# STOCK

PRECISION

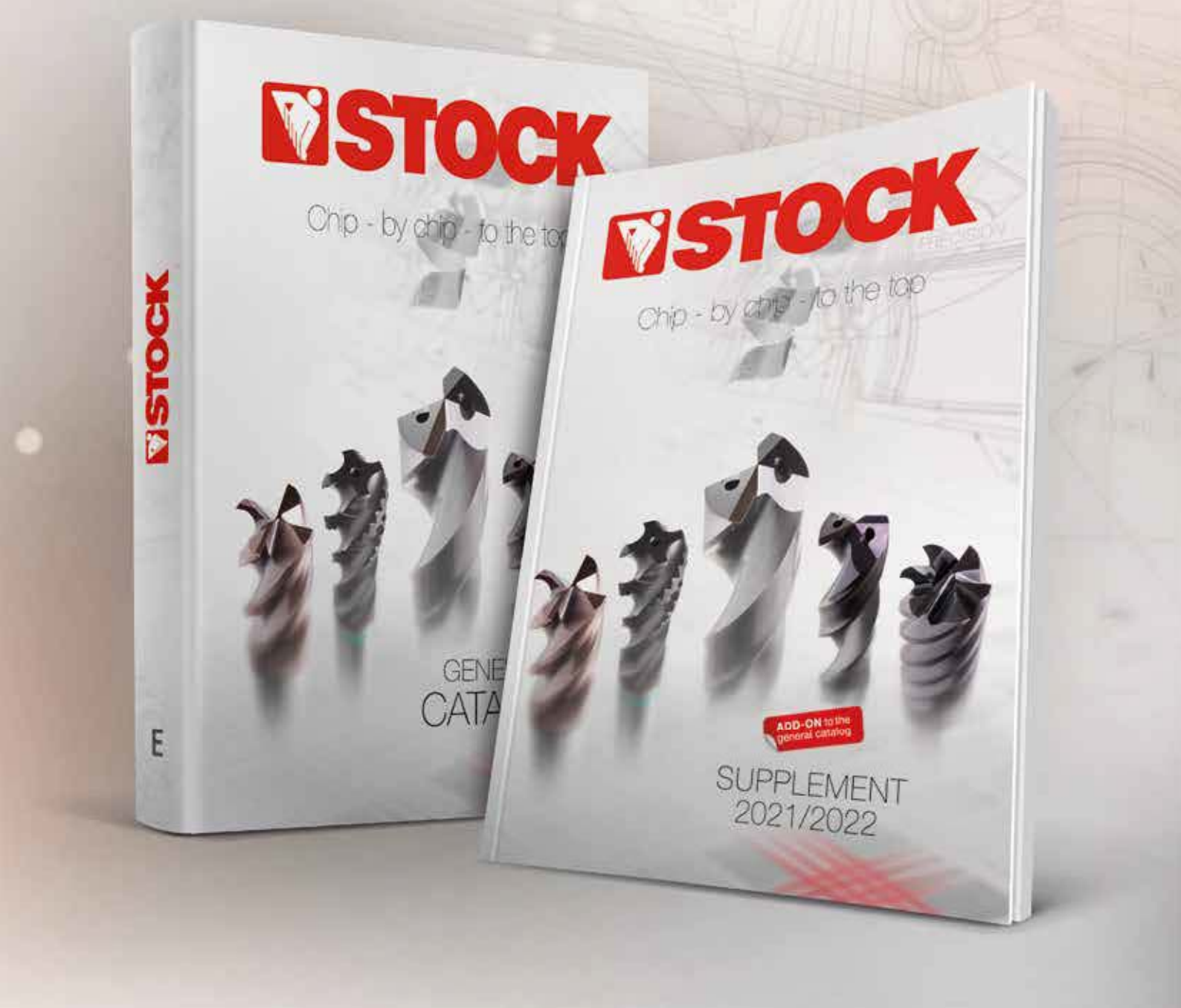
Chip - by chip - to the top

ADD-ON to the general catalog

# SUPPLEMENT 2021/2022

# **SUPPLEMENT 2021/2022**
# THE CATALOG TO THE CATALOG!

Your tool update is here: The General Catalog 2016 is for our customers a reliable basis for their tool procurement. As an addition, our supplement catalogs inform you regularly about new products in our program. This is how you also get that with the 2021/2022 edition. The complete add-on to the general catalog with all novelties on more than 220 pages.



| P | M | K | N | S | H | Type | Shank form | Drilling depth | Tool material | Surface | Standard | d1/mm | Catalogue no. | Progr. page |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

## SuperV drills without internal coolant

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ● | | ● | ○ | ○ | ○ | SuperV-U | HB | 3xD | **Solid carbide** | TiAlN nano | DIN 6537K | 3.000 - 20.000 | **51673** | 16 |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ● | | | | ○ | ○ | SuperV-S | HA | 3xD | **Solid carbide** | TiAlSiN | DIN 6537K | 3.000 - 20.000 | **51750** | 18 |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ● | | ● | ○ | ○ | ○ | SuperV-U | HB | 5xD | **Solid carbide** | TiAlN nano | DIN 6537L | 3.000 - 20.000 | **51687** | 20 |

## SuperV drills with internal cooling

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ● | ○ | ● | ○ | ○ | ○ | SuperV-IK-U | HB | 3xD | **Solid carbide** | TiAlN nano | DIN 6537K | 3.000 - 20.000 | **51676** | 22 |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ● | | | ○ | | SuperV-VA | HB | 3xD | **Solid carbide** | AlTiN nano | DIN 6537K | 3.000 - 20.000 | **51670** | 24 |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ● | | | | ● | ○ | SuperV-S | HA | 3xD | **Solid carbide** | TiAlSiN | DIN 6537K | 3.000 - 20.000 | **51752** | 26 |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ● | | | | ● | ○ | SuperV-S | HE | 3xD | **Solid carbide** | TiAlSiN | DIN 6537K | 3.000 - 20.000 | **51753** | 28 |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | ● | | | SuperV-Al | HA | 5xD | **Solid carbide** | bright | DIN 6537L | 3.000 - 20.000 | **71791** | 30 |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ● | ○ | ● | ○ | ○ | ○ | SuperV-IK-U | HB | 5xD | **Solid carbide** | TiAlN nano | DIN 6537L | 3.000 - 20.000 | **51681** | 32 |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ● | | | ○ | | SuperV-VA | HB | 5xD | **Solid carbide** | AlTiN nano | DIN 6537L | 3.000 - 20.000 | **51674** | 34 |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ● | ○ | ○ | | ○ | ○ | SuperV-X | HA | 5xD | **Solid carbide** | TiAlN nano | DIN 6537L | 3.000 - 20.000 | **51786** | 36 |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ● | | | | ● | ○ | SuperV-S | HA | 5xD | **Solid carbide** | TiAlSiN | DIN 6537L | 3.000 - 20.000 | **51754** | 38 |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ● | | | | ● | ○ | SuperV-S | HE | 5xD | **Solid carbide** | TiAlSiN | DIN 6537L | 3.000 - 20.000 | **51755** | 40 |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ● | ○ | ○ | | ○ | ○ | SuperV-X | HA | 7xD | **Solid carbide** | TiAlN nano | Company std. | 3.000 - 20.000 | **51791** | 42 |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ● | | | | ● | ○ | SuperV-S | HA | 7xD | **Solid carbide** | TiAlSiN | Company std. | 3.000 - 16.000 | **51756** | 44 |

| P | M | K | N | S | H | Type | Shank form | Drilling depth | Tool material | Surface | Standard | d1/mm | Catalogue no. | Progr. page |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **SuperV drills with internal cooling** | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| ● | ● | ● | ○ | ○ | | SuperV-T | HA | 15xD | **Solid carbide** | AlTiN | Company std. | 3.000 - 16.000 | **51764** | 45 |
| | | | | | | | | | | | | | | |
| ● | ● | ● | ○ | ○ | | SuperV-T | HA | 20xD | **Solid carbide** | AlTiN | Company std. | 3.000 - 16.000 | **51765** | 46 |
| | | | | | | | | | | | | | | |
| ● | ● | ● | ○ | ○ | | SuperV-T | HA | 25xD | **Solid carbide** | AlTiN | Company std. | 3.000 - 16.000 | **51766** | 47 |
| | | | | | | | | | | | | | | |
| ● | ● | ● | ○ | ○ | | SuperV-T | HA | 30xD | **Solid carbide** | AlTiN | Company std. | 3.000 - 14.000 | **51767** | 48 |
| | | | | | | | | | | | | | | |
| ● | ● | ● | ○ | ○ | | SuperV-T | HA | 40xD | **Solid carbide** | AlTiN | Company std. | 3.000 - 10.000 | **51768** | 49 |
| **Jobber drills** | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| ○ | ○ | ○ | ● | ○ | | N | cyl. | | **Solid carbide** | TiAlN nano | Company std. | 1.000 - 12.000 | **51290** | 50 |
| **Twist drills with reinforced straight shank** | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| ○ | | ○ | | | ● | H | HA | ~3xD | **Solid carbide** | AlTiN | DIN 6537K | 2.600 - 14.100 | **51146** | 51 |
| **Gun drills, type SuperT-NXL** | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| ● | ○ | ● | ○ | ○ | ○ | SuperT-NXL TBM-SEH | | | **Carbide** | TiN | Company std. | 5.000 - 25.000 | **65030** | 52 |
| | | | | | | | | | | | | | | |
| ● | ○ | ● | ○ | ○ | ○ | SuperT-NXL TBM-SEH | | | **Carbide** | TiN | Company std. | 5.000 - 22.000 | **65031** | 53 |
| | | | | | | | | | | | | | | |
| ● | ○ | ● | ○ | ○ | ○ | SuperT-NXL TBM-SEH | | | **Carbide** | TiN | Company std. | 4.000 - 22.000 | **65032** | 54 |
| | | | | | | | | | | | | | | |
| ● | ○ | ● | ○ | ○ | ○ | SuperT-NXL TBM-SEH | | | **Carbide** | TiN | Company std. | 5.000 - 22.000 | **65033** | 55 |
| **Stub drills** | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| ○ | ● | ○ | ○ | ● | | V18 | cyl. | ~3xD | **HSS-Co** | AlTiZrN | DIN 1897 | 1.000 - 13.000 | **61131** | 56 |

