310 0680 |
| 6.90 | 8 | 34 | 79 | DDDA 0310 0690 |
| 7.00 | 8 | 34 | 79 | DDDA 0310 0700 |
| 7.10 | 8 | 41 | 79 | DDDA 0310 0710 |
| 7.20 | 8 | 41 | 79 | DDDA 0310 0720 |
| 7.30 | 8 | 41 | 79 | DDDA 0310 0730 |
| 740 | 8 | 41 | 79 | DDDA 0310 0740 |
| 7.50 | 8 | 41 | 79 | DDDA 0310 0750 |
| 7.60 | 8 | 41 | 79 | DDDA 0310 0760 |
| 7.70 | 8 | 41 | 79 | DDDA 0310 0770 |
| 7.80 | 8 | 41 | 79 | DDDA 0310 0780 |
| 7.90 | 8 | 41 | 79 | DDDA 0310 0790 |
| 8.00 | 8 | 41 | 79 | DDDA 0310 0800 |
| 8.10 | 10 | 47 | 89 | DDDA 0310 0810 |
| 8.20 | 10 | 47 | 89 | DDDA 0310 0820 |
| 8.30 | 10 | 47 | 89 | DDDA 0310 0830 |

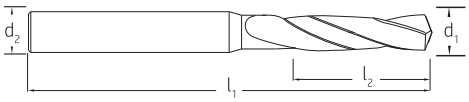
*Order Code for HB Shank, AlCrN Coated: DDDA 0311 | Order Code for HE Shank, AlCrN Coated: DDDA 0312

# DURONTO

## 3xd Without Internal Spiral Coolant Holes







M <45HRC  K <390 HB

*Technical Info. Page No.* ***151***

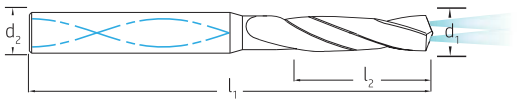
| $d_1$ (m7) | $d_2$ (h6) | $l_2$ ±0.50 | $l_1$ ±0.80 | EDP No. HA AlCrN |
|---|---|---|---|---|
| 840 | 10 | 47 | 89 | DDDA 0310 0840 |
| 8.50 | 10 | 47 | 89 | DDDA 0310 0850 |
| 8.60 | 10 | 47 | 89 | DDDA 0310 0860 |
| 8.70 | 10 | 47 | 89 | DDDA 0310 0870 |
| 8.80 | 10 | 47 | 89 | DDDA 0310 0880 |
| 8.90 | 10 | 47 | 89 | DDDA 0310 0890 |
| 9.00 | 10 | 47 | 89 | DDDA 0310 0900 |
| 9.10 | 10 | 47 | 89 | DDDA 0310 0910 |
| 9.20 | 10 | 47 | 89 | DDDA 0310 0920 |
| 9.30 | 10 | 47 | 89 | DDDA 0310 0930 |
| 940 | 10 | 47 | 89 | DDDA 0310 0940 |
| 9.50 | 10 | 47 | 89 | DDDA 0310 0950 |
| 9.60 | 10 | 47 | 89 | DDDA 0310 0960 |
| 9.70 | 10 | 47 | 89 | DDDA 0310 0970 |
| 9.80 | 10 | 47 | 89 | DDDA 0310 0980 |
| 9.90 | 10 | 47 | 89 | DDDA 0310 0990 |
| 10.00 | 10 | 47 | 89 | DDDA 0310 1000 |
| 10.10 | 12 | 55 | 102 | DDDA 0310 1010 |
| 10.20 | 12 | 55 | 102 | DDDA 0310 1020 |
| 10.30 | 12 | 55 | 102 | DDDA 0310 1030 |
| 1040 | 12 | 55 | 102 | DDDA 0310 1040 |
| 10.50 | 12 | 55 | 102 | DDDA 0310 1050 |
| 10.60 | 12 | 55 | 102 | DDDA 0310 1060 |
| 10.70 | 12 | 55 | 102 | DDDA 0310 1070 |
| 10.80 | 12 | 55 | 102 | DDDA 0310 1080 |
| 10.90 | 12 | 55 | 102 | DDDA 0310 1090 |
| 11.00 | 12 | 55 | 102 | DDDA 0310 1100 |

| $d_1$ (m7) | $d_2$ (h6) | $l_2$ ±0.50 | $l_1$ ±0.80 | EDP No. HA AlCrN |
|---|---|---|---|---|
| 11.10 | 12 | 55 | 102 | DDDA 0310 1110 |
| 11.20 | 12 | 55 | 102 | DDDA 0310 1120 |
| 11.30 | 12 | 55 | 102 | DDDA 0310 1130 |
| 1140 | 12 | 55 | 102 | DDDA 0310 1140 |
| 11.50 | 12 | 55 | 102 | DDDA 0310 1150 |
| 11.60 | 12 | 55 | 102 | DDDA 0310 1160 |
| 11.70 | 12 | 55 | 102 | DDDA 0310 1170 |
| 11.80 | 12 | 55 | 102 | DDDA 0310 1180 |
| 11.90 | 12 | 55 | 102 | DDDA 0310 1190 |
| 12.00 | 12 | 55 | 102 | DDDA 0310 1200 |
| 12.50 | 14 | 60 | 107 | DDDA 0310 1250 |
| 12.70 | 14 | 60 | 107 | DDDA 0310 1270 |
| 13.00 | 14 | 60 | 107 | DDDA 0310 1300 |
| 13.50 | 14 | 60 | 107 | DDDA 0310 1350 |
| 14.00 | 14 | 60 | 107 | DDDA 0310 1400 |
| 14.50 | 16 | 65 | 115 | DDDA 0310 1450 |
| 15.00 | 16 | 65 | 115 | DDDA 0310 1500 |
| 15.50 | 16 | 65 | 115 | DDDA 0310 1550 |
| 16.00 | 16 | 65 | 115 | DDDA 0310 1600 |
| 16.50 | 18 | 73 | 123 | DDDA 0310 1650 |
| 17.00 | 18 | 73 | 123 | DDDA 0310 1700 |
| 17.50 | 18 | 73 | 123 | DDDA 0310 1750 |
| 18.00 | 18 | 73 | 123 | DDDA 0310 1800 |
| 18.50 | 20 | 79 | 131 | DDDA 0310 1850 |
| 19.00 | 20 | 79 | 131 | DDDA 0310 1900 |
| 19.50 | 20 | 79 | 131 | DDDA 0310 1950 |
| 20.00 | 20 | 79 | 131 | DDDA 0310 2000 |

*Order Code for HB Shank, AlCrN Coated: DDDA 0311 | Order Code for HE Shank, AlCrN Coated: DDDA 0312

# DURONTO

## 3xd With Internal Spiral Coolant Holes




RH

140°±1°

SM

M <45HRC

K <390 HB

*Technical Info. Page No.* ***151***

| $d_1$ | $d_2$ | $l_2$ | $l_1$ | EDP No. HA |
|---|---|---|---|---|
| *(m7)* | *(h6)* | *±0.50* | *±0.80* | AlCrN |
| 3.00 | 6 | 20 | 62 | DDDA 0320 0300 |
| 3.10 | 6 | 20 | 62 | DDDA 0320 0310 |
| 3.20 | 6 | 20 | 62 | DDDA 0320 0320 |
| 3.30 | 6 | 20 | 62 | DDDA 0320 0330 |
| 340 | 6 | 20 | 62 | DDDA 0320 0340 |
| 3.50 | 6 | 20 | 62 | DDDA 0320 0350 |
| 3.60 | 6 | 20 | 62 | DDDA 0320 0360 |
| 3.70 | 6 | 20 | 62 | DDDA 0320 0370 |
| 3.80 | 6 | 24 | 66 | DDDA 0320 0380 |
| 3.90 | 6 | 24 | 66 | DDDA 0320 0390 |
| 4.00 | 6 | 24 | 66 | DDDA 0320 0400 |
| 4.10 | 6 | 24 | 66 | DDDA 0320 0410 |
| 4.20 | 6 | 24 | 66 | DDDA 0320 0420 |
| 4.30 | 6 | 24 | 66 | DDDA 0320 0430 |
| 440 | 6 | 24 | 66 | DDDA 0320 0440 |
| 4.50 | 6 | 24 | 66 | DDDA 0320 0450 |
| 4.60 | 6 | 24 | 66 | DDDA 0320 0460 |
| 4.70 | 6 | 24 | 66 | DDDA 0320 0470 |
| 4.80 | 6 | 28 | 66 | DDDA 0320 0480 |
| 4.90 | 6 | 28 | 66 | DDDA 0320 0490 |
| 5.00 | 6 | 28 | 66 | DDDA 0320 0500 |
| 5.10 | 6 | 28 | 66 | DDDA 0320 0510 |
| 5.20 | 6 | 28 | 66 | DDDA 0320 0520 |
| 5.30 | 6 | 28 | 66 | DDDA 0320 0530 |
| 540 | 6 | 28 | 66 | DDDA 0320 0540 |
| 5.50 | 6 | 28 | 66 | DDDA 0320 0550 |
| 5.60 | 6 | 28 | 66 | DDDA 0320 0560 |

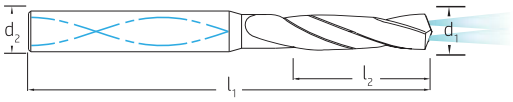
| $d_1$ | $d_2$ | $l_2$ | $l_1$ | EDP No. HA |
|---|---|---|---|---|
| *(m7)* | *(h6)* | *±0.50* | *±0.80* | AlCrN |
| 5.70 | 6 | 28 | 66 | DDDA 0320 0570 |
| 5.80 | 6 | 28 | 66 | DDDA 0320 0580 |
| 5.90 | 6 | 28 | 66 | DDDA 0320 0590 |
| 6.00 | 6 | 28 | 66 | DDDA 0320 0600 |
| 6.10 | 8 | 34 | 79 | DDDA 0320 0610 |
| 6.20 | 8 | 34 | 79 | DDDA 0320 0620 |
| 6.30 | 8 | 34 | 79 | DDDA 0320 0630 |
| 640 | 8 | 34 | 79 | DDDA 0320 0640 |
| 6.50 | 8 | 34 | 79 | DDDA 0320 0650 |
| 6.60 | 8 | 34 | 79 | DDDA 0320 0660 |
| 6.70 | 8 | 34 | 79 | DDDA 0320 0670 |
| 6.80 | 8 | 34 | 79 | DDDA 0320 0680 |
| 6.90 | 8 | 34 | 79 | DDDA 0320 0690 |
| 7.00 | 8 | 34 | 79 | DDDA 0320 0700 |
| 7.10 | 8 | 41 | 79 | DDDA 0320 0710 |
| 7.20 | 8 | 41 | 79 | DDDA 0320 0720 |
| 7.30 | 8 | 41 | 79 | DDDA 0320 0730 |
| 740 | 8 | 41 | 79 | DDDA 0320 0740 |
| 7.50 | 8 | 41 | 79 | DDDA 0320 0750 |
| 7.60 | 8 | 41 | 79 | DDDA 0320 0760 |
| 7.70 | 8 | 41 | 79 | DDDA 0320 0770 |
| 7.80 | 8 | 41 | 79 | DDDA 0320 0780 |
| 7.90 | 8 | 41 | 79 | DDDA 0320 0790 |
| 8.00 | 8 | 41 | 79 | DDDA 0320 0800 |
| 8.10 | 10 | 47 | 89 | DDDA 0320 0810 |
| 8.20 | 10 | 47 | 89 | DDDA 0320 0820 |
| 8.30 | 10 | 47 | 89 | DDDA 0320 0830 |

*Order Code for HB Shank, AlCrN Coated: DDDA 0321 | Order Code for HE Shank, AlCrN Coated: DDDA 0322

# DURONTO

## 3xd With Internal Spiral Coolant Holes

3xd IK





140°±1°

SM

M <45HRC

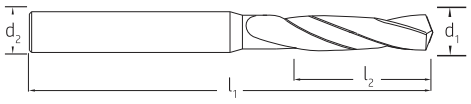
K <390 HB

*Technical Info. Page No.* ***151***

| $d_1$ | $d_2$ | $l_2$ | $l_1$ | EDP No. HA |
|---|---|---|---|---|
| *(m7)* | *(h6)* | *±0.50* | *±0.80* | AlCrN |
| 840 | 10 | 47 | 89 | DDDA 0320 0840 |
| 8.50 | 10 | 47 | 89 | DDDA 0320 0850 |
| 8.60 | 10 | 47 | 89 | DDDA 0320 0860 |
| 8.70 | 10 | 47 | 89 | DDDA 0320 0870 |
| 8.80 | 10 | 47 | 89 | DDDA 0320 0880 |
| 8.90 | 10 | 47 | 89 | DDDA 0320 0890 |
| 9.00 | 10 | 47 | 89 | DDDA 0320 0900 |
| 9.10 | 10 | 47 | 89 | DDDA 0320 0910 |
| 9.20 | 10 | 47 | 89 | DDDA 0320 0920 |
| 9.30 | 10 | 47 | 89 | DDDA 0320 0930 |
| 940 | 10 | 47 | 89 | DDDA 0320 0940 |
| 9.50 | 10 | 47 | 89 | DDDA 0320 0950 |
| 9.60 | 10 | 47 | 89 | DDDA 0320 0960 |
| 9.70 | 10 | 47 | 89 | DDDA 0320 0970 |
| 9.80 | 10 | 47 | 89 | DDDA 0320 0980 |
| 9.90 | 10 | 47 | 89 | DDDA 0320 0990 |
| 10.00 | 10 | 47 | 89 | DDDA 0320 1000 |
| 10.10 | 12 | 55 | 102 | DDDA 0320 1010 |
| 10.20 | 12 | 55 | 102 | DDDA 0320 1020 |
| 10.30 | 12 | 55 | 102 | DDDA 0320 1030 |
| 1040 | 12 | 55 | 102 | DDDA 0320 1040 |
| 10.50 | 12 | 55 | 102 | DDDA 0320 1050 |
| 10.60 | 12 | 55 | 102 | DDDA 0320 1060 |
| 10.70 | 12 | 55 | 102 | DDDA 0320 1070 |
| 10.80 | 12 | 55 | 102 | DDDA 0320 1080 |
| 10.90 | 12 | 55 | 102 | DDDA 0320 1090 |
| 11.00 | 12 | 55 | 102 | DDDA 0320 1100 |

| $d_1$ | $d_2$ | $l_2$ | $l_1$ | EDP No. HA |
|---|---|---|---|---|
| *(m7)* | *(h6)* | *±0.50* | *±0.80* | AlCrN |
| 11.10 | 12 | 55 | 102 | DDDA 0320 1110 |
| 11.20 | 12 | 55 | 102 | DDDA 0320 1120 |
| 11.30 | 12 | 55 | 102 | DDDA 0320 1130 |
| 1140 | 12 | 55 | 102 | DDDA 0320 1140 |
| 11.50 | 12 | 55 | 102 | DDDA 0320 1150 |
| 11.60 | 12 | 55 | 102 | DDDA 0320 1160 |
| 11.70 | 12 | 55 | 102 | DDDA 0320 1170 |
| 11.80 | 12 | 55 | 102 | DDDA 0320 1180 |
| 11.90 | 12 | 55 | 102 | DDDA 0320 1190 |
| 12.00 | 12 | 55 | 102 | DDDA 0320 1200 |
| 12.50 | 14 | 60 | 107 | DDDA 0320 1250 |
| 12.70 | 14 | 60 | 107 | DDDA 0320 1270 |
| 13.00 | 14 | 60 | 107 | DDDA 0320 1300 |
| 13.50 | 14 | 60 | 107 | DDDA 0320 1350 |
| 14.00 | 14 | 60 | 107 | DDDA 0320 1400 |
| 14.50 | 16 | 65 | 115 | DDDA 0320 1450 |
| 15.00 | 16 | 65 | 115 | DDDA 0320 1500 |
| 15.50 | 16 | 65 | 115 | DDDA 0320 1550 |
| 16.00 | 16 | 65 | 115 | DDDA 0320 1600 |
| 16.50 | 18 | 73 | 123 | DDDA 0320 1650 |
| 17.00 | 18 | 73 | 123 | DDDA 0320 1700 |
| 17.50 | 18 | 73 | 123 | DDDA 0320 1750 |
| 18.00 | 18 | 73 | 123 | DDDA 0320 1800 |
| 19.00 | 20 | 79 | 131 | DDDA 0320 1900 |
| 19.50 | 20 | 79 | 131 | DDDA 0320 1950 |
| 20.00 | 20 | 79 | 131 | DDDA 0320 2000 |

*Order Code for HB Shank, AlCrN Coated: DDDA 0321 | Order Code for HE Shank, AlCrN Coated: DDDA 0322





M <45HRC
K <390 HB

*Technical Info. Page No.* ***151***

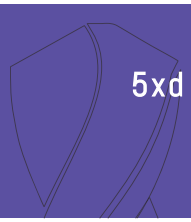
| $d_1$ | $d_2$ | $l_2$ | $l_1$ | EDP No. HA |
|---|---|---|---|---|
| *(m7)* | *(h6)* | *±0.50* | *±0.80* | AlCrN |
| 3.00 | 6 | 28 | 66 | DDDA 0510 0300 |
| 3.10 | 6 | 28 | 66 | DDDA 0510 0310 |
| 3.20 | 6 | 28 | 66 | DDDA 0510 0320 |
| 3.30 | 6 | 28 | 66 | DDDA 0510 0330 |
| 340 | 6 | 28 | 66 | DDDA 0510 0340 |
| 3.50 | 6 | 28 | 66 | DDDA 0510 0350 |
| 3.60 | 6 | 28 | 66 | DDDA 0510 0360 |
| 3.70 | 6 | 28 | 66 | DDDA 0510 0370 |
| 3.80 | 6 | 36 | 74 | DDDA 0510 0380 |
| 3.90 | 6 | 36 | 74 | DDDA 0510 0390 |
| 4.00 | 6 | 36 | 74 | DDDA 0510 0400 |
| 4.10 | 6 | 36 | 74 | DDDA 0510 0410 |
| 4.20 | 6 | 36 | 74 | DDDA 0510 0420 |
| 4.30 | 6 | 36 | 74 | DDDA 0510 0430 |
| 440 | 6 | 36 | 74 | DDDA 0510 0440 |
| 4.50 | 6 | 36 | 74 | DDDA 0510 0450 |
| 4.60 | 6 | 36 | 74 | DDDA 0510 0460 |
| 4.70 | 6 | 36 | 74 | DDDA 0510 0470 |
| 4.80 | 6 | 44 | 82 | DDDA 0510 0480 |
| 4.90 | 6 | 44 | 82 | DDDA 0510 0490 |
| 5.00 | 6 | 44 | 82 | DDDA 0510 0500 |
| 5.10 | 6 | 44 | 82 | DDDA 0510 0510 |
| 5.20 | 6 | 44 | 82 | DDDA 0510 0520 |
| 5.30 | 6 | 44 | 82 | DDDA 0510 0530 |
| 540 | 6 | 44 | 82 | DDDA 0510 0540 |
| 5.50 | 6 | 44 | 82 | DDDA 0510 0550 |
| 5.60 | 6 | 44 | 82 | DDDA 0510 0560 |

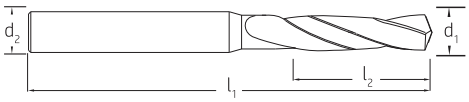
| $d_1$ | $d_2$ | $l_2$ | $l_1$ | EDP No. HA |
|---|---|---|---|---|
| *(m7)* | *(h6)* | *±0.50* | *±0.80* | AlCrN |
| 5.70 | 6 | 44 | 82 | DDDA 0510 0570 |
| 5.80 | 6 | 44 | 82 | DDDA 0510 0580 |
| 5.90 | 6 | 44 | 82 | DDDA 0510 0590 |
| 6.00 | 6 | 44 | 82 | DDDA 0510 0600 |
| 6.10 | 8 | 53 | 91 | DDDA 0510 0610 |
| 6.20 | 8 | 53 | 91 | DDDA 0510 0620 |
| 6.30 | 8 | 53 | 91 | DDDA 0510 0630 |
| 640 | 8 | 53 | 91 | DDDA 0510 0640 |
| 6.50 | 8 | 53 | 91 | DDDA 0510 0650 |
| 6.60 | 8 | 53 | 91 | DDDA 0510 0660 |
| 6.70 | 8 | 53 | 91 | DDDA 0510 0670 |
| 6.80 | 8 | 53 | 91 | DDDA 0510 0680 |
| 6.90 | 8 | 53 | 91 | DDDA 0510 0690 |
| 7.00 | 8 | 53 | 91 | DDDA 0510 0700 |
| 7.10 | 8 | 53 | 91 | DDDA 0510 0710 |
| 7.20 | 8 | 53 | 91 | DDDA 0510 0720 |
| 7.30 | 8 | 53 | 91 | DDDA 0510 0730 |
| 740 | 8 | 53 | 91 | DDDA 0510 0740 |
| 7.50 | 8 | 53 | 91 | DDDA 0510 0750 |
| 7.60 | 8 | 53 | 91 | DDDA 0510 0760 |
| 7.70 | 8 | 53 | 91 | DDDA 0510 0770 |
| 7.80 | 8 | 53 | 91 | DDDA 0510 0780 |
| 7.90 | 8 | 53 | 91 | DDDA 0510 0790 |
| 8.00 | 8 | 53 | 91 | DDDA 0510 0800 |
| 8.10 | 10 | 61 | 103 | DDDA 0510 0810 |
| 8.20 | 10 | 61 | 103 | DDDA 0510 0820 |
| 8.30 | 10 | 61 | 103 | DDDA 0510 0830 |

*Order Code for HB Shank, AlCrN Coated: DDDA 0511 | Order Code for HE Shank, AlCrN Coated: DDDA 0512

# DURONTO

## 5xd Without Internal Spiral Coolant Holes





140°±1°

SM

M <45HRC

K <390 HB

*Technical Info. Page No.* ***151***

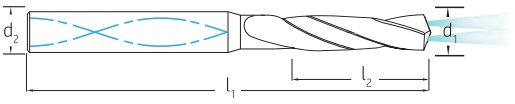
| $d_1$ | $d_2$ | $l_2$ | $l_1$ | EDP No. HA |
|---|---|---|---|---|
| *(m7)* | *(h6)* | *±0.50* | *±0.80* | AlCrN |
| 840 | 10 | 61 | 103 | DDDA 0510 0840 |
| 8.50 | 10 | 61 | 103 | DDDA 0510 0850 |
| 8.60 | 10 | 61 | 103 | DDDA 0510 0860 |
| 8.70 | 10 | 61 | 103 | DDDA 0510 0870 |
| 8.80 | 10 | 61 | 103 | DDDA 0510 0880 |
| 8.90 | 10 | 61 | 103 | DDDA 0510 0890 |
| 9.00 | 10 | 61 | 103 | DDDA 0510 0900 |
| 9.10 | 10 | 61 | 103 | DDDA 0510 0910 |
| 9.20 | 10 | 61 | 103 | DDDA 0510 0920 |
| 9.30 | 10 | 61 | 103 | DDDA 0510 0930 |
| 940 | 10 | 61 | 103 | DDDA 0510 0940 |
| 9.50 | 10 | 61 | 103 | DDDA 0510 0950 |
| 9.60 | 10 | 61 | 103 | DDDA 0510 0960 |
| 9.70 | 10 | 61 | 103 | DDDA 0510 0970 |
| 9.80 | 10 | 61 | 103 | DDDA 0510 0980 |
| 9.90 | 10 | 61 | 103 | DDDA 0510 0990 |
| 10.00 | 10 | 61 | 103 | DDDA 0510 1000 |
| 10.10 | 12 | 71 | 118 | DDDA 0510 1010 |
| 10.20 | 12 | 71 | 118 | DDDA 0510 1020 |
| 10.30 | 12 | 71 | 118 | DDDA 0510 1030 |
| 1040 | 12 | 71 | 118 | DDDA 0510 1040 |
| 10.50 | 12 | 71 | 118 | DDDA 0510 1050 |
| 10.60 | 12 | 71 | 118 | DDDA 0510 1060 |
| 10.70 | 12 | 71 | 118 | DDDA 0510 1070 |
| 10.80 | 12 | 71 | 118 | DDDA 0510 1080 |
| 10.90 | 12 | 71 | 118 | DDDA 0510 1090 |
| 11.00 | 12 | 71 | 118 | DDDA 0510 1100 |

| $d_1$ | $d_2$ | $l_2$ | $l_1$ | EDP No. HA |
|---|---|---|---|---|
| *(m7)* | *(h6)* | *±0.50* | *±0.80* | AlCrN |
| 11.10 | 12 | 71 | 118 | DDDA 0510 1110 |
| 11.20 | 12 | 71 | 118 | DDDA 0510 1120 |
| 11.30 | 12 | 71 | 118 | DDDA 0510 1130 |
| 1140 | 12 | 71 | 118 | DDDA 0510 1140 |
| 11.50 | 12 | 71 | 118 | DDDA 0510 1150 |
| 11.60 | 12 | 71 | 118 | DDDA 0510 1160 |
| 11.70 | 12 | 71 | 118 | DDDA 0510 1170 |
| 11.80 | 12 | 71 | 118 | DDDA 0510 1180 |
| 11.90 | 12 | 71 | 118 | DDDA 0510 1190 |
| 12.00 | 12 | 71 | 118 | DDDA 0510 1200 |
| 12.50 | 14 | 77 | 124 | DDDA 0510 1250 |
| 12.70 | 14 | 77 | 124 | DDDA 0510 1270 |
| 13.00 | 14 | 77 | 124 | DDDA 0510 1300 |
| 13.50 | 14 | 77 | 124 | DDDA 0510 1350 |
| 14.00 | 14 | 77 | 124 | DDDA 0510 1400 |
| 14.50 | 16 | 83 | 133 | DDDA 0510 1450 |
| 15.00 | 16 | 83 | 133 | DDDA 0510 1500 |
| 15.50 | 16 | 83 | 133 | DDDA 0510 1550 |
| 16.00 | 16 | 83 | 133 | DDDA 0510 1600 |
| 16.50 | 18 | 93 | 143 | DDDA 0510 1650 |
| 17.00 | 18 | 93 | 143 | DDDA 0510 1700 |
| 17.50 | 18 | 93 | 143 | DDDA 0510 1750 |
| 18.00 | 18 | 93 | 143 | DDDA 0510 1800 |
| 18.50 | 20 | 101 | 153 | DDDA 0510 1850 |
| 19.00 | 20 | 101 | 153 | DDDA 0510 1900 |
| 19.50 | 20 | 101 | 153 | DDDA 0510 1950 |
| 20.00 | 20 | 101 | 153 | DDDA 0510 2000 |

*Order Code for HB Shank, AlCrN Coated: DDDA 0511 | Order Code for HE Shank, AlCrN Coated: DDDA 0512

# DURONTO

## 5xd With Internal Spiral Coolant Holes




RH

140°±1°

SM

M <45HRC

K <390 HB

*Technical Info. Page No.* ***151***

| $d_1$ | $d_2$ | $l_2$ | $l_1$ | EDP No. HA |
|---|---|---|---|---|
| *(m7)* | *(h6)* | *±0.50* | *±0.80* | AlCrN |
| 3.00 | 6 | 28 | 66 | DDDA 0520 0300 |
| 3.10 | 6 | 28 | 66 | DDDA 0520 0310 |
| 3.20 | 6 | 28 | 66 | DDDA 0520 0320 |
| 3.30 | 6 | 28 | 66 | DDDA 0520 0330 |
| 340 | 6 | 28 | 66 | DDDA 0520 0340 |
| 3.50 | 6 | 28 | 66 | DDDA 0520 0350 |
| 3.60 | 6 | 28 | 66 | DDDA 0520 0360 |
| 3.70 | 6 | 28 | 66 | DDDA 0520 0370 |
| 3.80 | 6 | 36 | 74 | DDDA 0520 0380 |
| 3.90 | 6 | 36 | 74 | DDDA 0520 0390 |
| 4.00 | 6 | 36 | 74 | DDDA 0520 0400 |
| 4.10 | 6 | 36 | 74 | DDDA 0520 0410 |
| 4.20 | 6 | 36 | 74 | DDDA 0520 0420 |
| 4.30 | 6 | 36 | 74 | DDDA 0520 0430 |
| 440 | 6 | 36 | 74 | DDDA 0520 0440 |
| 4.50 | 6 | 36 | 74 | DDDA 0520 0450 |
| 4.60 | 6 | 36 | 74 | DDDA 0520 0460 |
| 4.70 | 6 | 36 | 74 | DDDA 0520 0470 |
| 4.80 | 6 | 44 | 82 | DDDA 0520 0480 |
| 4.90 | 6 | 44 | 82 | DDDA 0520 0490 |
| 5.00 | 6 | 44 | 82 | DDDA 0520 0500 |
| 5.10 | 6 | 44 | 82 | DDDA 0520 0510 |
| 5.20 | 6 | 44 | 82 | DDDA 0520 0520 |
| 5.30 | 6 | 44 | 82 | DDDA 0520 0530 |
| 540 | 6 | 44 | 82 | DDDA 0520 0540 |
| 5.50 | 6 | 44 | 82 | DDDA 0520 0550 |
| 5.60 | 6 | 44 | 82 | DDDA 0520 0560 |

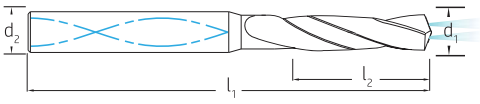
| $d_1$ | $d_2$ | $l_2$ | $l_1$ | EDP No. HA |
|---|---|---|---|---|
| *(m7)* | *(h6)* | *±0.50* | *±0.80* | AlCrN |
| 5.70 | 6 | 44 | 82 | DDDA 0520 0570 |
| 5.80 | 6 | 44 | 82 | DDDA 0520 0580 |
| 5.90 | 6 | 44 | 82 | DDDA 0520 0590 |
| 6.00 | 6 | 44 | 82 | DDDA 0520 0600 |
| 6.10 | 8 | 53 | 91 | DDDA 0520 0610 |
| 6.20 | 8 | 53 | 91 | DDDA 0520 0620 |
| 6.30 | 8 | 53 | 91 | DDDA 0520 0630 |
| 640 | 8 | 53 | 91 | DDDA 0520 0640 |
| 6.50 | 8 | 53 | 91 | DDDA 0520 0650 |
| 6.60 | 8 | 53 | 91 | DDDA 0520 0660 |
| 6.70 | 8 | 53 | 91 | DDDA 0520 0670 |
| 6.80 | 8 | 53 | 91 | DDDA 0520 0680 |
| 6.90 | 8 | 53 | 91 | DDDA 0520 0690 |
| 7.00 | 8 | 53 | 91 | DDDA 0520 0700 |
| 7.10 | 8 | 53 | 91 | DDDA 0520 0710 |
| 7.20 | 8 | 53 | 91 | DDDA 0520 0720 |
| 7.30 | 8 | 53 | 91 | DDDA 0520 0730 |
| 740 | 8 | 53 | 91 | DDDA 0520 0740 |
| 7.50 | 8 | 53 | 91 | DDDA 0520 0750 |
| 7.60 | 8 | 53 | 91 | DDDA 0520 0760 |
| 7.70 | 8 | 53 | 91 | DDDA 0520 0770 |
| 7.80 | 8 | 53 | 91 | DDDA 0520 0780 |
| 7.90 | 8 | 53 | 91 | DDDA 0520 0790 |
| 8.00 | 8 | 53 | 91 | DDDA 0520 0800 |
| 8.10 | 10 | 61 | 103 | DDDA 0520 0810 |
| 8.20 | 10 | 61 | 103 | DDDA 0520 0820 |
| 8.30 | 10 | 61 | 103 | DDDA 0520 0830 |

*Order Code for HB Shank, AlCrN Coated: DDDA 0521 | Order Code for HE Shank, AlCrN Coated: DDDA 0522