| P | M | K | N | S | H | Type | Shank form | Drilling depth | Tool material | Surface | Standard | d1/mm | Catalogue no. | Progr. page |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Jobber drills** | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| ○ | ● | ○ | ○ | ● | | V18 | cyl. | ~5xD | **HSS-Co** | AlTiZrN | DIN 338 | 1.000 - 13.000 | **61232** | 58 |
| **V16 Twist drills** | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| ● | ● | ● | ● | ● | ○ | V16 | cyl. | ~5xD | **M42** | Bronze-VAP | DIN 338 | 1.000 - 13.000 | **71018** | 60 |
| **V16 Set of twist drills** | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| ● | ● | ● | ● | ● | ○ | V16 | cyl. | ~5xD | **M42** | Bronze-VAP | DIN 338 | | **71019** | 62 |
| **V16-Pocket set (twist drills, taps and countersinks)** | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| ● | ○ | ○ | ○ | | | N | cyl. | | | | Company std. | | **71020** | 63 |
| **Aircraft extension drills, 6 inches long** | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| ● | | ● | ● | | | N | cyl. | | **HSS** | bright | NAS 907 | 1.500 - 8.500 | **71140** | 64 |
| | | | | | | | | | | | | | | |
| ● | | ● | ● | | | N | cyl. | | **HSS** | nitrided | NAS 907 | 1.500 - 8.000 | **71142** | 65 |
| **Aircraft extension drills, 12 inches long** | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| ● | | ● | ● | | | N | cyl. | | **HSS** | bright | NAS 907 | 1.500 - 8.500 | **71141** | 66 |
| | | | | | | | | | | | | | | |
| ● | | ● | ● | | | N | cyl. | | **HSS** | nitrided | NAS 907 | 1.500 - 8.000 | **71143** | 67 |

## Taps for ISO metric threads

| P | M | K | N | S | H | Type | Form | Tolerance class | Tool material | Surface | Standard | d1 | Catalogue no. | Progr. page |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | |
| ● | ● | ● | ○ | ● | | Produktiv N-X | B | 6HX | **HSS-E** | AlTiZrN | ~DIN 371/ ~DIN 376 | M2 - M42 | **53733** | 68 |
| | | | | | | | | | | | | | | |
| ● | ● | ○ | ○ | ○ | | Produktiv N-X LH | B | 6HX | **HSS-E** | AlTiZrN | DIN 371/ DIN 376 | M2 - M30 | **53734** | 69 |
| | | | | | | | | | | | | | | |
| ● | ● | ○ | ○ | ○ | | Produktiv N-X | B | 6HX | **HSS-E-PM** | AlTiZrN | DIN 371/ DIN 376 | M3 - M20 | **53735** | 70 |
| | | | | | | | | | | | | | | |
| ● | ● | ○ | ○ | ○ | | Produktiv N-X | B | 6HX | **HSS-E-PM** | AlTiZrN | DIN 371/ DIN 376 | M5 - M30 | **53736** | 71 |
| | | | | | | | | | | | | | | |
| ● | ● | ○ | ○ | ○ | | Produktiv N-X | B | 6H+0,1 | **HSS-E** | AlTiZrN | DIN 371/ DIN 376 | M2 - M30 | **53737** | 72 |
| | | | | | | | | | | | | | | |
| ● | ● | ○ | ○ | ○ | | Produktiv N-X | B | 6GX | **HSS-E** | AlTiZrN | DIN 371/ DIN 376 | M2 - M30 | **53738** | 73 |
| | | | | | | | | | | | | | | |
| ● | ● | ○ | ○ | ○ | | Produktiv N-X | B | 6HX | **HSS-E** | AlTiZrN | Company std. | M3 - M20 | **53739** | 74 |
| | | | | | | | | | | | | | | |
| ● | ● | ● | ○ | ○ | | Intensiv N-X | C | 6HX | **HSS-E** | TiAlN-H | ~DIN 371/ ~DIN 376 | M2 - M42 | **53746** | 75 |
| | | | | | | | | | | | | | | |
| ● | ● | ○ | ○ | ○ | | Intensiv N-X LH | C | 6HX | **HSS-E** | TiAlN-H | DIN 371/ DIN 376 | M2 - M30 | **53747** | 76 |
| | | | | | | | | | | | | | | |
| ● | ● | ○ | ○ | ○ | | Intensiv N-X | C | 6HX | **HSS-E-PM** | TiAlN-H | DIN 371/ DIN 376 | M3 - M20 | **53748** | 77 |
| | | | | | | | | | | | | | | |
| ● | ● | ○ | ○ | ○ | | Intensiv N-X | C | 6HX | **HSS-E-PM** | TiAlN-H | DIN 371/ DIN 376 | M5 - M30 | **53749** | 78 |
| | | | | | | | | | | | | | | |
| ● | ● | ○ | ○ | ○ | | Intensiv N-X | E | 6HX | **HSS-E** | TiAlN-H | DIN 371/ DIN 376 | M2 - M30 | **53760** | 79 |
| | | | | | | | | | | | | | | |
| ● | ● | ○ | ○ | ○ | | Intensiv N-X | C | 6H+0,1 | **HSS-E** | TiAlN-H | DIN 371/ DIN 376 | M2 - M30 | **53750** | 80 |
| | | | | | | | | | | | | | | |
| ● | ● | ○ | ○ | ○ | | Intensiv N-X | C | 6GX | **HSS-E** | TiAlN-H | DIN 371/ DIN 376 | M2 - M30 | **53751** | 81 |
| | | | | | | | | | | | | | | |
| ● | ● | ○ | ○ | ○ | | Intensiv N-X | C | 6HX | **HSS-E** | TiAlN-H | Company std. | M3 - M20 | **53752** | 82 |
| | | | | | | | | | | | | | | |
| ● | ○ | ○ | ○ | | | Produktiv N | B | ISO2/6H | **HSS-E** | TiN | DIN 371/ DIN 376 | M3 - M20 | **63033** | 83 |

| P | M | K | N | S | H | Type | Form | Tolerance class | Tool material | Surface | Standard | d1 | Catalogue no. | Progr. page |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

## Taps for ISO metric threads

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ● | | ● | ○ | | | H | C | 6HX | **HSS-E** | TiCN | DIN 376 | M16 - M39 | **53646** | 84 |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ● | | ● | ○ | | | H | C | 6HX | **HSS-E** | TiCN | ~DIN 376 | M16 - M39 | **53647** | 85 |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ● | | ○ | | | | Produktiv H | B | ISO2/6H | **HSS-E** | TiCN | DIN 371/ DIN 376 | M2 - M10 | **53642** | 86 |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ● | | ○ | | | | Produktiv H | B | ISO2/6H | **HSS-E-PM** | TiCN | DIN 371/ DIN 376 | M3 - M16 | **53640** | 87 |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ● | | ○ | | | | Intensiv H | C | ISO2/6H | **HSS-E** | nitrided | DIN 371 | M3 - M10 | **73661** | 88 |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ● | | ○ | | | | Intensiv H | C | ISO2/6H | **HSS-E** | nitrided | DIN 376 | M12 - M20 | **73664** | 89 |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ● | | ○ | | | | Intensiv H | C | ISO2/6H | **HSS-E** | TiCN | DIN 371/ DIN 376 | M2 - M16 | **53661** | 90 |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ● | | ○ | | | | Intensiv H | C | ISO2/6H | **HSS-E-PM** | TiAlN | DIN 371/ DIN 376 | M4 - M20 | **53664** | 91 |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | ○ | H | D | 6HX | **HSS-E-PM** | TiCN | DIN 371/ DIN 376 | M3 - M16 | **53676** | 92 |

## Taps for ISO metric fine threads

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ● | ● | ● | ○ | ○ | | Produktiv N-X | B | 6HX | **HSS-E** | AlTiZrN | DIN 374 | M3 x 0,35 - M24 x 2 | **53778** | 93 |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ● | ● | ○ | ○ | ○ | | Produktiv N-X | B | 6HX | **HSS-E-PM** | AlTiZrN | DIN 374 | M8 x 1 - M24 x 1,5 | **53789** | 94 |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ● | ● | ○ | ○ | ○ | | Produktiv N-X | B | 6HX | **HSS-E-PM** | AlTiZrN | DIN 374 | M8 x 1 - M24 x 1,5 | **53790** | 95 |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ● | ● | ○ | ○ | ○ | | Produktiv N-X | B | 6GX | **HSS-E** | AlTiZrN | DIN 374 | M6 x 0,75 - M24 x 1,5 | **53779** | 96 |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ● | ● | ● | ○ | ○ | | Intensiv N-X | C | 6HX | **HSS-E** | TiAlN-H | DIN 374 | M3 x 0,35 - M24 x 2 | **53780** | 97 |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ● | ● | ○ | ○ | ○ | | Intensiv N-X | C | 6HX | **HSS-E-PM** | TiAlN-H | DIN 374 | M8 x 1 - M24 x 1,5 | **53791** | 98 |

| P | M | K | N | S | H | Type | Form | Tolerance class | Tool material | Surface | Standard | d1 | Catalogue no. | Progr. page |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Taps for ISO metric fine threads** | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| ● | ● | ○ | ○ | ○ | | Intensiv N-X | C | 6HX | **HSS-E-PM** | TiAlN-H | DIN 374 | M8 x 1 - M24 x 1,5 | **53792** | 99 |
| | | | | | | | | | | | | | | |
| ● | ● | ○ | ○ | ○ | | Intensiv N-X | E | 6HX | **HSS-E** | TiAlN-H | DIN 374 | M6 x 0,75 - M24 x 1,5 | **53770** | 100 |
| | | | | | | | | | | | | | | |
| ● | ● | ○ | ○ | ○ | | Intensiv N-X | C | 6GX | **HSS-E** | TiAlN-H | DIN 374 | M6 x 0,75 - M24 x 1,5 | **53781** | 101 |
| | | | | | | | | | | | | | | |
| ≤ 1200 | | | | | | Intensiv H | C | ISO2/6H | **HSS-E** | nitrided | DIN 374 | M8 x 0,75 - M24 x 1,5 | **73647** | 102 |
| **Taps for UNC threads** | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| ● | ● | ○ | ○ | ○ | | Produktiv N-X | B | 2BX | **HSS-E** | AlTiZrN | DIN 371/ DIN 376 | 2 - 56 - 1 - 8 | **53782** | 103 |
| | | | | | | | | | | | | | | |
| ● | ● | ○ | ○ | ○ | | Intensiv N-X | C | 2BX | **HSS-E** | TiAlN-H | DIN 371/ DIN 376 | 2 - 56 - 1 - 8 | **53783** | 104 |
| **Taps for UNF threads** | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| ● | ● | ○ | ○ | ○ | | Produktiv N-X | B | 2BX | **HSS-E** | AlTiZrN | ~DIN 371/ ~DIN 374 | 2 - 64 - 1 - 12 | **53784** | 105 |
| | | | | | | | | | | | | | | |
| ● | ● | ○ | ○ | ○ | | Intensiv N-X | C | 2BX | **HSS-E** | TiAlN-H | ~DIN 371/ ~DIN 374 | 2 - 64 - 1 - 12 | **53785** | 106 |
| **Taps for BSP threads** | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| ● | ● | ○ | ○ | ○ | | Intensiv N-X | E | | **HSS-E** | TiAlN-H | DIN 5156 | G1/16 - G1 | **53775** | 107 |
| **Fluteless taps for ISO metric threads** | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| ● | ● | ● | ○ | ● | | Durativ N-X | C | 4HX/6HX | **HSS-E-PM** | TiCN | ~DIN 371/ ~DIN 376 | M1 - M20 | **53630** | 108 |
| | | | | | | | | | | | | | | |
| ● | ● | ● | ○ | ● | | Durativ N-X | C | 6GX | **HSS-E-PM** | TiCN | ~DIN 371/ ~DIN 376 | M2 - M20 | **53631** | 109 |

| P | M | K | N | S | H | Type | Form | Tolerance class | Tool material | Surface | Standard | d1 | Catalogue no. | Progr. page |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Fluteless taps for ISO metric fine threads** | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| ● | ● | ● | ○ | ● | | Durativ N-X | C | 6HX | **HSS-E-PM** | TiCN | ~DIN 374 | M3 x 0,35 - M24 x 2 | **53632** | 110 |
| **Fluteless taps for UNC threads** | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| ● | ● | ● | ○ | ● | | Durativ N-X | C | 2BX | **HSS-E-PM** | TiCN | ~DIN 371/ ~DIN 376 | 4 - 40 - 3/4 - 10 | **53633** | 111 |
| **Fluteless taps for UNF threads** | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| ● | ● | ● | ○ | ● | | Durativ N-X | C | 2BX | **HSS-E-PM** | TiCN | ~DIN 371/ ~DIN 374 | 4 - 48 - 3/4 - 16 | **53634** | 112 |
| **Fluteless taps for BSP threads** | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| ● | ● | ● | ○ | ● | | Durativ N-X | C | | **HSS-E-PM** | TiCN | DIN 2189 | G1/8 - G1/2 | **53635** | 113 |
| **Fluteless taps with coolant ducts for metric ISO threads** | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| ● | ● | ● | ○ | ● | | Durativ N-X | C | 6HX | **HSS-E-PM** | TiCN | ~DIN 371/ ~DIN 376 | M5 - M20 | **53610** | 114 |
| | | | | | | | | | | | | | | |
| ● | ● | ● | ○ | ● | | Durativ N-X | E | 6HX | **HSS-E-PM** | TiCN | ~DIN 371/ ~DIN 376 | M2 - M20 | **53618** | 115 |
| **Fluteless taps with coolant ducts for ISO metric fine threads** | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| ● | ● | ● | ○ | ● | | Durativ N-X | C | 6HX | **HSS-E-PM** | TiCN | ~DIN 374 | M8 x 1 - M20 x 1,5 | **53612** | 116 |
| | | | | | | | | | | | | | | |
| ● | ● | ● | ○ | ● | | Durativ N-X | E | 6HX | **HSS-E-PM** | TiCN | ~DIN 374 | M8 x 1 - M20 x 1,5 | **53619** | 117 |
| **Drill thread milling cutters** | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| ● | ● | ● | ● | ● | ≤ 66 | TMD-NX | | | **Solid carbide** | TiSiN | Company std. | M2 - M16 x 1,5 | **53948** | 118 |
| | | | | | | | | | | | | | | |
| ● | ● | ● | ● | ● | ≤ 66 | TMD-NX | | | **Solid carbide** | TiSiN | Company std. | UNF No 1 - UNF 5/8 | **53949** | 119 |

| P | M | K | N | S | H | Type | Form | Tolerance class | Tool material | Surface | Standard | d1 | Catalogue no. | Progr. page |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

## Drill thread milling cutters

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| • | • | • | • | • | ≤ 66 | TMD-NX | | | **Solid carbide** | TiSiN | Company std. | G1/16-G1/8 - G1/2-G5/8-G3/4 | **53950** | 120 |

## Thread milling cutters with chamfer for ISO metric threads

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| • | • | • | ○ | ○ | | TMC-NX SP | | | **Solid carbide** | AlCrN | Company std. | M3 - M16 x 1,5 | **53890** | 121 |

## Thread milling cutters without chamfer for ISO metric threads

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| • | ○ | • | • | ○ | ≤ 55 | TM SP | | | **Solid carbide** | TiCN | Company std. | M6 - M20 | **53860** | 122 |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| • | • | • | • | • | ≤ 55 | TMU SP | | | **Solid carbide** | TiCN | Company std. | > 10 - > 30 | **73830** | 123 |

## Thread milling cutters without chamfer for BSP threads

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| • | ○ | • | • | ○ | ≤ 55 | TM SP | | | **Solid carbide** | TiCN | Company std. | G1/8 - G3/8 | **53831** | 124 |

## Universal thread milling cutters for BSP threads

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| • | • | • | • | • | ≤ 55 | TMU SP | | | **Solid carbide** | TiCN | Company std. | ≥ 1/4 - ≥ 1 | **53832** | 125 |

## Micro thread milling cutters for ISO metric threads

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| • | • | • | • | • | ≤ 55 | MTM-NX SP | | | **Solid carbide** | TiCN | Company std. | M1,6 - M20 | **53892** | 126 |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| • | • | • | • | • | | TM SP | | | **Solid carbide** | TiCN | Company std. | M1,6 - M16 | **53840** | 127 |

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | ○ | • | TM SP | | | **Solid carbide** | TiAlN | Company std. | M2 - M12 | **53850** | 128 |

## Micro thread milling cutters for BSP-threads

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| • | • | • | • | • | | TM SP | | | **Solid carbide** | TiCN | Company std. | G1/16-G1/8 - G1-G2 | **53841** | 129 |

| P | M | K | N | S | H | Type | Shank form | Tool material | Surface | Standard | d1/mm | Catalogue no. | Progr. page |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

## SuperF-UT end mills Z

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ● | ● | | | ● | | SuperF-UT Z | HB | **Solid carbide** | AlTiN+ | Company std. | 3.000 - 20.000 | **54577** | 130 |

## SuperF-UT end mills ZS

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ● | ● | | | ● | | SuperF-UT ZS | HB | **Solid carbide** | AlTiN+ | Company std. | 3.000 - 20.000 | **54578** | 131 |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ● | ● | ● | ○ | ● | | SuperF-UT ZS-7 | HB | **Solid carbide** | AlTiN+ | Company std. | 6.000 - 20.000 | **54581** | 133 |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ● | ● | ● | ○ | ● | | SuperF-UT ZS-r | HB | **Solid carbide** | AlTiN+ | Company std. | 6.000 - 20.000 | **54555** | 132 |

## SuperF-UT end mills N-5

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ● | ● | ● | ● | ● | | SuperF-UT N-5 | HA | **Solid carbide** | TiAlN | Company std. | 4.000 - 20.000 | **54583** | 134 |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ● | ● | ● | ● | ● | | SuperF-UT N-5 | HB | **Solid carbide** | TiAlN | Company std. | 4.000 - 20.000 | **54584** | 135 |

## SuperF-UT-milling cutter FS²

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ○ | ● | ○ | ● | ● | ○ | SuperF-UT FS² | HB | **Solid carbide** | TiAlZrN | Company std. | 8.000 - 20.000 | **64560** | 136 |

## SuperF-UT end mills NX-3

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ● | ● | ● | ● | ● | | SuperF-UT NX-3 | HA | **Solid carbide** | TiAlSiN | Company std. | 3.000 - 20.000 | **54586** | 137 |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ● | ● | ● | ● | ● | | SuperF-UT NX-3 | HB | **Solid carbide** | TiAlSiN | Company std. | 3.000 - 20.000 | **54587** | 138 |

## SuperF-UT end mills NX

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ● | ● | ● | ● | ● | | SuperF-UT NX | HB | **Solid carbide** | TiAlSiN | DIN 6527K | 3.000 - 20.000 | **54589** | 139 |

| P | M | K | N | S | H | Type | Shank form | Tool material | Surface | Standard | d1/mm | Catalogue no. | Progr. page |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

## SuperF-UT end mills NX

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ● | ● | ● | ● | ● | | SuperF-UT NX-IK | HB | **Solid carbide** | TiAlSiN | DIN 6527L | 6.000 - 25.000 | **54585** | 140 |

## SuperF-UT end mills NX Micro

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ● | ● | ● | ● | ● | ○ | SuperF-UT NX Micro | cyl. | **Solid carbide** | TiSiN | Company std. | 0.800 - 3.000 | **54594** | 141 |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ● | ● | ● | ● | ● | ○ | SuperF-UT NX Micro | cyl. | **Solid carbide** | TiSiN | Company std. | 1.000 - 3.000 | **54595** | 142 |

## SuperF-UT end mills Ti

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ○ | ○ | | | ● | | SuperF-UT Ti | HA | **Solid carbide** | ZrN | DIN 6527L | 6.000 - 20.000 | **54560** | 143 |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ○ | ○ | | | ● | | SuperF-UT Ti | HB | **Solid carbide** | ZrN | DIN 6527L | 6.000 - 20.000 | **54561** | 144 |

## SuperF-UT end mills S

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ○ | ○ | ○ | ○ | ○ | | SuperF-UT S | HA | **Solid carbide** | AlTiN nano | DIN 6527L | 3.000 - 20.000 | **54556** | 145 |

## SuperF-UT end mills N²

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ● | ○ | ● | ○ | ○ | ○ | SuperF-UT N² | HB | **Solid carbide** | TiAlZrN | DIN 6527L | 3.000 - 25.000 | **64552** | 146 |

## SuperF-UT end mills NL

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ● | ○ | ● | ○ | ○ | ○ | SuperF-UT NL | HB | **Solid carbide** | TiAlN | Company std. | 6.000 - 25.000 | **54553** | 147 |