# DURONTO

## 5xd With Internal Spiral Coolant Holes






140°±1°


SM

M <45HRC

K <390 HB

*Technical Info. Page No.* ***151***

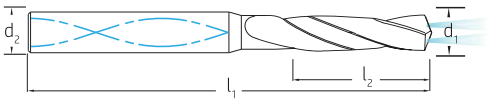
| $d_1$ (m7) | $d_2$ (h6) | $l_2$ ±0.50 | $l_1$ ±0.80 | EDP No. HA AlCrN |
|---|---|---|---|---|
| 840 | 10 | 61 | 103 | DDDA 0520 0840 |
| 8.50 | 10 | 61 | 103 | DDDA 0520 0850 |
| 8.60 | 10 | 61 | 103 | DDDA 0520 0860 |
| 8.70 | 10 | 61 | 103 | DDDA 0520 0870 |
| 8.80 | 10 | 61 | 103 | DDDA 0520 0880 |
| 8.90 | 10 | 61 | 103 | DDDA 0520 0890 |
| 9.00 | 10 | 61 | 103 | DDDA 0520 0900 |
| 9.10 | 10 | 61 | 103 | DDDA 0520 0910 |
| 9.20 | 10 | 61 | 103 | DDDA 0520 0920 |
| 9.30 | 10 | 61 | 103 | DDDA 0520 0930 |
| 940 | 10 | 61 | 103 | DDDA 0520 0940 |
| 9.50 | 10 | 61 | 103 | DDDA 0520 0950 |
| 9.60 | 10 | 61 | 103 | DDDA 0520 0960 |
| 9.70 | 10 | 61 | 103 | DDDA 0520 0970 |
| 9.80 | 10 | 61 | 103 | DDDA 0520 0980 |
| 9.90 | 10 | 61 | 103 | DDDA 0520 0990 |
| 10.00 | 10 | 61 | 103 | DDDA 0520 1000 |
| 10.10 | 12 | 71 | 118 | DDDA 0520 1010 |
| 10.20 | 12 | 71 | 118 | DDDA 0520 1020 |
| 10.30 | 12 | 71 | 118 | DDDA 0520 1030 |
| 1040 | 12 | 71 | 118 | DDDA 0520 1040 |
| 10.50 | 12 | 71 | 118 | DDDA 0520 1050 |
| 10.60 | 12 | 71 | 118 | DDDA 0520 1060 |
| 10.70 | 12 | 71 | 118 | DDDA 0520 1070 |
| 10.80 | 12 | 71 | 118 | DDDA 0520 1080 |
| 10.90 | 12 | 71 | 118 | DDDA 0520 1090 |
| 11.00 | 12 | 71 | 118 | DDDA 0520 1100 |

| $d_1$ (m7) | $d_2$ (h6) | $l_2$ ±0.50 | $l_1$ ±0.80 | EDP No. HA AlCrN |
|---|---|---|---|---|
| 11.10 | 12 | 71 | 118 | DDDA 0520 1110 |
| 11.20 | 12 | 71 | 118 | DDDA 0520 1120 |
| 11.30 | 12 | 71 | 118 | DDDA 0520 1130 |
| 1140 | 12 | 71 | 118 | DDDA 0520 1140 |
| 11.50 | 12 | 71 | 118 | DDDA 0520 1150 |
| 11.60 | 12 | 71 | 118 | DDDA 0520 1160 |
| 11.70 | 12 | 71 | 118 | DDDA 0520 1170 |
| 11.80 | 12 | 71 | 118 | DDDA 0520 1180 |
| 11.90 | 12 | 71 | 118 | DDDA 0520 1190 |
| 12.00 | 12 | 71 | 118 | DDDA 0520 1200 |
| 12.50 | 14 | 77 | 124 | DDDA 0520 1250 |
| 12.70 | 14 | 77 | 124 | DDDA 0520 1270 |
| 13.00 | 14 | 77 | 124 | DDDA 0520 1300 |
| 13.50 | 14 | 77 | 124 | DDDA 0520 1350 |
| 14.00 | 14 | 77 | 124 | DDDA 0520 1400 |
| 14.50 | 16 | 83 | 133 | DDDA 0520 1450 |
| 15.00 | 16 | 83 | 133 | DDDA 0520 1500 |
| 15.50 | 16 | 83 | 133 | DDDA 0520 1550 |
| 16.00 | 16 | 83 | 133 | DDDA 0520 1600 |
| 17.00 | 18 | 93 | 143 | DDDA 0520 1700 |
| 17.50 | 18 | 93 | 143 | DDDA 0520 1750 |
| 18.00 | 18 | 93 | 143 | DDDA 0520 1800 |
| 18.50 | 20 | 101 | 153 | DDDA 0520 1850 |
| 19.00 | 20 | 101 | 153 | DDDA 0520 1900 |
| 19.50 | 20 | 101 | 153 | DDDA 0520 1950 |
| 20.00 | 20 | 101 | 153 | DDDA 0520 2000 |

*Order Code for HB Shank, AlCrN Coated: DDDA 0521 | Order Code for HE Shank, AlCrN Coated: DDDA 0522

# DURONTO DRILL

## 8xd With Internal Spiral Coolant Holes




RH


140°±1°


DM

M <45HRC

K <390 HB

*Technical Info. Page No.* ***151***

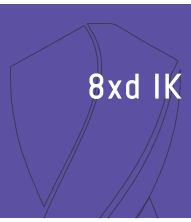
| $d_1$ | $d_2$ | $l_2$ | $l_1$ | EDP No. HA |
|---|---|---|---|---|
| *(m7)* | *(h6)* | *±0.50* | *±0.80* | AlCrN |
| 3.00 | 6 | 34 | 72 | DDDA 0820 0300 |
| 3.10 | 6 | 34 | 72 | DDDA 0820 0310 |
| 3.20 | 6 | 34 | 72 | DDDA 0820 0320 |
| 3.30 | 6 | 34 | 72 | DDDA 0820 0330 |
| 340 | 6 | 34 | 72 | DDDA 0820 0340 |
| 3.50 | 6 | 34 | 72 | DDDA 0820 0350 |
| 3.60 | 6 | 34 | 72 | DDDA 0820 0360 |
| 3.70 | 6 | 34 | 72 | DDDA 0820 0370 |
| 3.80 | 6 | 43 | 81 | DDDA 0820 0380 |
| 3.90 | 6 | 43 | 81 | DDDA 0820 0390 |
| 4.00 | 6 | 43 | 81 | DDDA 0820 0400 |
| 4.10 | 6 | 43 | 81 | DDDA 0820 0410 |
| 4.20 | 6 | 43 | 81 | DDDA 0820 0420 |
| 4.30 | 6 | 43 | 81 | DDDA 0820 0430 |
| 440 | 6 | 43 | 81 | DDDA 0820 0440 |
| 4.50 | 6 | 43 | 81 | DDDA 0820 0450 |
| 4.60 | 6 | 43 | 81 | DDDA 0820 0460 |
| 4.70 | 6 | 43 | 81 | DDDA 0820 0470 |
| 4.80 | 6 | 57 | 95 | DDDA 0820 0480 |
| 4.90 | 6 | 57 | 95 | DDDA 0820 0490 |
| 5.00 | 6 | 57 | 95 | DDDA 0820 0500 |
| 5.10 | 6 | 57 | 95 | DDDA 0820 0510 |
| 5.20 | 6 | 57 | 95 | DDDA 0820 0520 |
| 5.30 | 6 | 57 | 95 | DDDA 0820 0530 |
| 540 | 6 | 57 | 95 | DDDA 0820 0540 |
| 5.50 | 6 | 57 | 95 | DDDA 0820 0550 |
| 5.60 | 6 | 57 | 95 | DDDA 0820 0560 |

| $d_1$ | $d_2$ | $l_2$ | $l_1$ | EDP No. HA |
|---|---|---|---|---|
| *(m7)* | *(h6)* | *±0.50* | *±0.80* | AlCrN |
| 5.70 | 6 | 57 | 95 | DDDA 0820 0570 |
| 5.80 | 6 | 57 | 95 | DDDA 0820 0580 |
| 5.90 | 6 | 57 | 95 | DDDA 0820 0590 |
| 6.00 | 6 | 57 | 95 | DDDA 0820 0600 |
| 6.10 | 8 | 76 | 114 | DDDA 0820 0610 |
| 6.20 | 8 | 76 | 114 | DDDA 0820 0620 |
| 6.30 | 8 | 76 | 114 | DDDA 0820 0630 |
| 640 | 8 | 76 | 114 | DDDA 0820 0640 |
| 6.50 | 8 | 76 | 114 | DDDA 0820 0650 |
| 6.60 | 8 | 76 | 114 | DDDA 0820 0660 |
| 6.70 | 8 | 76 | 114 | DDDA 0820 0670 |
| 6.80 | 8 | 76 | 114 | DDDA 0820 0680 |
| 6.90 | 8 | 76 | 114 | DDDA 0820 0690 |
| 7.00 | 8 | 76 | 114 | DDDA 0820 0700 |
| 7.10 | 8 | 76 | 114 | DDDA 0820 0710 |
| 7.20 | 8 | 76 | 114 | DDDA 0820 0720 |
| 7.30 | 8 | 76 | 114 | DDDA 0820 0730 |
| 740 | 8 | 76 | 114 | DDDA 0820 0740 |
| 7.50 | 8 | 76 | 114 | DDDA 0820 0750 |
| 7.60 | 8 | 76 | 114 | DDDA 0820 0760 |
| 7.70 | 8 | 76 | 114 | DDDA 0820 0770 |
| 7.80 | 8 | 76 | 114 | DDDA 0820 0780 |
| 7.90 | 8 | 76 | 114 | DDDA 0820 0790 |
| 8.00 | 8 | 76 | 114 | DDDA 0820 0800 |
| 8.10 | 10 | 95 | 142 | DDDA 0820 0810 |
| 8.20 | 10 | 95 | 142 | DDDA 0820 0820 |
| 8.30 | 10 | 95 | 142 | DDDA 0820 0830 |

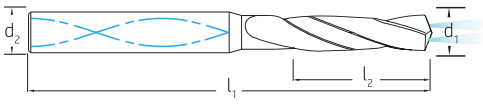
*Order Code for HB Shank, AlCrN Coated: DDDA 0821 | Order Code for HE Shank, AlCrN Coated: DDDA 0822

# DURONTO

## 8xd With Internal Spiral Coolant Holes



8xd IK





140°±1°

DM

M <45HRC

K <390 HB

*Technical Info. Page No.* ***151***

| $d_1$ | $d_2$ | $l_2$ | $l_1$ | EDP No. HA |
|---|---|---|---|---|
| *(m7)* | *(h6)* | *±0.50* | *±0.80* | AlCrN |
| 840 | 10 | 95 | 142 | DDDA 0820 0840 |
| 8.50 | 10 | 95 | 142 | DDDA 0820 0850 |
| 8.60 | 10 | 95 | 142 | DDDA 0820 0860 |
| 8.70 | 10 | 95 | 142 | DDDA 0820 0870 |
| 8.80 | 10 | 95 | 142 | DDDA 0820 0880 |
| 8.90 | 10 | 95 | 142 | DDDA 0820 0890 |
| 9.00 | 10 | 95 | 142 | DDDA 0820 0900 |
| 9.10 | 10 | 95 | 142 | DDDA 0820 0910 |
| 9.20 | 10 | 95 | 142 | DDDA 0820 0920 |
| 9.30 | 10 | 95 | 142 | DDDA 0820 0930 |
| 940 | 10 | 95 | 142 | DDDA 0820 0940 |
| 9.50 | 10 | 95 | 142 | DDDA 0820 0950 |
| 9.60 | 10 | 95 | 142 | DDDA 0820 0960 |
| 9.80 | 10 | 95 | 142 | DDDA 0820 0980 |
| 9.90 | 10 | 95 | 142 | DDDA 0820 0990 |
| 10.00 | 10 | 95 | 142 | DDDA 0820 1000 |
| 10.10 | 12 | 114 | 162 | DDDA 0820 1010 |
| 10.20 | 12 | 114 | 162 | DDDA 0820 1020 |
| 10.30 | 12 | 114 | 162 | DDDA 0820 1030 |

| $d_1$ | $d_2$ | $l_2$ | $l_1$ | EDP No. HA |
|---|---|---|---|---|
| *(m7)* | *(h6)* | *±0.50* | *±0.80* | AlCrN |
| 10.32 | 12 | 114 | 162 | DDDA 0820 1032 |
| 1040 | 12 | 114 | 162 | DDDA 0820 1040 |
| 10.50 | 12 | 114 | 162 | DDDA 0820 1050 |
| 10.60 | 12 | 114 | 162 | DDDA 0820 1060 |
| 10.70 | 12 | 114 | 162 | DDDA 0820 1070 |
| 10.80 | 12 | 114 | 162 | DDDA 0820 1080 |
| 10.90 | 12 | 114 | 162 | DDDA 0820 1090 |
| 11.00 | 12 | 114 | 162 | DDDA 0820 1100 |
| 11.10 | 12 | 114 | 162 | DDDA 0820 1110 |
| 11.20 | 12 | 114 | 162 | DDDA 0820 1120 |
| 11.30 | 12 | 114 | 162 | DDDA 0820 1130 |
| 1140 | 12 | 114 | 162 | DDDA 0820 1140 |
| 11.50 | 12 | 114 | 162 | DDDA 0820 1150 |
| 11.60 | 12 | 114 | 162 | DDDA 0820 1160 |
| 11.70 | 12 | 114 | 162 | DDDA 0820 1170 |
| 11.80 | 12 | 114 | 162 | DDDA 0820 1180 |
| 11.90 | 12 | 114 | 162 | DDDA 0820 1190 |
| 12.00 | 12 | 114 | 162 | DDDA 0820 1200 |

*Order Code for HB Shank, AlCrN Coated: DDDA 0821 | Order Code for HE Shank, AlCrN Coated: DDDA 0822

# DURONTO INOX

3xd and 5xd with Internal Coolant Holes for
Stainless Steels, Steels

P M K

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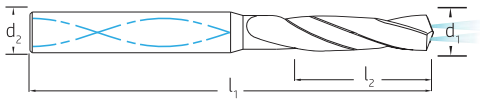
# DURONTO-INOX

## 3xd With Internal Spiral Coolant Holes

3xd IK





140°±1°

SM

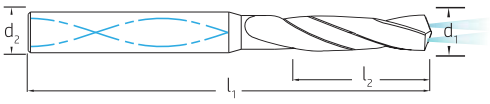
M <35HRC | M <1100 N/mm² | K <300 HB

*Technical Info. Page No.* ***152***

| $d_1$ | $d_2$ | $l_2$ | $l_1$ | EDP No. HA |
|---|---|---|---|---|
| *(m7)* | *(h6)* | *±0.50* | *±0.80* | AlCrN |
| 3.00 | 6 | 20 | 62 | DDIA 0320 0300 |
| 3.10 | 6 | 20 | 62 | DDIA 0320 0310 |
| 3.20 | 6 | 20 | 62 | DDIA 0320 0320 |
| 3.30 | 6 | 20 | 62 | DDIA 0320 0330 |
| 340 | 6 | 20 | 62 | DDIA 0320 0340 |
| 3.50 | 6 | 20 | 62 | DDIA 0320 0350 |
| 3.60 | 6 | 20 | 62 | DDIA 0320 0360 |
| 3.70 | 6 | 20 | 62 | DDIA 0320 0370 |
| 3.80 | 6 | 24 | 66 | DDIA 0320 0380 |
| 3.90 | 6 | 24 | 66 | DDIA 0320 0390 |
| 4.00 | 6 | 24 | 66 | DDIA 0320 0400 |
| 4.10 | 6 | 24 | 66 | DDIA 0320 0410 |
| 4.20 | 6 | 24 | 66 | DDIA 0320 0420 |
| 4.30 | 6 | 24 | 66 | DDIA 0320 0430 |
| 440 | 6 | 24 | 66 | DDIA 0320 0440 |
| 4.50 | 6 | 24 | 66 | DDIA 0320 0450 |
| 4.60 | 6 | 24 | 66 | DDIA 0320 0460 |
| 4.70 | 6 | 24 | 66 | DDIA 0320 0470 |
| 4.80 | 6 | 28 | 66 | DDIA 0320 0480 |
| 4.90 | 6 | 28 | 66 | DDIA 0320 0490 |
| 5.00 | 6 | 28 | 66 | DDIA 0320 0500 |
| 5.10 | 6 | 28 | 66 | DDIA 0320 0510 |
| 5.20 | 6 | 28 | 66 | DDIA 0320 0520 |
| 5.30 | 6 | 28 | 66 | DDIA 0320 0530 |
| 540 | 6 | 28 | 66 | DDIA 0320 0540 |
| 5.50 | 6 | 28 | 66 | DDIA 0320 0550 |
| 5.60 | 6 | 28 | 66 | DDIA 0320 0560 |

| $d_1$ | $d_2$ | $l_2$ | $l_1$ | EDP No. HA |
|---|---|---|---|---|
| *(m7)* | *(h6)* | *±0.50* | *±0.80* | AlCrN |
| 5.70 | 6 | 28 | 66 | DDIA 0320 0570 |
| 5.80 | 6 | 28 | 66 | DDIA 0320 0580 |
| 5.90 | 6 | 28 | 66 | DDIA 0320 0590 |
| 6.00 | 6 | 28 | 66 | DDIA 0320 0600 |
| 6.10 | 8 | 34 | 79 | DDIA 0320 0610 |
| 6.20 | 8 | 34 | 79 | DDIA 0320 0620 |
| 6.30 | 8 | 34 | 79 | DDIA 0320 0630 |
| 640 | 8 | 34 | 79 | DDIA 0320 0640 |
| 6.50 | 8 | 34 | 79 | DDIA 0320 0650 |
| 6.60 | 8 | 34 | 79 | DDIA 0320 0660 |
| 6.70 | 8 | 34 | 79 | DDIA 0320 0670 |
| 6.80 | 8 | 34 | 79 | DDIA 0320 0680 |
| 6.90 | 8 | 34 | 79 | DDIA 0320 0690 |
| 7.00 | 8 | 34 | 79 | DDIA 0320 0700 |
| 7.10 | 8 | 41 | 79 | DDIA 0320 0710 |
| 7.20 | 8 | 41 | 79 | DDIA 0320 0720 |
| 7.30 | 8 | 41 | 79 | DDIA 0320 0730 |
| 740 | 8 | 41 | 79 | DDIA 0320 0740 |
| 7.50 | 8 | 41 | 79 | DDIA 0320 0750 |
| 7.60 | 8 | 41 | 79 | DDIA 0320 0760 |
| 7.70 | 8 | 41 | 79 | DDIA 0320 0770 |
| 7.80 | 8 | 41 | 79 | DDIA 0320 0780 |
| 7.90 | 8 | 41 | 79 | DDIA 0320 0790 |
| 8.00 | 8 | 41 | 79 | DDIA 0320 0800 |
| 8.10 | 10 | 47 | 89 | DDIA 0320 0810 |
| 8.20 | 10 | 47 | 89 | DDIA 0320 0820 |
| 8.30 | 10 | 47 | 89 | DDIA 0320 0830 |

*Order Code for HB Shank, AlCrN Coated: DDIA 0321 | Order Code for HE Shank, AlCrN Coated: DDIA 0322





M <35HRC | M <1100 N/mm² | K <300 HB

*Technical Info. Page No.* ***152***

| $d_1$ | $d_2$ | $l_2$ | $l_1$ | EDP No. HA |
|---|---|---|---|---|
| *(m7)* | *(h6)* | *±0.50* | *±0.80* | AlCrN |
| 8.40 | 10 | 47 | 89 | DDIA 0320 0840 |
| 8.50 | 10 | 47 | 89 | DDIA 0320 0850 |
| 8.60 | 10 | 47 | 89 | DDIA 0320 0860 |
| 8.70 | 10 | 47 | 89 | DDIA 0320 0870 |
| 8.80 | 10 | 47 | 89 | DDIA 0320 0880 |
| 8.90 | 10 | 47 | 89 | DDIA 0320 0890 |
| 9.00 | 10 | 47 | 89 | DDIA 0320 0900 |
| 9.10 | 10 | 47 | 89 | DDIA 0320 0910 |
| 9.20 | 10 | 47 | 89 | DDIA 0320 0920 |
| 9.30 | 10 | 47 | 89 | DDIA 0320 0930 |
| 9.40 | 10 | 47 | 89 | DDIA 0320 0940 |
| 9.50 | 10 | 47 | 89 | DDIA 0320 0950 |
| 9.60 | 10 | 47 | 89 | DDIA 0320 0960 |
| 9.70 | 10 | 47 | 89 | DDIA 0320 0970 |
| 9.80 | 10 | 47 | 89 | DDIA 0320 0980 |
| 9.90 | 10 | 47 | 89 | DDIA 0320 0990 |
| 10.00 | 10 | 47 | 89 | DDIA 0320 1000 |
| 10.10 | 12 | 55 | 102 | DDIA 0320 1010 |
| 10.20 | 12 | 55 | 102 | DDIA 0320 1020 |
| 10.30 | 12 | 55 | 102 | DDIA 0320 1030 |
| 10.40 | 12 | 55 | 102 | DDIA 0320 1040 |
| 10.50 | 12 | 55 | 102 | DDIA 0320 1050 |
| 10.60 | 12 | 55 | 102 | DDIA 0320 1060 |
| 10.70 | 12 | 55 | 102 | DDIA 0320 1070 |
| 10.80 | 12 | 55 | 102 | DDIA 0320 1080 |
| 10.90 | 12 | 55 | 102 | DDIA 0320 1090 |
| 11.00 | 12 | 55 | 102 | DDIA 0320 1100 |

| $d_1$ | $d_2$ | $l_2$ | $l_1$ | EDP No. HA |
|---|---|---|---|---|
| *(m7)* | *(h6)* | *±0.50* | *±0.80* | AlCrN |
| 11.10 | 12 | 55 | 102 | DDIA 0320 1110 |
| 11.20 | 12 | 55 | 102 | DDIA 0320 1120 |
| 11.30 | 12 | 55 | 102 | DDIA 0320 1130 |
| 11.40 | 12 | 55 | 102 | DDIA 0320 1140 |
| 11.50 | 12 | 55 | 102 | DDIA 0320 1150 |
| 11.60 | 12 | 55 | 102 | DDIA 0320 1160 |
| 11.70 | 12 | 55 | 102 | DDIA 0320 1170 |
| 11.80 | 12 | 55 | 102 | DDIA 0320 1180 |
| 11.90 | 12 | 55 | 102 | DDIA 0320 1190 |
| 12.00 | 12 | 55 | 102 | DDIA 0320 1200 |
| 12.50 | 14 | 60 | 107 | DDIA 0320 1250 |
| 12.70 | 14 | 60 | 107 | DDIA 0320 1270 |
| 13.00 | 14 | 60 | 107 | DDIA 0320 1300 |
| 13.50 | 14 | 60 | 107 | DDIA 0320 1350 |
| 14.00 | 14 | 60 | 107 | DDIA 0320 1400 |
| 14.50 | 16 | 65 | 115 | DDIA 0320 1450 |
| 15.00 | 16 | 65 | 115 | DDIA 0320 1500 |
| 15.50 | 16 | 65 | 115 | DDIA 0320 1550 |
| 16.00 | 16 | 65 | 115 | DDIA 0320 1600 |
| 16.50 | 18 | 73 | 123 | DDIA 0320 1650 |
| 17.00 | 18 | 73 | 123 | DDIA 0320 1700 |
| 17.50 | 18 | 73 | 123 | DDIA 0320 1750 |
| 18.00 | 18 | 73 | 123 | DDIA 0320 1800 |
| 19.00 | 20 | 79 | 131 | DDIA 0320 1900 |
| 19.50 | 20 | 79 | 131 | DDIA 0320 1950 |
| 20.00 | 20 | 79 | 131 | DDIA 0320 2000 |

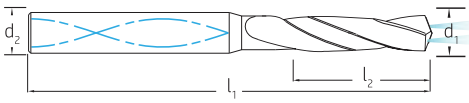
*Order Code for HB Shank, AlCrN Coated: DDIA 0321 | Order Code for HE Shank, AlCrN Coated: DDIA 0322

# DURONTO-INOX

## 5xd With Internal Spiral Coolant Holes

5xd IK








140°±1°


SM

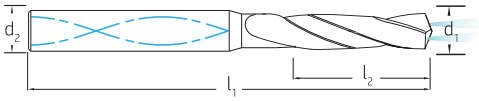
M <35HRC | M <1100 N/mm² | K <300 HB

*Technical Info. Page No.* ***152***

| $d_1$ (m7) | $d_2$ (h6) | $l_2$ ±0.50 | $l_1$ ±0.80 | EDP No. HA AlCrN |
|---|---|---|---|---|
| 3.00 | 6 | 28 | 66 | DDIA 0520 0300 |
| 3.10 | 6 | 28 | 66 | DDIA 0520 0310 |
| 3.20 | 6 | 28 | 66 | DDIA 0520 0320 |
| 3.30 | 6 | 28 | 66 | DDIA 0520 0330 |
| 340 | 6 | 28 | 66 | DDIA 0520 0340 |
| 3.50 | 6 | 28 | 66 | DDIA 0520 0350 |
| 3.60 | 6 | 28 | 66 | DDIA 0520 0360 |
| 3.70 | 6 | 28 | 66 | DDIA 0520 0370 |
| 3.80 | 6 | 36 | 74 | DDIA 0520 0380 |
| 3.90 | 6 | 36 | 74 | DDIA 0520 0390 |
| 4.00 | 6 | 36 | 74 | DDIA 0520 0400 |
| 4.10 | 6 | 36 | 74 | DDIA 0520 0410 |
| 4.20 | 6 | 36 | 74 | DDIA 0520 0420 |
| 4.30 | 6 | 36 | 74 | DDIA 0520 0430 |
| 440 | 6 | 36 | 74 | DDIA 0520 0440 |
| 4.50 | 6 | 36 | 74 | DDIA 0520 0450 |
| 4.60 | 6 | 36 | 74 | DDIA 0520 0460 |
| 4.70 | 6 | 36 | 74 | DDIA 0520 0470 |
| 4.80 | 6 | 44 | 82 | DDIA 0520 0480 |
| 4.90 | 6 | 44 | 82 | DDIA 0520 0490 |
| 5.00 | 6 | 44 | 82 | DDIA 0520 0500 |
| 5.10 | 6 | 44 | 82 | DDIA 0520 0510 |
| 5.20 | 6 | 44 | 82 | DDIA 0520 0520 |
| 5.30 | 6 | 44 | 82 | DDIA 0520 0530 |
| 540 | 6 | 44 | 82 | DDIA 0520 0540 |
| 5.50 | 6 | 44 | 82 | DDIA 0520 0550 |
| 5.60 | 6 | 44 | 82 | DDIA 0520 0560 |

| $d_1$ (m7) | $d_2$ (h6) | $l_2$ ±0.50 | $l_1$ ±0.80 | EDP No. HA AlCrN |
|---|---|---|---|---|
| 5.70 | 6 | 44 | 82 | DDIA 0520 0570 |
| 5.80 | 6 | 44 | 82 | DDIA 0520 0580 |
| 5.90 | 6 | 44 | 82 | DDIA 0520 0590 |
| 6.00 | 6 | 44 | 82 | DDIA 0520 0600 |
| 6.10 | 8 | 53 | 91 | DDIA 0520 0610 |
| 6.20 | 8 | 53 | 91 | DDIA 0520 0620 |
| 6.30 | 8 | 53 | 91 | DDIA 0520 0630 |
| 640 | 8 | 53 | 91 | DDIA 0520 0640 |
| 6.50 | 8 | 53 | 91 | DDIA 0520 0650 |
| 6.60 | 8 | 53 | 91 | DDIA 0520 0660 |
| 6.70 | 8 | 53 | 91 | DDIA 0520 0670 |
| 6.80 | 8 | 53 | 91 | DDIA 0520 0680 |
| 6.90 | 8 | 53 | 91 | DDIA 0520 0690 |
| 7.00 | 8 | 53 | 91 | DDIA 0520 0700 |
| 7.10 | 8 | 53 | 91 | DDIA 0520 0710 |
| 7.20 | 8 | 53 | 91 | DDIA 0520 0720 |
| 7.30 | 8 | 53 | 91 | DDIA 0520 0730 |
| 740 | 8 | 53 | 91 | DDIA 0520 0740 |
| 7.50 | 8 | 53 | 91 | DDIA 0520 0750 |
| 7.60 | 8 | 53 | 91 | DDIA 0520 0760 |
| 7.70 | 8 | 53 | 91 | DDIA 0520 0770 |
| 7.80 | 8 | 53 | 91 | DDIA 0520 0780 |
| 7.90 | 8 | 53 | 91 | DDIA 0520 0790 |
| 8.00 | 8 | 53 | 91 | DDIA 0520 0800 |
| 8.10 | 10 | 61 | 103 | DDIA 0520 0810 |
| 8.20 | 10 | 61 | 103 | DDIA 0520 0820 |
| 8.30 | 10 | 61 | 103 | DDIA 0520 0830 |

*Order Code for HB Shank, AlCrN Coated: DDIA 0521 | Order Code for HE Shank, AlCrN Coated: DDIA 0522






140°±1°


SM

M <35HRC | M <1100 N/mm² | K <300 HB

*Technical Info. Page No.* ***152***

| $d_1$ | $d_2$ | $l_2$ | $l_1$ | EDP No. HA |
|---|---|---|---|---|
| *(m7)* | *(h6)* | *±0.50* | *±0.80* | AlCrN |
| 840 | 10 | 61 | 103 | DDIA 0520 0840 |
| 8.50 | 10 | 61 | 103 | DDIA 0520 0850 |
| 8.60 | 10 | 61 | 103 | DDIA 0520 0860 |
| 8.70 | 10 | 61 | 103 | DDIA 0520 0870 |
| 8.80 | 10 | 61 | 103 | DDIA 0520 0880 |
| 8.90 | 10 | 61 | 103 | DDIA 0520 0890 |
| 9.00 | 10 | 61 | 103 | DDIA 0520 0900 |
| 9.10 | 10 | 61 | 103 | DDIA 0520 0910 |
| 9.20 | 10 | 61 | 103 | DDIA 0520 0920 |
| 9.30 | 10 | 61 | 103 | DDIA 0520 0930 |
| 940 | 10 | 61 | 103 | DDIA 0520 0940 |
| 9.50 | 10 | 61 | 103 | DDIA 0520 0950 |
| 9.60 | 10 | 61 | 103 | DDIA 0520 0960 |
| 9.70 | 10 | 61 | 103 | DDIA 0520 0970 |
| 9.80 | 10 | 61 | 103 | DDIA 0520 0980 |
| 9.90 | 10 | 61 | 103 | DDIA 0520 0990 |
| 10.00 | 10 | 61 | 103 | DDIA 0520 1000 |
| 10.10 | 12 | 71 | 118 | DDIA 0520 1010 |
| 10.20 | 12 | 71 | 118 | DDIA 0520 1020 |
| 10.30 | 12 | 71 | 118 | DDIA 0520 1030 |
| 1040 | 12 | 71 | 118 | DDIA 0520 1040 |
| 10.50 | 12 | 71 | 118 | DDIA 0520 1050 |
| 10.60 | 12 | 71 | 118 | DDIA 0520 1060 |
| 10.70 | 12 | 71 | 118 | DDIA 0520 1070 |
| 10.80 | 12 | 71 | 118 | DDIA 0520 1080 |
| 10.90 | 12 | 71 | 118 | DDIA 0520 1090 |
| 11.00 | 12 | 71 | 118 | DDIA 0520 1100 |

| $d_1$ | $d_2$ | $l_2$ | $l_1$ | EDP No. HA |
|---|---|---|---|---|
| *(m7)* | *(h6)* | *±0.50* | *±0.80* | AlCrN |
| 11.10 | 12 | 71 | 118 | DDIA 0520 1110 |
| 11.20 | 12 | 71 | 118 | DDIA 0520 1120 |
| 11.30 | 12 | 71 | 118 | DDIA 0520 1130 |
| 1140 | 12 | 71 | 118 | DDIA 0520 1140 |
| 11.50 | 12 | 71 | 118 | DDIA 0520 1150 |
| 11.60 | 12 | 71 | 118 | DDIA 0520 1160 |
| 11.70 | 12 | 71 | 118 | DDIA 0520 1170 |
| 11.80 | 12 | 71 | 118 | DDIA 0520 1180 |
| 11.90 | 12 | 71 | 118 | DDIA 0520 1190 |
| 12.00 | 12 | 71 | 118 | DDIA 0520 1200 |
| 12.50 | 14 | 77 | 124 | DDIA 0520 1250 |
| 12.70 | 14 | 77 | 124 | DDIA 0520 1270 |
| 13.00 | 14 | 77 | 124 | DDIA 0520 1300 |
| 13.50 | 14 | 77 | 124 | DDIA 0520 1350 |
| 14.00 | 14 | 77 | 124 | DDIA 0520 1400 |
| 14.50 | 16 | 83 | 133 | DDIA 0520 1450 |
| 15.00 | 16 | 83 | 133 | DDIA 0520 1500 |
| 15.50 | 16 | 83 | 133 | DDIA 0520 1550 |
| 16.00 | 16 | 83 | 133 | DDIA 0520 1600 |
| 17.00 | 18 | 93 | 143 | DDIA 0520 1700 |
| 17.50 | 18 | 93 | 143 | DDIA 0520 1750 |
| 18.00 | 18 | 93 | 143 | DDIA 0520 1800 |
| 18.50 | 20 | 101 | 153 | DDIA 0520 1850 |
| 19.00 | 20 | 101 | 153 | DDIA 0520 1900 |
| 19.50 | 20 | 101 | 153 | DDIA 0520 1950 |
| 20.00 | 20 | 101 | 153 | DDIA 0520 2000 |

*Order Code for HB Shank, AlCrN Coated: DDIA 0521 | Order Code for HE Shank, AlCrN Coated: DDIA 0522

# DURONTO RX

3xd to 40xd Double margin drills with
Internal Coolant holes - Universal application

P M K S

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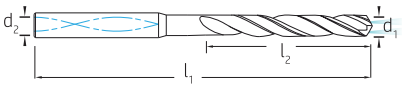
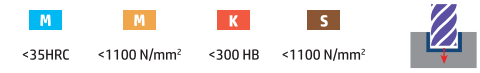