## SuperF-UT end mills N-r

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ● | ○ | | ● | ● | | SuperF-UT N-r | HB | **Solid carbide** | AlCrN | DIN 6527L | 3.000 - 20.000 | **54550** | 148 |

| P | M | K | N | S | H | Type | Shank form | Tool material | Surface | Standard | d1/mm | Catalogue no. | Progr. page |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **SuperF-UT end mills VA-X²** | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| ○ | ● | | ○ | ● | | SuperF-UT VA-X² | HB | **Solid carbide** | TiAlZrN | DIN 6527L | 3.000 - 25.000 | **64553** | 150 |
| **SuperF-UT end mills VA-r** | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| ○ | ● | | ○ | ● | | SuperF-UT VA-r | HB | **Solid carbide** | TiAlSiN | DIN 6527L | 3.000 - 20.000 | **54542** | 151 |
| **SuperF-UT end mills Al-L** | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | ● | | | SuperF-UT Al-L | HB | **Solid carbide** | bright | Company std. | 5.000 - 20.000 | **74556** | 154 |
| | | | | | | | | | | | | | |
| | | | ● | | | SuperF-UT Al-XL | HB | **Solid carbide** | bright | Company std. | 6.000 - 20.000 | **74558** | 153 |
| | | | | | | | | | | | | | |
| | | | ● | | | SuperF-UT Al-r | HB | **Solid carbide** | bright | Company std. | 6.000 - 25.000 | **74562** | 155 |
| | | | | | | | | | | | | | |
| | | | ● | | | SuperF-UT Al-X | HB | **Solid carbide** | DLC | Company std. | 5.000 - 20.000 | **54592** | 156 |

| P | M | K | N | S | H | Type | Shank form | Tool material | Surface | Standard | d1/mm | Catalogue no. | Progr. page |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

## SuperF-UT end mill Z, sets

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ● | ● | | | ● | | SuperF-UT Z | HB | **Solid carbide** | AlTiN+ | Company std. | | **78882** | 157 |

## SuperF-UT end mill N², sets

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ● | ○ | ● | ○ | ○ | ○ | SuperF-UT N² | HB | **Solid carbide** | TiAlZrN | DIN 6527L | | **78883** | 158 |

## Torus end mills

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ○ | | ● | | | ● | H | HA | **Solid carbide** | TiAlSiN | Company std. | 1.000 - 16.000 | **54304** | 159 |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ○ | | ● | | | ● | H | HA | **Solid carbide** | TiAlSiN | Company std. | 1.000 - 16.000 | **54305** | 160 |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ● | ● | ● | ○ | ● | ○ | NH | HA | **Solid carbide** | TiAlSiN | Company std. | 0.500 - 12.000 | **54302** | 161 |

## Deburring end mills 90°

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ● | ● | ● | ● | ● | ○ | SuperAF-90 | HB | **Solid carbide** | TiAlZrN | Company std. | 6.000 - 20.000 | **53399** | 162 |

| P | M | K | N | S | H | Type | Shank form | Tool material | Surface | Standard | d1/mm | Catalogue no. | Progr. page |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

## Solid carbide high-performance reamers

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ● | ● | ○ | | ● | ● | SuperR-HS-KS | HA | **Solid carbide** | AlTiN nano | Company std. | 14.000 - 42.000 | **72874** | 163 |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ● | ● | ○ | | ● | ● | SuperR-HS-KD | HA | **Solid carbide** | AlTiN nano | Company std. | 14.000 - 42.000 | **72875** | 164 |

## Shrink fit extensions

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | HA | | bright | Company std. | | **78719** | 165 |

## 90° Countersinks, spiral-fluted

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ● | ● | ● | ○ | ○ | | V-NX | cyl. | **HSS-Co** | AlTiN | DIN 335 | 6.300 - 40.000 | **52348** | 166 |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ● | ● | ● | ○ | ○ | | V-NX | 3-flats | **HSS-Co** | AlTiN | DIN 335 | 6.300 - 40.000 | **52350** | 167 |

## 90° Countersink sets, spiral-fluted

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ● | ● | ● | ○ | ○ | | V-NX | cyl. | **HSS-Co** | AlTiN | DIN 335 | | **52398** | 168 |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ● | ● | ● | ○ | ○ | | V-NX | 3-flats | **HSS-Co** | AlTiN | DIN 335 | | **52399** | 169 |

# SuperV drills

## SuperV drills without internal coolant

**Catalogue no. 51673**

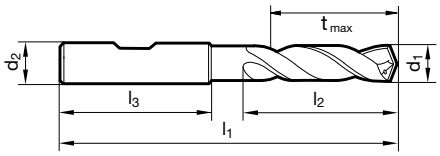
SuperV-U | 3xD | DIN 6537 K | VHM | TiAlN nano | 140° | m7 | R | HB

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ● | | ● | ○ | ○ | ○ |

Application recommendations page 172

- facet point grind
- main cutting edge form straight
- optimised cutting geometry

$t_{max} = l_2 - 1{,}5 \times d_1$




| d1 mm | d2 mm | l1 mm | l2 mm | l3 mm |
|---|---|---|---|---|
| **3.000** | 6.000 | 62.000 | 20.000 | 36.000 |
| **3.100** | 6.000 | 62.000 | 20.000 | 36.000 |
| **3.170** | 6.000 | 62.000 | 20.000 | 36.000 |
| **3.200** | 6.000 | 62.000 | 20.000 | 36.000 |
| **3.250** | 6.000 | 62.000 | 20.000 | 36.000 |
| **3.300** | 6.000 | 62.000 | 20.000 | 36.000 |
| **3.400** | 6.000 | 62.000 | 20.000 | 36.000 |
| **3.500** | 6.000 | 62.000 | 20.000 | 36.000 |
| **3.570** | 6.000 | 62.000 | 20.000 | 36.000 |
| **3.600** | 6.000 | 62.000 | 20.000 | 36.000 |
| **3.700** | 6.000 | 62.000 | 20.000 | 36.000 |
| **3.800** | 6.000 | 66.000 | 24.000 | 36.000 |
| **3.900** | 6.000 | 66.000 | 24.000 | 36.000 |
| **3.970** | 6.000 | 66.000 | 24.000 | 36.000 |
| **4.000** | 6.000 | 66.000 | 24.000 | 36.000 |
| **4.040** | 6.000 | 66.000 | 24.000 | 36.000 |
| **4.100** | 6.000 | 66.000 | 24.000 | 36.000 |
| **4.200** | 6.000 | 66.000 | 24.000 | 36.000 |
| **4.300** | 6.000 | 66.000 | 24.000 | 36.000 |
| **4.370** | 6.000 | 66.000 | 24.000 | 36.000 |
| **4.400** | 6.000 | 66.000 | 24.000 | 36.000 |
| **4.500** | 6.000 | 66.000 | 24.000 | 36.000 |
| **4.600** | 6.000 | 66.000 | 24.000 | 36.000 |
| **4.650** | 6.000 | 66.000 | 24.000 | 36.000 |
| **4.700** | 6.000 | 66.000 | 24.000 | 36.000 |
| **4.760** | 6.000 | 66.000 | 28.000 | 36.000 |
| **4.800** | 6.000 | 66.000 | 28.000 | 36.000 |
| **4.900** | 6.000 | 66.000 | 28.000 | 36.000 |
| **5.000** | 6.000 | 66.000 | 28.000 | 36.000 |
| **5.100** | 6.000 | 66.000 | 28.000 | 36.000 |
| **5.110** | 6.000 | 66.000 | 28.000 | 36.000 |
| **5.160** | 6.000 | 66.000 | 28.000 | 36.000 |
| **5.200** | 6.000 | 66.000 | 28.000 | 36.000 |
| **5.250** | 6.000 | 66.000 | 28.000 | 36.000 |
| **5.300** | 6.000 | 66.000 | 28.000 | 36.000 |
| **5.400** | 6.000 | 66.000 | 28.000 | 36.000 |
| **5.410** | 6.000 | 66.000 | 28.000 | 36.000 |
| **5.500** | 6.000 | 66.000 | 28.000 | 36.000 |
| **5.550** | 6.000 | 66.000 | 28.000 | 36.000 |
| **5.560** | 6.000 | 66.000 | 28.000 | 36.000 |
| **5.600** | 6.000 | 66.000 | 28.000 | 36.000 |
| **5.700** | 6.000 | 66.000 | 28.000 | 36.000 |
| **5.800** | 6.000 | 66.000 | 28.000 | 36.000 |
| **5.900** | 6.000 | 66.000 | 28.000 | 36.000 |
| **5.950** | 6.000 | 66.000 | 28.000 | 36.000 |
| **6.000** | 6.000 | 66.000 | 28.000 | 36.000 |
| **6.100** | 8.000 | 79.000 | 34.000 | 36.000 |
| **6.200** | 8.000 | 79.000 | 34.000 | 36.000 |

| d1 mm | d2 mm | l1 mm | l2 mm | l3 mm |
|---|---|---|---|---|
| **6.300** | 8.000 | 79.000 | 34.000 | 36.000 |
| **6.350** | 8.000 | 79.000 | 34.000 | 36.000 |
| **6.400** | 8.000 | 79.000 | 34.000 | 36.000 |
| **6.500** | 8.000 | 79.000 | 34.000 | 36.000 |
| **6.530** | 8.000 | 79.000 | 34.000 | 36.000 |
| **6.600** | 8.000 | 79.000 | 34.000 | 36.000 |
| **6.700** | 8.000 | 79.000 | 34.000 | 36.000 |
| **6.750** | 8.000 | 79.000 | 34.000 | 36.000 |
| **6.800** | 8.000 | 79.000 | 34.000 | 36.000 |
| **6.900** | 8.000 | 79.000 | 34.000 | 36.000 |
| **7.000** | 8.000 | 79.000 | 34.000 | 36.000 |
| **7.100** | 8.000 | 79.000 | 41.000 | 36.000 |
| **7.140** | 8.000 | 79.000 | 41.000 | 36.000 |
| **7.200** | 8.000 | 79.000 | 41.000 | 36.000 |
| **7.300** | 8.000 | 79.000 | 41.000 | 36.000 |
| **7.400** | 8.000 | 79.000 | 41.000 | 36.000 |
| **7.500** | 8.000 | 79.000 | 41.000 | 36.000 |
| **7.540** | 8.000 | 79.000 | 41.000 | 36.000 |
| **7.600** | 8.000 | 79.000 | 41.000 | 36.000 |
| **7.700** | 8.000 | 79.000 | 41.000 | 36.000 |
| **7.800** | 8.000 | 79.000 | 41.000 | 36.000 |
| **7.900** | 8.000 | 79.000 | 41.000 | 36.000 |
| **7.940** | 8.000 | 79.000 | 41.000 | 36.000 |
| **8.000** | 8.000 | 79.000 | 41.000 | 36.000 |
| **8.100** | 10.000 | 89.000 | 47.000 | 40.000 |
| **8.200** | 10.000 | 89.000 | 47.000 | 40.000 |
| **8.300** | 10.000 | 89.000 | 47.000 | 40.000 |
| **8.330** | 10.000 | 89.000 | 47.000 | 40.000 |
| **8.400** | 10.000 | 89.000 | 47.000 | 40.000 |
| **8.500** | 10.000 | 89.000 | 47.000 | 40.000 |
| **8.600** | 10.000 | 89.000 | 47.000 | 40.000 |
| **8.700** | 10.000 | 89.000 | 47.000 | 40.000 |
| **8.730** | 10.000 | 89.000 | 47.000 | 40.000 |
| **8.800** | 10.000 | 89.000 | 47.000 | 40.000 |
| **8.900** | 10.000 | 89.000 | 47.000 | 40.000 |
| **9.000** | 10.000 | 89.000 | 47.000 | 40.000 |
| **9.100** | 10.000 | 89.000 | 47.000 | 40.000 |
| **9.130** | 10.000 | 89.000 | 47.000 | 40.000 |
| **9.200** | 10.000 | 89.000 | 47.000 | 40.000 |
| **9.250** | 10.000 | 89.000 | 47.000 | 40.000 |
| **9.300** | 10.000 | 89.000 | 47.000 | 40.000 |
| **9.340** | 10.000 | 89.000 | 47.000 | 40.000 |
| **9.400** | 10.000 | 89.000 | 47.000 | 40.000 |
| **9.500** | 10.000 | 89.000 | 47.000 | 40.000 |
| **9.520** | 10.000 | 89.000 | 47.000 | 40.000 |
| **9.600** | 10.000 | 89.000 | 47.000 | 40.000 |
| **9.700** | 10.000 | 89.000 | 47.000 | 40.000 |
| **9.800** | 10.000 | 89.000 | 47.000 | 40.000 |

| **d1** | d2 | l1 | l2 | l3 |
|---|---|---|---|---|
| **mm** | mm | mm | mm | mm |
| **9.900** | 10.000 | 89.000 | 47.000 | 40.000 |
| **9.920** | 10.000 | 89.000 | 47.000 | 40.000 |
| **10.000** | 10.000 | 89.000 | 47.000 | 40.000 |
| **10.100** | 12.000 | 102.000 | 55.000 | 45.000 |
| **10.200** | 12.000 | 102.000 | 55.000 | 45.000 |
| **10.300** | 12.000 | 102.000 | 55.000 | 45.000 |
| **10.320** | 12.000 | 102.000 | 55.000 | 45.000 |
| **10.400** | 12.000 | 102.000 | 55.000 | 45.000 |
| **10.500** | 12.000 | 102.000 | 55.000 | 45.000 |
| **10.600** | 12.000 | 102.000 | 55.000 | 45.000 |
| **10.700** | 12.000 | 102.000 | 55.000 | 45.000 |
| **10.720** | 12.000 | 102.000 | 55.000 | 45.000 |
| **10.800** | 12.000 | 102.000 | 55.000 | 45.000 |
| **10.900** | 12.000 | 102.000 | 55.000 | 45.000 |
| **11.000** | 12.000 | 102.000 | 55.000 | 45.000 |
| **11.100** | 12.000 | 102.000 | 55.000 | 45.000 |
| **11.110** | 12.000 | 102.000 | 55.000 | 45.000 |
| **11.200** | 12.000 | 102.000 | 55.000 | 45.000 |
| **11.300** | 12.000 | 102.000 | 55.000 | 45.000 |
| **11.400** | 12.000 | 102.000 | 55.000 | 45.000 |
| **11.500** | 12.000 | 102.000 | 55.000 | 45.000 |
| **11.510** | 12.000 | 102.000 | 55.000 | 45.000 |
| **11.600** | 12.000 | 102.000 | 55.000 | 45.000 |
| **11.700** | 12.000 | 102.000 | 55.000 | 45.000 |
| **11.800** | 12.000 | 102.000 | 55.000 | 45.000 |
| **11.900** | 12.000 | 102.000 | 55.000 | 45.000 |
| **11.910** | 12.000 | 102.000 | 55.000 | 45.000 |
| **12.000** | 12.000 | 102.000 | 55.000 | 45.000 |
| **12.100** | 14.000 | 107.000 | 60.000 | 45.000 |
| **12.200** | 14.000 | 107.000 | 60.000 | 45.000 |
| **12.300** | 14.000 | 107.000 | 60.000 | 45.000 |
| **12.400** | 14.000 | 107.000 | 60.000 | 45.000 |
| **12.500** | 14.000 | 107.000 | 60.000 | 45.000 |
| **12.600** | 14.000 | 107.000 | 60.000 | 45.000 |
| **12.700** | 14.000 | 107.000 | 60.000 | 45.000 |
| **12.800** | 14.000 | 107.000 | 60.000 | 45.000 |
| **12.900** | 14.000 | 107.000 | 60.000 | 45.000 |
| **13.000** | 14.000 | 107.000 | 60.000 | 45.000 |
| **13.100** | 14.000 | 107.000 | 60.000 | 45.000 |
| **13.200** | 14.000 | 107.000 | 60.000 | 45.000 |
| **13.300** | 14.000 | 107.000 | 60.000 | 45.000 |
| **13.400** | 14.000 | 107.000 | 60.000 | 45.000 |
| **13.490** | 14.000 | 107.000 | 60.000 | 45.000 |
| **13.500** | 14.000 | 107.000 | 60.000 | 45.000 |
| **13.600** | 14.000 | 107.000 | 60.000 | 45.000 |
| **13.700** | 14.000 | 107.000 | 60.000 | 45.000 |
| **13.800** | 14.000 | 107.000 | 60.000 | 45.000 |
| **13.900** | 14.000 | 107.000 | 60.000 | 45.000 |

| **d1** | d2 | l1 | l2 | l3 |
|---|---|---|---|---|
| **mm** | mm | mm | mm | mm |
| **14.000** | 14.000 | 107.000 | 60.000 | 45.000 |
| **14.100** | 16.000 | 115.000 | 65.000 | 48.000 |
| **14.200** | 16.000 | 115.000 | 65.000 | 48.000 |
| **14.290** | 16.000 | 115.000 | 65.000 | 48.000 |
| **14.300** | 16.000 | 115.000 | 65.000 | 48.000 |
| **14.400** | 16.000 | 115.000 | 65.000 | 48.000 |
| **14.500** | 16.000 | 115.000 | 65.000 | 48.000 |
| **14.600** | 16.000 | 115.000 | 65.000 | 48.000 |
| **14.680** | 16.000 | 115.000 | 65.000 | 48.000 |
| **14.700** | 16.000 | 115.000 | 65.000 | 48.000 |
| **14.800** | 16.000 | 115.000 | 65.000 | 48.000 |
| **14.900** | 16.000 | 115.000 | 65.000 | 48.000 |
| **15.000** | 16.000 | 115.000 | 65.000 | 48.000 |
| **15.080** | 16.000 | 115.000 | 65.000 | 48.000 |
| **15.100** | 16.000 | 115.000 | 65.000 | 48.000 |
| **15.200** | 16.000 | 115.000 | 65.000 | 48.000 |
| **15.300** | 16.000 | 115.000 | 65.000 | 48.000 |
| **15.400** | 16.000 | 115.000 | 65.000 | 48.000 |
| **15.480** | 16.000 | 115.000 | 65.000 | 48.000 |
| **15.500** | 16.000 | 115.000 | 65.000 | 48.000 |
| **15.600** | 16.000 | 115.000 | 65.000 | 48.000 |
| **15.700** | 16.000 | 115.000 | 65.000 | 48.000 |
| **15.800** | 16.000 | 115.000 | 65.000 | 48.000 |
| **15.870** | 16.000 | 115.000 | 65.000 | 48.000 |
| **15.900** | 16.000 | 115.000 | 65.000 | 48.000 |
| **16.000** | 16.000 | 115.000 | 65.000 | 48.000 |
| **16.270** | 18.000 | 123.000 | 73.000 | 48.000 |
| **16.500** | 18.000 | 123.000 | 73.000 | 48.000 |
| **16.670** | 18.000 | 123.000 | 73.000 | 48.000 |
| **17.000** | 18.000 | 123.000 | 73.000 | 48.000 |
| **17.070** | 18.000 | 123.000 | 73.000 | 48.000 |
| **17.460** | 18.000 | 123.000 | 73.000 | 48.000 |
| **17.500** | 18.000 | 123.000 | 73.000 | 48.000 |
| **17.860** | 18.000 | 123.000 | 73.000 | 48.000 |
| **18.000** | 18.000 | 123.000 | 73.000 | 48.000 |
| **18.260** | 20.000 | 131.000 | 79.000 | 50.000 |
| **18.500** | 20.000 | 131.000 | 79.000 | 50.000 |
| **19.000** | 20.000 | 131.000 | 79.000 | 50.000 |
| **19.050** | 20.000 | 131.000 | 79.000 | 50.000 |
| **19.250** | 20.000 | 131.000 | 79.000 | 50.000 |
| **19.446** | 20.000 | 131.000 | 79.000 | 50.000 |
| **19.500** | 20.000 | 131.000 | 79.000 | 50.000 |
| **19.840** | 20.000 | 131.000 | 79.000 | 50.000 |
| **20.000** | 20.000 | 131.000 | 79.000 | 50.000 |