*Technical Info. Page No.* ***153***

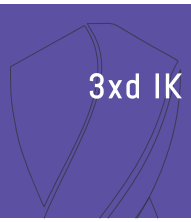
| $d_1$ | $d_2$ | $l_2$ | $l_1$ | EDP No. HA |
|---|---|---|---|---|
| *(m7)* | *(h6)* | *±0.50* | *±0.80* | PX |
| 3.00 | 6 | 20 | 62 | DRX2 0320 0300 |
| 3.10 | 6 | 20 | 62 | DRX2 0320 0310 |
| 3.20 | 6 | 20 | 62 | DRX2 0320 0320 |
| 3.30 | 6 | 20 | 62 | DRX2 0320 0330 |
| 340 | 6 | 20 | 62 | DRX2 0320 0340 |
| 3.50 | 6 | 20 | 62 | DRX2 0320 0350 |
| 3.60 | 6 | 20 | 62 | DRX2 0320 0360 |
| 3.70 | 6 | 20 | 62 | DRX2 0320 0370 |
| 3.80 | 6 | 24 | 66 | DRX2 0320 0380 |
| 3.90 | 6 | 24 | 66 | DRX2 0320 0390 |
| 4.00 | 6 | 24 | 66 | DRX2 0320 0400 |
| 4.10 | 6 | 24 | 66 | DRX2 0320 0410 |
| 4.20 | 6 | 24 | 66 | DRX2 0320 0420 |
| 4.30 | 6 | 24 | 66 | DRX2 0320 0430 |
| 440 | 6 | 24 | 66 | DRX2 0320 0440 |
| 4.50 | 6 | 24 | 66 | DRX2 0320 0450 |
| 4.60 | 6 | 24 | 66 | DRX2 0320 0460 |
| 4.70 | 6 | 24 | 66 | DRX2 0320 0470 |
| 4.80 | 6 | 28 | 66 | DRX2 0320 0480 |
| 4.90 | 6 | 28 | 66 | DRX2 0320 0490 |
| 5.00 | 6 | 28 | 66 | DRX2 0320 0500 |
| 5.10 | 6 | 28 | 66 | DRX2 0320 0510 |
| 5.20 | 6 | 28 | 66 | DRX2 0320 0520 |
| 5.30 | 6 | 28 | 66 | DRX2 0320 0530 |
| 540 | 6 | 28 | 66 | DRX2 0320 0540 |
| 5.50 | 6 | 28 | 66 | DRX2 0320 0550 |
| 5.60 | 6 | 28 | 66 | DRX2 0320 0560 |

| $d_1$ | $d_2$ | $l_2$ | $l_1$ | EDP No. HA |
|---|---|---|---|---|
| *(m7)* | *(h6)* | *±0.50* | *±0.80* | PX |
| 5.70 | 6 | 28 | 66 | DRX2 0320 0570 |
| 5.80 | 6 | 28 | 66 | DRX2 0320 0580 |
| 5.90 | 6 | 28 | 66 | DRX2 0320 0590 |
| 6.00 | 6 | 28 | 66 | DRX2 0320 0600 |
| 6.10 | 8 | 34 | 79 | DRX2 0320 0610 |
| 6.20 | 8 | 34 | 79 | DRX2 0320 0620 |
| 6.30 | 8 | 34 | 79 | DRX2 0320 0630 |
| 640 | 8 | 34 | 79 | DRX2 0320 0640 |
| 6.50 | 8 | 34 | 79 | DRX2 0320 0650 |
| 6.60 | 8 | 34 | 79 | DRX2 0320 0660 |
| 6.70 | 8 | 34 | 79 | DRX2 0320 0670 |
| 6.80 | 8 | 34 | 79 | DRX2 0320 0680 |
| 6.90 | 8 | 34 | 79 | DRX2 0320 0690 |
| 7.00 | 8 | 34 | 79 | DRX2 0320 0700 |
| 7.10 | 8 | 41 | 79 | DRX2 0320 0710 |
| 7.20 | 8 | 41 | 79 | DRX2 0320 0720 |
| 7.30 | 8 | 41 | 79 | DRX2 0320 0730 |
| 740 | 8 | 41 | 79 | DRX2 0320 0740 |
| 7.50 | 8 | 41 | 79 | DRX2 0320 0750 |
| 7.60 | 8 | 41 | 79 | DRX2 0320 0760 |
| 7.70 | 8 | 41 | 79 | DRX2 0320 0770 |
| 7.80 | 8 | 41 | 79 | DRX2 0320 0780 |
| 7.90 | 8 | 41 | 79 | DRX2 0320 0790 |
| 8.00 | 8 | 41 | 79 | DRX2 0320 0800 |
| 8.10 | 10 | 47 | 89 | DRX2 0320 0810 |
| 8.20 | 10 | 47 | 89 | DRX2 0320 0820 |
| 8.30 | 10 | 47 | 89 | DRX2 0320 0830 |

*Order Code for HB Shank, PX Coated: DRX2 0321 | Order Code for HE Shank, PX Coated: DRX2 0322

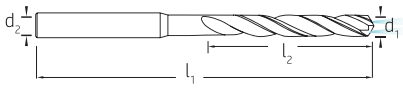
# DURONTO-RX

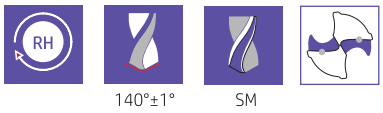
## 3xd With Internal Spiral Coolant Holes



3xd IK






M <35HRC | M <1100 N/mm² | K <300 HB | S <1100 N/mm²

*Technical Info. Page No.* ***153***

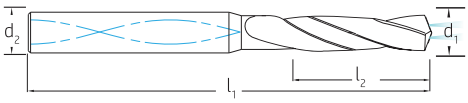
| $d_1$ (m7) | $d_2$ (h6) | $l_2$ ±0.50 | $l_1$ ±0.80 | EDP No. HA PX |
|---|---|---|---|---|
| 840 | 10 | 47 | 89 | DRX2 0320 0840 |
| 8.50 | 10 | 47 | 89 | DRX2 0320 0850 |
| 8.60 | 10 | 47 | 89 | DRX2 0320 0860 |
| 8.70 | 10 | 47 | 89 | DRX2 0320 0870 |
| 8.80 | 10 | 47 | 89 | DRX2 0320 0880 |
| 8.90 | 10 | 47 | 89 | DRX2 0320 0890 |
| 9.00 | 10 | 47 | 89 | DRX2 0320 0900 |
| 9.10 | 10 | 47 | 89 | DRX2 0320 0910 |
| 9.20 | 10 | 47 | 89 | DRX2 0320 0920 |
| 9.30 | 10 | 47 | 89 | DRX2 0320 0930 |
| 940 | 10 | 47 | 89 | DRX2 0320 0940 |
| 9.50 | 10 | 47 | 89 | DRX2 0320 0950 |
| 9.60 | 10 | 47 | 89 | DRX2 0320 0960 |
| 9.70 | 10 | 47 | 89 | DRX2 0320 0970 |
| 9.80 | 10 | 47 | 89 | DRX2 0320 0980 |
| 9.90 | 10 | 47 | 89 | DRX2 0320 0990 |
| 10.00 | 10 | 47 | 89 | DRX2 0320 1000 |
| 10.10 | 12 | 55 | 102 | DRX2 0320 1010 |
| 10.20 | 12 | 55 | 102 | DRX2 0320 1020 |
| 10.30 | 12 | 55 | 102 | DRX2 0320 1030 |
| 1040 | 12 | 55 | 102 | DRX2 0320 1040 |
| 10.50 | 12 | 55 | 102 | DRX2 0320 1050 |
| 10.60 | 12 | 55 | 102 | DRX2 0320 1060 |
| 10.70 | 12 | 55 | 102 | DRX2 0320 1070 |
| 10.80 | 12 | 55 | 102 | DRX2 0320 1080 |
| 10.90 | 12 | 55 | 102 | DRX2 0320 1090 |
| 11.00 | 12 | 55 | 102 | DRX2 0320 1100 |

| $d_1$ (m7) | $d_2$ (h6) | $l_2$ ±0.50 | $l_1$ ±0.80 | EDP No. HA PX |
|---|---|---|---|---|
| 11.10 | 12 | 55 | 102 | DRX2 0320 1110 |
| 11.20 | 12 | 55 | 102 | DRX2 0320 1120 |
| 11.30 | 12 | 55 | 102 | DRX2 0320 1130 |
| 1140 | 12 | 55 | 102 | DRX2 0320 1140 |
| 11.50 | 12 | 55 | 102 | DRX2 0320 1150 |
| 11.60 | 12 | 55 | 102 | DRX2 0320 1160 |
| 11.70 | 12 | 55 | 102 | DRX2 0320 1170 |
| 11.80 | 12 | 55 | 102 | DRX2 0320 1180 |
| 11.90 | 12 | 55 | 102 | DRX2 0320 1190 |
| 12.00 | 12 | 55 | 102 | DRX2 0320 1200 |
| 12.50 | 14 | 60 | 107 | DRX2 0320 1250 |
| 12.70 | 14 | 60 | 107 | DRX2 0320 1270 |
| 13.00 | 14 | 60 | 107 | DRX2 0320 1300 |
| 13.50 | 14 | 60 | 107 | DRX2 0320 1350 |
| 14.00 | 14 | 60 | 107 | DRX2 0320 1400 |
| 14.50 | 16 | 65 | 115 | DRX2 0320 1450 |
| 15.00 | 16 | 65 | 115 | DRX2 0320 1500 |
| 15.50 | 16 | 65 | 115 | DRX2 0320 1550 |
| 16.00 | 16 | 65 | 115 | DRX2 0320 1600 |
| 16.50 | 18 | 73 | 123 | DRX2 0320 1650 |
| 17.00 | 18 | 73 | 123 | DRX2 0320 1700 |
| 17.50 | 18 | 73 | 123 | DRX2 0320 1750 |
| 18.00 | 18 | 73 | 123 | DRX2 0320 1800 |
| 19.00 | 20 | 79 | 131 | DRX2 0320 1900 |
| 19.50 | 20 | 79 | 131 | DRX2 0320 1950 |
| 20.00 | 20 | 79 | 131 | DRX2 0320 2000 |

*Order Code for HB Shank, PX Coated: DRX2 0321 | Order Code for HE Shank, PX Coated: DRX2 0322

# DURONTO-RX

## 5xd With Internal Spiral Coolant Holes




RH


140°±1°


SM

M <35HRC | M <1100 N/mm² | K <300 HB | S <1100 N/mm²

*Technical Info. Page No.* ***153***

| $d_1$ (m7) | $d_2$ (h6) | $l_2$ ±0.50 | $l_1$ ±0.80 | EDP No. HA PX |
|---|---|---|---|---|
| 3.00 | 6 | 28 | 66 | DRX2 0520 0300 |
| 3.10 | 6 | 28 | 66 | DRX2 0520 0310 |
| 3.20 | 6 | 28 | 66 | DRX2 0520 0320 |
| 3.30 | 6 | 28 | 66 | DRX2 0520 0330 |
| 340 | 6 | 28 | 66 | DRX2 0520 0340 |
| 3.50 | 6 | 28 | 66 | DRX2 0520 0350 |
| 3.60 | 6 | 28 | 66 | DRX2 0520 0360 |
| 3.70 | 6 | 28 | 66 | DRX2 0520 0370 |
| 3.80 | 6 | 36 | 74 | DRX2 0520 0380 |
| 3.90 | 6 | 36 | 74 | DRX2 0520 0390 |
| 4.00 | 6 | 36 | 74 | DRX2 0520 0400 |
| 4.10 | 6 | 36 | 74 | DRX2 0520 0410 |
| 4.20 | 6 | 36 | 74 | DRX2 0520 0420 |
| 4.30 | 6 | 36 | 74 | DRX2 0520 0430 |
| 440 | 6 | 36 | 74 | DRX2 0520 0440 |
| 4.50 | 6 | 36 | 74 | DRX2 0520 0450 |
| 4.60 | 6 | 36 | 74 | DRX2 0520 0460 |
| 4.70 | 6 | 36 | 74 | DRX2 0520 0470 |
| 4.80 | 6 | 44 | 82 | DRX2 0520 0480 |
| 4.90 | 6 | 44 | 82 | DRX2 0520 0490 |
| 5.00 | 6 | 44 | 82 | DRX2 0520 0500 |
| 5.10 | 6 | 44 | 82 | DRX2 0520 0510 |
| 5.20 | 6 | 44 | 82 | DRX2 0520 0520 |
| 5.30 | 6 | 44 | 82 | DRX2 0520 0530 |
| 540 | 6 | 44 | 82 | DRX2 0520 0540 |
| 5.50 | 6 | 44 | 82 | DRX2 0520 0550 |
| 5.60 | 6 | 44 | 82 | DRX2 0520 0560 |

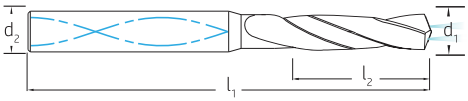
| $d_1$ (m7) | $d_2$ (h6) | $l_2$ ±0.50 | $l_1$ ±0.80 | EDP No. HA PX |
|---|---|---|---|---|
| 5.70 | 6 | 44 | 82 | DRX2 0520 0570 |
| 5.80 | 6 | 44 | 82 | DRX2 0520 0580 |
| 5.90 | 6 | 44 | 82 | DRX2 0520 0590 |
| 6.00 | 6 | 44 | 82 | DRX2 0520 0600 |
| 6.10 | 8 | 53 | 91 | DRX2 0520 0610 |
| 6.20 | 8 | 53 | 91 | DRX2 0520 0620 |
| 6.30 | 8 | 53 | 91 | DRX2 0520 0630 |
| 640 | 8 | 53 | 91 | DRX2 0520 0640 |
| 6.50 | 8 | 53 | 91 | DRX2 0520 0650 |
| 6.60 | 8 | 53 | 91 | DRX2 0520 0660 |
| 6.70 | 8 | 53 | 91 | DRX2 0520 0670 |
| 6.80 | 8 | 53 | 91 | DRX2 0520 0680 |
| 6.90 | 8 | 53 | 91 | DRX2 0520 0690 |
| 7.00 | 8 | 53 | 91 | DRX2 0520 0700 |
| 7.10 | 8 | 53 | 91 | DRX2 0520 0710 |
| 7.20 | 8 | 53 | 91 | DRX2 0520 0720 |
| 7.30 | 8 | 53 | 91 | DRX2 0520 0730 |
| 740 | 8 | 53 | 91 | DRX2 0520 0740 |
| 7.50 | 8 | 53 | 91 | DRX2 0520 0750 |
| 7.60 | 8 | 53 | 91 | DRX2 0520 0760 |
| 7.70 | 8 | 53 | 91 | DRX2 0520 0770 |
| 7.80 | 8 | 53 | 91 | DRX2 0520 0780 |
| 7.90 | 8 | 53 | 91 | DRX2 0520 0790 |
| 8.00 | 8 | 53 | 91 | DRX2 0520 0800 |
| 8.10 | 10 | 61 | 103 | DRX2 0520 0810 |
| 8.20 | 10 | 61 | 103 | DRX2 0520 0820 |
| 8.30 | 10 | 61 | 103 | DRX2 0520 0830 |

*Order Code for HB Shank, PX Coated: DRX2 0521 | Order Code for HE Shank, PX Coated: DRX2 0522

# DURONTO-RX

## 5xd With Internal Spiral Coolant Holes

5xd IK





140°±1°

SM

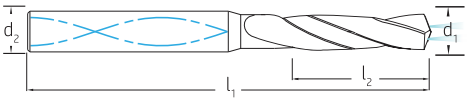
| M | M | K | S |
|---|---|---|---|
| <35HRC | <1100 N/mm² | <300 HB | <1100 N/mm² |

*Technical Info. Page No.* ***153***

| $d_1$ | $d_2$ | $l_2$ | $l_1$ | EDP No. HA |
|---|---|---|---|---|
| *(m7)* | *(h6)* | *±0.50* | *±0.80* | PX |
| 840 | 10 | 61 | 103 | DRX2 0520 0840 |
| 8.50 | 10 | 61 | 103 | DRX2 0520 0850 |
| 8.60 | 10 | 61 | 103 | DRX2 0520 0860 |
| 8.70 | 10 | 61 | 103 | DRX2 0520 0870 |
| 8.80 | 10 | 61 | 103 | DRX2 0520 0880 |
| 8.90 | 10 | 61 | 103 | DRX2 0520 0890 |
| 9.00 | 10 | 61 | 103 | DRX2 0520 0900 |
| 9.10 | 10 | 61 | 103 | DRX2 0520 0910 |
| 9.20 | 10 | 61 | 103 | DRX2 0520 0920 |
| 9.30 | 10 | 61 | 103 | DRX2 0520 0930 |
| 940 | 10 | 61 | 103 | DRX2 0520 0940 |
| 9.50 | 10 | 61 | 103 | DRX2 0520 0950 |
| 9.60 | 10 | 61 | 103 | DRX2 0520 0960 |
| 9.70 | 10 | 61 | 103 | DRX2 0520 0970 |
| 9.80 | 10 | 61 | 103 | DRX2 0520 0980 |
| 9.90 | 10 | 61 | 103 | DRX2 0520 0990 |
| 10.00 | 10 | 61 | 103 | DRX2 0520 1000 |
| 10.10 | 12 | 71 | 118 | DRX2 0520 1010 |
| 10.20 | 12 | 71 | 118 | DRX2 0520 1020 |
| 10.30 | 12 | 71 | 118 | DRX2 0520 1030 |
| 1040 | 12 | 71 | 118 | DRX2 0520 1040 |
| 10.50 | 12 | 71 | 118 | DRX2 0520 1050 |
| 10.60 | 12 | 71 | 118 | DRX2 0520 1060 |
| 10.70 | 12 | 71 | 118 | DRX2 0520 1070 |
| 10.80 | 12 | 71 | 118 | DRX2 0520 1080 |
| 10.90 | 12 | 71 | 118 | DRX2 0520 1090 |
| 11.00 | 12 | 71 | 118 | DRX2 0520 1100 |

| $d_1$ | $d_2$ | $l_2$ | $l_1$ | EDP No. HA |
|---|---|---|---|---|
| *(m7)* | *(h6)* | *±0.50* | *±0.80* | PX |
| 11.10 | 12 | 71 | 118 | DRX2 0520 1110 |
| 11.20 | 12 | 71 | 118 | DRX2 0520 1120 |
| 11.30 | 12 | 71 | 118 | DRX2 0520 1130 |
| 1140 | 12 | 71 | 118 | DRX2 0520 1140 |
| 11.50 | 12 | 71 | 118 | DRX2 0520 1150 |
| 11.60 | 12 | 71 | 118 | DRX2 0520 1160 |
| 11.70 | 12 | 71 | 118 | DRX2 0520 1170 |
| 11.80 | 12 | 71 | 118 | DRX2 0520 1180 |
| 11.90 | 12 | 71 | 118 | DRX2 0520 1190 |
| 12.00 | 12 | 71 | 118 | DRX2 0520 1200 |
| 12.50 | 14 | 77 | 124 | DRX2 0520 1250 |
| 12.70 | 14 | 77 | 124 | DRX2 0520 1270 |
| 13.00 | 14 | 77 | 124 | DRX2 0520 1300 |
| 13.50 | 14 | 77 | 124 | DRX2 0520 1350 |
| 14.00 | 14 | 77 | 124 | DRX2 0520 1400 |
| 14.50 | 16 | 83 | 133 | DRX2 0520 1450 |
| 15.00 | 16 | 83 | 133 | DRX2 0520 1500 |
| 15.50 | 16 | 83 | 133 | DRX2 0520 1550 |
| 16.00 | 16 | 83 | 133 | DRX2 0520 1600 |
| 17.00 | 18 | 93 | 143 | DRX2 0520 1700 |
| 17.50 | 18 | 93 | 143 | DRX2 0520 1750 |
| 18.00 | 18 | 93 | 143 | DRX2 0520 1800 |
| 18.50 | 20 | 101 | 153 | DRX2 0520 1850 |
| 19.00 | 20 | 101 | 153 | DRX2 0520 1900 |
| 19.50 | 20 | 101 | 153 | DRX2 0520 1950 |
| 20.00 | 20 | 101 | 153 | DRX2 0520 2000 |

*Order Code for HB Shank, PX Coated: DRX2 0521 | Order Code for HE Shank, PX Coated: DRX2 0522





| M | M | K | S |
|---|---|---|---|
| <35HRC | <1100 N/mm² | <300 HB | <1100 N/mm² |

*Technical Info. Page No.* ***153***

| $d_1$ | $d_2$ | $l_2$ | $l_1$ | EDP No. HA |
|---|---|---|---|---|
| *(m7)* | *(h6)* | *±0.50* | *±0.80* | PX |
| 3.00 | 6 | 34 | 72 | DRX2 0820 0300 |
| 3.10 | 6 | 34 | 72 | DRX2 0820 0310 |
| 3.20 | 6 | 34 | 72 | DRX2 0820 0320 |
| 3.30 | 6 | 34 | 72 | DRX2 0820 0330 |
| 340 | 6 | 34 | 72 | DRX2 0820 0340 |
| 3.50 | 6 | 34 | 72 | DRX2 0820 0350 |
| 3.60 | 6 | 34 | 72 | DRX2 0820 0360 |
| 3.70 | 6 | 34 | 72 | DRX2 0820 0370 |
| 3.80 | 6 | 43 | 81 | DRX2 0820 0380 |
| 3.90 | 6 | 43 | 81 | DRX2 0820 0390 |
| 4.00 | 6 | 43 | 81 | DRX2 0820 0400 |
| 4.10 | 6 | 43 | 81 | DRX2 0820 0410 |
| 4.20 | 6 | 43 | 81 | DRX2 0820 0420 |
| 4.30 | 6 | 43 | 81 | DRX2 0820 0430 |
| 440 | 6 | 43 | 81 | DRX2 0820 0440 |
| 4.50 | 6 | 43 | 81 | DRX2 0820 0450 |
| 4.60 | 6 | 43 | 81 | DRX2 0820 0460 |
| 4.70 | 6 | 43 | 81 | DRX2 0820 0470 |
| 4.80 | 6 | 57 | 95 | DRX2 0820 0480 |
| 4.90 | 6 | 57 | 95 | DRX2 0820 0490 |
| 5.00 | 6 | 57 | 95 | DRX2 0820 0500 |
| 5.10 | 6 | 57 | 95 | DRX2 0820 0510 |
| 5.20 | 6 | 57 | 95 | DRX2 0820 0520 |
| 5.30 | 6 | 57 | 95 | DRX2 0820 0530 |
| 540 | 6 | 57 | 95 | DRX2 0820 0540 |
| 5.50 | 6 | 57 | 95 | DRX2 0820 0550 |

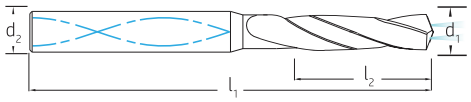
| $d_1$ | $d_2$ | $l_2$ | $l_1$ | EDP No. HA |
|---|---|---|---|---|
| *(m7)* | *(h6)* | *±0.50* | *±0.80* | PX |
| 5.60 | 6 | 57 | 95 | DRX2 0820 0560 |
| 5.70 | 6 | 57 | 95 | DRX2 0820 0570 |
| 5.80 | 6 | 57 | 95 | DRX2 0820 0580 |
| 5.90 | 6 | 57 | 95 | DRX2 0820 0590 |
| 6.00 | 6 | 57 | 95 | DRX2 0820 0600 |
| 6.10 | 8 | 76 | 114 | DRX2 0820 0610 |
| 6.20 | 8 | 76 | 114 | DRX2 0820 0620 |
| 6.30 | 8 | 76 | 114 | DRX2 0820 0630 |
| 640 | 8 | 76 | 114 | DRX2 0820 0640 |
| 6.50 | 8 | 76 | 114 | DRX2 0820 0650 |
| 6.60 | 8 | 76 | 114 | DRX2 0820 0660 |
| 6.70 | 8 | 76 | 114 | DRX2 0820 0670 |
| 6.80 | 8 | 76 | 114 | DRX2 0820 0680 |
| 6.90 | 8 | 76 | 114 | DRX2 0820 0690 |
| 7.00 | 8 | 76 | 114 | DRX2 0820 0700 |
| 7.10 | 8 | 76 | 114 | DRX2 0820 0710 |
| 7.20 | 8 | 76 | 114 | DRX2 0820 0720 |
| 7.30 | 8 | 76 | 114 | DRX2 0820 0730 |
| 740 | 8 | 76 | 114 | DRX2 0820 0740 |
| 7.50 | 8 | 76 | 114 | DRX2 0820 0750 |
| 7.60 | 8 | 76 | 114 | DRX2 0820 0760 |
| 7.70 | 8 | 76 | 114 | DRX2 0820 0770 |
| 7.80 | 8 | 76 | 114 | DRX2 0820 0780 |
| 7.90 | 8 | 76 | 114 | DRX2 0820 0790 |
| 8.00 | 8 | 76 | 114 | DRX2 0820 0800 |
| 8.10 | 10 | 95 | 142 | DRX2 0820 0810 |

*Order Code for HB Shank, PX Coated: DRX2 0821 | Order Code for HE Shank, PX Coated: DRX2 0822

# DURONTO-RX

## 8xd With Internal Spiral Coolant Holes

8xd IK





140°±1°

DM

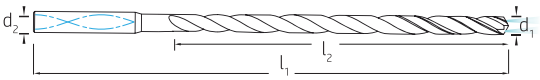
| M | M | K | S |
|---|---|---|---|
| <35HRC | <1100 N/mm² | <300 HB | <1100 N/mm² |

*Technical Info. Page No.* ***153***

| $d_1$ (m7) | $d_2$ (h6) | $l_2$ ±0.50 | $l_1$ ±0.80 | EDP No. HA PX |
|---|---|---|---|---|
| 8.20 | 10 | 95 | 142 | DRX2 0820 0820 |
| 8.30 | 10 | 95 | 142 | DRX2 0820 0830 |
| 840 | 10 | 95 | 142 | DRX2 0820 0840 |
| 8.50 | 10 | 95 | 142 | DRX2 0820 0850 |
| 8.60 | 10 | 95 | 142 | DRX2 0820 0860 |
| 8.70 | 10 | 95 | 142 | DRX2 0820 0870 |
| 8.80 | 10 | 95 | 142 | DRX2 0820 0880 |
| 8.90 | 10 | 95 | 142 | DRX2 0820 0890 |
| 9.00 | 10 | 95 | 142 | DRX2 0820 0900 |
| 9.10 | 10 | 95 | 142 | DRX2 0820 0910 |
| 9.20 | 10 | 95 | 142 | DRX2 0820 0920 |
| 9.30 | 10 | 95 | 142 | DRX2 0820 0930 |
| 940 | 10 | 95 | 142 | DRX2 0820 0940 |
| 9.50 | 10 | 95 | 142 | DRX2 0820 0950 |
| 9.60 | 10 | 95 | 142 | DRX2 0820 0960 |
| 9.80 | 10 | 95 | 142 | DRX2 0820 0980 |
| 9.90 | 10 | 95 | 142 | DRX2 0820 0990 |
| 10.00 | 10 | 95 | 142 | DRX2 0820 1000 |
| 10.10 | 12 | 114 | 162 | DRX2 0820 1010 |
| 10.20 | 12 | 114 | 162 | DRX2 0820 1020 |

| $d_1$ (m7) | $d_2$ (h6) | $l_2$ ±0.50 | $l_1$ ±0.80 | EDP No. HA PX |
|---|---|---|---|---|
| 10.30 | 12 | 114 | 162 | DRX2 0820 1030 |
| 10.32 | 12 | 114 | 162 | DRX2 0820 1032 |
| 1040 | 12 | 114 | 162 | DRX2 0820 1040 |
| 10.50 | 12 | 114 | 162 | DRX2 0820 1050 |
| 10.60 | 12 | 114 | 162 | DRX2 0820 1060 |
| 10.70 | 12 | 114 | 162 | DRX2 0820 1070 |
| 10.80 | 12 | 114 | 162 | DRX2 0820 1080 |
| 10.90 | 12 | 114 | 162 | DRX2 0820 1090 |
| 11.00 | 12 | 114 | 162 | DRX2 0820 1100 |
| 11.10 | 12 | 114 | 162 | DRX2 0820 1110 |
| 11.20 | 12 | 114 | 162 | DRX2 0820 1120 |
| 11.30 | 12 | 114 | 162 | DRX2 0820 1130 |
| 1140 | 12 | 114 | 162 | DRX2 0820 1140 |
| 11.50 | 12 | 114 | 162 | DRX2 0820 1150 |
| 11.60 | 12 | 114 | 162 | DRX2 0820 1160 |
| 11.70 | 12 | 114 | 162 | DRX2 0820 1170 |
| 11.80 | 12 | 114 | 162 | DRX2 0820 1180 |
| 11.90 | 12 | 114 | 162 | DRX2 0820 1190 |
| 12.00 | 12 | 114 | 162 | DRX2 0820 1200 |

*Order Code for HB Shank, PX Coated: DRX2 0821 | Order Code for HE Shank, PX Coated: DRX2 0822





140°±1°

DM

| M | M | K | S |
|---|---|---|---|
| <35HRC | <1100 N/mm² | <300 HB | <1100 N/mm² |

*Technical Info. Page No.* ***153***

| $d_1$ | $d_2$ | $l_2$ | $l_1$ | EDP No. HA |
|---|---|---|---|---|
| *(h7)* | *(h6)* | *±0.50* | *±0.80* | PX |
| 3.00 | 6 | 46 | 86 | DRX2 1220 0300 |
| 3.10 | 6 | 54 | 94 | DRX2 1220 0310 |
| 3.20 | 6 | 54 | 94 | DRX2 1220 0320 |
| 3.30 | 6 | 54 | 94 | DRX2 1220 0330 |
| 340 | 6 | 54 | 94 | DRX2 1220 0340 |
| 3.50 | 6 | 54 | 94 | DRX2 1220 0350 |
| 3.60 | 6 | 61 | 101 | DRX2 1220 0360 |
| 3.70 | 6 | 61 | 101 | DRX2 1220 0370 |
| 3.80 | 6 | 61 | 101 | DRX2 1220 0380 |
| 3.90 | 6 | 61 | 101 | DRX2 1220 0390 |
| 4.00 | 6 | 61 | 101 | DRX2 1220 0400 |
| 4.10 | 6 | 69 | 109 | DRX2 1220 0410 |
| 4.20 | 6 | 69 | 109 | DRX2 1220 0420 |
| 4.30 | 6 | 69 | 109 | DRX2 1220 0430 |
| 440 | 6 | 69 | 109 | DRX2 1220 0440 |
| 4.50 | 6 | 69 | 109 | DRX2 1220 0450 |
| 4.60 | 6 | 76 | 116 | DRX2 1220 0460 |
| 4.70 | 6 | 76 | 116 | DRX2 1220 0470 |
| 4.80 | 6 | 76 | 116 | DRX2 1220 0480 |
| 4.90 | 6 | 76 | 116 | DRX2 1220 0490 |
| 5.00 | 6 | 76 | 116 | DRX2 1220 0500 |
| 5.10 | 6 | 84 | 124 | DRX2 1220 0510 |

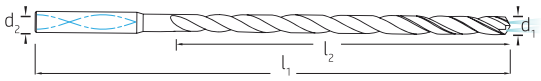
| $d_1$ | $d_2$ | $l_2$ | $l_1$ | EDP No. HA |
|---|---|---|---|---|
| *(h7)* | *(h6)* | *±0.50* | *±0.80* | PX |
| 5.20 | 6 | 84 | 124 | DRX2 1220 0520 |
| 5.30 | 6 | 84 | 124 | DRX2 1220 0530 |
| 540 | 6 | 84 | 124 | DRX2 1220 0540 |
| 5.50 | 6 | 84 | 124 | DRX2 1220 0550 |
| 5.60 | 6 | 91 | 131 | DRX2 1220 0560 |
| 5.70 | 6 | 91 | 131 | DRX2 1220 0570 |
| 5.80 | 6 | 91 | 131 | DRX2 1220 0580 |
| 5.90 | 6 | 91 | 131 | DRX2 1220 0590 |
| 6.00 | 6 | 91 | 131 | DRX2 1220 0600 |
| 6.50 | 8 | 99 | 139 | DRX2 1220 0650 |
| 7.00 | 8 | 106 | 146 | DRX2 1220 0700 |
| 7.50 | 8 | 114 | 154 | DRX2 1220 0750 |
| 8.00 | 8 | 121 | 161 | DRX2 1220 0800 |
| 8.50 | 10 | 129 | 173 | DRX2 1220 0850 |
| 9.00 | 10 | 136 | 180 | DRX2 1220 0900 |
| 9.50 | 10 | 145 | 189 | DRX2 1220 0950 |
| 10.00 | 10 | 152 | 196 | DRX2 1220 1000 |
| 10.50 | 12 | 160 | 209 | DRX2 1220 1050 |
| 11.00 | 12 | 167 | 216 | DRX2 1220 1100 |
| 11.50 | 12 | 175 | 224 | DRX2 1220 1150 |
| 12.00 | 12 | 182 | 231 | DRX2 1220 1200 |

*Order Code for HB Shank, PX Coated: DRX2 1221 | Order Code for HE Shank, PX Coated: DRX2 1222

# DURONTO-RX

## 15xd With Internal Spiral Coolant Holes

15xd IK





140°±1°

DM

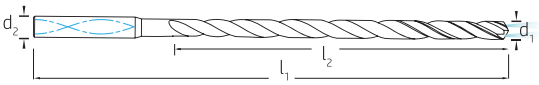
M <35HRC | M <1100 N/mm² | K <300 HB | S <1100 N/mm²