# SuperV drills

## SuperV drills without internal coolant

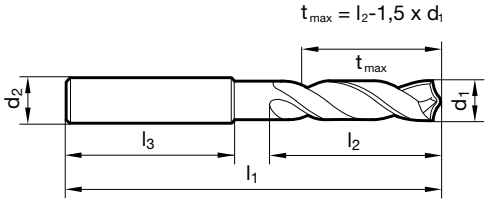
**Catalogue no. 51750**

SuperV-S | 3xD | DIN 6537 K | VHM | TiAlSiN | 140° | m7 | R | HA

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ● | | | | ○ | ○ |

Application recommendations page 174

- web thinning ≥ Ø 3.000
- relieved cone
- main cutting edge form concave
- very hard coating
- double margin




| d1 mm | d2 mm | l1 mm | l2 mm | l3 mm |
|---|---|---|---|---|
| **3.000** | 6.000 | 62.000 | 20.000 | 36.000 |
| **3.100** | 6.000 | 62.000 | 20.000 | 36.000 |
| **3.170** | 6.000 | 62.000 | 20.000 | 36.000 |
| **3.200** | 6.000 | 62.000 | 20.000 | 36.000 |
| **3.250** | 6.000 | 62.000 | 20.000 | 36.000 |
| **3.300** | 6.000 | 62.000 | 20.000 | 36.000 |
| **3.400** | 6.000 | 62.000 | 20.000 | 36.000 |
| **3.500** | 6.000 | 62.000 | 20.000 | 36.000 |
| **3.570** | 6.000 | 62.000 | 20.000 | 36.000 |
| **3.600** | 6.000 | 62.000 | 20.000 | 36.000 |
| **3.700** | 6.000 | 62.000 | 20.000 | 36.000 |
| **3.800** | 6.000 | 66.000 | 24.000 | 36.000 |
| **3.900** | 6.000 | 66.000 | 24.000 | 36.000 |
| **3.970** | 6.000 | 66.000 | 24.000 | 36.000 |
| **4.000** | 6.000 | 66.000 | 24.000 | 36.000 |
| **4.100** | 6.000 | 66.000 | 24.000 | 36.000 |
| **4.200** | 6.000 | 66.000 | 24.000 | 36.000 |
| **4.300** | 6.000 | 66.000 | 24.000 | 36.000 |
| **4.370** | 6.000 | 66.000 | 24.000 | 36.000 |
| **4.400** | 6.000 | 66.000 | 24.000 | 36.000 |
| **4.500** | 6.000 | 66.000 | 24.000 | 36.000 |
| **4.600** | 6.000 | 66.000 | 24.000 | 36.000 |
| **4.650** | 6.000 | 66.000 | 24.000 | 36.000 |
| **4.700** | 6.000 | 66.000 | 24.000 | 36.000 |
| **4.760** | 6.000 | 66.000 | 28.000 | 36.000 |
| **4.800** | 6.000 | 66.000 | 28.000 | 36.000 |
| **4.900** | 6.000 | 66.000 | 28.000 | 36.000 |
| **5.000** | 6.000 | 66.000 | 28.000 | 36.000 |
| **5.100** | 6.000 | 66.000 | 28.000 | 36.000 |
| **5.160** | 6.000 | 66.000 | 28.000 | 36.000 |
| **5.200** | 6.000 | 66.000 | 28.000 | 36.000 |
| **5.300** | 6.000 | 66.000 | 28.000 | 36.000 |
| **5.400** | 6.000 | 66.000 | 28.000 | 36.000 |
| **5.500** | 6.000 | 66.000 | 28.000 | 36.000 |
| **5.550** | 6.000 | 66.000 | 28.000 | 36.000 |
| **5.560** | 6.000 | 66.000 | 28.000 | 36.000 |
| **5.600** | 6.000 | 66.000 | 28.000 | 36.000 |
| **5.700** | 6.000 | 66.000 | 28.000 | 36.000 |
| **5.800** | 6.000 | 66.000 | 28.000 | 36.000 |
| **5.900** | 6.000 | 66.000 | 28.000 | 36.000 |
| **5.950** | 6.000 | 66.000 | 28.000 | 36.000 |
| **6.000** | 6.000 | 66.000 | 28.000 | 36.000 |
| **6.100** | 8.000 | 79.000 | 34.000 | 36.000 |
| **6.200** | 8.000 | 79.000 | 34.000 | 36.000 |
| **6.300** | 8.000 | 79.000 | 34.000 | 36.000 |
| **6.350** | 8.000 | 79.000 | 34.000 | 36.000 |
| **6.400** | 8.000 | 79.000 | 34.000 | 36.000 |
| **6.500** | 8.000 | 79.000 | 34.000 | 36.000 |

| d1 mm | d2 mm | l1 mm | l2 mm | l3 mm |
|---|---|---|---|---|
| **6.600** | 8.000 | 79.000 | 34.000 | 36.000 |
| **6.700** | 8.000 | 79.000 | 34.000 | 36.000 |
| **6.750** | 8.000 | 79.000 | 34.000 | 36.000 |
| **6.800** | 8.000 | 79.000 | 34.000 | 36.000 |
| **6.900** | 8.000 | 79.000 | 34.000 | 36.000 |
| **7.000** | 8.000 | 79.000 | 34.000 | 36.000 |
| **7.100** | 8.000 | 79.000 | 41.000 | 36.000 |
| **7.140** | 8.000 | 79.000 | 41.000 | 36.000 |
| **7.200** | 8.000 | 79.000 | 41.000 | 36.000 |
| **7.300** | 8.000 | 79.000 | 41.000 | 36.000 |
| **7.400** | 8.000 | 79.000 | 41.000 | 36.000 |
| **7.500** | 8.000 | 79.000 | 41.000 | 36.000 |
| **7.540** | 8.000 | 79.000 | 41.000 | 36.000 |
| **7.600** | 8.000 | 79.000 | 41.000 | 36.000 |
| **7.700** | 8.000 | 79.000 | 41.000 | 36.000 |
| **7.800** | 8.000 | 79.000 | 41.000 | 36.000 |
| **7.900** | 8.000 | 79.000 | 41.000 | 36.000 |
| **7.940** | 8.000 | 79.000 | 41.000 | 36.000 |
| **8.000** | 8.000 | 79.000 | 41.000 | 36.000 |
| **8.100** | 10.000 | 89.000 | 47.000 | 40.000 |
| **8.200** | 10.000 | 89.000 | 47.000 | 40.000 |
| **8.300** | 10.000 | 89.000 | 47.000 | 40.000 |
| **8.330** | 10.000 | 89.000 | 47.000 | 40.000 |
| **8.400** | 10.000 | 89.000 | 47.000 | 40.000 |
| **8.500** | 10.000 | 89.000 | 47.000 | 40.000 |
| **8.600** | 10.000 | 89.000 | 47.000 | 40.000 |
| **8.700** | 10.000 | 89.000 | 47.000 | 40.000 |
| **8.730** | 10.000 | 89.000 | 47.000 | 40.000 |
| **8.800** | 10.000 | 89.000 | 47.000 | 40.000 |
| **8.900** | 10.000 | 89.000 | 47.000 | 40.000 |
| **9.000** | 10.000 | 89.000 | 47.000 | 40.000 |
| **9.100** | 10.000 | 89.000 | 47.000 | 40.000 |
| **9.130** | 10.000 | 89.000 | 47.000 | 40.000 |
| **9.200** | 10.000 | 89.000 | 47.000 | 40.000 |
| **9.250** | 10.000 | 89.000 | 47.000 | 40.000 |
| **9.300** | 10.000 | 89.000 | 47.000 | 40.000 |
| **9.400** | 10.000 | 89.000 | 47.000 | 40.000 |
| **9.500** | 10.000 | 89.000 | 47.000 | 40.000 |
| **9.520** | 10.000 | 89.000 | 47.000 | 40.000 |
| **9.600** | 10.000 | 89.000 | 47.000 | 40.000 |
| **9.700** | 10.000 | 89.000 | 47.000 | 40.000 |
| **9.800** | 10.000 | 89.000 | 47.000 | 40.000 |
| **9.900** | 10.000 | 89.000 | 47.000 | 40.000 |
| **9.920** | 10.000 | 89.000 | 47.000 | 40.000 |
| **10.000** | 10.000 | 89.000 | 47.000 | 40.000 |
| **10.100** | 12.000 | 102.000 | 55.000 | 45.000 |
| **10.200** | 12.000 | 102.000 | 55.000 | 45.000 |
| **10.300** | 12.000 | 102.000 | 55.000 | 45.000 |

| **d1** | d2 | l1 | l2 | l3 |
|---|---|---|---|---|
| **mm** | mm | mm | mm | mm |
| **10.320** | 12.000 | 102.000 | 55.000 | 45.000 |
| **10.400** | 12.000 | 102.000 | 55.000 | 45.000 |
| **10.500** | 12.000 | 102.000 | 55.000 | 45.000 |
| **10.600** | 12.000 | 102.000 | 55.000 | 45.000 |
| **10.700** | 12.000 | 102.000 | 55.000 | 45.000 |
| **10.800** | 12.000 | 102.000 | 55.000 | 45.000 |
| **10.900** | 12.000 | 102.000 | 55.000 | 45.000 |
| **11.000** | 12.000 | 102.000 | 55.000 | 45.000 |
| **11.100** | 12.000 | 102.000 | 55.000 | 45.000 |
| **11.110** | 12.000 | 102.000 | 55.000 | 45.000 |
| **11.200** | 12.000 | 102.000 | 55.000 | 45.000 |
| **11.300** | 12.000 | 102.000 | 55.000 | 45.000 |
| **11.400** | 12.000 | 102.000 | 55.000 | 45.000 |
| **11.500** | 12.000 | 102.000 | 55.000 | 45.000 |
| **11.600** | 12.000 | 102.000 | 55.000 | 45.000 |
| **11.700** | 12.000 | 102.000 | 55.000 | 45.000 |
| **11.800** | 12.000 | 102.000 | 55.000 | 45.000 |
| **11.900** | 12.000 | 102.000 | 55.000 | 45.000 |
| **11.910** | 12.000 | 102.000 | 55.000 | 45.000 |
| **12.000** | 12.000 | 102.000 | 55.000 | 45.000 |
| **12.200** | 14.000 | 107.000 | 60.000 | 45.000 |
| **12.500** | 14.000 | 107.000 | 60.000 | 45.000 |
| **12.700** | 14.000 | 107.000 | 60.000 | 45.000 |
| **12.800** | 14.000 | 107.000 | 60.000 | 45.000 |
| **13.000** | 14.000 | 107.000 | 60.000 | 45.000 |
| **13.300** | 14.000 | 107.000 | 60.000 | 45.000 |
| **13.500** | 14.000 | 107.000 | 60.000 | 45.000 |
| **13.700** | 14.000 | 107.000 | 60.000 | 45.000 |
| **14.000** | 14.000 | 107.000 | 60.000 | 45.000 |
| **14.200** | 16.000 | 115.000 | 65.000 | 48.000 |