*Technical Info. Page No.* ***153***

| $d_1$ (h7) | $d_2$ (h6) | $l_2$ ±0.50 | $l_1$ ±0.80 | EDP No. HA PX |
|---|---|---|---|---|
| 3.00 | 6 | 55 | 95 | DRX2 1520 0300 |
| 3.10 | 6 | 64 | 104 | DRX2 1520 0310 |
| 3.20 | 6 | 64 | 104 | DRX2 1520 0320 |
| 3.30 | 6 | 64 | 104 | DRX2 1520 0330 |
| 340 | 6 | 64 | 104 | DRX2 1520 0340 |
| 3.50 | 6 | 64 | 104 | DRX2 1520 0350 |
| 3.60 | 6 | 73 | 113 | DRX2 1520 0360 |
| 3.70 | 6 | 73 | 113 | DRX2 1520 0370 |
| 3.80 | 6 | 73 | 113 | DRX2 1520 0380 |
| 3.90 | 6 | 73 | 113 | DRX2 1520 0390 |
| 4.00 | 6 | 73 | 113 | DRX2 1520 0400 |
| 4.10 | 6 | 82 | 122 | DRX2 1520 0410 |
| 4.20 | 6 | 82 | 122 | DRX2 1520 0420 |
| 4.30 | 6 | 82 | 122 | DRX2 1520 0430 |
| 440 | 6 | 82 | 122 | DRX2 1520 0440 |
| 4.50 | 6 | 82 | 122 | DRX2 1520 0450 |
| 4.60 | 6 | 91 | 131 | DRX2 1520 0460 |
| 4.70 | 6 | 91 | 131 | DRX2 1520 0470 |
| 4.80 | 6 | 91 | 131 | DRX2 1520 0480 |
| 4.90 | 6 | 91 | 131 | DRX2 1520 0490 |

| $d_1$ (h7) | $d_2$ (h6) | $l_2$ ±0.50 | $l_1$ ±0.80 | EDP No. HA PX |
|---|---|---|---|---|
| 5.00 | 6 | 91 | 131 | DRX2 1520 0500 |
| 5.10 | 6 | 100 | 140 | DRX2 1520 0510 |
| 5.20 | 6 | 100 | 140 | DRX2 1520 0520 |
| 5.30 | 6 | 100 | 140 | DRX2 1520 0530 |
| 540 | 6 | 100 | 140 | DRX2 1520 0540 |
| 5.50 | 6 | 100 | 140 | DRX2 1520 0550 |
| 5.60 | 6 | 109 | 149 | DRX2 1520 0560 |
| 5.70 | 6 | 109 | 149 | DRX2 1520 0570 |
| 5.80 | 6 | 109 | 149 | DRX2 1520 0580 |
| 5.90 | 6 | 109 | 149 | DRX2 1520 0590 |
| 6.00 | 6 | 109 | 149 | DRX2 1520 0600 |
| 6.50 | 8 | 118 | 158 | DRX2 1520 0650 |
| 7.00 | 8 | 127 | 167 | DRX2 1520 0700 |
| 7.50 | 8 | 136 | 176 | DRX2 1520 0750 |
| 8.00 | 8 | 145 | 185 | DRX2 1520 0800 |
| 8.50 | 10 | 154 | 198 | DRX2 1520 0850 |
| 9.00 | 10 | 163 | 207 | DRX2 1520 0900 |
| 9.50 | 10 | 173 | 217 | DRX2 1520 0950 |
| 10.00 | 10 | 182 | 226 | DRX2 1520 1000 |

*Order Code for HB Shank, PX Coated: DRX2 1521 | Order Code for HE Shank, PX Coated: DRX2 1522





135°±1°

DM

| M | M | K | S |
|---|---|---|---|
| <35HRC | <1100 N/mm² | <300 HB | <1100 N/mm² |

*Technical Info. Page No.* ***153***

| $d_1$ | $d_2$ | $l_2$ | $l_1$ | EDP No. HA |
|---|---|---|---|---|
| *(h7)* | *(h6)* | *±0.50* | *±0.80* | PX |
| 3.00 | 6 | 70 | 110 | DRX2 2020 0300 |
| 3.10 | 6 | 82 | 122 | DRX2 2020 0310 |
| 3.20 | 6 | 82 | 122 | DRX2 2020 0320 |
| 3.30 | 6 | 82 | 122 | DRX2 2020 0330 |
| 340 | 6 | 82 | 122 | DRX2 2020 0340 |
| 3.50 | 6 | 82 | 122 | DRX2 2020 0350 |
| 3.60 | 6 | 93 | 133 | DRX2 2020 0360 |
| 3.70 | 6 | 93 | 133 | DRX2 2020 0370 |
| 3.80 | 6 | 93 | 133 | DRX2 2020 0380 |
| 3.90 | 6 | 93 | 133 | DRX2 2020 0390 |
| 4.00 | 6 | 93 | 133 | DRX2 2020 0400 |
| 4.10 | 6 | 105 | 145 | DRX2 2020 0410 |
| 4.20 | 6 | 105 | 145 | DRX2 2020 0420 |
| 4.30 | 6 | 105 | 145 | DRX2 2020 0430 |
| 440 | 6 | 105 | 145 | DRX2 2020 0440 |
| 4.50 | 6 | 105 | 145 | DRX2 2020 0450 |
| 4.60 | 6 | 116 | 156 | DRX2 2020 0460 |
| 4.70 | 6 | 116 | 156 | DRX2 2020 0470 |

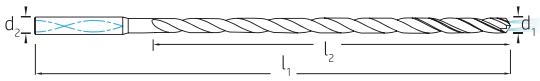
| $d_1$ | $d_2$ | $l_2$ | $l_1$ | EDP No. HA |
|---|---|---|---|---|
| *(h7)* | *(h6)* | *±0.50* | *±0.80* | PX |
| 4.80 | 6 | 116 | 156 | DRX2 2020 0480 |
| 4.90 | 6 | 116 | 156 | DRX2 2020 0490 |
| 5.00 | 6 | 116 | 156 | DRX2 2020 0500 |
| 5.10 | 6 | 128 | 168 | DRX2 2020 0510 |
| 5.20 | 6 | 128 | 168 | DRX2 2020 0520 |
| 5.30 | 6 | 128 | 168 | DRX2 2020 0530 |
| 540 | 6 | 128 | 168 | DRX2 2020 0540 |
| 5.50 | 6 | 128 | 168 | DRX2 2020 0550 |
| 5.60 | 6 | 139 | 179 | DRX2 2020 0560 |
| 5.70 | 6 | 139 | 179 | DRX2 2020 0570 |
| 5.80 | 6 | 139 | 179 | DRX2 2020 0580 |
| 5.90 | 6 | 139 | 179 | DRX2 2020 0590 |
| 6.00 | 6 | 139 | 179 | DRX2 2020 0600 |
| 6.50 | 8 | 151 | 191 | DRX2 2020 0650 |
| 7.00 | 8 | 162 | 202 | DRX2 2020 0700 |
| 7.50 | 8 | 174 | 214 | DRX2 2020 0750 |
| 8.00 | 8 | 185 | 225 | DRX2 2020 0800 |

*Order Code for HB Shank, PX Coated: DRX2 2021 | Order Code for HE Shank, PX Coated: DRX2 2022

# DURONTO-RX

## 25xd With Internal Spiral Coolant Holes







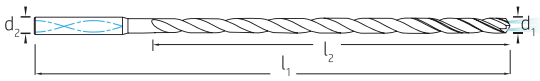
| M | M | K | S |
|---|---|---|---|
| <35HRC | <1100 N/mm² | <300 HB | <1100 N/mm² |

*Technical Info. Page No.* ***153***

| $d_1$ (h7) | $d_2$ (h6) | $l_2$ ±0.50 | $l_1$ ±0.80 | EDP No. HA PX |
|---|---|---|---|---|
| 3.00 | 6 | 85 | 125 | DRX2 2520 0300 |
| 3.10 | 6 | 99 | 139 | DRX2 2520 0310 |
| 3.20 | 6 | 99 | 139 | DRX2 2520 0320 |
| 3.30 | 6 | 99 | 139 | DRX2 2520 0330 |
| 340 | 6 | 99 | 139 | DRX2 2520 0340 |
| 3.50 | 6 | 99 | 139 | DRX2 2520 0350 |
| 3.60 | 6 | 113 | 153 | DRX2 2520 0360 |
| 3.70 | 6 | 113 | 153 | DRX2 2520 0370 |
| 3.80 | 6 | 113 | 153 | DRX2 2520 0380 |
| 3.90 | 6 | 113 | 153 | DRX2 2520 0390 |
| 4.00 | 6 | 113 | 153 | DRX2 2520 0400 |
| 4.10 | 6 | 127 | 167 | DRX2 2520 0410 |
| 4.20 | 6 | 127 | 167 | DRX2 2520 0420 |
| 4.30 | 6 | 127 | 167 | DRX2 2520 0430 |
| 440 | 6 | 127 | 167 | DRX2 2520 0440 |
| 4.50 | 6 | 127 | 167 | DRX2 2520 0450 |

| $d_1$ (h7) | $d_2$ (h6) | $l_2$ ±0.50 | $l_1$ ±0.80 | EDP No. HA PX |
|---|---|---|---|---|
| 4.60 | 6 | 141 | 181 | DRX2 2520 0460 |
| 4.70 | 6 | 141 | 181 | DRX2 2520 0470 |
| 4.80 | 6 | 141 | 181 | DRX2 2520 0480 |
| 4.90 | 6 | 141 | 181 | DRX2 2520 0490 |
| 5.00 | 6 | 141 | 181 | DRX2 2520 0500 |
| 5.10 | 6 | 155 | 195 | DRX2 2520 0510 |
| 5.20 | 6 | 155 | 195 | DRX2 2520 0520 |
| 5.30 | 6 | 155 | 195 | DRX2 2520 0530 |
| 540 | 6 | 155 | 195 | DRX2 2520 0540 |
| 5.50 | 6 | 155 | 195 | DRX2 2520 0550 |
| 5.60 | 6 | 169 | 209 | DRX2 2520 0560 |
| 5.70 | 6 | 169 | 209 | DRX2 2520 0570 |
| 5.80 | 6 | 169 | 209 | DRX2 2520 0580 |
| 5.90 | 6 | 169 | 209 | DRX2 2520 0590 |
| 6.00 | 6 | 169 | 209 | DRX2 2520 0600 |

*Order Code for HB Shank, PX Coated: DRX2 2521 | Order Code for HE Shank, PX Coated: DRX2 2522





M <35HRC | M <1100 N/mm² | K <300 HB | S <1100 N/mm²

*Technical Info. Page No.* ***153***

| $d_1$ (h7) | $d_2$ (h6) | $l_2$ ±0.50 | $l_1$ ±0.80 | EDP No. HA PX |
|---|---|---|---|---|
| 3.00 | 6 | 100 | 140 | DRX2 3020 0300 |
| 3.10 | 6 | 117 | 157 | DRX2 3020 0310 |
| 3.20 | 6 | 117 | 157 | DRX2 3020 0320 |
| 3.30 | 6 | 117 | 157 | DRX2 3020 0330 |
| 340 | 6 | 117 | 157 | DRX2 3020 0340 |
| 3.50 | 6 | 117 | 157 | DRX2 3020 0350 |
| 3.60 | 6 | 133 | 173 | DRX2 3020 0360 |
| 3.70 | 6 | 133 | 173 | DRX2 3020 0370 |
| 3.80 | 6 | 133 | 173 | DRX2 3020 0380 |
| 3.90 | 6 | 133 | 173 | DRX2 3020 0390 |
| 4.00 | 6 | 133 | 173 | DRX2 3020 0400 |
| 4.10 | 6 | 150 | 190 | DRX2 3020 0410 |
| 4.20 | 6 | 150 | 190 | DRX2 3020 0420 |
| 4.30 | 6 | 150 | 190 | DRX2 3020 0430 |
| 440 | 6 | 150 | 190 | DRX2 3020 0440 |
| 4.50 | 6 | 150 | 190 | DRX2 3020 0450 |

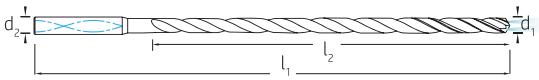
| $d_1$ (h7) | $d_2$ (h6) | $l_2$ ±0.50 | $l_1$ ±0.80 | EDP No. HA PX |
|---|---|---|---|---|
| 4.60 | 6 | 166 | 206 | DRX2 3020 0460 |
| 4.70 | 6 | 166 | 206 | DRX2 3020 0470 |
| 4.80 | 6 | 166 | 206 | DRX2 3020 0480 |
| 4.90 | 6 | 166 | 206 | DRX2 3020 0490 |
| 5.00 | 6 | 166 | 206 | DRX2 3020 0500 |
| 5.10 | 6 | 183 | 223 | DRX2 3020 0510 |
| 5.20 | 6 | 183 | 223 | DRX2 3020 0520 |
| 5.30 | 6 | 183 | 223 | DRX2 3020 0530 |
| 540 | 6 | 183 | 223 | DRX2 3020 0540 |
| 5.50 | 6 | 183 | 223 | DRX2 3020 0550 |
| 5.60 | 6 | 199 | 239 | DRX2 3020 0560 |
| 5.70 | 6 | 199 | 239 | DRX2 3020 0570 |
| 5.80 | 6 | 199 | 239 | DRX2 3020 0580 |
| 5.90 | 6 | 199 | 239 | DRX2 3020 0590 |
| 6.00 | 6 | 199 | 239 | DRX2 3020 0600 |

*Order Code for HB Shank, PX Coated: DRX2 2021 | Order Code for HE Shank, PX Coated: DRX2 3022

# DURONTO-RX

## 40xd With Internal Spiral Coolant Holes







| M | M | K | S |
|---|---|---|---|
| <35HRC | <1100 N/mm² | <300 HB | <1100 N/mm² |

*Technical Info. Page No.* ***153***

| $d_1$ | $d_2$ | $l_2$ | $l_1$ | EDP No. HA |
|---|---|---|---|---|
| *(h7)* | *(h6)* | *±0.50* | *±0.80* | PX |
| 3.00 | 6 | 131 | 174 | DRX2 4020 0300 |
| 3.10 | 6 | 141 | 191 | DRX2 4020 0310 |
| 3.20 | 6 | 141 | 191 | DRX2 4020 0320 |
| 3.30 | 6 | 151 | 191 | DRX2 4020 0330 |
| 340 | 6 | 151 | 191 | DRX2 4020 0340 |
| 3.50 | 6 | 151 | 191 | DRX2 4020 0350 |

| $d_1$ | $d_2$ | $l_2$ | $l_1$ | EDP No. HA |
|---|---|---|---|---|
| *(h7)* | *(h6)* | *±0.50* | *±0.80* | PX |
| 3.60 | 6 | 163 | 213 | DRX2 4020 0360 |
| 3.70 | 6 | 163 | 213 | DRX2 4020 0370 |
| 3.80 | 6 | 173 | 213 | DRX2 4020 0380 |
| 3.90 | 6 | 173 | 213 | DRX2 4020 0390 |
| 4.00 | 6 | 173 | 213 | DRX2 4020 0400 |

*Order Code for HB Shank, PX Coated: DRX2 4021 | Order Code for HE Shank, PX Coated: DRX2 4022

# Formulae

**Calculation of the spindle speed in [$min^{-1}$]**

$$n = \frac{V_c \times 1000}{\pi \times D}$$ Example $$n = \frac{(224 \times 1000)}{(3.1415 \times 12)}$$ **= 5942 $min^{-1}$**

**Calculation of the cutting speed in [m/min]**

$$V_c = \frac{\pi \times D \times n}{1000}$$ Example $$Vc = \frac{(3.1415 \times 12 \times 5941.96)}{1000}$$ **= 224 m/min**

**Calculation of the feedrate in [mm/min]**

$$V_f = n \times z \times f_z$$ Example $V_f = 5941.96 \times 4 \times 0.134$ **= 3185 mm/min**

**Calculation of the tooth feed in [mm/tooth]**

$$f_z = \frac{V_f}{n \times z}$$ Example $$f_z = \frac{3184.89}{(5941.96 \times 4)}$$ **=0.134 mm/tooth**

**Calculation of the feed per revolution in [mm/rev]**

$$f_n = z \times f_z$$

$$f_n = \frac{V_f}{n}$$ Example $$f_n = \frac{4 \times 0.134}{\frac{3184.89}{5941.96}}$$ **= 0.536 mm/U** **= 0.536 mm/U**

**Calculation of the cutting volume in [$cm^3$/min]**

$$Q = \frac{a_e \times a_p \times V_f}{1000}$$ Example $$Q = \frac{(1.5 \times 18 \times 3184.89)}{1000}$$ **= 85.992 $cm^3$/min**

**Calculation of the average chip thickness [mm]**

$$h_m = f_z \times \sqrt{\frac{a_e}{D}}\ [mm]$$ Example $$h_m = 0.134 \times \sqrt{\frac{1.5}{12}}$$ **= 0.047 mm**

**Calculation of the required machine power in [kW]**

$$P = \frac{a_e \times a_p \times V_f}{18000}$$ Example $$P = \frac{(1.5 \times 18 \times 3184.89)}{18000}$$ **= 4.777 kW**

# Coatings

| **Types** | AlCrN | ALD | GX | DX | PX | HX |
|---|---|---|---|---|---|---|
| Chemical Material | AlCrN Base | TiAlN base | AlTiSiN Based | AlTiN/TiSiXN | AlTiN-based | ta-C |
| Coating hardness HIT[GPa]* | 36 +/-3 | 34 +/- 3 | 38 +/-5 | 37 ±3 | 35 +/-3 | 50-60 |
| Max. Service temperature (°C) | 1100° | >1100° | 1000° | 1000° | 1000° | 500° |
| Application | Steels up to 52 HRC | Steels 45-60HRC | Steels up to 65 HRC | Steels 56 - 72 HRC | Deep-hole drills | Aluminium and aluminium alloys with up to 14% Si |
| | Cast iron | | Stainless Steels | | Step drills | |
| | Stainless Steels | | Super Alloys | Super Alloys | As well as all standard drills | |

| | MATERIAL | Hardness | ap max xD | ae max xD | Vc (m/min) | fz (mm/z) Ø 3 | 4 | 5 | 6 | 8 | 10 | 12 | 14 | 16 | 20 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **SLOTTING** | | | | | | | | | | | | | | |
| P | Steels, Alloy Steels and Tool Steels | <850 N/mm² | 1 | 1 | 120-150 | 0.015 | 0.020 | 0.025 | 0.030 | 0.040 | 0.050 | 0.060 | 0.070 | 0.080 | 0.100 |
| | Steels, Alloy Steels and Tool Steels | 850-1200 N/mm² | 1 | 1 | 80-100 | 0.110 | 0.015 | 0.019 | 0.022 | 0.028 | 0.034 | 0.039 | 0.044 | 0.049 | 0.059 |
| | Steels, Alloy Steels and Tool Steels | <1400 N/mm² | ≤ 1 | 1 | 80-100 | 0.011 | 0.014 | 0.018 | 0.021 | 0.028 | 0.035 | 0.042 | 0.049 | 0.056 | 0.070 |
| M | Stainless Steel : Easy To Machine | <750 N/mm² | | | | | | | | | | | | | |
| | Stainless Steel : Difficult To Machine | <950 N/mm² | | | | | | | | | | | | | |
| K | Cast Irons, Grey, Spher., Melleable | <300 HB | 1 | 1 | 80-120 | 0.110 | 0.015 | 0.019 | 0.022 | 0.028 | 0.034 | 0.039 | 0.044 | 0.049 | 0.059 |
| N | Aluminium, Aluminiums Alloys | <6% Si | | | | | | | | | | | | | |
| S | Titanium , Titanium Alloys | <1100N/mm² | | | | | | | | | | | | | |
| S | HRSA (Nickel Alloys, Co. Alloys) | <1300N/mm² | 0.5 | 1 | 30-40 | 0.009 | 0.012 | 0.012 | 0.017 | 0.022 | 0.026 | 0.030 | 0.034 | 0.038 | 0.046 |
| | **SIDE MILLING** | | | | | | | | | | | | | | |
| P | Steels, Alloy Steels and Tool Steels | <850 N/mm² | 1 | 0.3 | 150-180 | 0.015 | 0.020 | 0.025 | 0.030 | 0.040 | 0.050 | 0.060 | 0.070 | 0.080 | 0.100 |
| | Steels, Alloy Steels and Tool Steels | 850-1200 N/mm² | 1 | 0.3 | 100-150 | 0.012 | 0.016 | 0.020 | 0.024 | 0.032 | 0.040 | 0.048 | 0.056 | 0.064 | 0.080 |
| | Steels, Alloy Steels and Tool Steels | <1400 N/mm² | | | | | | | | | | | | | |
| M | Stainless Steel : Easy To Machine | <750 N/mm² | | | | | | | | | | | | | |
| | Stainless Steel : Difficult To Machine | <950 N/mm² | | | | | | | | | | | | | |
| K | Cast Irons, Grey, Spher., Melleable | <300 HB | 1 | 0.3 | 100-150 | 0.014 | 0.018 | 0.022 | 0.026 | 0.034 | 0.041 | 0.047 | 0.052 | 0.058 | 0.071 |
| N | Aluminiums, Aluminiums Alloys | <6% Si | | | | | | | | | | | | | |
| S | Titanium , Titanium Alloys | <1100N/mm² | | | | | | | | | | | | | |
| S | HRSA (Nickel Alloys, Co. Alloys) | <1300N/mm² | 1 | 0.3 | 40-45 | 0.017 | 0.022 | 0.027 | 0.032 | 0.042 | 0.050 | 0.057 | 0.064 | 0.064 | 0.078 |
| | **RAMPING** | | | | | | | | | | | | | | |
| P | Steels, Alloy Steels and Tool Steels | <850 N/mm² | | | | | | | | | | | | | |
| | Steels, Alloy Steels and Tool Steels | 850-1200 N/mm² | | | | | | | | | | | | | |
| | Steels, Alloy Steels and Tool Steels | <1400 N/mm² | | | | | | | | | | | | | |
| M | Stainless Steel : Easy To Machine | <750 N/mm² | | | | | | | | | | | | | |
| | Stainless Steel : Difficult To Machine | <950 N/mm² | | | | | | | | | | | | | |
| K | Cast Irons, Grey, Spher., Melleable | <300 HB | | | | | | | | | | | | | |
| N | Aluminiums, Aluminiums Alloys | <6% Si | | | | | | | | | | | | | |
| S | Titanium , Titanium Alloys | <1100N/mm² | | | | | | | | | | | | | |
| S | HRSA (Nickel Alloys, Co. Alloys) | <1300N/mm² | | | | | | | | | | | | | |
| | **HELICAL MILLING** | | | | | | | | | | | | | | |
| P | Steels, Alloy Steels and Tool Steels | <850 N/mm² | 5° | 0.3 | 120 | 0.010 | 0.012 | 0.015 | 0.018 | 0.024 | 0.030 | 0.032 | 0.035 | 0.040 | 0.048 |
| | Steels, Alloy Steels and Tool Steels | 850-1200 N/mm² | 4° | 0.3 | 80 | 0.009 | 0.011 | 0.014 | 0.016 | 0.021 | 0.026 | 0.029 | 0.033 | 0.037 | 0.045 |
| | Steels, Alloy Steels and Tool Steels | <1400 N/mm² | 3° | 0.3 | 70 | 0.010 | 0.012 | 0.015 | 0.018 | 0.024 | 0.030 | 0.032 | 0.035 | 0.040 | 0.048 |
| M | Stainless Steel : Easy To Machine | <750 N/mm² | | | | | | | | | | | | | |
| | Stainless Steel : Difficult To Machine | <950 N/mm² | | | | | | | | | | | | | |
| K | Cast Irons, Grey, Spher., Melleable | <300 HB | | | | | | | | | | | | | |
| N | Aluminiums, Aluminiums Alloys | <6% Si | | | | | | | | | | | | | |
| S | Titanium , Titanium Alloys | <1100N/mm² | | | | | | | | | | | | | |
| S | HRSA (Nickel Alloys, Co. Alloys) | <1300N/mm² | | | | | | | | | | | | | |
| | **DRILLING** | | | | | | | | | | | | | | |
| P | Steels, Alloy Steels and Tool Steels | <850 N/mm² | | | | | | | | | | | | | |
| | Steels, Alloy Steels and Tool Steels | 850-1200 N/mm² | | | | | | | | | | | | | |
| | Steels, Alloy Steels and Tool Steels | <1400 N/mm² | | | | | | | | | | | | | |
| M | Stainless Steel : Easy To Machine | <750 N/mm² | | | | | | | | | | | | | |
| | Stainless Steel : Difficult To Machine | <950 N/mm² | | | | | | | | | | | | | |
| K | Cast Irons, Grey, Spher., Melleable | <300 HB | | | | | | | | | | | | | |
| N | Aluminiums, Aluminiums Alloys | <6% Si | | | | | | | | | | | | | |
| S | Titanium , Titanium Alloys | <1100N/mm² | | | | | | | | | | | | | |
| S | HRSA (Nickel Alloys, Co. Alloys) | <1300N/mm² | | | | | | | | | | | | | |
| | **TROCHOIDAL MILLING** | | | | | | | | | | | | | | |
| P | Steels, Alloy Steels and Tool Steels | <850 N/mm² | 2 | 0.1 | 200 | | | | 0.061 | 0.079 | 0.095 | 0.108 | 0.122 | 0.135 | 0.164 |
| | Steels, Alloy Steels and Tool Steels | 850-1200 N/mm² | 2 | 0.1 | 130 | | | | 0.055 | 0.071 | 0.085 | 0.097 | 0.109 | 0.122 | 0.148 |
| | Steels, Alloy Steels and Tool Steels | <1400 N/mm² | 2 | 0.1 | 80 | | | | 0.049 | 0.063 | 0.076 | 0.086 | 0.097 | 0.108 | 0.131 |
| M | Stainless Steel : Easy To Machine | <750 N/mm² | | | | | | | | | | | | | |
| | Stainless Steel : Difficult To Machine | <950 N/mm² | | | | | | | | | | | | | |
| K | Cast Irons, Grey, Spher., Melleable | <300 HB | 2 | 0.1 | 130 | | | | 0.055 | 0.071 | 0.085 | 0.097 | 0.109 | 0.122 | 0.148 |
| N | Aluminiums, Aluminiums Alloys | <6% Si | | | | | | | | | | | | | |
| S | Titanium , Titanium Alloys | <1100N/mm² | | | | | | | | | | | | | |
| S | HRSA (Nickel Alloys, Co. Alloys) | <1300N/mm² | 1.5 | 0.1 | 50 | | | | 0.067 | 0.087 | 0.104 | 0.119 | 0.134 | 0.149 | 0.181 |

Technical Data provided should be considered advisory only as variations may be necessary depending on the particular application

| | MATERIAL | Hardness | ap max xD | ae max xD | Vc (m/min) | fz (mm/z) Ø 4 | 5 | 6 | 8 | 10 | 12 | 16 | 20 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **SLOTTING** | | | | | | | | | | | | |
| P | Steels, Alloy Steels and Tool Steels | <850 N/mm² | 1 | 1 | 110 | 0.014 | 0.018 | 0.026 | 0.034 | 0.041 | 0.047 | 0.058 | 0.071 |
| | Steels, Alloy Steels and Tool Steels | 850-1200 N/mm² | 1 | 1 | 70 | 0.013 | 0.016 | 0.024 | 0.031 | 0.037 | 0.042 | 0.052 | 0.064 |
| | Steels, Alloy Steels and Tool Steels | <1400 N/mm² | 1 | 1 | 50 | 0.010 | 0.013 | 0.020 | 0.026 | 0.031 | 0.035 | 0.044 | 0.053 |
| M | Stainless Steel : Easy To Machine | <750 N/mm² | | | | | | | | | | | |
| | Stainless Steel : Difficult To Machine | <950 N/mm² | 0.5 | 1 | 50 | 0.010 | 0.013 | 0.020 | 0.026 | 0.031 | 0.035 | 0.044 | 0.053 |
| K | Cast Irons, Grey, Spher., Melleable | <300 HB | 1 | 1 | 70 | 0.013 | 0.016 | 0.024 | 0.031 | 0.037 | 0.042 | 0.052 | 0.064 |
| N | Aluminiums, Aluminiums Alloys | <6% Si | | | | | | | | | | | |
| S | Titanium , Titanium Alloys | <1100N/mm² | | | | | | | | | | | |
| S | HRSA (Nickel Alloys, Co. Alloys) | <1300N/mm² | 0.5 | 1 | 30 | 0.012 | 0.015 | 0.018 | 0.024 | 0.029 | 0.033 | 0.041 | 0.050 |
| | **SIDE MILLING** | | | | | | | | | | | | |
| P | Steels, Alloy Steels and Tool Steels | <850 N/mm² | 1.5 | 0.5 | 130 | 0.020 | 0.025 | 0.031 | 0.041 | 0.049 | 0.056 | 0.070 | 0.085 |
| | Steels, Alloy Steels and Tool Steels | 850-1200 N/mm² | 1.5 | 0.5 | 90 | 0.020 | 0.025 | 0.028 | 0.037 | 0.044 | 0.050 | 0.063 | 0.077 |
| | Steels, Alloy Steels and Tool Steels | <1400 N/mm² | 1.2 | 0.3 | 60 | 0.016 | 0.020 | 0.025 | 0.033 | 0.039 | 0.045 | 0.056 | 0.068 |
| M | Stainless Steel : Easy To Machine | <750 N/mm² | | | | | | | | | | | |
| | Stainless Steel : Difficult To Machine | <950 N/mm² | 1.2 | 0.3 | 60 | 0.016 | 0.020 | 0.025 | 0.033 | 0.039 | 0.045 | 0.056 | 0.068 |
| K | Cast Irons, Grey, Spher., Melleable | <300 HB | 1.5 | 0.5 | 90 | 0.020 | 0.025 | 0.028 | 0.037 | 0.044 | 0.050 | 0.063 | 0.077 |
| N | Aluminiums, Aluminiums Alloys | <6% Si | | | | | | | | | | | |
| S | Titanium , Titanium Alloys | <1100N/mm² | | | | | | | | | | | |
| S | HRSA (Nickel Alloys, Co. Alloys) | <1300N/mm² | 1.2 | 0.3 | 40 | 0.024 | 0.030 | 0.035 | 0.045 | 0.054 | 0.062 | 0.077 | 0.094 |
| | **RAMPING** | | | | | | | | | | | | |
| P | Steels, Alloy Steels and Tool Steels | <850 N/mm² | | | | | | | | | | | |
| | Steels, Alloy Steels and Tool Steels | 850-1200 N/mm2 | | | | | | | | | | | |
| | Steels, Alloy Steels and Tool Steels | <1400 N/mm2 | | | | | | | | | | | |
| M | Stainless Steel : Easy To Machine | <750 N/mm2 | | | | | | | | | | | |
| | Stainless Steel : Difficult To Machine | <950 N/mm2 | | | | | | | | | | | |
| K | Cast Irons, Grey, Spher., Melleable | <300 HB | | | | | | | | | | | |
| N | Aluminiums, Aluminiums Alloys | <6% Si | | | | | | | | | | | |
| S | Titanium , Titanium Alloys | <1100N/mm2 | | | | | | | | | | | |
| S | HRSA (Nickel Alloys, Co. Alloys) | <1300N/mm2 | | | | | | | | | | | |
| | **HELICAL MILLING** | | | | | | | | | | | | |
| P | Steels, Alloy Steels and Tool Steels | <850 N/mm² | 7° | 04 | 110 | 0.012 | 0.015 | 0.018 | 0.024 | 0.029 | 0.033 | 0.041 | 0.050 |
| | Steels, Alloy Steels and Tool Steels | 850-1200 N/mm² | 5° | 04 | 70 | 0.011 | 0.014 | 0.017 | 0.022 | 0.027 | 0.031 | 0.038 | 0.046 |
| | Steels, Alloy Steels and Tool Steels | <1400 N/mm² | 3° | 04 | 50 | 0.010 | 0.013 | 0.016 | 0.020 | 0.025 | 0.028 | 0.035 | 0.043 |
| M | Stainless Steel : Easy To Machine | <750 N/mm² | | | | | | | | | | | |
| | Stainless Steel : Difficult To Machine | <950 N/mm² | 3° | 04 | 50 | 0.010 | 0.013 | 0.016 | 0.020 | 0.025 | 0.028 | 0.035 | 0.043 |
| K | Cast Irons, Grey, Spher., Melleable | <300 HB | 5° | 04 | 70 | 0.011 | 0.014 | 0.017 | 0.022 | 0.027 | 0.031 | 0.038 | 0.046 |
| N | Aluminiums, Aluminiums Alloys | <6% Si | | | | | | | | | | | |
| S | Titanium , Titanium Alloys | <1100N/mm² | | | | | | | | | | | |
| S | HRSA (Nickel Alloys, Co. Alloys) | <1300N/mm² | | | | | | | | | | | |
| | **DRILLING** | | | | | | | | | | | | |
| P | Steels, Alloy Steels and Tool Steels | <850 N/mm² | | | | | | | | | | | |
| | Steels, Alloy Steels and Tool Steels | 850-1200 N/mm² | | | | | | | | | | | |
| | Steels, Alloy Steels and Tool Steels | <1400 N/mm² | | | | | | | | | | | |
| M | Stainless Steel : Easy To Machine | <750 N/mm² | | | | | | | | | | | |
| | Stainless Steel : Difficult To Machine | <950 N/mm² | | | | | | | | | | | |
| K | Cast Irons, Grey, Spher., Melleable | <300 HB | | | | | | | | | | | |
| N | Aluminiums, Aluminiums Alloys | <6% Si | | | | | | | | | | | |
| S | Titanium , Titanium Alloys | <1100N/mm² | | | | | | | | | | | |
| S | HRSA (Nickel Alloys, Co. Alloys) | <1300N/mm² | | | | | | | | | | | |
| | **TROCHOIDAL MILLING** | | | | | | | | | | | | |
| P | Steels, Alloy Steels and Tool Steels | <850 N/mm² | 2 | 0.1 | 160 | 0.044 | 0.055 | 0.066 | 0.085 | 0.102 | 0.117 | 0.146 | 0.177 |
| | Steels, Alloy Steels and Tool Steels | 850-1200 N/mm² | 2 | 0.1 | 110 | 0.039 | 0.049 | 0.059 | 0.077 | 0.092 | 0.105 | 0.131 | 0.160 |
| | Steels, Alloy Steels and Tool Steels | <1400 N/mm² | 1.5 | 0.05 | 80 | 0.036 | 0.045 | 0.052 | 0.068 | 0.082 | 0.093 | 0.117 | 0.142 |
| M | Stainless Steel : Easy To Machine | <750 N/mm² | | | | | | | | | | | |
| | Stainless Steel : Difficult To Machine | <950 N/mm² | 1.5 | 0.05 | 80 | 0.036 | 0.045 | 0.052 | 0.068 | 0.082 | 0.093 | 0.117 | 0.142 |
| K | Cast Irons, Grey, Spher., Melleable | <300 HB | 2 | 0.1 | 110 | 0.039 | 0.049 | 0.059 | 0.077 | 0.092 | 0.105 | 0.131 | 0.160 |
| N | Aluminiums, Aluminiums Alloys | <6% Si | | | | | | | | | | | |
| S | Titanium , Titanium Alloys | <1100N/mm² | | | | | | | | | | | |
| S | HRSA (Nickel Alloys, Co. Alloys) | <1300N/mm² | 1.5 | 0.05 | 50 | 0.048 | 0.060 | 0.072 | 0.094 | 0.112 | 0.128 | 0.016 | 0.195 |

Technical Data provided should be considered advisory only as variations may be necessary depending on the particular application

| | MATERIAL | Hardness | ap max xD | ae max xD | Vc (m/min) | fz (mm/z) Ø 3 | 4 | 5 | 6 | 8 | 10 | 12 | 16 | 18 | 20 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **SLOTTING** | | | | | | | | | | | | | | |
| P | Steels, Alloy Steels and Tool Steels | <850 N/mm² | 1 | 1 | 130-150 | 0.015 | 0.020 | 0.025 | 0.030 | 0.040 | 0.050 | 0.060 | 0.070 | 0.080 | 0.100 |
| | Steels, Alloy Steels and Tool Steels | 850-1200 N/mm² | 1 | 1 | 90-110 | 0.110 | 0.015 | 0.019 | 0.022 | 0.028 | 0.034 | 0.039 | 0.044 | 0.049 | 0.059 |
| | Steels, Alloy Steels and Tool Steels | <1400 N/mm² | ≤ 1 | 1 | 90-110 | 0.011 | 0.014 | 0.018 | 0.021 | 0.028 | 0.035 | 0.042 | 0.049 | 0.056 | 0.070 |
| M | Stainless Steel : Easy To Machine | <750 N/mm² | 1 | 1 | 70-90 | 0.110 | 0.015 | 0.019 | 0.022 | 0.028 | 0.034 | 0.039 | 0.044 | 0.049 | 0.059 |
| | Stainless Steel : Difficult To Machine | <950 N/mm² | 0.5 | 1 | 50-70 | 0.009 | 0.012 | 0.012 | 0.017 | 0.022 | 0.026 | 0.030 | 0.034 | 0.038 | 0.046 |
| K | Cast Irons, Grey, Spher., Melleable | <300 HB | 1 | 1 | 90-130 | 0.110 | 0.015 | 0.019 | 0.022 | 0.028 | 0.034 | 0.039 | 0.044 | 0.049 | 0.059 |
| N | Aluminiums, Aluminiums Alloys | <6% Si | | | | | | | | | | | | | |
| S | Titanium , Titanium Alloys | <1100N/mm² | 0.5 | 1 | 30-50 | 0.009 | 0.012 | 0.012 | 0.017 | 0.022 | 0.026 | 0.030 | 0.034 | 0.038 | 0.046 |
| S | HRSA (Nickel Alloys, Co. Alloys) | <1300N/mm² | | | | | | | | | | | | | |
| | **SIDE MILLING** | | | | | | | | | | | | | | |
| P | Steels, Alloy Steels and Tool Steels | <850 N/mm² | 1 | 0.3 | 150-180 | 0.015 | 0.020 | 0.025 | 0.030 | 0.040 | 0.050 | 0.060 | 0.070 | 0.080 | 0.100 |
| | Steels, Alloy Steels and Tool Steels | 850-1200 N/mm² | 1 | 0.3 | 120-150 | 0.012 | 0.016 | 0.020 | 0.024 | 0.032 | 0.040 | 0.048 | 0.056 | 0.064 | 0.080 |
| | Steels, Alloy Steels and Tool Steels | <1400 N/mm² | | | | | | | | | | | | | |
| M | Stainless Steel : Easy To Machine | <750 N/mm² | 1.5 | 0.5 | 90-110 | 0.014 | 0.018 | 0.022 | 0.026 | 0.034 | 0.041 | 0.047 | 0.052 | 0.058 | 0.071 |
| | Stainless Steel : Difficult To Machine | <950 N/mm² | 1.2 | 0.3 | 60-80 | 0.012 | 0.016 | 0.020 | 0.023 | 0.030 | 0.036 | 0.041 | 0.047 | 0.052 | 0.063 |
| K | Cast Irons, Grey, Spher., Melleable | <300 HB | 1 | 0.3 | 120-150 | 0.014 | 0.018 | 0.022 | 0.026 | 0.034 | 0.041 | 0.047 | 0.052 | 0.058 | 0.071 |
| N | Aluminiums, Aluminiums Alloys | <6% Si | | | | | | | | | | | | | |
| S | Titanium , Titanium Alloys | <1100N/mm² | 1 | 0.3 | 40-50 | 0.017 | 0.022 | 0.027 | 0.032 | 0.042 | 0.050 | 0.057 | 0.064 | 0.064 | 0.078 |
| S | HRSA (Nickel Alloys, Co. Alloys) | <1300N/mm² | | | | | | | | | | | | | |
| | **RAMPING** | | | | | | | | | | | | | | |
| P | Steels, Alloy Steels and Tool Steels | <850 N/mm² | | | | | | | | | | | | | |
| | Steels, Alloy Steels and Tool Steels | 850-1200 N/mm² | | | | | | | | | | | | | |
| | Steels, Alloy Steels and Tool Steels | <1400 N/mm² | | | | | | | | | | | | | |
| M | Stainless Steel : Easy To Machine | <750 N/mm² | | | | | | | | | | | | | |
| | Stainless Steel : Difficult To Machine | <950 N/mm² | | | | | | | | | | | | | |
| K | Cast Irons, Grey, Spher., Melleable | <300 HB | | | | | | | | | | | | | |
| N | Aluminiums, Aluminiums Alloys | <6% Si | | | | | | | | | | | | | |
| S | Titanium , Titanium Alloys | <1100N/mm² | | | | | | | | | | | | | |
| S | HRSA (Nickel Alloys, Co. Alloys) | <1300N/mm² | | | | | | | | | | | | | |
| | **HELICAL MILLING** | | | | | | | | | | | | | | |
| P | Steels, Alloy Steels and Tool Steels | <850 N/mm² | 5° | 0.3 | 130 | 0.010 | 0.012 | 0.015 | 0.018 | 0.024 | 0.030 | 0.032 | 0.035 | 0.040 | 0.048 |
| | Steels, Alloy Steels and Tool Steels | 850-1200 N/mm² | 4° | 0.3 | 90 | 0.009 | 0.011 | 0.014 | 0.016 | 0.021 | 0.026 | 0.029 | 0.033 | 0.037 | 0.045 |
| | Steels, Alloy Steels and Tool Steels | <1400 N/mm² | | | | | | | | | | | | | |
| M | Stainless Steel : Easy To Machine | <750 N/mm² | 4° | 04 | 90 | 0.009 | 0.011 | 0.014 | 0.016 | 0.021 | 0.026 | 0.029 | 0.033 | 0.037 | 0.045 |
| | Stainless Steel : Difficult To Machine | <950 N/mm² | 3° | 04 | 70 | 0.008 | 0.010 | 0.012 | 0.015 | 0.019 | 0.023 | 0.026 | 0.029 | 0.036 | 0.039 |
| K | Cast Irons, Grey, Spher., Melleable | <300 HB | | | | | | | | | | | | | |
| N | Aluminiums, Aluminiums Alloys | <6% Si | | | | | | | | | | | | | |
| S | Titanium , Titanium Alloys | <1100N/mm² | | | | | | | | | | | | | |
| S | HRSA (Nickel Alloys, Co. Alloys) | <1300N/mm² | | | | | | | | | | | | | |
| | **DRILLING** | | | | | | | | | | | | | | |
| P | Steels, Alloy Steels and Tool Steels | <850 N/mm² | | | | | | | | | | | | | |
| | Steels, Alloy Steels and Tool Steels | 850-1200 N/mm² | | | | | | | | | | | | | |
| | Steels, Alloy Steels and Tool Steels | <1400 N/mm² | | | | | | | | | | | | | |
| M | Stainless Steel : Easy To Machine | <750 N/mm² | | | | | | | | | | | | | |
| | Stainless Steel : Difficult To Machine | <950 N/mm² | | | | | | | | | | | | | |
| K | Cast Irons, Grey, Spher., Melleable | <300 HB | | | | | | | | | | | | | |
| N | Aluminiums, Aluminiums Alloys | <6% Si | | | | | | | | | | | | | |
| S | Titanium , Titanium Alloys | <1100N/mm² | | | | | | | | | | | | | |
| S | HRSA (Nickel Alloys, Co. Alloys) | <1300N/mm² | | | | | | | | | | | | | |
| | **TROCHOIDAL MILLING** | | | | | | | | | | | | | | |
| P | Steels, Alloy Steels and Tool Steels | <850 N/mm² | 2 | 0.1 | 220 | | | | 0.061 | 0.079 | 0.095 | 0.108 | 0.122 | 0.135 | 0.164 |
| | Steels, Alloy Steels and Tool Steels | 850-1200 N/mm² | 2 | 0.1 | 150 | | | | 0.055 | 0.071 | 0.085 | 0.097 | 0.109 | 0.122 | 0.148 |
| | Steels, Alloy Steels and Tool Steels | <1400 N/mm² | 2 | 0.1 | 100 | | | | 0.049 | 0.063 | 0.076 | 0.086 | 0.097 | 0.108 | 0.131 |
| M | Stainless Steel : Easy To Machine | <750 N/mm² | | | | | | | | | | | | | |
| | Stainless Steel : Difficult To Machine | <950 N/mm² | | | | | | | | | | | | | |
| K | Cast Irons, Grey, Spher., Melleable | <300 HB | 2 | 0.1 | 150 | | | | 0.055 | 0.071 | 0.085 | 0.097 | 0.109 | 0.122 | 0.148 |
| N | Aluminiums, Aluminiums Alloys | <6% Si | | | | | | | | | | | | | |
| S | Titanium , Titanium Alloys | <1100N/mm² | 1.5 | 0.1 | 70 | | | | 0.067 | 0.087 | 0.104 | 0.119 | 0.134 | 0.149 | 0.181 |
| S | HRSA (Nickel Alloys, Co. Alloys) | <1300N/mm² | | | | | | | | | | | | | |

Technical Data provided should be considered advisory only as variations may be necessary depending on the particular application

| | MATERIAL | Hardness | ap max xD | ae max xD | Vc (m/min) | fz (mm/z) Ø 4 | 5 | 6 | 8 | 10 | 12 | 16 | 20 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **SLOTTING** | | | | | | | | | | | | |
| P | Steels, Alloy Steels and Tool Steels | <850 N/mm² | 1 | 1 | 130 | 0.014 | 0.018 | 0.026 | 0.034 | 0.041 | 0.047 | 0.058 | 0.071 |
| | Steels, Alloy Steels and Tool Steels | 850-1200 N/mm² | 1 | 1 | 90 | 0.013 | 0.016 | 0.024 | 0.031 | 0.037 | 0.042 | 0.052 | 0.064 |
| | Steels, Alloy Steels and Tool Steels | <1400 N/mm² | 1 | 1 | 70 | 0.010 | 0.013 | 0.020 | 0.026 | 0.031 | 0.035 | 0.044 | 0.053 |
| M | Stainless Steel : Easy To Machine | <750 N/mm² | 1 | 1 | 90 | 0.013 | 0.016 | 0.024 | 0.031 | 0.037 | 0.042 | 0.052 | 0.064 |
| | Stainless Steel : Difficult To Machine | <950 N/mm² | 0.5 | 1 | 70 | 0.010 | 0.013 | 0.020 | 0.026 | 0.031 | 0.035 | 0.044 | 0.053 |
| K | Cast Irons, Grey, Spher., Malleable | <300 HB | 1 | 1 | 90 | 0.013 | 0.016 | 0.024 | 0.031 | 0.037 | 0.042 | 0.052 | 0.064 |
| N | Aluminiums, Aluminiums Alloys | <6% Si | | | | | | | | | | | |
| S | Titanium , Titanium Alloys | <1100N/mm² | 0.5 | 1 | 50 | 0.012 | 0.015 | 0.018 | 0.024 | 0.029 | 0.033 | 0.041 | 0.050 |
| S | HRSA (Nickel Alloys, Co. Alloys) | <1300N/mm² | | | | | | | | | | | |
| | **SIDE MILLING** | | | | | | | | | | | | |
| P | Steels, Alloy Steels and Tool Steels | <850 N/mm² | 1.5 | 0.5 | 150 | 0.020 | 0.025 | 0.031 | 0.041 | 0.049 | 0.056 | 0.070 | 0.085 |
| | Steels, Alloy Steels and Tool Steels | 850-1200 N/mm² | 1.5 | 0.5 | 110 | 0.020 | 0.025 | 0.028 | 0.037 | 0.044 | 0.050 | 0.063 | 0.077 |
| | Steels, Alloy Steels and Tool Steels | <1400 N/mm² | 1.2 | 0.3 | 80 | 0.016 | 0.020 | 0.025 | 0.033 | 0.039 | 0.045 | 0.056 | 0.068 |
| M | Stainless Steel : Easy To Machine | <750 N/mm² | 1.5 | 0.5 | 110 | 0.020 | 0.025 | 0.028 | 0.037 | 0.044 | 0.050 | 0.063 | 0.077 |
| | Stainless Steel : Difficult To Machine | <950 N/mm² | 1.2 | 0.3 | 80 | 0.016 | 0.020 | 0.025 | 0.033 | 0.039 | 0.045 | 0.056 | 0.068 |
| K | Cast Irons, Grey, Spher., Malleable | <300 HB | 1.5 | 0.5 | 110 | 0.020 | 0.025 | 0.028 | 0.037 | 0.044 | 0.050 | 0.063 | 0.077 |
| N | Aluminiums, Aluminiums Alloys | <6% Si | | | | | | | | | | | |
| S | Titanium , Titanium Alloys | <1100N/mm² | | | | | | | | | | | |
| S | HRSA (Nickel Alloys, Co. Alloys) | <1300N/mm² | 1.2 | 0.3 | 40 | 0.024 | 0.030 | 0.035 | 0.045 | 0.054 | 0.062 | 0.077 | 0.094 |
| | **RAMPING** | | | | | | | | | | | | |
| P | Steels, Alloy Steels and Tool Steels | <850 N/mm² | | | | | | | | | | | |
| | Steels, Alloy Steels and Tool Steels | 850-1200 N/mm² | | | | | | | | | | | |
| | Steels, Alloy Steels and Tool Steels | <1400 N/mm² | | | | | | | | | | | |
| M | Stainless Steel : Easy To Machine | <750 N/mm² | | | | | | | | | | | |
| | Stainless Steel : Difficult To Machine | <950 N/mm² | | | | | | | | | | | |
| K | Cast Irons, Grey, Spher., Malleable | <300 HB | | | | | | | | | | | |
| N | Aluminiums, Aluminiums Alloys | <6% Si | | | | | | | | | | | |
| S | Titanium , Titanium Alloys | <1100N/mm² | | | | | | | | | | | |
| S | HRSA (Nickel Alloys, Co. Alloys) | <1300N/mm² | | | | | | | | | | | |
| | **HELICAL MILLING** | | | | | | | | | | | | |
| P | Steels, Alloy Steels and Tool Steels | <850 N/mm² | 7° | 0.4 | 130 | 0.012 | 0.015 | 0.018 | 0.024 | 0.029 | 0.033 | 0.041 | 0.050 |
| | Steels, Alloy Steels and Tool Steels | 850-1200 N/mm² | 5° | 0.4 | 90 | 0.011 | 0.014 | 0.017 | 0.022 | 0.027 | 0.031 | 0.038 | 0.046 |
| | Steels, Alloy Steels and Tool Steels | <1400 N/mm² | 3° | 0.4 | 70 | 0.010 | 0.013 | 0.016 | 0.020 | 0.025 | 0.028 | 0.035 | 0.043 |
| M | Stainless Steel : Easy To Machine | <750 N/mm² | 5° | 0.4 | 90 | 0.011 | 0.014 | 0.017 | 0.022 | 0.027 | 0.031 | 0.038 | 0.046 |
| | Stainless Steel : Difficult To Machine | <950 N/mm² | 3° | 0.4 | 70 | 0.010 | 0.013 | 0.016 | 0.020 | 0.025 | 0.028 | 0.035 | 0.043 |
| K | Cast Irons, Grey, Spher., Malleable | <300 HB | 5° | 0.4 | 70 | 0.011 | 0.014 | 0.017 | 0.022 | 0.027 | 0.031 | 0.038 | 0.046 |
| N | Aluminiums, Aluminiums Alloys | <6% Si | | | | | | | | | | | |
| S | Titanium , Titanium Alloys | <1100N/mm² | | | | | | | | | | | |
| S | HRSA (Nickel Alloys, Co. Alloys) | <1300N/mm² | 3° | 0.4 | 40 | 0.010 | 0.013 | 0.015 | 0.019 | 0.023 | 0.026 | 0.033 | 0.400 |
| | **DRILLING** | | | | | | | | | | | | |
| P | Steels, Alloy Steels and Tool Steels | <850 N/mm² | | | | | | | | | | | |
| | Steels, Alloy Steels and Tool Steels | 850-1200 N/mm² | | | | | | | | | | | |
| | Steels, Alloy Steels and Tool Steels | <1400 N/mm² | | | | | | | | | | | |
| M | Stainless Steel : Easy To Machine | <750 N/mm² | | | | | | | | | | | |
| | Stainless Steel : Difficult To Machine | <950 N/mm² | | | | | | | | | | | |
| K | Cast Irons, Grey, Spher., Malleable | <300 HB | | | | | | | | | | | |
| N | Aluminiums, Aluminiums Alloys | <6% Si | | | | | | | | | | | |
| S | Titanium , Titanium Alloys | <1100N/mm² | | | | | | | | | | | |
| S | HRSA (Nickel Alloys, Co. Alloys) | <1300N/mm² | | | | | | | | | | | |
| | **TROCHOIDAL MILLING** | | | | | | | | | | | | |
| P | Steels, Alloy Steels and Tool Steels | <850 N/mm² | 2 | 0.1 | 200 | 0.044 | 0.055 | 0.066 | 0.085 | 0.102 | 0.117 | 0.146 | 0.177 |
| | Steels, Alloy Steels and Tool Steels | 850-1200 N/mm² | 2 | 0.1 | 130 | 0.039 | 0.049 | 0.059 | 0.077 | 0.092 | 0.105 | 0.131 | 0.160 |
| | Steels, Alloy Steels and Tool Steels | <1400 N/mm² | 1.5 | 0.05 | 100 | 0.036 | 0.045 | 0.052 | 0.068 | 0.082 | 0.093 | 0.117 | 0.142 |
| M | Stainless Steel : Easy To Machine | <750 N/mm² | 2 | 0.1 | 130 | 0.039 | 0.049 | 0.059 | 0.077 | 0.092 | 0.105 | 0.131 | 0.160 |
| | Stainless Steel : Difficult To Machine | <950 N/mm² | 1.5 | 0.05 | 100 | 0.036 | 0.045 | 0.052 | 0.068 | 0.082 | 0.093 | 0.117 | 0.142 |
| K | Cast Irons, Grey, Spher., Malleable | <300 HB | 2 | 0.1 | 130 | 0.039 | 0.049 | 0.059 | 0.077 | 0.092 | 0.105 | 0.131 | 0.160 |
| N | Aluminiums, Aluminiums Alloys | <6% Si | | | | | | | | | | | |
| S | Titanium , Titanium Alloys | <1100N/mm² | | | | | | | | | | | |
| S | HRSA (Nickel Alloys, Co. Alloys) | <1300N/mm² | 1.5 | 0.05 | 60 | 0.048 | 0.060 | 0.072 | 0.094 | 0.112 | 0.128 | 0.016 | 0.195 |

Technical Data provided should be considered advisory only as variations may be necessary depending on the particular application

| | MATERIAL | Hardness | ap max xD | ae max xD | Vc (m/min) | fz (mm/z) Ø 6 | 8 | 10 | 12 | 14 | 20 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | **SLOTTING** | | | | | | | | | | |
| P | Steels, Alloy Steels and Tool Steels | <850 N/mm² | | | | | | | | | |
| | Steels, Alloy Steels and Tool Steels | 850-1200 N/mm² | | | | | | | | | |
| | Steels, Alloy Steels and Tool Steels | <1400 N/mm² | | | | | | | | | |
| M | Stainless Steel : Easy To Machine | <750 N/mm² | | | | | | | | | |
| | Stainless Steel : Difficult To Machine | <950 N/mm² | | | | | | | | | |
| K | Cast Irons, Grey, Spher., Melleable | <300 HB | | | | | | | | | |
| N | Aluminiums, Aluminiums Alloys | <6% Si | | | | | | | | | |
| S | Titanium , Titanium Alloys | <1100N/mm² | | | | | | | | | |
| S | HRSA (Nickel Alloys, Co. Alloys) | <1300N/mm² | | | | | | | | | |
| | **SIDE MILLING** | | | | | | | | | | |
| P | Steels, Alloy Steels and Tool Steels | <850 N/mm² | <2 | <0.05 | 176-263 | 0.048 | 0.081 | 0.101 | 0.121 | 0.142 | 0.158 |
| | Steels, Alloy Steels and Tool Steels | 850-1200 N/mm² | <2 | <0.05 | 119-179 | 0.036 | 0.061 | 0.077 | 0.092 | 0.107 | 0.119 |
| | Steels, Alloy Steels and Tool Steels | <1400 N/mm² | | | | | | | | | |
| M | Stainless Steel : Easy To Machine | <750 N/mm² | <2 | <0.05 | 96-117 | 0.029 | 0.049 | 0.061 | 0.073 | 0.086 | 0.096 |
| | Stainless Steel : Difficult To Machine | <950 N/mm² | <2 | <0.05 | 89-109 | 0.029 | 0.049 | 0.061 | 0.073 | 0.086 | 0.096 |
| K | Cast Irons, Grey, Spher., Melleable | <300 HB | | | | | | | | | |
| N | Aluminiums, Aluminiums Alloys | <6% Si | | | | | | | | | |
| S | Titanium , Titanium Alloys | <1100N/mm² | <2 | <0.05 | 68-102 | 0.023 | 0.033 | 0.049 | 0.059 | 0.068 | 0.077 |
| S | HRSA (Nickel Alloys, Co. Alloys) | <1300N/mm² | | | | | | | | | |
| | **RAMPING** | | | | | | | | | | |
| P | Steels, Alloy Steels and Tool Steels | <850 N/mm² | | | | | | | | | |
| | Steels, Alloy Steels and Tool Steels | 850-1200 N/mm² | | | | | | | | | |
| | Steels, Alloy Steels and Tool Steels | <1400 N/mm² | | | | | | | | | |
| M | Stainless Steel : Easy To Machine | <750 N/mm² | | | | | | | | | |
| | Stainless Steel : Difficult To Machine | <950 N/mm² | | | | | | | | | |
| K | Cast Irons, Grey, Spher., Melleable | <300 HB | | | | | | | | | |
| N | Aluminiums, Aluminiums Alloys | <6% Si | | | | | | | | | |
| S | Titanium , Titanium Alloys | <1100N/mm² | | | | | | | | | |
| S | HRSA (Nickel Alloys, Co. Alloys) | <1300N/mm² | | | | | | | | | |
| | **HELICAL MILLING** | | | | | | | | | | |
| P | Steels, Alloy Steels and Tool Steels | <850 N/mm² | | | | | | | | | |
| | Steels, Alloy Steels and Tool Steels | 850-1200 N/mm² | | | | | | | | | |
| | Steels, Alloy Steels and Tool Steels | <1400 N/mm² | | | | | | | | | |
| M | Stainless Steel : Easy To Machine | <750 N/mm² | | | | | | | | | |
| | Stainless Steel : Difficult To Machine | <950 N/mm² | | | | | | | | | |
| K | Cast Irons, Grey, Spher., Melleable | <300 HB | | | | | | | | | |
| N | Aluminiums, Aluminiums Alloys | <6% Si | | | | | | | | | |
| S | Titanium , Titanium Alloys | <1100N/mm² | | | | | | | | | |
| S | HRSA (Nickel Alloys, Co. Alloys) | <1300N/mm² | | | | | | | | | |
| | **DRILLING** | | | | | | | | | | |
| P | Steels, Alloy Steels and Tool Steels | <850 N/mm² | | | | | | | | | |
| | Steels, Alloy Steels and Tool Steels | 850-1200 N/mm² | | | | | | | | | |
| | Steels, Alloy Steels and Tool Steels | <1400 N/mm² | | | | | | | | | |
| M | Stainless Steel : Easy To Machine | <750 N/mm² | | | | | | | | | |
| | Stainless Steel : Difficult To Machine | <950 N/mm² | | | | | | | | | |
| K | Cast Irons, Grey, Spher., Melleable | <300 HB | | | | | | | | | |
| N | Aluminiums, Aluminiums Alloys | <6% Si | | | | | | | | | |
| S | Titanium , Titanium Alloys | <1100N/mm² | | | | | | | | | |
| S | HRSA (Nickel Alloys, Co. Alloys) | <1300N/mm² | | | | | | | | | |
| | **TROCHOIDAL MILLING** | | | | | | | | | | |
| P | Steels, Alloy Steels and Tool Steels | <850 N/mm² | | | | | | | | | |
| | Steels, Alloy Steels and Tool Steels | 850-1200 N/mm² | | | | | | | | | |
| | Steels, Alloy Steels and Tool Steels | <1400 N/mm² | | | | | | | | | |
| M | Stainless Steel : Easy To Machine | <750 N/mm² | | | | | | | | | |
| | Stainless Steel : Difficult To Machine | <950 N/mm² | | | | | | | | | |
| K | Cast Irons, Grey, Spher., Melleable | <300 HB | | | | | | | | | |
| N | Aluminiums, Aluminiums Alloys | <6% Si | | | | | | | | | |
| S | Titanium , Titanium Alloys | <1100N/mm² | | | | | | | | | |
| S | HRSA (Nickel Alloys, Co. Alloys) | <1300N/mm² | | | | | | | | | |

Technical Data provided should be considered advisory only as variations may be necessary depending on the particular application

| | MATERIAL | Hardness | ap max xD | ae max xD | Vc (m/min) | fz (mm/z) Ø 3 | 6 | 8 | 10 | 12 | 16 | 20 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **SLOTTING** | | | | | | | | | | | |
| P | Steels, Alloy Steels and Tool Steels | <850 N/mm² | 1 | 1 | 100-160 | 0.012 | 0.029 | 0.049 | 0.061 | 0.074 | 0.100 | 0.108 |
| | Steels, Alloy Steels and Tool Steels | 850-1200 N/mm² | 1 | 1 | 60-90 | 0.010 | 0.022 | 0.036 | 0.045 | 0.055 | 0.074 | 0.080 |
| | Steels, Alloy Steels and Tool Steels | <1400 N/mm² | | | | | | | | | | |
| M | Stainless Steel : Easy To Machine | <750 N/mm² | 1 | 1 | 90-120 | 0.009 | 0.024 | 0.041 | 0.051 | 0.060 | 0.076 | 0.085 |
| | Stainless Steel : Difficult To Machine | <950 N/mm² | 0.3 | 1 | 60-90 | 0.007 | 0.019 | 0.032 | 0.040 | 0.048 | 0.064 | 0.069 |
| K | Cast Irons, Grey, Spher., Melleable | <300 HB | 1 | 1 | 60-90 | 0.010 | 0.022 | 0.036 | 0.045 | 0.055 | 0.074 | 0.080 |
| N | Aluminiums, Aluminiums Alloys | <6% Si | | | | | | | | | | |
| S | Titanium , Titanium Alloys | <1100N/mm² | 0.3 | 1 | 40-60 | 0.007 | 0.019 | 0.032 | 0.040 | 0.048 | 0.064 | 0.069 |
| S | HRSA (Nickel Alloys, Co. Alloys) | <1300N/mm² | 0.3 | 1 | 12-20 | 0.008 | 0.026 | 0.045 | 0.056 | 0.067 | 0.090 | 0.096 |
| | **SIDE MILLING** | | | | | | | | | | | |
| P | Steels, Alloy Steels and Tool Steels | <850 N/mm² | 1 | 0.3 | 130-200 | 0.012 | 0.029 | 0.049 | 0.061 | 0.074 | 0.100 | 0.107 |
| | Steels, Alloy Steels and Tool Steels | 850-1200 N/mm² | 1 | 0.3 | 70-120 | 0.010 | 0.022 | 0.036 | 0.045 | 0.055 | 0.074 | 0.080 |
| | Steels, Alloy Steels and Tool Steels | <1400 N/mm² | | | | | | | | | | |
| M | Stainless Steel : Easy To Machine | <750 N/mm² | 1 | 0.3 | 120-180 | 0.009 | 0.024 | 0.041 | 0.051 | 0.060 | 0.079 | 0.085 |
| | Stainless Steel : Difficult To Machine | <950 N/mm² | 1 | 0.3 | 70-110 | 0.007 | 0.019 | 0.032 | 0.040 | 0.048 | 0.064 | 0.069 |
| K | Cast Irons, Grey, Spher., Melleable | <300 HB | 1 | 0.3 | 80-120 | 0.007 | 0.019 | 0.034 | 0.043 | 0.050 | 0.067 | 0.072 |
| N | Aluminiums, Aluminiums Alloys | <6% Si | | | | | | | | | | |
| S | Titanium , Titanium Alloys | <1100N/mm² | 1 | <0.3 | 50-70 | 0.007 | 0.019 | 0.032 | 0.040 | 0.048 | 0.064 | 0.069 |
| S | HRSA (Nickel Alloys, Co. Alloys) | <1300N/mm² | 1 | <0.3 | 15-23 | 0.005 | 0.012 | 0.019 | 0.024 | 0.029 | 0.038 | 0.043 |
| | **RAMPING** | | | | | | | | | | | |
| P | Steels, Alloy Steels and Tool Steels | <850 N/mm² | | | | | | | | | | |
| | Steels, Alloy Steels and Tool Steels | 850-1200 N/mm² | | | | | | | | | | |
| | Steels, Alloy Steels and Tool Steels | <1400 N/mm² | | | | | | | | | | |
| M | Stainless Steel : Easy To Machine | <750 N/mm² | | | | | | | | | | |
| | Stainless Steel : Difficult To Machine | <950 N/mm² | | | | | | | | | | |
| K | Cast Irons, Grey, Spher., Melleable | <300 HB | | | | | | | | | | |
| N | Aluminiums, Aluminiums Alloys | <6% Si | | | | | | | | | | |
| S | Titanium , Titanium Alloys | <1100N/mm² | | | | | | | | | | |
| S | HRSA (Nickel Alloys, Co. Alloys) | <1300N/mm² | | | | | | | | | | |
| | **HELICAL MILLING** | | | | | | | | | | | |
| P | Steels, Alloy Steels and Tool Steels | <850 N/mm² | | | | | | | | | | |
| | Steels, Alloy Steels and Tool Steels | 850-1200 N/mm² | | | | | | | | | | |
| | Steels, Alloy Steels and Tool Steels | <1400 N/mm² | | | | | | | | | | |
| M | Stainless Steel : Easy To Machine | <750 N/mm² | | | | | | | | | | |
| | Stainless Steel : Difficult To Machine | <950 N/mm² | | | | | | | | | | |
| K | Cast Irons, Grey, Spher., Melleable | <300 HB | | | | | | | | | | |
| N | Aluminiums, Aluminiums Alloys | <6% Si | | | | | | | | | | |
| S | Titanium , Titanium Alloys | <1100N/mm² | | | | | | | | | | |
| S | HRSA (Nickel Alloys, Co. Alloys) | <1300N/mm² | | | | | | | | | | |
| | **DRILLING** | | | | | | | | | | | |
| P | Steels, Alloy Steels and Tool Steels | <850 N/mm² | | | | | | | | | | |
| | Steels, Alloy Steels and Tool Steels | 850-1200 N/mm² | | | | | | | | | | |
| | Steels, Alloy Steels and Tool Steels | <1400 N/mm² | | | | | | | | | | |
| M | Stainless Steel : Easy To Machine | <750 N/mm² | | | | | | | | | | |
| | Stainless Steel : Difficult To Machine | <950 N/mm² | | | | | | | | | | |
| K | Cast Irons, Grey, Spher., Melleable | <300 HB | | | | | | | | | | |
| N | Aluminiums, Aluminiums Alloys | <6% Si | | | | | | | | | | |
| S | Titanium , Titanium Alloys | <1100N/mm² | | | | | | | | | | |
| S | HRSA (Nickel Alloys, Co. Alloys) | <1300N/mm² | | | | | | | | | | |
| | **TROCHOIDAL MILLING** | | | | | | | | | | | |
| P | Steels, Alloy Steels and Tool Steels | <850 N/mm² | | | | | | | | | | |
| | Steels, Alloy Steels and Tool Steels | 850-1200 N/mm² | | | | | | | | | | |
| | Steels, Alloy Steels and Tool Steels | <1400 N/mm² | | | | | | | | | | |
| M | Stainless Steel : Easy To Machine | <750 N/mm² | | | | | | | | | | |
| | Stainless Steel : Difficult To Machine | <950 N/mm² | | | | | | | | | | |
| K | Cast Irons, Grey, Spher., Melleable | <300 HB | | | | | | | | | | |
| N | Aluminiums, Aluminiums Alloys | <6% Si | | | | | | | | | | |
| S | Titanium , Titanium Alloys | <1100N/mm² | | | | | | | | | | |
| S | HRSA (Nickel Alloys, Co. Alloys) | <1300N/mm² | | | | | | | | | | |