| **d1** | d2 | l1 | l2 | l3 |
|---|---|---|---|---|
| **mm** | mm | mm | mm | mm |
| **14.290** | 16.000 | 115.000 | 65.000 | 48.000 |
| **14.300** | 16.000 | 115.000 | 65.000 | 48.000 |
| **14.500** | 16.000 | 115.000 | 65.000 | 48.000 |
| **14.700** | 16.000 | 115.000 | 65.000 | 48.000 |
| **15.000** | 16.000 | 115.000 | 65.000 | 48.000 |
| **15.200** | 16.000 | 115.000 | 65.000 | 48.000 |
| **15.300** | 16.000 | 115.000 | 65.000 | 48.000 |
| **15.500** | 16.000 | 115.000 | 65.000 | 48.000 |
| **15.700** | 16.000 | 115.000 | 65.000 | 48.000 |
| **16.000** | 16.000 | 115.000 | 65.000 | 48.000 |
| **16.300** | 18.000 | 123.000 | 73.000 | 48.000 |
| **16.500** | 18.000 | 123.000 | 73.000 | 48.000 |
| **16.900** | 18.000 | 123.000 | 73.000 | 48.000 |
| **17.000** | 18.000 | 123.000 | 73.000 | 48.000 |
| **17.300** | 18.000 | 123.000 | 73.000 | 48.000 |
| **17.500** | 18.000 | 123.000 | 73.000 | 48.000 |
| **18.000** | 18.000 | 123.000 | 73.000 | 48.000 |
| **18.500** | 20.000 | 131.000 | 79.000 | 50.000 |
| **18.900** | 20.000 | 131.000 | 79.000 | 50.000 |
| **19.000** | 20.000 | 131.000 | 79.000 | 50.000 |
| **19.050** | 20.000 | 131.000 | 79.000 | 50.000 |
| **19.300** | 20.000 | 131.000 | 79.000 | 50.000 |
| **19.500** | 20.000 | 131.000 | 79.000 | 50.000 |
| **20.000** | 20.000 | 131.000 | 79.000 | 50.000 |

# SuperV drills

## SuperV drills without internal coolant

**Catalogue no. 51687**

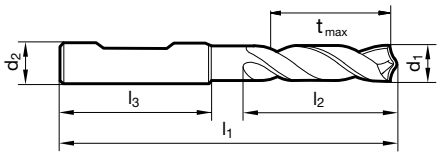
SuperV-U | 5xD | DIN 6537L | VHM | TiAlN nano | 140° | m7 | R | HB

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ● | | ● | ○ | ○ | ○ |

Application recommendations page 172

- facet point grind
- main cutting edge form straight
- optimised cutting geometry

$t_{max} = l_2 - 1{,}5 \times d_1$




| d1 mm | d2 mm | l1 mm | l2 mm | l3 mm |
|---|---|---|---|---|
| **3.000** | 6.000 | 66.000 | 28.000 | 36.000 |
| **3.100** | 6.000 | 66.000 | 28.000 | 36.000 |
| **3.170** | 6.000 | 66.000 | 28.000 | 36.000 |
| **3.200** | 6.000 | 66.000 | 28.000 | 36.000 |
| **3.250** | 6.000 | 66.000 | 28.000 | 36.000 |
| **3.300** | 6.000 | 66.000 | 28.000 | 36.000 |
| **3.400** | 6.000 | 66.000 | 28.000 | 36.000 |
| **3.500** | 6.000 | 66.000 | 28.000 | 36.000 |
| **3.570** | 6.000 | 66.000 | 28.000 | 36.000 |
| **3.600** | 6.000 | 66.000 | 28.000 | 36.000 |
| **3.700** | 6.000 | 66.000 | 28.000 | 36.000 |
| **3.800** | 6.000 | 74.000 | 36.000 | 36.000 |
| **3.900** | 6.000 | 74.000 | 36.000 | 36.000 |
| **3.970** | 6.000 | 74.000 | 36.000 | 36.000 |
| **4.000** | 6.000 | 74.000 | 36.000 | 36.000 |
| **4.100** | 6.000 | 74.000 | 36.000 | 36.000 |
| **4.200** | 6.000 | 74.000 | 36.000 | 36.000 |
| **4.300** | 6.000 | 74.000 | 36.000 | 36.000 |
| **4.370** | 6.000 | 74.000 | 36.000 | 36.000 |
| **4.400** | 6.000 | 74.000 | 36.000 | 36.000 |
| **4.500** | 6.000 | 74.000 | 36.000 | 36.000 |
| **4.600** | 6.000 | 74.000 | 36.000 | 36.000 |
| **4.650** | 6.000 | 74.000 | 36.000 | 36.000 |
| **4.700** | 6.000 | 74.000 | 36.000 | 36.000 |
| **4.760** | 6.000 | 82.000 | 44.000 | 36.000 |
| **4.800** | 6.000 | 82.000 | 44.000 | 36.000 |
| **4.900** | 6.000 | 82.000 | 44.000 | 36.000 |
| **5.000** | 6.000 | 82.000 | 44.000 | 36.000 |
| **5.100** | 6.000 | 82.000 | 44.000 | 36.000 |
| **5.160** | 6.000 | 82.000 | 44.000 | 36.000 |
| **5.200** | 6.000 | 82.000 | 44.000 | 36.000 |
| **5.300** | 6.000 | 82.000 | 44.000 | 36.000 |
| **5.400** | 6.000 | 82.000 | 44.000 | 36.000 |
| **5.500** | 6.000 | 82.000 | 44.000 | 36.000 |
| **5.550** | 6.000 | 82.000 | 44.000 | 36.000 |
| **5.560** | 6.000 | 82.000 | 44.000 | 36.000 |
| **5.600** | 6.000 | 82.000 | 44.000 | 36.000 |
| **5.700** | 6.000 | 82.000 | 44.000 | 36.000 |
| **5.800** | 6.000 | 82.000 | 44.000 | 36.000 |
| **5.900** | 6.000 | 82.000 | 44.000 | 36.000 |
| **5.950** | 6.000 | 82.000 | 44.000 | 36.000 |
| **6.000** | 6.000 | 82.000 | 44.000 | 36.000 |
| **6.100** | 8.000 | 91.000 | 53.000 | 36.000 |
| **6.200** | 8.000 | 91.000 | 53.000 | 36.000 |
| **6.300** | 8.000 | 91.000 | 53.000 | 36.000 |
| **6.350** | 8.000 | 91.000 | 53.000 | 36.000 |
| **6.400** | 8.000 | 91.000 | 53.000 | 36.000 |
| **6.500** | 8.000 | 91.000 | 53.000 | 36.000 |

| d1 mm | d2 mm | l1 mm | l2 mm | l3 mm |
|---|---|---|---|---|
| **6.600** | 8.000 | 91.000 | 53.000 | 36.000 |
| **6.700** | 8.000 | 91.000 | 53.000 | 36.000 |
| **6.750** | 8.000 | 91.000 | 53.000 | 36.000 |
| **6.800** | 8.000 | 91.000 | 53.000 | 36.000 |
| **6.900** | 8.000 | 91.000 | 53.000 | 36.000 |
| **7.000** | 8.000 | 91.000 | 53.000 | 36.000 |
| **7.100** | 8.000 | 91.000 | 53.000 | 36.000 |
| **7.140** | 8.000 | 91.000 | 53.000 | 36.000 |
| **7.200** | 8.000 | 91.000 | 53.000 | 36.000 |
| **7.300** | 8.000 | 91.000 | 53.000 | 36.000 |
| **7.400** | 8.000 | 91.000 | 53.000 | 36.000 |
| **7.500** | 8.000 | 91.000 | 53.000 | 36.000 |
| **7.540** | 8.000 | 91.000 | 53.000 | 36.000 |
| **7.600** | 8.000 | 91.000 | 53.000 | 36.000 |
| **7.700** | 8.000 | 91.000 | 53.000 | 36.000 |
| **7.800** | 8.000 | 91.000 | 53.000 | 36.000 |
| **7.900** | 8.000 | 91.000 | 53.000 | 36.000 |
| **7.940** | 8.000 | 91.000 | 53.000 | 36.000 |
| **8.000** | 8.000 | 91.000 | 53.000 | 36.000 |
| **8.100** | 10.000 | 103.000 | 61.000 | 40.000 |
| **8.200** | 10.000 | 103.000 | 61.000 | 40.000 |
| **8.300** | 10.000 | 103.000 | 61.000 | 40.000 |
| **8.330** | 10.000 | 103.000 | 61.000 | 40.000 |
| **8.400** | 10.000 | 103.000 | 61.000 | 40.000 |
| **8.500** | 10.000 | 103.000 | 61.000 | 40.000 |
| **8.600** | 10.000 | 103.000 | 61.000 | 40.000 |
| **8.700** | 10.000 | 103.000 | 61.000 | 40.000 |
| **8.730** | 10.000 | 103.000 | 61.000 | 40.000 |
| **8.800** | 10.000 | 103.000 | 61.000 | 40.000 |
| **8.900** | 10.000 | 103.000 | 61.000 | 40.000 |
| **9.000** | 10.000 | 103.000 | 61.000 | 40.000 |
| **9.100** | 10.000 | 103.000 | 61.000 | 40.000 |
| **9.130** | 10.000 | 103.000 | 61.000 | 40.000 |
| **9.200** | 10.000 | 103.000 | 61.000 | 40.000 |
| **9.250** | 10.000 | 103.000 | 61.000 | 40.000 |
| **9.300** | 10.000 | 103.000 | 61.000 | 40.000 |
| **9.400** | 10.000 | 103.000 | 61.000 | 40.000 |
| **9.500** | 10.000 | 103.000 | 61.000 | 40.000 |
| **9.520** | 10.000 | 103.000 | 61.000 | 40.000 |
| **9.600** | 10.000 | 103.000 | 61.000 | 40.000 |
| **9.700** | 10.000 | 103.000 | 61.000 | 40.000 |
| **9.800** | 10.000 | 103.000 | 61.000 | 40.000 |
| **9.900** | 10.000 | 103.000 | 61.000 | 40.000 |
| **9.920** | 10.000 | 103.000 | 61.000 | 40.000 |
| **10.000** | 10.000 | 103.000 | 61.000 | 40.000 |
| **10.100** | 12.000 | 118.000 | 71.000 | 45.000 |
| **10.200** | 12.000 | 118.000 | 71.000 | 45.000 |
| **10.300** | 12.000 | 118.000 | 71.000 | 45.000 |