Technical Data provided should be considered advisory only as variations may be necessary depending on the particular application

| | MATERIAL | Hardness | ap max xD | ae max xD | Vc (m/min) | fz (mm/z) Ø 6 | 8 | 10 | 12 | 14 | 16 | 20 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **SLOTTING** | | | | | | | | | | | |
| P | Steels, Alloy Steels and Tool Steels | <850 N/mm² | 1 | 1 | 130-150 | 0.030 | 0.040 | 0.050 | 0.060 | 0.070 | 0.080 | 0.100 |
| | Steels, Alloy Steels and Tool Steels | 850-1200 N/mm² | 1 | 1 | 90-110 | 0.022 | 0.028 | 0.034 | 0.039 | 0.044 | 0.049 | 0.059 |
| | Steels, Alloy Steels and Tool Steels | <1400 N/mm² | ≤ 1 | 1 | 50-70 | 0.018 | 0.024 | 0.029 | 0.032 | 0.036 | 0.041 | 0.049 |
| M | Stainless Steel : Easy To Machine | <750 N/mm² | 1 | 1 | 70-90 | 0.022 | 0.028 | 0.034 | 0.039 | 0.044 | 0.049 | 0.059 |
| | Stainless Steel : Difficult To Machine | <950 N/mm² | 0.5 | 1 | 50-70 | 0.017 | 0.022 | 0.026 | 0.030 | 0.034 | 0.038 | 0.046 |
| K | Cast Irons, Grey, Spher., Melleable | <300 HB | 1 | 1 | 90-130 | 0.022 | 0.028 | 0.034 | 0.039 | 0.044 | 0.049 | 0.059 |
| N | Aluminiums, Aluminiums Alloys | <6% Si | | | | | | | | | | |
| S | Titanium , Titanium Alloys | <1100N/mm² | 0.5 | 1 | 30-50 | 0.017 | 0.022 | 0.026 | 0.030 | 0.034 | 0.038 | 0.046 |
| S | HRSA (Nickel Alloys, Co. Alloys) | <1300N/mm² | 0.5 | 1 | 30-50 | 0.017 | 0.022 | 0.026 | 0.030 | 0.034 | 0.038 | 0.046 |
| | **SIDE MILLING** | | | | | | | | | | | |
| P | Steels, Alloy Steels and Tool Steels | <850 N/mm² | 1 | 0.3 | 150-180 | 0.030 | 0.040 | 0.050 | 0.060 | 0.070 | 0.080 | 0.100 |
| | Steels, Alloy Steels and Tool Steels | 850-1200 N/mm² | 1 | 0.3 | 120-150 | 0.024 | 0.032 | 0.040 | 0.048 | 0.056 | 0.064 | 0.080 |
| | Steels, Alloy Steels and Tool Steels | <1400 N/mm² | 1 | 0.3 | 60-80 | 0.023 | 0.030 | 0.036 | 0.041 | 0.047 | 0.052 | 0.063 |
| M | Stainless Steel : Easy To Machine | <750 N/mm² | 1.5 | 0.5 | 90-110 | 0.026 | 0.034 | 0.041 | 0.047 | 0.052 | 0.058 | 0.071 |
| | Stainless Steel : Difficult To Machine | <950 N/mm² | 1.2 | 0.3 | 60-80 | 0.023 | 0.030 | 0.036 | 0.041 | 0.047 | 0.052 | 0.063 |
| K | Cast Irons, Grey, Spher., Melleable | <300 HB | 1 | 0.3 | 120-150 | 0.026 | 0.034 | 0.041 | 0.047 | 0.052 | 0.058 | 0.071 |
| N | Aluminiums, Aluminiums Alloys | <6% Si | | | | | | | | | | |
| S | Titanium , Titanium Alloys | <1100N/mm² | 1 | 0.3 | 40-50 | 0.032 | 0.042 | 0.050 | 0.057 | 0.064 | 0.064 | 0.078 |
| S | HRSA (Nickel Alloys, Co. Alloys) | <1300N/mm² | 1 | 0.3 | 40-50 | 0.032 | 0.042 | 0.050 | 0.057 | 0.064 | 0.064 | 0.078 |
| | **RAMPING** | | | | | | | | | | | |
| P | Steels, Alloy Steels and Tool Steels | <850 N/mm² | 45° | 1 | 100-120 | 0.019 | 0.021 | 0.024 | 0.028 | 0.032 | 0.035 | 0.043 |
| | Steels, Alloy Steels and Tool Steels | 850-1200 N/mm² | 15° | 1 | 55-75 | 0.017 | 0.023 | 0.023 | 0.026 | 0.029 | 0.032 | 0.039 |
| | Steels, Alloy Steels and Tool Steels | <1400 N/mm² | | | | | | | | | | |
| M | Stainless Steel : Easy To Machine | <750 N/mm² | 10° | 1 | 60-80 | 0.018 | 0.023 | 0.028 | 0.032 | 0.036 | 0.040 | 0.048 |
| | Stainless Steel : Difficult To Machine | <950 N/mm² | 5° | 1 | 45-65 | 0.017 | 0.022 | 0.026 | 0.030 | 0.034 | 0.038 | 0.046 |
| K | Cast Irons, Grey, Spher., Melleable | <300 HB | 15° | 1 | 60-80 | 0.018 | 0.023 | 0.028 | 0.032 | 0.036 | 0.040 | 0.048 |
| N | Aluminiums, Aluminiums Alloys | <6% Si | | | | | | | | | | |
| S | Titanium , Titanium Alloys | <1100N/mm² | 5° | 1 | 30-40 | 0.023 | 0.030 | 0.036 | 0.042 | 0.047 | 0.052 | 0.063 |
| S | HRSA (Nickel Alloys, Co. Alloys) | <1300N/mm² | 5° | 1 | 30-40 | 0.023 | 0.030 | 0.036 | 0.042 | 0.047 | 0.052 | 0.063 |
| | **HELICAL MILLING** | | | | | | | | | | | |
| P | Steels, Alloy Steels and Tool Steels | <850 N/mm² | 5° | 0.3 | 110-130 | 0.018 | 0.024 | 0.030 | 0.032 | 0.035 | 0.040 | 0.048 |
| | Steels, Alloy Steels and Tool Steels | 850-1200 N/mm² | 4° | 0.3 | 70-90 | 0.016 | 0.021 | 0.026 | 0.029 | 0.033 | 0.037 | 0.045 |
| | Steels, Alloy Steels and Tool Steels | <1400 N/mm² | 3° | 0.3 | 50-70 | 0.015 | 0.019 | 0.023 | 0.026 | 0.029 | 0.032 | 0.039 |
| M | Stainless Steel : Easy To Machine | <750 N/mm² | 4° | 0.4 | 70-90 | 0.016 | 0.021 | 0.026 | 0.029 | 0.033 | 0.037 | 0.045 |
| | Stainless Steel : Difficult To Machine | <950 N/mm² | 3° | 0.4 | 70-90 | 0.015 | 0.019 | 0.023 | 0.026 | 0.029 | 0.036 | 0.039 |
| K | Cast Irons, Grey, Spher., Melleable | <300 HB | 4° | 0.4 | 70-90 | 0.016 | 0.021 | 0.026 | 0.029 | 0.033 | 0.037 | 0.045 |
| N | Aluminiums, Aluminiums Alloys | <6% Si | | | | | | | | | | |
| S | Titanium , Titanium Alloys | <1100N/mm² | 3° | 0.4 | 30-50 | 0.014 | 0.019 | 0.021 | 0.024 | 0.027 | 0.030 | 0.037 |
| S | HRSA (Nickel Alloys, Co. Alloys) | <1300N/mm² | 3° | 0.4 | 30-50 | 0.014 | 0.019 | 0.021 | 0.024 | 0.027 | 0.030 | 0.037 |
| | **DRILLING** | | | | | | | | | | | |
| P | Steels, Alloy Steels and Tool Steels | <850 N/mm² | 1 | 1 | 85-105 | 0.012 | 0.016 | 0.019 | 0.022 | 0.024 | 0.027 | 0.033 |
| | Steels, Alloy Steels and Tool Steels | 850-1200 N/mm² | 1 | 1 | 55-75 | 0.011 | 0.014 | 0.017 | 0.019 | 0.022 | 0.024 | 0.030 |
| | Steels, Alloy Steels and Tool Steels | <1400 N/mm² | | | | | | | | | | |
| M | Stainless Steel : Easy To Machine | <750 N/mm² | 1 | 1 | 55-75 | 0.011 | 0.014 | 0.017 | 0.019 | 0.022 | 0.024 | 0.030 |
| | Stainless Steel : Difficult To Machine | <950 N/mm² | | | | | | | | | | |
| K | Cast Irons, Grey, Spher., Melleable | <300 HB | 1 | 1 | 55-75 | 0.011 | 0.014 | 0.017 | 0.019 | 0.022 | 0.024 | 0.030 |
| N | Aluminiums, Aluminiums Alloys | <6% Si | | | | | | | | | | |
| S | Titanium , Titanium Alloys | <1100N/mm² | 0.5 | 1 | 20-40 | 0.013 | 0.017 | 0.021 | 0.024 | 0.027 | 0.030 | 0.036 |
| S | HRSA (Nickel Alloys, Co. Alloys) | <1300N/mm² | | | | | | | | | | |
| | **TROCHOIDAL MILLING** | | | | | | | | | | | |
| P | Steels, Alloy Steels and Tool Steels | <850 N/mm² | 2 | 0.1 | 160-200 | 0.061 | 0.079 | 0.095 | 0.108 | 0.122 | 0.135 | 0.164 |
| | Steels, Alloy Steels and Tool Steels | 850-1200 N/mm² | 2 | 0.1 | 110-130 | 0.055 | 0.071 | 0.085 | 0.097 | 0.109 | 0.122 | 0.148 |
| | Steels, Alloy Steels and Tool Steels | <1400 N/mm² | 2 | 0.1 | 80-100 | 0.049 | 0.063 | 0.076 | 0.086 | 0.097 | 0.108 | 0.131 |
| M | Stainless Steel : Easy To Machine | <750 N/mm² | 2 | 0.1 | 110-130 | 0.055 | 0.071 | 0.085 | 0.097 | 0.109 | 0.122 | 0.148 |
| | Stainless Steel : Difficult To Machine | <950 N/mm² | 1.5 | 0.1 | 80-100 | 0.049 | 0.063 | 0.076 | 0.086 | 0.097 | 0.108 | 0.131 |
| K | Cast Irons, Grey, Spher., Melleable | <300 HB | 2 | 0.1 | 150 | 0.055 | 0.071 | 0.085 | 0.097 | 0.109 | 0.122 | 0.148 |
| N | Aluminiums, Aluminiums Alloys | <6% Si | | | | | | | | | | |
| S | Titanium , Titanium Alloys | <1100N/mm² | 1.5 | 0.05 | 50-70 | 0.067 | 0.087 | 0.104 | 0.119 | 0.134 | 0.149 | 0.181 |
| S | HRSA (Nickel Alloys, Co. Alloys) | <1300N/mm² | 1.5 | 0.05 | 50-70 | 0.067 | 0.087 | 0.104 | 0.119 | 0.134 | 0.149 | 0.181 |

Technical Data provided should be considered advisory only as variations may be necessary depending on the particular application

| | MATERIAL | Hardness | ap max xD | ae max xD | Vc (m/min) | fz (mm/z) Ø 6 | 8 | 10 | 12 | 16 | 20 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | **SLOTTING** | | | | | | | | | | |
| P | Steels, Alloy Steels and Tool Steels | <850 N/mm² | | | | | | | | | |
| | Steels, Alloy Steels and Tool Steels | 850-1200 N/mm² | 1 | 1 | 80 | 0.030 | 0.040 | 0.050 | 0.055 | 0.055 | 0.060 |
| | Steels, Alloy Steels and Tool Steels | <1400 N/mm² | 1 | 1 | 60 | 0.030 | 0.040 | 0.050 | 0.055 | 0.055 | 0.060 |
| M | Stainless Steel : Easy To Machine | <750 N/mm² | | | | | | | | | |
| | Stainless Steel : Difficult To Machine | <950 N/mm² | 1 | 1 | 50 | 0.025 | 0.030 | 0.040 | 0.045 | 0.045 | 0.050 |
| K | Cast Irons, Grey, Spher., Melleable | <300 HB | 1 | 1 | 80 | 0.030 | 0.040 | 0.050 | 0.055 | 0.055 | 0.060 |
| N | Aluminiums, Aluminiums Alloys | <6% Si | | | | | | | | | |
| S | Titanium , Titanium Alloys | <1100N/mm² | 0.5 | 1 | 35 | 0.025 | 0.030 | 0.040 | 0.045 | 0.045 | 0.050 |
| S | HRSA (Nickel Alloys, Co. Alloys) | <1300N/mm² | 0.5 | 1 | 25-35 | 0.025 | 0.030 | 0.040 | 0.045 | 0.045 | 0.050 |
| | **SIDE MILLING** | | | | | | | | | | |
| P | Steels, Alloy Steels and Tool Steels | <850 N/mm² | | | | | | | | | |
| | Steels, Alloy Steels and Tool Steels | 850-1200 N/mm² | 1 | 0.3 | 130 | 0.030 | 0.040 | 0.050 | 0.055 | 0.055 | 0.060 |
| | Steels, Alloy Steels and Tool Steels | <1400 N/mm² | 1 | 0.3 | 80 | 0.030 | 0.040 | 0.050 | 0.055 | 0.055 | 0.060 |
| M | Stainless Steel : Easy To Machine | <750 N/mm² | | | | | | | | | |
| | Stainless Steel : Difficult To Machine | <950 N/mm² | 1 | 0.3 | 60 | 0.025 | 0.030 | 0.040 | 0.045 | 0.045 | 0.050 |
| K | Cast Irons, Grey, Spher., Melleable | <300 HB | 1 | 0.3 | 130 | 0.030 | 0.040 | 0.050 | 0.055 | 0.055 | 0.060 |
| N | Aluminiums, Aluminiums Alloys | <6% Si | | | | | | | | | |
| S | Titanium , Titanium Alloys | <1100N/mm² | 1 | 0.2 | 45 | 0.025 | 0.030 | 0.040 | 0.045 | 0.045 | 0.050 |
| S | HRSA (Nickel Alloys, Co. Alloys) | <1300N/mm² | 1 | 0.2 | 35 | 0.025 | 0.030 | 0.040 | 0.045 | 0.045 | 0.050 |
| | **RAMPING** | | | | | | | | | | |
| P | Steels, Alloy Steels and Tool Steels | <850 N/mm² | | | | | | | | | |
| | Steels, Alloy Steels and Tool Steels | 850-1200 N/mm² | 10° | 1 | 150 | 0.030 | 0.040 | 0.050 | 0.055 | 0.055 | 0.060 |
| | Steels, Alloy Steels and Tool Steels | <1400 N/mm² | 10° | 1 | 80 | 0.030 | 0.040 | 0.050 | 0.055 | 0.055 | 0.060 |
| M | Stainless Steel : Easy To Machine | <750 N/mm² | | | | | | | | | |
| | Stainless Steel : Difficult To Machine | <950 N/mm² | 7° | 1 | 50 | 0.025 | 0.030 | 0.040 | 0.045 | 0.045 | 0.050 |
| K | Cast Irons, Grey, Spher., Melleable | <300 HB | 10° | 1 | 150 | 0.030 | 0.040 | 0.050 | 0.055 | 0.055 | 0.060 |
| N | Aluminiums, Aluminiums Alloys | <6% Si | | | | | | | | | |
| S | Titanium , Titanium Alloys | <1100N/mm² | 5° | 1 | 35 | 0.025 | 0.030 | 0.040 | 0.045 | 0.045 | 0.050 |
| S | HRSA (Nickel Alloys, Co. Alloys) | <1300N/mm² | 5° | 1 | 35 | 0.025 | 0.030 | 0.040 | 0.045 | 0.045 | 0.050 |
| | **HELICAL MILLING** | | | | | | | | | | |
| P | Steels, Alloy Steels and Tool Steels | <850 N/mm² | | | | | | | | | |
| | Steels, Alloy Steels and Tool Steels | 850-1200 N/mm² | | | | | | | | | |
| | Steels, Alloy Steels and Tool Steels | <1400 N/mm² | | | | | | | | | |
| M | Stainless Steel : Easy To Machine | <750 N/mm² | | | | | | | | | |
| | Stainless Steel : Difficult To Machine | <950 N/mm² | | | | | | | | | |
| K | Cast Irons, Grey, Spher., Melleable | <300 HB | | | | | | | | | |
| N | Aluminiums, Aluminiums Alloys | <6% Si | | | | | | | | | |
| S | Titanium , Titanium Alloys | <1100N/mm² | | | | | | | | | |
| S | HRSA (Nickel Alloys, Co. Alloys) | <1300N/mm² | | | | | | | | | |
| | **DRILLING** | | | | | | | | | | |
| P | Steels, Alloy Steels and Tool Steels | <850 N/mm² | | | | | | | | | |
| | Steels, Alloy Steels and Tool Steels | 850-1200 N/mm² | | | | | | | | | |
| | Steels, Alloy Steels and Tool Steels | <1400 N/mm² | | | | | | | | | |
| M | Stainless Steel : Easy To Machine | <750 N/mm² | | | | | | | | | |
| | Stainless Steel : Difficult To Machine | <950 N/mm² | | | | | | | | | |
| K | Cast Irons, Grey, Spher., Melleable | <300 HB | | | | | | | | | |
| N | Aluminiums, Aluminiums Alloys | <6% Si | | | | | | | | | |
| S | Titanium , Titanium Alloys | <1100N/mm² | | | | | | | | | |
| S | HRSA (Nickel Alloys, Co. Alloys) | <1300N/mm² | | | | | | | | | |
| | **TROCHOIDAL MILLING** | | | | | | | | | | |
| P | Steels, Alloy Steels and Tool Steels | <850 N/mm² | | | | | | | | | |
| | Steels, Alloy Steels and Tool Steels | 850-1200 N/mm² | | | | | | | | | |
| | Steels, Alloy Steels and Tool Steels | <1400 N/mm² | | | | | | | | | |
| M | Stainless Steel : Easy To Machine | <750 N/mm² | | | | | | | | | |
| | Stainless Steel : Difficult To Machine | <950 N/mm² | | | | | | | | | |
| K | Cast Irons, Grey, Spher., Melleable | <300 HB | | | | | | | | | |
| N | Aluminiums, Aluminiums Alloys | <6% Si | | | | | | | | | |
| S | Titanium , Titanium Alloys | <1100N/mm² | | | | | | | | | |
| S | HRSA (Nickel Alloys, Co. Alloys) | <1300N/mm² | | | | | | | | | |

Technical Data provided should be considered advisory only as variations may be necessary depending on the particular application

| | MATERIAL | Hardness | ap max xD | ae max xD | Vc (m/min) | fz (mm/z) Ø 6 | 8 | 10 | 12 | 16 | 18 | 20 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **SLOTTING** | | | | | | | | | | | |
| P | Steels, Alloy Steels and Tool Steels | <850 N/mm² | 1 | 1 | 130-150 | 0.030 | 0.040 | 0.050 | 0.060 | 0.070 | 0.080 | 0.100 |
| | Steels, Alloy Steels and Tool Steels | 850-1200 N/mm² | 1 | 1 | 90-110 | 0.022 | 0.028 | 0.034 | 0.039 | 0.044 | 0.049 | 0.059 |
| | Steels, Alloy Steels and Tool Steels | <1400 N/mm² | ≤ 1 | 1 | 50-70 | 0.018 | 0.024 | 0.029 | 0.032 | 0.036 | 0.041 | 0.049 |
| M | Stainless Steel : Easy To Machine | <750 N/mm² | 1 | 1 | 70-90 | 0.022 | 0.028 | 0.034 | 0.039 | 0.044 | 0.049 | 0.059 |
| | Stainless Steel : Difficult To Machine | <950 N/mm² | 0.5 | 1 | 50-70 | 0.017 | 0.022 | 0.026 | 0.030 | 0.034 | 0.038 | 0.046 |
| K | Cast Irons, Grey, Spher., Melleable | <300 HB | 1 | 1 | 90-130 | 0.022 | 0.028 | 0.034 | 0.039 | 0.044 | 0.049 | 0.059 |
| N | Aluminiums, Aluminiums Alloys | <6% Si | | | | | | | | | | |
| S | Titanium , Titanium Alloys | <1100N/mm² | 0.5 | 1 | 30-50 | 0.017 | 0.022 | 0.026 | 0.030 | 0.034 | 0.038 | 0.046 |
| S | HRSA (Nickel Alloys, Co. Alloys) | <1300N/mm² | 0.5 | 1 | 30-50 | 0.017 | 0.022 | 0.026 | 0.030 | 0.034 | 0.038 | 0.046 |
| | **SIDE MILLING** | | | | | | | | | | | |
| P | Steels, Alloy Steels and Tool Steels | <850 N/mm² | 1 | 0.3 | 150-180 | 0.030 | 0.040 | 0.050 | 0.060 | 0.070 | 0.080 | 0.100 |
| | Steels, Alloy Steels and Tool Steels | 850-1200 N/mm² | 1 | 0.3 | 120-150 | 0.024 | 0.032 | 0.040 | 0.048 | 0.056 | 0.064 | 0.080 |
| | Steels, Alloy Steels and Tool Steels | <1400 N/mm² | 1 | 0.3 | 60-80 | 0.023 | 0.030 | 0.036 | 0.041 | 0.047 | 0.052 | 0.063 |
| M | Stainless Steel : Easy To Machine | <750 N/mm² | 1.5 | 0.5 | 90-110 | 0.026 | 0.034 | 0.041 | 0.047 | 0.052 | 0.058 | 0.071 |
| | Stainless Steel : Difficult To Machine | <950 N/mm² | 1.2 | 0.3 | 60-80 | 0.023 | 0.030 | 0.036 | 0.041 | 0.047 | 0.052 | 0.063 |
| K | Cast Irons, Grey, Spher., Melleable | <300 HB | 1 | 0.3 | 120-150 | 0.026 | 0.034 | 0.041 | 0.047 | 0.052 | 0.058 | 0.071 |
| N | Aluminiums, Aluminiums Alloys | <6% Si | | | | | | | | | | |
| S | Titanium , Titanium Alloys | <1100N/mm² | 1 | 0.3 | 40-50 | 0.032 | 0.042 | 0.050 | 0.057 | 0.064 | 0.064 | 0.078 |
| S | HRSA (Nickel Alloys, Co. Alloys) | <1300N/mm² | 1 | 0.3 | 40-50 | 0.032 | 0.042 | 0.050 | 0.057 | 0.064 | 0.064 | 0.078 |
| | **RAMPING** | | | | | | | | | | | |
| P | Steels, Alloy Steels and Tool Steels | <850 N/mm² | 10° | 1 | 100-120 | 0.019 | 0.021 | 0.024 | 0.028 | 0.032 | 0.035 | 0.043 |
| | Steels, Alloy Steels and Tool Steels | 850-1200 N/mm² | 10° | 1 | 55-75 | 0.017 | 0.023 | 0.023 | 0.026 | 0.029 | 0.032 | 0.039 |
| | Steels, Alloy Steels and Tool Steels | <1400 N/mm² | | | | | | | | | | |
| M | Stainless Steel : Easy To Machine | <750 N/mm² | 10° | 1 | 60-80 | 0.018 | 0.023 | 0.028 | 0.032 | 0.036 | 0.040 | 0.048 |
| | Stainless Steel : Difficult To Machine | <950 N/mm² | 5° | 1 | 45-65 | 0.017 | 0.022 | 0.026 | 0.030 | 0.034 | 0.038 | 0.046 |
| K | Cast Irons, Grey, Spher., Melleable | <300 HB | 10° | 1 | 60-80 | 0.018 | 0.023 | 0.028 | 0.032 | 0.036 | 0.040 | 0.048 |
| N | Aluminiums, Aluminiums Alloys | <6% Si | | | | | | | | | | |
| S | Titanium , Titanium Alloys | <1100N/mm² | 5° | 1 | 30-40 | 0.023 | 0.030 | 0.036 | 0.042 | 0.047 | 0.052 | 0.063 |
| S | HRSA (Nickel Alloys, Co. Alloys) | <1300N/mm² | 5° | 1 | 30-40 | 0.023 | 0.030 | 0.036 | 0.042 | 0.047 | 0.052 | 0.063 |
| | **HELICAL MILLING** | | | | | | | | | | | |
| P | Steels, Alloy Steels and Tool Steels | <850 N/mm² | 5° | 0.3 | 110-130 | 0.018 | 0.024 | 0.030 | 0.032 | 0.035 | 0.040 | 0.048 |
| | Steels, Alloy Steels and Tool Steels | 850-1200 N/mm² | 4° | 0.3 | 70-90 | 0.016 | 0.021 | 0.026 | 0.029 | 0.033 | 0.037 | 0.045 |
| | Steels, Alloy Steels and Tool Steels | <1400 N/mm² | 3° | 0.3 | 50-70 | 0.015 | 0.019 | 0.023 | 0.026 | 0.029 | 0.032 | 0.039 |
| M | Stainless Steel : Easy To Machine | <750 N/mm² | 4° | 0.4 | 70-90 | 0.016 | 0.021 | 0.026 | 0.029 | 0.033 | 0.037 | 0.045 |
| | Stainless Steel : Difficult To Machine | <950 N/mm² | 3° | 0.4 | 70-90 | 0.015 | 0.019 | 0.023 | 0.026 | 0.029 | 0.036 | 0.039 |
| K | Cast Irons, Grey, Spher., Melleable | <300 HB | 4° | 0.4 | 70-90 | 0.016 | 0.021 | 0.026 | 0.029 | 0.033 | 0.037 | 0.045 |
| N | Aluminiums, Aluminiums Alloys | <6% Si | | | | | | | | | | |
| S | Titanium , Titanium Alloys | <1100N/mm² | 3° | 0.4 | 30-50 | 0.014 | 0.019 | 0.021 | 0.024 | 0.027 | 0.030 | 0.037 |
| S | HRSA (Nickel Alloys, Co. Alloys) | <1300N/mm² | 3° | 0.4 | 30-50 | 0.014 | 0.019 | 0.021 | 0.024 | 0.027 | 0.030 | 0.037 |
| | **DRILLING** | | | | | | | | | | | |
| P | Steels, Alloy Steels and Tool Steels | <850 N/mm² | | | | | | | | | | |
| | Steels, Alloy Steels and Tool Steels | 850-1200 N/mm² | | | | | | | | | | |
| | Steels, Alloy Steels and Tool Steels | <1400 N/mm² | | | | | | | | | | |
| M | Stainless Steel : Easy To Machine | <750 N/mm² | | | | | | | | | | |
| | Stainless Steel : Difficult To Machine | <950 N/mm² | | | | | | | | | | |
| K | Cast Irons, Grey, Spher., Melleable | <300 HB | | | | | | | | | | |
| N | Aluminiums, Aluminiums Alloys | <6% Si | | | | | | | | | | |
| S | Titanium , Titanium Alloys | <1100N/mm² | | | | | | | | | | |
| S | HRSA (Nickel Alloys, Co. Alloys) | <1300N/mm² | | | | | | | | | | |
| | **TROCHOIDAL MILLING** | | | | | | | | | | | |
| P | Steels, Alloy Steels and Tool Steels | <850 N/mm² | 2 | 0.1 | 160-200 | 0.061 | 0.079 | 0.095 | 0.108 | 0.122 | 0.135 | 0.164 |
| | Steels, Alloy Steels and Tool Steels | 850-1200 N/mm² | 2 | 0.1 | 110-130 | 0.055 | 0.071 | 0.085 | 0.097 | 0.109 | 0.122 | 0.148 |
| | Steels, Alloy Steels and Tool Steels | <1400 N/mm² | 2 | 0.1 | 80-100 | 0.049 | 0.063 | 0.076 | 0.086 | 0.097 | 0.108 | 0.131 |
| M | Stainless Steel : Easy To Machine | <750 N/mm² | 2 | 0.1 | 110-130 | 0.055 | 0.071 | 0.085 | 0.097 | 0.109 | 0.122 | 0.148 |
| | Stainless Steel : Difficult To Machine | <950 N/mm² | 1.5 | 0.1 | 80-100 | 0.049 | 0.063 | 0.076 | 0.086 | 0.097 | 0.108 | 0.131 |
| K | Cast Irons, Grey, Spher., Melleable | <300 HB | 2 | 0.1 | 150 | 0.055 | 0.071 | 0.085 | 0.097 | 0.109 | 0.122 | 0.148 |
| N | Aluminiums, Aluminiums Alloys | <6% Si | | | | | | | | | | |
| S | Titanium , Titanium Alloys | <1100N/mm² | 1.5 | 0.05 | 50-70 | 0.067 | 0.087 | 0.104 | 0.119 | 0.134 | 0.149 | 0.181 |
| S | HRSA (Nickel Alloys, Co. Alloys) | <1300N/mm² | 1.5 | 0.05 | 50-70 | 0.067 | 0.087 | 0.104 | 0.119 | 0.134 | 0.149 | 0.181 |

Technical Data provided should be considered advisory only as variations may be necessary depending on the particular application

# SUPER NOX-905R

| | MATERIAL | Hardness | ap max xD | ae max xD | Vc (m/min) | fz (mm/z) Ø 6 | 8 | 10 | 12 | 16 | 20 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **SLOTTING** | | | | | | | | | | | |
| P | Steels, Alloy Steels and Tool Steels | <850 N/mm² | | | | | | | | | |
| | Steels, Alloy Steels and Tool Steels | 850-1200 N/mm² | | | | | | | | | |
| | Steels, Alloy Steels and Tool Steels | <1400 N/mm² | | | | | | | | | |
| M | Stainless Steel : Easy To Machine | <750 N/mm² | | | | | | | | | |
| | Stainless Steel : Difficult To Machine | <950 N/mm² | | | | | | | | | |
| K | Cast Irons, Grey, Spher., Melleable | <300 HB | | | | | | | | | |
| N | Aluminiums, Aluminiums Alloys | <6% Si | | | | | | | | | |
| S | Titanium , Titanium Alloys | <1100N/mm² | | | | | | | | | |
| S | HRSA (Nickel Alloys, Co. Alloys) | <1300N/mm² | | | | | | | | | |
| **SIDE MILLING** | | | | | | | | | | | |
| P | Steels, Alloy Steels and Tool Steels | <850 N/mm² | | | | | | | | | |
| | Steels, Alloy Steels and Tool Steels | 850-1200 N/mm² | | | | | | | | | |
| | Steels, Alloy Steels and Tool Steels | <1400 N/mm² | 3 | 0.25 | 40 | 0.028 | 0.036 | 0.045 | 0.055 | 0.070 | 0.085 |
| M | Stainless Steel : Easy To Machine | <750 N/mm² | | | | | | | | | |
| | Stainless Steel : Difficult To Machine | <950 N/mm² | 3 | 0.25 | 60 | 0.038 | 0.050 | 0.060 | 0.072 | 0.095 | 0.120 |
| K | Cast Irons, Grey, Spher., Melleable | <300 HB | | | | | | | | | |
| N | Aluminiums, Aluminiums Alloys | <6% Si | | | | | | | | | |
| S | Titanium , Titanium Alloys | <1100N/mm² | 3 | 0.25 | 40 | 0.028 | 0.036 | 0.045 | 0.055 | 0.070 | 0.085 |
| S | HRSA (Nickel Alloys, Co. Alloys) | <1300N/mm² | 3 | 0.25 | 40 | 0.028 | 0.036 | 0.045 | 0.055 | 0.070 | 0.085 |
| **RAMPING** | | | | | | | | | | | |
| P | Steels, Alloy Steels and Tool Steels | <850 N/mm² | | | | | | | | | |
| | Steels, Alloy Steels and Tool Steels | 850-1200 N/mm² | | | | | | | | | |
| | Steels, Alloy Steels and Tool Steels | <1400 N/mm² | | | | | | | | | |
| M | Stainless Steel : Easy To Machine | <750 N/mm² | | | | | | | | | |
| | Stainless Steel : Difficult To Machine | <950 N/mm² | | | | | | | | | |
| K | Cast Irons, Grey, Spher., Melleable | <300 HB | | | | | | | | | |
| N | Aluminiums, Aluminiums Alloys | <6% Si | | | | | | | | | |
| S | Titanium , Titanium Alloys | <1100N/mm² | | | | | | | | | |
| S | HRSA (Nickel Alloys, Co. Alloys) | <1300N/mm² | | | | | | | | | |
| **HELICAL MILLING** | | | | | | | | | | | |
| P | Steels, Alloy Steels and Tool Steels | <850 N/mm² | | | | | | | | | |
| | Steels, Alloy Steels and Tool Steels | 850-1200 N/mm² | | | | | | | | | |
| | Steels, Alloy Steels and Tool Steels | <1400 N/mm² | | | | | | | | | |
| M | Stainless Steel : Easy To Machine | <750 N/mm² | | | | | | | | | |
| | Stainless Steel : Difficult To Machine | <950 N/mm² | | | | | | | | | |
| K | Cast Irons, Grey, Spher., Melleable | <300 HB | | | | | | | | | |
| N | Aluminiums, Aluminiums Alloys | <6% Si | | | | | | | | | |
| S | Titanium , Titanium Alloys | <1100N/mm² | | | | | | | | | |
| S | HRSA (Nickel Alloys, Co. Alloys) | <1300N/mm² | | | | | | | | | |
| **DRILLING** | | | | | | | | | | | |
| P | Steels, Alloy Steels and Tool Steels | <850 N/mm² | | | | | | | | | |
| | Steels, Alloy Steels and Tool Steels | 850-1200 N/mm² | | | | | | | | | |
| | Steels, Alloy Steels and Tool Steels | <1400 N/mm² | | | | | | | | | |
| M | Stainless Steel : Easy To Machine | <750 N/mm² | | | | | | | | | |
| | Stainless Steel : Difficult To Machine | <950 N/mm² | | | | | | | | | |
| K | Cast Irons, Grey, Spher., Melleable | <300 HB | | | | | | | | | |
| N | Aluminiums, Aluminiums Alloys | <6% Si | | | | | | | | | |
| S | Titanium , Titanium Alloys | <1100N/mm² | | | | | | | | | |
| S | HRSA (Nickel Alloys, Co. Alloys) | <1300N/mm² | | | | | | | | | |
| **TROCHOIDAL MILLING** | | | | | | | | | | | |
| P | Steels, Alloy Steels and Tool Steels | <850 N/mm² | | | | | | | | | |
| | Steels, Alloy Steels and Tool Steels | 850-1200 N/mm² | | | | | | | | | |
| | Steels, Alloy Steels and Tool Steels | <1400 N/mm² | 3 | 0.05 | 50 | 0.018 | 0.025 | 0.032 | 0.038 | 0.050 | 0.060 |
| M | Stainless Steel : Easy To Machine | <750 N/mm² | | | | | | | | | |
| | Stainless Steel : Difficult To Machine | <950 N/mm² | 3 | 0.05 | 80 | 0.030 | 0.040 | 0.050 | 0.060 | 0.080 | 0.110 |
| K | Cast Irons, Grey, Spher., Melleable | <300 HB | | | | | | | | | |
| N | Aluminiums, Aluminiums Alloys | <6% Si | | | | | | | | | |
| S | Titanium , Titanium Alloys | <1100N/mm² | 3 | 0.05 | 50 | 0.018 | 0.025 | 0.032 | 0.038 | 0.050 | 0.060 |
| S | HRSA (Nickel Alloys, Co. Alloys) | <1300N/mm² | 3 | 0.05 | 50 | 0.018 | 0.025 | 0.032 | 0.038 | 0.050 | 0.060 |

Technical Data provided should be considered advisory only as variations may be necessary depending on the particular application

| | MATERIAL | Hardness | ap max xD | ae max xD | Vc (m/min) | fz (mm/z) Ø 6 | 8 | 10 | 12 | 16 | 20 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | **TROCHOIDAL MILLING [NTC 0310P] [3xd]** | | | | | | | | | | |
| P | Steels, Alloy Steels and Tool Steels | <850 N/mm² | 3 | 0.03-0.14 | 240-400 | 0.038-0.081 | 0.050-0.108 | 0.070-0.150 | 0.083-0.177 | 0.101-0.216 | 0.126-0.270 |
| | Steels, Alloy Steels and Tool Steels | 850-1200 N/mm² | 3 | 0.03-0.14 | 210-350 | 0.038-0.081 | 0.050-0.108 | 0.063-0.135 | 0.070-0.150 | 0.076-0.162 | 0.101-0.216 |
| | Steels, Alloy Steels and Tool Steels | <1400 N/mm² | 3 | 0.03-0.14 | 240-400 | 0.032-0.069 | 0.045-0.146 | 0.063-0.135 | 0.076-0.162 | 0.088-0.189 | 0.113-0.243 |
| M | Stainless Steel : Easy To Machine | <750 N/mm² | | | | | | | | | |
| | Stainless Steel : Difficult To Machine | <950 N/mm² | 3 | 0.03-0.14 | 120-200 | 0.038-0.081 | 0.050-0.108 | 0.063-0.135 | 0.078-0.168 | 0.088-0.189 | 0.101-0.216 |
| K | Cast Irons, Grey, Spher., Melleable | <300 HB | 3 | 0.03-0.14 | 210-350 | 0.038-0.081 | 0.050-0.108 | 0.063-0.135 | 0.070-0.150 | 0.076-0.162 | 0.101-0.216 |
| N | Aluminiums, Aluminiums Alloys | <6% Si | | | | | | | | | |
| S | Titanium , Titanium Alloys | <1100N/mm² | | | | | | | | | |
| S | HRSA (Nickel Alloys, Co. Alloys) | <1300N/mm² | 3 | 0.03-0.14 | 98-163 | 0.038-0.081 | 0.050-0.108 | 0.063-0.135 | 0.076-0.162 | 0.083-0.177 | 0.101-0.216 |
| | **TROCHOIDAL MILLING [NTC 0410P] [4xd]** | | | | | | | | | | |
| P | Steels, Alloy Steels and Tool Steels | <850 N/mm² | 4 | 0.03-0.14 | 182-396 | 0.045-0.090 | 0.063-0.126 | 0.078-0.157 | 0.095-0.190 | 0.113-0.227 | 0.139-0.284 |
| | Steels, Alloy Steels and Tool Steels | 850-1200 N/mm² | 4 | 0.03-0.14 | 154-336 | 0.038-0.076 | 0.050-0.101 | 0.063-0.126 | 0.070-0.140 | 0.076-0.151 | 0.101-0.205 |
| | Steels, Alloy Steels and Tool Steels | <1400 N/mm² | 4 | 0.03-0.14 | 176-384 | 0.032-0.064 | 0.045-0.090 | 0.063-0.126 | 0.076-0.151 | 0.088-0.176 | 0.113-0.231 |
| M | Stainless Steel : Easy To Machine | <750 N/mm² | | | | | | | | | |
| | Stainless Steel : Difficult To Machine | <950 N/mm² | 4 | 0.03-0.14 | 88-192 | 0.038-0.076 | 0.050-0.101 | 0.063-0.126 | 0.078-0.157 | 0.088-0.176 | 0.101-0.205 |
| K | Cast Irons, Grey, Spher., Melleable | <300 HB | 4 | 0.03-0.14 | 154-336 | 0.038-0.076 | 0.050-0.101 | 0.063-0.126 | 0.070-0.140 | 0.076-0.151 | 0.101-0.205 |
| N | Aluminiums, Aluminiums Alloys | <6% Si | | | | | | | | | |
| S | Titanium , Titanium Alloys | <1100N/mm² | | | | | | | | | |
| S | HRSA (Nickel Alloys, Co. Alloys) | <1300N/mm² | 4 | 0.03-0.14 | 72-156 | 0.032-0.064 | 0.045-0.090 | 0.057-0.115 | 0.063-0.126 | 0.083-0.165 | 0.101-0.205 |
| | **TROCHOIDAL MILLING [NTC 0510P] [5xd]** | | | | | | | | | | |
| P | Steels, Alloy Steels and Tool Steels | <850 N/mm² | 5 | 0.03-0.14 | 182-396 | 0.045-0.090 | 0.063-0.126 | 0.078-0.157 | 0.095-0.190 | 0.113-0.227 | 0.139-0.284 |
| | Steels, Alloy Steels and Tool Steels | 850-1200 N/mm² | 5 | 0.03-0.14 | 154-336 | 0.038-0.076 | 0.050-0.101 | 0.063-0.126 | 0.070-0.140 | 0.076-0.151 | 0.101-0.205 |
| | Steels, Alloy Steels and Tool Steels | <1400 N/mm² | 5 | 0.03-0.14 | 176-384 | 0.032-0.064 | 0.045-0.090 | 0.063-0.126 | 0.076-0.151 | 0.088-0.176 | 0.113-0.231 |
| M | Stainless Steel : Easy To Machine | <750 N/mm² | | | | | | | | | |
| | Stainless Steel : Difficult To Machine | <950 N/mm² | 5 | 0.03-0.14 | 88-192 | 0.038-0.076 | 0.050-0.101 | 0.063-0.126 | 0.078-0.157 | 0.088-0.176 | 0.101-0.205 |
| K | Cast Irons, Grey, Spher., Melleable | <300 HB | 5 | 0.03-0.14 | 154-336 | 0.038-0.076 | 0.050-0.101 | 0.063-0.126 | 0.070-0.140 | 0.076-0.151 | 0.101-0.205 |
| N | Aluminiums, Aluminiums Alloys | <6% Si | | | | | | | | | |
| S | Titanium , Titanium Alloys | <1100N/mm² | | | | | | | | | |
| S | HRSA (Nickel Alloys, Co. Alloys) | <1300N/mm² | 5 | 0.03-0.14 | 72-156 | 0.032-0.064 | 0.045-0.090 | 0.057-0.115 | 0.063-0.126 | 0.083-0.165 | 0.101-0.205 |

| | MATERIAL | Hardness | ap max xD | ae max xD | Vc (m/min) | fz (mm/z) Ø 6 | 8 | 10 | 12 | 16 | 20 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | **TROCHOIDAL MILLING [NTC-SX 0310P] [3xd]** | | | | | | | | | | |
| P | Steels, Alloy Steels and Tool Steels | <850 N/mm² | 3 | 0.03-0.14 | 240-400 | 0.038-0.081 | 0.050-0.108 | 0.070-0.150 | 0.083-0.177 | 0.101-0.216 | 0.126-0.270 |
| | Steels, Alloy Steels and Tool Steels | 850-1200 N/mm² | 3 | 0.03-0.14 | 210-350 | 0.038-0.081 | 0.050-0.108 | 0.063-0.135 | 0.070-0.150 | 0.076-0.162 | 0.101-0.216 |
| | Steels, Alloy Steels and Tool Steels | <1400 N/mm² | 3 | 0.03-0.14 | 240-400 | 0.032-0.069 | 0.045-0.146 | 0.063-0.135 | 0.076-0.162 | 0.088-0.189 | 0.113-0.243 |
| M | Stainless Steel : Easy To Machine | <750 N/mm² | 3 | 0.03-0.14 | 165-275 | 0.038-0.081 | 0.050-0.108 | 0.063-0.135 | 0.076-0.162 | 0.088-0.189 | 0.101-0.216 |
| | Stainless Steel : Difficult To Machine | <950 N/mm² | 3 | 0.03-0.14 | 120-200 | 0.038-0.081 | 0.050-0.108 | 0.063-0.135 | 0.078-0.168 | 0.088-0.189 | 0.101-0.216 |
| K | Cast Irons, Grey, Spher., Melleable | <300 HB | 3 | 0.03-0.14 | 210-350 | 0.038-0.081 | 0.050-0.108 | 0.063-0.135 | 0.070-0.150 | 0.076-0.162 | 0.101-0.216 |
| N | Aluminiums, Aluminiums Alloys | <6% Si | | | | | | | | | |
| S | Titanium , Titanium Alloys | <1100N/mm² | 3 | 0.03-0.14 | 90-150 | 0.038-0.081 | 0.050-0.108 | 0.063-0.135 | 0.076-0.162 | 0.088-0.189 | 0.113-0.243 |
| S | HRSA (Nickel Alloys, Co. Alloys) | <1300N/mm² | 3 | 0.03-0.14 | 98-163 | 0.038-0.081 | 0.050-0.108 | 0.063-0.135 | 0.076-0.162 | 0.083-0.177 | 0.101-0.216 |
| | **TROCHOIDAL MILLING [NTC-SX 0410P] [4xd]** | | | | | | | | | | |
| P | Steels, Alloy Steels and Tool Steels | <850 N/mm² | 4 | 0.03-0.14 | 182-396 | 0.045-0.090 | 0.063-0.126 | 0.078-0.157 | 0.095-0.190 | 0.113-0.227 | 0.139-0.284 |
| | Steels, Alloy Steels and Tool Steels | 850-1200 N/mm² | 4 | 0.03-0.14 | 154-336 | 0.038-0.076 | 0.050-0.101 | 0.063-0.126 | 0.070-0.140 | 0.076-0.151 | 0.101-0.205 |
| | Steels, Alloy Steels and Tool Steels | <1400 N/mm² | 4 | 0.03-0.14 | 176-384 | 0.032-0.064 | 0.045-0.090 | 0.063-0.126 | 0.076-0.151 | 0.088-0.176 | 0.113-0.231 |
| M | Stainless Steel : Easy To Machine | <750 N/mm² | 4 | 0.03-0.14 | 105-228 | 0.038-0.076 | 0.050-0.101 | 0.063-0.126 | 0.076-0.151 | 0.088-0.176 | 0.101-0.205 |
| | Stainless Steel : Difficult To Machine | <950 N/mm² | 4 | 0.03-0.14 | 88-192 | 0.038-0.076 | 0.050-0.101 | 0.063-0.126 | 0.078-0.157 | 0.088-0.176 | 0.101-0.205 |
| K | Cast Irons, Grey, Spher., Melleable | <300 HB | 4 | 0.03-0.14 | 154-336 | 0.038-0.076 | 0.050-0.101 | 0.063-0.126 | 0.070-0.140 | 0.076-0.151 | 0.101-0.205 |
| N | Aluminiums, Aluminiums Alloys | <6% Si | | | | | | | | | |
| S | Titanium , Titanium Alloys | <1100N/mm² | 4 | 0.03-0.14 | 66-144 | 0.038-0.076 | 0.050-0.101 | 0.063-0.126 | 0.076-0.151 | 0.088-0.176 | 0.113-0.231 |
| S | HRSA (Nickel Alloys, Co. Alloys) | <1300N/mm² | 4 | 0.03-0.14 | 72-156 | 0.032-0.064 | 0.045-0.090 | 0.057-0.115 | 0.063-0.126 | 0.083-0.165 | 0.101-0.205 |
| | **TROCHOIDAL MILLING [NTC-SX 0510P] [5xd]** | | | | | | | | | | |
| P | Steels, Alloy Steels and Tool Steels | <850 N/mm² | 5 | 0.03-0.14 | 182-396 | 0.045-0.090 | 0.063-0.126 | 0.078-0.157 | 0.095-0.190 | 0.113-0.227 | 0.139-0.284 |
| | Steels, Alloy Steels and Tool Steels | 850-1200 N/mm² | 5 | 0.03-0.14 | 154-336 | 0.038-0.076 | 0.050-0.101 | 0.063-0.126 | 0.070-0.140 | 0.076-0.151 | 0.101-0.205 |
| | Steels, Alloy Steels and Tool Steels | <1400 N/mm² | 5 | 0.03-0.14 | 176-384 | 0.032-0.064 | 0.045-0.090 | 0.063-0.126 | 0.076-0.151 | 0.088-0.176 | 0.113-0.231 |
| M | Stainless Steel : Easy To Machine | <750 N/mm² | 5 | 0.03-0.14 | 105-228 | 0.038-0.076 | 0.050-0.101 | 0.063-0.126 | 0.076-0.151 | 0.088-0.176 | 0.101-0.205 |
| | Stainless Steel : Difficult To Machine | <950 N/mm² | 5 | 0.03-0.14 | 88-192 | 0.038-0.076 | 0.050-0.101 | 0.063-0.126 | 0.078-0.157 | 0.088-0.176 | 0.101-0.205 |
| K | Cast Irons, Grey, Spher., Melleable | <300 HB | 5 | 0.03-0.14 | 154-336 | 0.038-0.076 | 0.050-0.101 | 0.063-0.126 | 0.070-0.140 | 0.076-0.151 | 0.101-0.205 |
| N | Aluminiums, Aluminiums Alloys | <6% Si | | | | | | | | | |
| S | Titanium , Titanium Alloys | <1100N/mm² | 5 | 0.03-0.14 | 66-144 | 0.038-0.076 | 0.050-0.101 | 0.063-0.126 | 0.076-0.151 | 0.088-0.176 | 0.113-0.231 |
| S | HRSA (Nickel Alloys, Co. Alloys) | <1300N/mm² | 5 | 0.03-0.14 | 72-156 | 0.032-0.064 | 0.045-0.090 | 0.057-0.115 | 0.063-0.126 | 0.083-0.165 | 0.101-0.205 |

| | MATERIAL | Hardness | ap max xD | ae max xD | Vc (m/min) | fz (mm/z) Ø 6 | 8 | 10 | 12 | 16 | 20 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | **TROCHOIDAL MILLING [3xd] 934-H, 935-H** | | | | | | | | | | |
| P | Steels, Alloy Steels and Tool Steels | <850 N/mm² | 3 | 0.03-0.14 | 240-400 | 0.038-0.081 | 0.050-0.108 | 0.070-0.150 | 0.083-0.177 | 0.101-0.216 | 0.126-0.270 |
| | Steels, Alloy Steels and Tool Steels | 850-1200 N/mm² | 3 | 0.03-0.14 | 210-350 | 0.038-0.081 | 0.050-0.108 | 0.063-0.135 | 0.070-0.150 | 0.076-0.162 | 0.101-0.216 |
| | Steels, Alloy Steels and Tool Steels | <1400 N/mm² | 3 | 0.03-0.14 | 240-400 | 0.032-0.069 | 0.045-0.146 | 0.063-0.135 | 0.076-0.162 | 0.088-0.189 | 0.113-0.243 |
| M | Stainless Steel : Easy To Machine | <750 N/mm² | 3 | 0.03-0.14 | 165-275 | 0.038-0.081 | 0.050-0.108 | 0.063-0.135 | 0.076-0.162 | 0.088-0.189 | 0.101-0.216 |
| | Stainless Steel : Difficult To Machine | <950 N/mm² | 3 | 0.03-0.14 | 120-200 | 0.038-0.081 | 0.050-0.108 | 0.063-0.135 | 0.078-0.168 | 0.088-0.189 | 0.101-0.216 |
| K | Cast Irons, Grey, Spher., Melleable | <300 HB | 3 | 0.03-0.14 | 210-350 | 0.038-0.081 | 0.050-0.108 | 0.063-0.135 | 0.070-0.150 | 0.076-0.162 | 0.101-0.216 |
| N | Aluminiums, Aluminiums Alloys | <6% Si | | | | | | | | | |
| S | Titanium , Titanium Alloys | <1100N/mm² | 3 | 0.03-0.14 | 90-150 | 0.038-0.081 | 0.050-0.108 | 0.063-0.135 | 0.076-0.162 | 0.088-0.189 | 0.113-0.243 |
| S | HRSA (Nickel Alloys, Co. Alloys) | <1300N/mm² | 3 | 0.03-0.14 | 98-163 | 0.038-0.081 | 0.050-0.108 | 0.063-0.135 | 0.076-0.162 | 0.083-0.177 | 0.101-0.216 |
| | **TROCHOIDAL MILLING [3xd] 945-H** | | | | | | | | | | |
| P | Steels, Alloy Steels and Tool Steels | <850 N/mm² | 4 | 0.03-0.14 | 182-396 | 0.045-0.090 | 0.063-0.126 | 0.078-0.157 | 0.095-0.190 | 0.113-0.227 | 0.139-0.284 |
| | Steels, Alloy Steels and Tool Steels | 850-1200 N/mm² | 4 | 0.03-0.14 | 154-336 | 0.038-0.076 | 0.050-0.101 | 0.063-0.126 | 0.070-0.140 | 0.076-0.151 | 0.101-0.205 |
| | Steels, Alloy Steels and Tool Steels | <1400 N/mm² | 4 | 0.03-0.14 | 176-384 | 0.032-0.064 | 0.045-0.090 | 0.063-0.126 | 0.076-0.151 | 0.088-0.176 | 0.113-0.231 |
| M | Stainless Steel : Easy To Machine | <750 N/mm² | 4 | 0.03-0.14 | 105-228 | 0.038-0.076 | 0.050-0.101 | 0.063-0.126 | 0.076-0.151 | 0.088-0.176 | 0.101-0.205 |
| | Stainless Steel : Difficult To Machine | <950 N/mm² | 4 | 0.03-0.14 | 88-192 | 0.038-0.076 | 0.050-0.101 | 0.063-0.126 | 0.078-0.157 | 0.088-0.176 | 0.101-0.205 |
| K | Cast Irons, Grey, Spher., Melleable | <300 HB | 4 | 0.03-0.14 | 154-336 | 0.038-0.076 | 0.050-0.101 | 0.063-0.126 | 0.070-0.140 | 0.076-0.151 | 0.101-0.205 |
| N | Aluminiums, Aluminiums Alloys | <6% Si | | | | | | | | | |
| S | Titanium , Titanium Alloys | <1100N/mm² | 4 | 0.03-0.14 | 66-144 | 0.038-0.076 | 0.050-0.101 | 0.063-0.126 | 0.076-0.151 | 0.088-0.176 | 0.113-0.231 |
| S | HRSA (Nickel Alloys, Co. Alloys) | <1300N/mm² | 4 | 0.03-0.14 | 72-156 | 0.032-0.064 | 0.045-0.090 | 0.057-0.115 | 0.063-0.126 | 0.083-0.165 | 0.101-0.205 |
| | **TROCHOIDAL MILLING [3xd] 955-H** | | | | | | | | | | |
| P | Steels, Alloy Steels and Tool Steels | <850 N/mm² | 5 | 0.03-0.14 | 182-396 | 0.045-0.090 | 0.063-0.126 | 0.078-0.157 | 0.095-0.190 | 0.113-0.227 | 0.139-0.284 |
| | Steels, Alloy Steels and Tool Steels | 850-1200 N/mm² | 5 | 0.03-0.14 | 154-336 | 0.038-0.076 | 0.050-0.101 | 0.063-0.126 | 0.070-0.140 | 0.076-0.151 | 0.101-0.205 |
| | Steels, Alloy Steels and Tool Steels | <1400 N/mm² | 5 | 0.03-0.14 | 176-384 | 0.032-0.064 | 0.045-0.090 | 0.063-0.126 | 0.076-0.151 | 0.088-0.176 | 0.113-0.231 |
| M | Stainless Steel : Easy To Machine | <750 N/mm² | 5 | 0.03-0.14 | 105-228 | 0.038-0.076 | 0.050-0.101 | 0.063-0.126 | 0.076-0.151 | 0.088-0.176 | 0.101-0.205 |
| | Stainless Steel : Difficult To Machine | <950 N/mm² | 5 | 0.03-0.14 | 88-192 | 0.038-0.076 | 0.050-0.101 | 0.063-0.126 | 0.078-0.157 | 0.088-0.176 | 0.101-0.205 |
| K | Cast Irons, Grey, Spher., Melleable | <300 HB | 5 | 0.03-0.14 | 154-336 | 0.038-0.076 | 0.050-0.101 | 0.063-0.126 | 0.070-0.140 | 0.076-0.151 | 0.101-0.205 |
| N | Aluminiums, Aluminiums Alloys | <6% Si | | | | | | | | | |
| S | Titanium , Titanium Alloys | <1100N/mm² | 5 | 0.03-0.14 | 66-144 | 0.038-0.076 | 0.050-0.101 | 0.063-0.126 | 0.076-0.151 | 0.088-0.176 | 0.113-0.231 |
| S | HRSA (Nickel Alloys, Co. Alloys) | <1300N/mm² | 5 | 0.03-0.14 | 72-156 | 0.032-0.064 | 0.045-0.090 | 0.057-0.115 | 0.063-0.126 | 0.083-0.165 | 0.101-0.205 |

# RAZOR-1400

| | MATERIAL | Hardness | ap max xD | ae max xD | Vc (m/min) | fz (mm/z) Ø 2 | 3 | 4 | 5 | 6 | 8 | 10 | 12 | 16 | 20 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **SLOTTING** | | | | | | | | | | | | | | |
| N | Aluminiums, Aluminiums Alloys | <6% Si | 0.5 | 1 | 300-500 | 0.023 | 0.030 | 0.039 | 0.049 | 0.058 | 0.079 | 0.098 | 0.116 | | |
| | Brass , Bronze | | 0.5 | 1 | 150-350 | 0.017 | 0.021 | 0.027 | 0.034 | 0.040 | 0.055 | 0.068 | 0.081 | | |
| | Plastics | | 0.5 | 1 | 400-600 | 0.023 | 0.030 | 0.039 | 0.049 | 0.058 | 0.079 | 0.098 | 0.116 | | |
| | **SIDE MILLING** | | | | | | | | | | | | | | |
| N | Aluminiums, Aluminiums Alloys | <6% Si | 1 | 0.5 | 300-600 | 0.030 | 0.040 | 0.052 | 0.065 | 0.077 | 0.105 | 0.130 | 0.155 | | |
| | Brass , Bronze | | 1 | 0.5 | 200-400 | 0.021 | 0.028 | 0.036 | 0.046 | 0.054 | 0.074 | 0.091 | 0.109 | | |
| | Plastics | | 1 | 0.5 | 400-800 | 0.030 | 0.040 | 0.052 | 0.065 | 0.077 | 0.105 | 0.130 | 0.155 | | |
| | **DRILLING** | | | | | | | | | | | | | | |
| N | Aluminiums, Aluminiums Alloys | <6% Si | 1 | 1 | 200-400 | 0.011 | 0.015 | 0.020 | 0.024 | 0.029 | 0.039 | 0.049 | 0.058 | | |
| | Brass , Bronze | | 1 | 1 | 100-300 | 0.008 | 0.011 | 0.014 | 0.017 | 0.020 | 0.028 | 0.034 | 0.041 | | |
| | Plastics | | 0.5 | 1 | 300-500 | 0.011 | 0.015 | 0.020 | 0.024 | 0.029 | 0.039 | 0.049 | 0.058 | | |

# RAZOR 1300, 1500

| | MATERIAL | Hardness | ap max xD | ae max xD | Vc (m/min) | fz (mm/z) Ø 2 | 3 | 4 | 5 | 6 | 8 | 10 | 12 | 16 | 20 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **SLOTTING** | | | | | | | | | | | | | | |
| N | Aluminiums, Aluminiums Alloys | <6% Si | 0.5 | 1 | 200-600 | | 0.028 | 0.038 | 0.047 | 0.057 | 0.075 | 0.094 | 0.112 | 0.148 | 0.185 |
| | Brass , Bronze | | 0.5 | 1 | 150-250 | | 0.020 | 0.026 | 0.033 | 0.039 | 0.052 | 0.066 | 0.078 | 0.103 | 0.129 |
| | Plastics | | 0.5 | 1 | 500-900 | | 0.028 | 0.038 | 0.047 | 0.057 | 0.075 | 0.094 | 0.112 | 0.148 | 0.185 |
| | **SIDE MILLING** | | | | | | | | | | | | | | |
| N | Aluminiums, Aluminiums Alloys | <6% Si | 1 | 0.5 | 300-500 | | 0.034 | 0.045 | 0.056 | 0.068 | 0.090 | 0.112 | 0.134 | 0.177 | 0.222 |
| | Brass , Bronze | | 1 | 0.5 | 150-350 | | 0.024 | 0.032 | 0.040 | 0.047 | 0.063 | 0.079 | 0.094 | 0.124 | 0.155 |
| | Plastics | | 1 | 0.5 | 600-1000 | | 0.034 | 0.045 | 0.056 | 0.068 | 0.090 | 0.112 | 0.134 | 0.177 | 0.222 |

# ALU-T, ALU-T IK, ALU-X

| | MATERIAL | Hardness | ap max xD | ae max xD | Vc (m/min) | fz (mm/z) Ø 2 | 3 | 4 | 5 | 6 | 8 | 10 | 12 | 16 | 20 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **SLOTTING** | | | | | | | | | | | | | | |
| N | Aluminiums, Aluminiums Alloys | <6% Si | 1 | 1 | 300-500 | | 0.033 | 0.044 | 0.055 | 0.065 | 0.086 | 0.105 | 0.120 | 0.160 | 0.195 |
| | Brass , Bronze | | 1 | 1 | 150-350 | | 0.023 | 0.031 | 0.039 | 0.046 | 0.060 | 0.074 | 0.084 | 0.112 | 0.137 |
| | Plastics | | 1 | 1 | 600-900 | | 0.036 | 0.048 | 0.061 | 0.072 | 0.095 | 0.116 | 0.132 | 0.176 | 0.215 |
| | **SIDE MILLING** | | | | | | | | | | | | | | |
| N | Aluminiums, Aluminiums Alloys | <6% Si | 1.5 | 0.5 | 300-600 | | 0.040 | 0.053 | 0.066 | 0.078 | 0.103 | 0.126 | 0.144 | 0.192 | 0.234 |
| | Brass , Bronze | | 1.5 | 0.5 | 200-400 | | 0.032 | 0.042 | 0.053 | 0.062 | 0.083 | 0.101 | 0.115 | 0.154 | 0.187 |
| | Plastics | | 1.5 | 0.5 | 600-1000 | | 0.044 | 0.058 | 0.073 | 0.086 | 0.114 | 0.139 | 0.158 | 0.211 | 0.257 |
| | **HELICAL DRILLING** | | | | | | | | | | | | | | |
| N | Aluminiums, Aluminiums Alloys | <6% Si | 8° | 0.5 | 300-500 | | 0.023 | 0.030 | 0.038 | 0.045 | 0.058 | 0.073 | 0.083 | 0.111 | 0.135 |
| | Brass , Bronze | | 5° | 0.5 | 150-350 | | 0.017 | 0.022 | 0.028 | 0.033 | 0.044 | 0.054 | 0.061 | 0.082 | 0.099 |
| | Plastics | | 8° | 0.5 | 600-900 | | 0.025 | 0.033 | 0.042 | 0.049 | 0.065 | 0.080 | 0.091 | 0.122 | 0.148 |
| | **RAMPING** | | | | | | | | | | | | | | |
| N | Aluminiums, Aluminiums Alloys | <6% Si | 15° | 0.5 | 300-500 | | 0.022 | 0.029 | 0.037 | 0.043 | 0.057 | 0.070 | 0.080 | 0.106 | 0.130 |
| | Brass , Bronze | | 7° | 0.5 | 150-350 | | 0.016 | 0.022 | 0.027 | 0.032 | 0.042 | 0.051 | 0.059 | 0.078 | 0.096 |
| | Plastics | | 15° | 0.5 | 600-900 | | 0.024 | 0.032 | 0.040 | 0.048 | 0.063 | 0.077 | 0.088 | 0.117 | 0.143 |

Technical Data provided should be considered advisory only as variations may be necessary depending on the particular application

| MATERIAL | | Hardness | ap max xD | ae max xD | Vc (m/min) | fz (mm/z) Ø 1 | 2 | 3 | 4 | 5 | 6 | 8 | 10 | 12 | 16 | 20 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **COPY MILLING [EMBD 2100]** | | | | | | | | | | | | | | | | |
| P | High tensile strength steel | 35-45 HRC | 0.05 | 0.2 | 140-180 | 0.009 | 0.012 | 0.018 | 0.025 | 0.032 | 0.038 | 0.048 | 0.057 | 0.067 | 0.095 | 0.108 |
| H | Hardened steel | 45-55HRC | 0.05 | 0.2 | 80-100 | 0.007 | 0.010 | 0.014 | 0.020 | 0.026 | 0.030 | 0.038 | 0.045 | 0.054 | 0.076 | 0.086 |
| **SLOTTING [ EMSD 2100]** | | | | | | | | | | | | | | | | |
| P | High tensile strength steel | 35-45 HRC | 0.2 | 1 | 30-70 | 0.005 | 0.008 | 0.012 | 0.016 | 0.020 | 0.026 | 0.031 | 0.037 | 0.044 | 0.058 | 0.075 |
| H | Hardened steel | 45-55HRC | 0.1 | 1 | 20-40 | 0.004 | 0.007 | 0.010 | 0.014 | 0.018 | 0.023 | 0.027 | 0.032 | 0.039 | 0.051 | 0.065 |
| **SIDE MILLING [EMSD 4100]** | | | | | | | | | | | | | | | | |
| P | High tensile strength steel | 35-45 HRC | 1 | 0.05 | 40-60 | 0.007 | 0.014 | 0.020 | 0.027 | 0.031 | 0.034 | 0.044 | 0.057 | 0.068 | 0.088 | 0.112 |
| H | Hardened steel | 45-55HRC | 1 | 0.05 | 20-40 | 0.006 | 0.012 | 0.018 | 0.024 | 0.027 | 0.030 | 0.039 | 0.050 | 0.060 | 0.077 | 0.098 |
| **SIDE MILLING** | | | | | | | | | | | | | | | | |
| P | High tensile strength steel | 35-45 HRC | 1.5 | 0.05 | 20-60 | | 0.012 | 0.017 | 0.023 | 0.026 | 0.029 | 0.038 | 0.048 | 0.058 | 0.075 | 0.095 |
| H | Hardened steel | 45-55HRC | 1.5 | 0.05 | 20-40 | | 0.010 | 0.015 | 0.020 | 0.023 | 0.025 | 0.033 | 0.042 | 0.051 | 0.065 | 0.083 |
| **SIDE MILLING** | | | | | | | | | | | | | | | | |
| P | High tensile strength steel | 35-45 HRC | 1.5 | 0.02 | 60-100 | | | 0.007 | 0.010 | 0.012 | 0.014 | 0.022 | 0.027 | 0.033 | 0.045 | 0.058 |
| H | Hardened steel | 45-55HRC | 1.5 | 0.02 | 50-70 | | | 0.006 | 0.008 | 0.010 | 0.013 | 0.019 | 0.024 | 0.029 | 0.039 | 0.051 |
| **SLOTTING** | | | | | | | | | | | | | | | | |
| P | High tensile strength steel | 35-45 HRC | 0.3 | 1 | 30-50 | | | 0.008 | 0.011 | 0.013 | 0.015 | 0.020 | 0.024 | 0.028 | 0.034 | 0.042 |
| H | Hardened steel | 45-55HRC | 0.2 | 1 | 20-40 | | | 0.007 | 0.010 | 0.012 | 0.014 | 0.019 | 0.022 | 0.026 | 0.032 | 0.039 |
| **SIDE MILLING** | | | | | | | | | | | | | | | | |
| P | High tensile strength steel | 35-45 HRC | 1.2 | 0.2 | 40-60 | | | 0.010 | 0.014 | 0.017 | 0.020 | 0.026 | 0.031 | 0.035 | 0.044 | 0.054 |
| H | Hardened steel | 45-55HRC | 1 | 0.1 | 30-50 | | | 0.014 | 0.019 | 0.023 | 0.027 | 0.035 | 0.042 | 0.048 | 0.061 | 0.074 |
| **HELICAL MILLING** | | | | | | | | | | | | | | | | |
| P | High tensile strength steel | 35-45 HRC | 3° | 04 | 30-50 | | | 0.006 | 0.008 | 0.011 | 0.012 | 0.016 | 0.019 | 0.022 | 0.028 | 0.034 |
| H | Hardened steel | 45-55HRC | 2° | 04 | 20-40 | | | 0.007 | 0.009 | 0.011 | 0.013 | 0.017 | 0.020 | 0.023 | 0.029 | 0.035 |
| **TROCHOIDAL MILLING** | | | | | | | | | | | | | | | | |
| P | High tensile strength steel | 35-45 HRC | 1 | 0.1 | 50-70 | | | 0.021 | 0.029 | 0.034 | 0.041 | 0.054 | 0.064 | 0.073 | 0.092 | 0.112 |
| H | Hardened steel | 45-55HRC | 1 | 0.1 | 40-60 | | | 0.029 | 0.040 | 0.048 | 0.057 | 0.074 | 0.088 | 0.101 | 0.126 | 0.154 |

Technical Data provided should be considered advisory only as variations may be necessary depending on the particular application

| | MATERIAL | Hardness | ap max xD | ae max xD | Vc (m/min) | fz (mm/z) Ø 0.8 | 1.0 | 1.2 | 1.4 | 1.5 | 1.6 | 1.8 | 2.0 | 2.5 | 3.0 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **SLOTTING EMS 586** | | | | | | | | | | | | | | |
| P | Steels, Alloy Steels and Tool Steels | <850 N/mm² | 0.06 | 1 | 78-85 | 0.0070 | 0.010 | 0.014 | 0.016 | 0.017 | 0.018 | 0.019 | 0.021 | 0.023 | 0.031 |
| | Steels, Alloy Steels and Tool Steels | 850-1200 N/mm² | 0.06 | 1 | 55-60 | 0.0060 | 0.009 | 0.012 | 0.015 | 0.016 | 0.017 | 0.018 | 0.020 | 0.022 | 0.030 |
| | Steels, Alloy Steels and Tool Steels | <1400 N/mm² | 0.01 | 1 | 34-37 | 0.0030 | 0.004 | 0.005 | 0.006 | 0.007 | 0.007 | 0.008 | 0.008 | 0.010 | 0.012 |
| M | Stainless Steel : Easy To Machine | <750 N/mm² | | | | | | | | | | | | | |
| | Stainless Steel : Difficult To Machine | <950 N/mm² | 0.06 | 1 | 55-60 | 0.0060 | 0.009 | 0.012 | 0.015 | 0.016 | 0.017 | 0.018 | 0.020 | 0.022 | 0.030 |
| K | Cast Irons, Grey, Spher., Melleable | <300 HB | 0.06 | 1 | 78-85 | 0.0070 | 0.010 | 0.014 | 0.016 | 0.017 | 0.018 | 0.019 | 0.021 | 0.023 | 0.031 |
| N | Aluminiums, Aluminiums Alloys | <6% Si | | | | | | | | | | | | | |
| S | Titanium , Titanium Alloys | <1100N/mm² | | | | | | | | | | | | | |
| S | HRSA (Nickel Alloys, Co. Alloys) | <1300N/mm² | 0.01 | 1 | 34-37 | 0.0030 | 0.004 | 0.005 | 0.006 | 0.007 | 0.007 | 0.008 | 0.008 | 0.010 | 0.012 |
| | **SIDE MILLING EMB 586** | | | | | | | | | | | | | | |
| P | Steels, Alloy Steels and Tool Steels | <850 N/mm² | 0.06 | 1 | 66-122 | 0.0060 | 0.007 | 0.009 | 0.009 | 0.011 | 0.012 | 0.012 | 0.014 | 0.021 | 0.025 |
| | Steels, Alloy Steels and Tool Steels | 850-1200 N/mm² | 0.06 | 1 | 55-60 | 0.0040 | 0.005 | 0.006 | 0.007 | 0.008 | 0.009 | 0.009 | 0.010 | 0.014 | 0.018 |
| | Steels, Alloy Steels and Tool Steels | <1400 N/mm² | 0.01 | 1 | 30-55 | 0.0050 | 0.006 | 0.007 | 0.009 | 0.009 | 0.010 | 0.010 | 0.011 | 0.012 | 0.018 |
| M | Stainless Steel : Easy To Machine | <750 N/mm² | | | | | | | | | | | | | |
| | Stainless Steel : Difficult To Machine | <950 N/mm² | 0.06 | 1 | 55-60 | 0.0040 | 0.005 | 0.006 | 0.007 | 0.008 | 0.009 | 0.009 | 0.010 | 0.014 | 0.018 |
| K | Cast Irons, Grey, Spher., Melleable | <300 HB | 0.06 | 1 | 66-122 | 0.0060 | 0.007 | 0.009 | 0.009 | 0.011 | 0.012 | 0.012 | 0.014 | 0.021 | 0.025 |
| N | Aluminiums, Aluminiums Alloys | <6% Si | | | | | | | | | | | | | |
| S | Titanium , Titanium Alloys | <1100N/mm² | | | | | | | | | | | | | |
| S | HRSA (Nickel Alloys, Co. Alloys) | <1300N/mm² | 0.01 | 1 | 30-55 | 0.0050 | 0.006 | 0.007 | 0.009 | 0.009 | 0.010 | 0.010 | 0.011 | 0.012 | 0.018 |

Technical Data provided should be considered advisory only as variations may be necessary depending on the particular application

| MATERIAL | | | Dia Ø | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| H | Hardened Steel | 45-55 HRC | 1.00 | Neck Length | 3.0 | 4.0 | 5.0 | 6.0 | 8.0 | 10.0 | 12.0 | 14.0 | 16.0 | 18.0 | 20.0 | |
| | | | | Depth of Cut (mm) | 0.050 | 0.050 | 0.030 | 0.030 | 0.020 | 0.010 | 0.010 | 0.008 | 0.008 | 0.005 | 0.005 | |
| | | | | RPM (n) | 40000 | 40000 | 40000 | 35000 | 30000 | 20000 | 20000 | 18000 | 18000 | 13000 | 13000 | |
| | | | | Vf (mm/min) | 4000 | 4000 | 3000 | 2000 | 1600 | 1000 | 1000 | 600 | 500 | 300 | 250 | |
| H | Hardened Steel | 55-62 HRC | 1.00 | Neck Length | 3.0 | 4.0 | 5.0 | 6.0 | 8.0 | 10.0 | 12.0 | 14.0 | 16.0 | 18.0 | 20.0 | |
| | | | | Depth of Cut (mm) | 0.040 | 0.040 | 0.020 | 0.020 | 0.010 | 0.010 | 0.008 | 0.008 | 0.006 | 0.004 | 0.004 | |
| | | | | RPM (n) | 40000 | 40000 | 40000 | 35000 | 30000 | 20000 | 20000 | 18000 | 18000 | 13000 | 13000 | |
| | | | | Vf (mm/min) | 4000 | 4000 | 3000 | 2000 | 1600 | 1000 | 800 | 480 | 400 | 2400 | 200 | |
| H | Hardened Steel | 45-55 HRC | 1.20 | Neck Length | 6.0 | 8.0 | 10.0 | 12.0 | 14.0 | 16.0 | | | | | | |
| | | | | Depth of Cut (mm) | 0.050 | 0.050 | 0.030 | 0.020 | 0.010 | 0.010 | | | | | | |
| | | | | RPM (n) | 40000 | 40000 | 27000 | 16000 | 16000 | 15000 | | | | | | |
| | | | | Vf (mm/min) | 4000 | 3000 | 1900 | 1100 | 850 | 500 | | | | | | |
| H | Hardened Steel | 55-62 HRC | 1.20 | Neck Length | 6.0 | 8.0 | 10.0 | 12.0 | 14.0 | 16.0 | | | | | | |
| | | | | Depth of Cut (mm) | 0.040 | 0.040 | 0.020 | 0.010 | 0.010 | 0.006 | | | | | | |
| | | | | RPM (n) | 35000 | 27000 | 24000 | 16000 | 16000 | 14000 | | | | | | |
| | | | | Vf (mm/min) | 3500 | 2000 | 1700 | 1000 | 780 | 400 | | | | | | |
| H | Hardened Steel | 45-55 HRC | 140 | Neck Length | 8.0 | 12.0 | 16.0 | | | | | | | | | |
| | | | | Depth of Cut (mm) | 0.060 | 0.030 | 0.020 | | | | | | | | | |
| | | | | RPM (n) | 40000 | 32000 | 15000 | | | | | | | | | |
| | | | | Vf (mm/min) | 4500 | 3000 | 1000 | | | | | | | | | |
| H | Hardened Steel | 55-62 HRC | 140 | Neck Length | 8.0 | 12.0 | 16.0 | | | | | | | | | |
| | | | | Depth of Cut (mm) | 0.050 | 0.020 | 0.010 | | | | | | | | | |
| | | | | RPM (n) | 28000 | 19000 | 14000 | | | | | | | | | |
| | | | | Vf (mm/min) | 3200 | 1800 | 800 | | | | | | | | | |
| H | Hardened Steel | 45-55 HRC | 1.50 | Neck Length | 6.0 | 8.0 | 10.0 | 12.0 | 14.0 | 16.0 | 18.0 | 20.0 | | | | |
| | | | | Depth of Cut (mm) | 0.070 | 0.070 | 0.060 | 0.040 | 0.040 | 0.030 | 0.020 | 0.020 | | | | |
| | | | | RPM (n) | 40000 | 40000 | 40000 | 32000 | 16000 | 13000 | 13000 | 12000 | | | | |
| | | | | Vf (mm/min) | 5000 | 5000 | 4500 | 3400 | 1500 | 1200 | 1100 | 900 | | | | |
| H | Hardened Steel | 55-62 HRC | 1.50 | Neck Length | 6.0 | 8.0 | 10.0 | 12.0 | 14.0 | 16.0 | 18.0 | 20.0 | | | | |
| | | | | Depth of Cut (mm) | 0.060 | 0.060 | 0.040 | 0.030 | 0.030 | 0.020 | 0.020 | 0.010 | | | | |
| | | | | RPM (n) | 32000 | 28000 | 21000 | 19000 | 13000 | 13000 | 10000 | 9000 | | | | |
| | | | | Vf (mm/min) | 4000 | 3500 | 2400 | 2000 | 1200 | 1200 | 800 | 700 | | | | |
| H | Hardened Steel | 45-55 HRC | 1.60 | Neck Length | 8.0 | 12.0 | 16.0 | 20.0 | | | | | | | | |
| | | | | Depth of Cut (mm) | 0.080 | 0.050 | 0.040 | 0.020 | | | | | | | | |
| | | | | RPM (n) | 40000 | 35000 | 13000 | 10000 | | | | | | | | |
| | | | | Vf (mm/min) | 5000 | 3800 | 1200 | 750 | | | | | | | | |
| H | Hardened Steel | 55-62 HRC | 1.60 | Neck Length | 8.0 | 12.0 | 16.0 | 20.0 | | | | | | | | |
| | | | | Depth of Cut (mm) | 0.070 | 0.030 | 0.020 | 0.010 | | | | | | | | |
| | | | | RPM (n) | 26000 | 20000 | 12000 | 8000 | | | | | | | | |
| | | | | Vf (mm/min) | 3200 | 2100 | 1100 | 600 | | | | | | | | |
| H | Hardened Steel | 45-55 HRC | 1.80 | Neck Length | 8.0 | 12.0 | 16.0 | 20.0 | | | | | | | | |
| | | | | Depth of Cut (mm) | 0.090 | 0.060 | 0.040 | 0.030 | | | | | | | | |
| | | | | RPM (n) | 40000 | 36000 | 25000 | 10000 | | | | | | | | |
| | | | | Vf (mm/min) | 5000 | 3800 | 2500 | 1000 | | | | | | | | |
| H | Hardened Steel | 55-62 HRC | 1.80 | Neck Length | 8.0 | 12.0 | 16.0 | 20.0 | | | | | | | | |
| | | | | Depth of Cut (mm) | 0.080 | 0.040 | 0.025 | 0.020 | | | | | | | | |
| | | | | RPM (n) | 25000 | 18000 | 14000 | 8000 | | | | | | | | |
| | | | | Vf (mm/min) | 3100 | 1900 | 1300 | 800 | | | | | | | | |
| H | Hardened Steel | 45-55 HRC | 2.00 | Neck Length | 6.0 | 8.0 | 10.0 | 12.0 | 14.0 | 16.0 | 18.0 | 20.0 | 22.0 | 25.0 | 30.0 | 35.0 |
| | | | | Depth of Cut (mm) | 0.100 | 0.100 | 0.080 | 0.080 | 0.060 | 0.050 | 0.040 | 0.040 | 0.040 | 0.040 | 0.020 | 0.020 |
| | | | | RPM (n) | 40000 | 40000 | 40000 | 40000 | 40000 | 32000 | 24000 | 10000 | 10000 | 10000 | 10000 | 10000 |
| | | | | Vf (mm/min) | 6000 | 5000 | 5000 | 5000 | 5000 | 3500 | 2400 | 1000 | 1000 | 1000 | 800 | 500 |

| MATERIAL | | | Dia Ø | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| H | Hardened Steel | 55-62 HRC | 2.00 | Neck Length | 6.0 | 8.0 | 10.0 | 12.0 | 14.0 | 16.0 | 18.0 | 20.0 | 22.0 | 25.0 | 30.0 | 35.0 |
| | | | | Depth of Cut (mm) | 0.100 | 0.100 | 0.070 | 0.050 | 0.050 | 0.030 | 0.030 | 0.030 | 0.020 | 0.020 | 0.015 | 0.010 |
| | | | | RPM (n) | 24000 | 24000 | 24000 | 24000 | 21000 | 16000 | 13000 | 10000 | 10000 | 8000 | 8000 | 8000 |
| | | | | Vf (mm/min) | 3400 | 3000 | 3000 | 2600 | 2300 | 1700 | 1300 | 1000 | 1000 | 800 | 800 | 400 |
| H | Hardened Steel | 45-55 HRC | 2.50 | Neck Length | 10.0 | 15.0 | 20.0 | 25.0 | 30.0 | 35.0 | | | | | | |
| | | | | Depth of Cut (mm) | 0.120 | 0.080 | 0.070 | 0.060 | 0.050 | 0.030 | | | | | | |
| | | | | RPM (n) | 36000 | 36000 | 26000 | 10000 | 8000 | 8000 | | | | | | |
| | | | | Vf (mm/min) | 5000 | 4600 | 3000 | 1100 | 800 | 500 | | | | | | |
| H | Hardened Steel | 55-62 HRC | 2.50 | Neck Length | 10.0 | 15.0 | 20.0 | 25.0 | 30.0 | 35.0 | | | | | | |
| | | | | Depth of Cut (mm) | 0.110 | 0.075 | 0.050 | 0.040 | 0.030 | 0.030 | | | | | | |
| | | | | RPM (n) | 20000 | 18000 | 13000 | 8000 | 7000 | 5000 | | | | | | |
| | | | | Vf (mm/min) | 2600 | 2000 | 140 | 800 | 700 | 400 | | | | | | |
| H | Hardened Steel | 45-55 HRC | 3.00 | Neck Length | 8.0 | 10.0 | 12.0 | 14.0 | 16.0 | 20.0 | 25.0 | 30.0 | 35.0 | 40.0 | | |
| | | | | Depth of Cut (mm) | 0.150 | 0.150 | 0.130 | 0.130 | 0.100 | 0.100 | 0.080 | 0.080 | 0.060 | 0.040 | | |
| | | | | RPM (n) | 32000 | 32000 | 32000 | 32000 | 32000 | 27000 | 21000 | 9000 | 6000 | 6000 | | |
| | | | | Vf (mm/min) | 6400 | 5100 | 5100 | 4500 | 4500 | 3800 | 2700 | 1000 | 700 | 600 | | |
| H | Hardened Steel | 55-62 HRC | 3.00 | Neck Length | 8.0 | 10.0 | 12.0 | 14.0 | 16.0 | 20.0 | 25.0 | 30.0 | 35.0 | 40.0 | | |
| | | | | Depth of Cut (mm) | 0.150 | 0.150 | 0.130 | 0.100 | 0.100 | 0.060 | 0.060 | 0.050 | 0.040 | 0.030 | | |
| | | | | RPM (n) | 16000 | 16000 | 16000 | 16000 | 16000 | 14000 | 11000 | 7000 | 6000 | 5000 | | |
| | | | | Vf (mm/min) | 3000 | 2200 | 2200 | 2200 | 1800 | 1600 | 1200 | 700 | 600 | 400 | | |
| H | Hardened Steel | 45-55 HRC | 3.50 | Neck Length | 16.0 | 20.0 | 25.0 | 30.0 | 35.0 | 40.0 | | | | | | |
| | | | | Depth of Cut (mm) | 0.130 | 0.130 | 0.120 | 0.090 | 0.080 | 0.070 | | | | | | |
| | | | | RPM (n) | 28000 | 26000 | 23000 | 13000 | 9000 | 8500 | | | | | | |
| | | | | Vf (mm/min) | 4200 | 3800 | 3300 | 1900 | 1200 | 1100 | | | | | | |
| H | Hardened Steel | 55-62 HRC | 3.50 | Neck Length | 16.0 | 20.0 | 25.0 | 30.0 | 35.0 | 40.0 | | | | | | |
| | | | | Depth of Cut (mm) | 0.130 | 0.110 | 0.080 | 0.070 | 0.060 | 0.040 | | | | | | |
| | | | | RPM (n) | 14000 | 13000 | 11000 | 9000 | 6000 | 5500 | | | | | | |
| | | | | Vf (mm/min) | 1600 | 1600 | 1200 | 1000 | 600 | 500 | | | | | | |
| H | Hardened Steel | 45-55 HRC | 4.00 | Neck Length | 10.0 | 12.0 | 14.0 | 16.0 | 20.0 | 25.0 | 30.0 | 35.0 | 40.0 | 45.0 | 50.0 | |
| | | | | Depth of Cut (mm) | 0.200 | 0.200 | 0.150 | 0.150 | 0.150 | 0.150 | 0.100 | 0.100 | 0.100 | 0.080 | 0.050 | |
| | | | | RPM (n) | 24000 | 24000 | 24000 | 24000 | 24000 | 24000 | 20000 | 12000 | 11000 | 10000 | 8000 | |
| | | | | Vf (mm/min) | 4800 | 4800 | 3800 | 3800 | 3800 | 3800 | 3000 | 1700 | 1500 | 1300 | 1000 | |
| H | Hardened Steel | 55-62 HRC | 4.00 | Neck Length | 10.0 | 12.0 | 14.0 | 16.0 | 20.0 | 25.0 | 30.0 | 35.0 | 40.0 | 45.0 | 50.0 | |
| | | | | Depth of Cut (mm) | 0.200 | 0.200 | 0.150 | 0.150 | 0.150 | 0.100 | 0.080 | 0.080 | 0.060 | 0.050 | 0.040 | |
| | | | | RPM (n) | 12000 | 12000 | 12000 | 12000 | 12000 | 10000 | 10000 | 8000 | 5000 | 5000 | 4000 | |
| | | | | Vf (mm/min) | 2200 | 2200 | 1500 | 1500 | 1500 | 1100 | 1100 | 900 | 500 | 500 | 400 | |
| H | Hardened Steel | 45-55 HRC | 5.00 | Neck Length | 15.0 | 25.0 | 35.0 | 45.0 | | | | | | | | |
| | | | | Depth of Cut (mm) | 0.200 | 0.200 | 0.150 | 0.100 | | | | | | | | |
| | | | | RPM (n) | 19000 | 19000 | 19000 | 16000 | | | | | | | | |
| | | | | Vf (mm/min) | 3400 | 3400 | 3200 | 2700 | | | | | | | | |
| H | Hardened Steel | 55-62 HRC | 5.00 | Neck Length | 15.0 | 25.0 | 35.0 | 45.0 | | | | | | | | |
| | | | | Depth of Cut (mm) | 0.200 | 0.200 | 0.150 | 0.100 | | | | | | | | |
| | | | | RPM (n) | 10000 | 10000 | 8000 | 8000 | | | | | | | | |
| | | | | Vf (mm/min) | 1400 | 1400 | 1000 | 900 | | | | | | | | |
| H | Hardened Steel | 45-55 HRC | 6.00 | Neck Length | 15.0 | 30.0 | | | | | | | | | | |
| | | | | Depth of Cut (mm) | 0.200 | 0.150 | | | | | | | | | | |
| | | | | RPM (n) | 16000 | 16000 | | | | | | | | | | |
| | | | | Vf (mm/min) | 3500 | 3000 | | | | | | | | | | |
| H | Hardened Steel | 55-62 HRC | 6.00 | Neck Length | 15.0 | 30.0 | | | | | | | | | | |
| | | | | Depth of Cut (mm) | 0.200 | 0.150 | | | | | | | | | | |
| | | | | RPM (n) | 8000 | 8000 | | | | | | | | | | |
| | | | | Vf (mm/min) | 1000 | 800 | | | | | | | | | | |

# UNIVERSAL-2 / 4 FL

| | MATERIAL | Hardness | ap max xD | ae max xD | Vc (m/min) | fz (mm/z) Ø 1 | 2 | 3 | 4 | 5 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **SLOTTING** | | | | | | | | | | | | | | | | | |
| P | Steels, Alloy Steels and Tool Steels | <850 N/mm² | 0.5 | 1 | 80-100 | 0.004 | 0.008 | 0.012 | 0.016 | 0.020 | 0.025 | 0.032 | 0.038 | 0.045 | 0.052 | 0.060 | 0.070 | 0.080 |
| | Steels, Alloy Steels and Tool Steels | 850-1200 N/mm² | 0.5 | 1 | 50-70 | 0.003 | 0.007 | 0.010 | 0.014 | 0.017 | 0.021 | 0.027 | 0.032 | 0.038 | 0.044 | 0.051 | 0.060 | 0.068 |
| | Steels, Alloy Steels and Tool Steels | <1400 N/mm² | 0.5 | 1 | 30-50 | 0.003 | 0.006 | 0.009 | 0.012 | 0.015 | 0.019 | 0.024 | 0.029 | 0.034 | 0.039 | 0.045 | 0.053 | 0.060 |
| M | Stainless Steel : Easy To Machine | <750 N/mm² | 0.5 | 1 | 50-70 | 0.003 | 0.007 | 0.010 | 0.014 | 0.017 | 0.021 | 0.027 | 0.032 | 0.038 | 0.044 | 0.051 | 0.060 | 0.068 |
| | Stainless Steel : Difficult To Machine | <950 N/mm² | 0.5 | 1 | 30-50 | 0.003 | 0.006 | 0.009 | 0.012 | 0.015 | 0.019 | 0.024 | 0.029 | 0.034 | 0.039 | 0.045 | 0.053 | 0.060 |
| K | Cast Irons, Grey, Spher., Melleable | <300 HB | 0.5 | 1 | 50-70 | 0.003 | 0.007 | 0.010 | 0.014 | 0.017 | 0.021 | 0.027 | 0.032 | 0.038 | 0.044 | 0.051 | 0.060 | 0.068 |
| N | Aluminiums, Aluminiums Alloys | <6% Si | 0.5 | 1 | 100-120 | 0.005 | 0.010 | 0.016 | 0.021 | 0.026 | 0.033 | 0.042 | 0.049 | 0.059 | 0.068 | 0.079 | 0.091 | 0.104 |
| S | Titanium , Titanium Alloys | <1100N/mm² | | | | | | | | | | | | | | | | |
| S | HRSA (Nickel Alloys, Co. Alloys) | <1300N/mm² | | | | | | | | | | | | | | | | |
| | **SIDE MILLING** | | | | | | | | | | | | | | | | | |
| P | Steels, Alloy Steels and Tool Steels | <850 N/mm² | 1.5 | 0.5 | 80-100 | 0.005 | 0.010 | 0.014 | 0.019 | 0.024 | 0.030 | 0.038 | 0.046 | 0.054 | 0.063 | 0.072 | 0.084 | 0.096 |
| | Steels, Alloy Steels and Tool Steels | 850-1200 N/mm² | 1.5 | 0.5 | 50-70 | 0.004 | 0.008 | 0.012 | 0.016 | 0.020 | 0.026 | 0.033 | 0.039 | 0.046 | 0.053 | 0.061 | 0.071 | 0.082 |
| | Steels, Alloy Steels and Tool Steels | <1400 N/mm² | 1.5 | 0.5 | 30-50 | 0.004 | 0.007 | 0.011 | 0.014 | 0.019 | 0.023 | 0.029 | 0.034 | 0.041 | 0.047 | 0.054 | 0.063 | 0.072 |
| M | Stainless Steel : Easy To Machine | <750 N/mm² | 1.5 | 0.5 | 50-70 | 0.004 | 0.008 | 0.012 | 0.016 | 0.020 | 0.026 | 0.033 | 0.039 | 0.046 | 0.053 | 0.061 | 0.071 | 0.082 |
| | Stainless Steel : Difficult To Machine | <950 N/mm² | 1.5 | 0.5 | 30-50 | 0.004 | 0.007 | 0.011 | 0.014 | 0.019 | 0.023 | 0.029 | 0.034 | 0.041 | 0.047 | 0.054 | 0.063 | 0.072 |
| K | Cast Irons, Grey, Spher., Melleable | <300 HB | 1.5 | 0.5 | 50-70 | 0.004 | 0.008 | 0.012 | 0.016 | 0.020 | 0.026 | 0.033 | 0.039 | 0.046 | 0.053 | 0.061 | 0.071 | 0.082 |
| N | Aluminiums, Aluminiums Alloys | <6% Si | 1.5 | 0.5 | 100-120 | 0.006 | 0.012 | 0.019 | 0.025 | 0.031 | 0.039 | 0.050 | 0.059 | 0.070 | 0.081 | 0.094 | 0.109 | 0.125 |
| S | Titanium , Titanium Alloys | <1100N/mm² | | | | | | | | | | | | | | | | |
| S | HRSA (Nickel Alloys, Co. Alloys) | <1300N/mm² | | | | | | | | | | | | | | | | |
| | **COPYING MILLING [ EMB 230 , EMB 430]** | | | | | | | | | | | | | | | | | |
| P | Steels, Alloy Steels and Tool Steels | <850 N/mm² | 0.1 | 0.1 | 80-100 | 0.030 | 0.040 | 0.050 | 0.060 | 0.070 | 0.080 | 0.090 | 0.105 | 0.120 | 0.126 | 0.150 | 0.162 | 0.018 |
| | Steels, Alloy Steels and Tool Steels | 850-1200 N/mm² | 0.1 | 0.1 | 60-80 | 0.023 | 0.030 | 0.038 | 0.045 | 0.053 | 0.060 | 0.068 | 0.079 | 0.090 | 0.098 | 0.113 | 0.126 | 0.135 |
| | Steels, Alloy Steels and Tool Steels | <1400 N/mm² | 0.1 | 0.1 | 40-60 | 0.021 | 0.028 | 0.035 | 0.042 | 0.049 | 0.056 | 0.063 | 0.074 | 0.084 | 0.084 | 0.106 | 0.108 | 0.126 |
| M | Stainless Steel : Easy To Machine | <750 N/mm² | 0.1 | 0.1 | 60-80 | 0.023 | 0.030 | 0.038 | 0.045 | 0.053 | 0.060 | 0.068 | 0.079 | 0.090 | 0.098 | 0.113 | 0.126 | 0.135 |
| | Stainless Steel : Difficult To Machine | <950 N/mm² | 0.1 | 0.1 | 40-60 | 0.021 | 0.028 | 0.035 | 0.042 | 0.049 | 0.056 | 0.063 | 0.074 | 0.084 | 0.084 | 0.106 | 0.108 | 0.126 |
| K | Cast Irons, Grey, Spher., Melleable | <300 HB | 0.1 | 0.1 | 60-80 | 0.023 | 0.030 | 0.038 | 0.045 | 0.053 | 0.060 | 0.068 | 0.079 | 0.090 | 0.098 | 0.113 | 0.126 | 0.135 |
| N | Aluminiums, Aluminiums Alloys | <6% Si | 0.1 | 0.1 | 110-130 | 0.036 | 0.048 | 0.060 | 0.072 | 0.084 | 0.096 | 0.108 | 0.124 | 0.144 | 0.154 | 0.180 | 0.198 | 0.216 |
| S | Titanium , Titanium Alloys | <1100N/mm² | | | | | | | | | | | | | | | | |
| S | HRSA (Nickel Alloys, Co. Alloys) | <1300N/mm² | | | | | | | | | | | | | | | | |
| | **DRILLING [ONLY 2FL, EMS 230]** | | | | | | | | | | | | | | | | | |
| P | Steels, Alloy Steels and Tool Steels | <850 N/mm² | 1 | 1 | 70-90 | 0.002 | 0.005 | 0.007 | 0.010 | 0.012 | 0.016 | 0.019 | 0.023 | 0.027 | 0.031 | 0.036 | 0.042 | 0.048 |
| | Steels, Alloy Steels and Tool Steels | 850-1200 N/mm² | 1 | 1 | 40-60 | 0.002 | 0.004 | 0.006 | 0.008 | 0.010 | 0.013 | 0.016 | 0.019 | 0.023 | 0.027 | 0.031 | 0.036 | 0.041 |
| | Steels, Alloy Steels and Tool Steels | <1400 N/mm² | 0.5 | 1 | 25-35 | 0.002 | 0.004 | 0.005 | 0.007 | 0.009 | 0.011 | 0.014 | 0.017 | 0.020 | 0.023 | 0.027 | 0.032 | 0.036 |
| M | Stainless Steel : Easy To Machine | <750 N/mm² | 1 | 1 | 40-60 | 0.002 | 0.004 | 0.006 | 0.008 | 0.010 | 0.013 | 0.016 | 0.019 | 0.023 | 0.027 | 0.031 | 0.036 | 0.041 |
| | Stainless Steel : Difficult To Machine | <950 N/mm² | 0.5 | 1 | 25-35 | 0.002 | 0.004 | 0.005 | 0.007 | 0.009 | 0.011 | 0.014 | 0.017 | 0.020 | 0.023 | 0.027 | 0.032 | 0.036 |
| K | Cast Irons, Grey, Spher., Melleable | <300 HB | 1 | 1 | 40-60 | 0.002 | 0.004 | 0.006 | 0.008 | 0.010 | 0.013 | 0.016 | 0.019 | 0.023 | 0.027 | 0.031 | 0.036 | 0.041 |
| N | Aluminiums, Aluminiums Alloys | <6% Si | 1 | 1 | 80-100 | 0.003 | 0.006 | 0.009 | 0.012 | 0.016 | 0.020 | 0.025 | 0.030 | 0.035 | 0.041 | 0.047 | 0.055 | 0.062 |
| S | Titanium , Titanium Alloys | <1100N/mm² | | | | | | | | | | | | | | | | |
| S | HRSA (Nickel Alloys, Co. Alloys) | <1300N/mm² | | | | | | | | | | | | | | | | |

# CHAMFER MILLS

**EMDA 60/90/120**

| | MATERIAL | Hardness | ap max xD | ae max xD | Vc (m/min) | fz (mm/z) Ø 3 | 4 | 5 | 6 | 8 | 10 | 12 | 16 | 20 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **SIDE MILLING** | | | | | | | | | | | | | |
| P | Steels, Alloy Steels and Tool Steels | <850 N/mm² | 1 | <0.3 | 130-180 | 0.015 | 0.020 | 0.024 | 0.030 | 0.040 | 0.045 | 0.065 | 0.080 | 0.100 |
| | Steels, Alloy Steels and Tool Steels | 850-1200 N/mm² | 1 | <0.3 | 130-180 | 0.015 | 0.020 | 0.024 | 0.030 | 0.040 | 0.045 | 0.065 | 0.080 | 0.100 |
| | Steels, Alloy Steels and Tool Steels | <1400 N/mm² | 1 | <0.3 | 90-100 | 0.015 | 0.020 | 0.024 | 0.030 | 0.040 | 0.045 | 0.065 | 0.080 | 0.100 |
| M | Stainless Steel : Easy To Machine | <750 N/mm² | 1 | <0.3 | 60-80 | 0.015 | 0.020 | 0.024 | 0.030 | 0.040 | 0.045 | 0.065 | 0.080 | 0.100 |
| | Stainless Steel : Difficult To Machine | <950 N/mm² | 1 | <0.3 | 60-80 | 0.015 | 0.020 | 0.024 | 0.030 | 0.040 | 0.045 | 0.065 | 0.080 | 0.100 |
| K | Cast Irons, Grey, Spher., Melleable | <300 HB | 1 | <0.3 | 110-160 | 0.015 | 0.020 | 0.024 | 0.030 | 0.040 | 0.045 | 0.065 | 0.080 | 0.100 |
| N | Aluminiums, Aluminiums Alloys | <6% Si | | | | | | | | | | | | |
| S | Titanium , Titanium Alloys | <1100N/mm² | 1 | <0.3 | 60-80 | 0.015 | 0.020 | 0.024 | 0.030 | 0.040 | 0.045 | 0.065 | 0.080 | 0.100 |
| S | HRSA (Nickel Alloys, Co. Alloys) | <1300N/mm² | | | | | | | | | | | | |

Technical Data provided should be considered advisory only as variations may be necessary depending on the particular application