| **d1** | d2 | l1 | l2 | l3 |
|---|---|---|---|---|
| **mm** | mm | mm | mm | mm |
| **10.320** | 12.000 | 118.000 | 71.000 | 45.000 |
| **10.400** | 12.000 | 118.000 | 71.000 | 45.000 |
| **10.500** | 12.000 | 118.000 | 71.000 | 45.000 |
| **10.600** | 12.000 | 118.000 | 71.000 | 45.000 |
| **10.700** | 12.000 | 118.000 | 71.000 | 45.000 |
| **10.800** | 12.000 | 118.000 | 71.000 | 45.000 |
| **10.900** | 12.000 | 118.000 | 71.000 | 45.000 |
| **11.000** | 12.000 | 118.000 | 71.000 | 45.000 |
| **11.100** | 12.000 | 118.000 | 71.000 | 45.000 |
| **11.110** | 12.000 | 118.000 | 71.000 | 45.000 |
| **11.200** | 12.000 | 118.000 | 71.000 | 45.000 |
| **11.300** | 12.000 | 118.000 | 71.000 | 45.000 |
| **11.400** | 12.000 | 118.000 | 71.000 | 45.000 |
| **11.500** | 12.000 | 118.000 | 71.000 | 45.000 |
| **11.600** | 12.000 | 118.000 | 71.000 | 45.000 |
| **11.700** | 12.000 | 118.000 | 71.000 | 45.000 |
| **11.800** | 12.000 | 118.000 | 71.000 | 45.000 |
| **11.900** | 12.000 | 118.000 | 71.000 | 45.000 |
| **11.910** | 12.000 | 118.000 | 71.000 | 45.000 |
| **12.000** | 12.000 | 118.000 | 71.000 | 45.000 |
| **12.200** | 14.000 | 124.000 | 77.000 | 45.000 |
| **12.500** | 14.000 | 124.000 | 77.000 | 45.000 |
| **12.700** | 14.000 | 124.000 | 77.000 | 45.000 |
| **13.000** | 14.000 | 124.000 | 77.000 | 45.000 |

| **d1** | d2 | l1 | l2 | l3 |
|---|---|---|---|---|
| **mm** | mm | mm | mm | mm |
| **13.500** | 14.000 | 124.000 | 77.000 | 45.000 |
| **13.700** | 14.000 | 124.000 | 77.000 | 45.000 |
| **14.000** | 14.000 | 124.000 | 77.000 | 45.000 |
| **14.200** | 16.000 | 133.000 | 83.000 | 48.000 |
| **14.290** | 16.000 | 133.000 | 83.000 | 48.000 |
| **14.500** | 16.000 | 133.000 | 83.000 | 48.000 |
| **14.700** | 16.000 | 133.000 | 83.000 | 48.000 |
| **15.000** | 16.000 | 133.000 | 83.000 | 48.000 |
| **15.200** | 16.000 | 133.000 | 83.000 | 48.000 |
| **15.500** | 16.000 | 133.000 | 83.000 | 48.000 |
| **15.700** | 16.000 | 133.000 | 83.000 | 48.000 |
| **16.000** | 16.000 | 133.000 | 83.000 | 48.000 |
| **16.500** | 18.000 | 143.000 | 93.000 | 48.000 |
| **17.000** | 18.000 | 143.000 | 93.000 | 48.000 |
| **17.500** | 18.000 | 143.000 | 93.000 | 48.000 |
| **18.000** | 18.000 | 143.000 | 93.000 | 48.000 |
| **18.500** | 20.000 | 153.000 | 101.000 | 50.000 |
| **19.000** | 20.000 | 153.000 | 101.000 | 50.000 |
| **19.500** | 20.000 | 153.000 | 101.000 | 50.000 |
| **20.000** | 20.000 | 153.000 | 101.000 | 50.000 |

# SuperV drills

## SuperV drills with internal cooling

**Catalogue no. 51676**

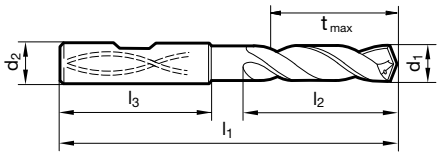
SuperV-IK-U | 3xD | DIN 6537 K | VHM | TiAlN nano | 140° | m7 | R | HB

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ● | ○ | ● | ○ | ○ | ○ |

Application recommendations page 172

- facet point grind
- main cutting edge form straight
- optimised cutting geometry

$t_{max} = l_2 - 1{,}5 \times d_1$




| d1 mm | d2 mm | l1 mm | l2 mm | l3 mm |
|---|---|---|---|---|
| **3.000** | 6.000 | 62.000 | 20.000 | 36.000 |
| **3.100** | 6.000 | 62.000 | 20.000 | 36.000 |
| **3.170** | 6.000 | 62.000 | 20.000 | 36.000 |
| **3.200** | 6.000 | 62.000 | 20.000 | 36.000 |
| **3.250** | 6.000 | 62.000 | 20.000 | 36.000 |
| **3.300** | 6.000 | 62.000 | 20.000 | 36.000 |
| **3.400** | 6.000 | 62.000 | 20.000 | 36.000 |
| **3.500** | 6.000 | 62.000 | 20.000 | 36.000 |
| **3.570** | 6.000 | 62.000 | 20.000 | 36.000 |
| **3.600** | 6.000 | 62.000 | 20.000 | 36.000 |
| **3.700** | 6.000 | 62.000 | 20.000 | 36.000 |
| **3.800** | 6.000 | 66.000 | 24.000 | 36.000 |
| **3.900** | 6.000 | 66.000 | 24.000 | 36.000 |
| **3.970** | 6.000 | 66.000 | 24.000 | 36.000 |
| **4.000** | 6.000 | 66.000 | 24.000 | 36.000 |
| **4.040** | 6.000 | 66.000 | 24.000 | 36.000 |
| **4.100** | 6.000 | 66.000 | 24.000 | 36.000 |
| **4.200** | 6.000 | 66.000 | 24.000 | 36.000 |
| **4.300** | 6.000 | 66.000 | 24.000 | 36.000 |
| **4.370** | 6.000 | 66.000 | 24.000 | 36.000 |
| **4.400** | 6.000 | 66.000 | 24.000 | 36.000 |
| **4.500** | 6.000 | 66.000 | 24.000 | 36.000 |
| **4.600** | 6.000 | 66.000 | 24.000 | 36.000 |
| **4.650** | 6.000 | 66.000 | 24.000 | 36.000 |
| **4.700** | 6.000 | 66.000 | 24.000 | 36.000 |
| **4.760** | 6.000 | 66.000 | 28.000 | 36.000 |
| **4.800** | 6.000 | 66.000 | 28.000 | 36.000 |
| **4.900** | 6.000 | 66.000 | 28.000 | 36.000 |
| **5.000** | 6.000 | 66.000 | 28.000 | 36.000 |
| **5.100** | 6.000 | 66.000 | 28.000 | 36.000 |
| **5.110** | 6.000 | 66.000 | 28.000 | 36.000 |
| **5.160** | 6.000 | 66.000 | 28.000 | 36.000 |
| **5.200** | 6.000 | 66.000 | 28.000 | 36.000 |
| **5.250** | 6.000 | 66.000 | 28.000 | 36.000 |
| **5.300** | 6.000 | 66.000 | 28.000 | 36.000 |
| **5.400** | 6.000 | 66.000 | 28.000 | 36.000 |
| **5.410** | 6.000 | 66.000 | 28.000 | 36.000 |
| **5.500** | 6.000 | 66.000 | 28.000 | 36.000 |
| **5.550** | 6.000 | 66.000 | 28.000 | 36.000 |
| **5.560** | 6.000 | 66.000 | 28.000 | 36.000 |
| **5.600** | 6.000 | 66.000 | 28.000 | 36.000 |
| **5.650** | 6.000 | 66.000 | 28.000 | 36.000 |
| **5.700** | 6.000 | 66.000 | 28.000 | 36.000 |
| **5.750** | 6.000 | 66.000 | 28.000 | 36.000 |
| **5.800** | 6.000 | 66.000 | 28.000 | 36.000 |
| **5.900** | 6.000 | 66.000 | 28.000 | 36.000 |
| **5.950** | 6.000 | 66.000 | 28.000 | 36.000 |
| **6.000** | 6.000 | 66.000 | 28.000 | 36.000 |

| d1 mm | d2 mm | l1 mm | l2 mm | l3 mm |
|---|---|---|---|---|
| **6.100** | 8.000 | 79.000 | 34.000 | 36.000 |
| **6.200** | 8.000 | 79.000 | 34.000 | 36.000 |
| **6.300** | 8.000 | 79.000 | 34.000 | 36.000 |
| **6.350** | 8.000 | 79.000 | 34.000 | 36.000 |
| **6.400** | 8.000 | 79.000 | 34.000 | 36.000 |
| **6.500** | 8.000 | 79.000 | 34.000 | 36.000 |
| **6.530** | 8.000 | 79.000 | 34.000 | 36.000 |
| **6.600** | 8.000 | 79.000 | 34.000 | 36.000 |
| **6.700** | 8.000 | 79.000 | 34.000 | 36.000 |
| **6.750** | 8.000 | 79.000 | 34.000 | 36.000 |
| **6.800** | 8.000 | 79.000 | 34.000 | 36.000 |
| **6.900** | 8.000 | 79.000 | 34.000 | 36.000 |
| **7.000** | 8.000 | 79.000 | 34.000 | 36.000 |
| **7.100** | 8.000 | 79.000 | 41.000 | 36.000 |
| **7.140** | 8.000 | 79.000 | 41.000 | 36.000 |
| **7.200** | 8.000 | 79.000 | 41.000 | 36.000 |
| **7.300** | 8.000 | 79.000 | 41.000 | 36.000 |
| **7.400** | 8.000 | 79.000 | 41.000 | 36.000 |
| **7.450** | 8.000 | 79.000 | 41.000 | 36.000 |
| **7.500** | 8.000 | 79.000 | 41.000 | 36.000 |
| **7.540** | 8.000 | 79.000 | 41.000 | 36.000 |
| **7.600** | 8.000 | 79.000 | 41.000 | 36.000 |
| **7.700** | 8.000 | 79.000 | 41.000 | 36.000 |
| **7.800** | 8.000 | 79.000 | 41.000 | 36.000 |
| **7.900** | 8.000 | 79.000 | 41.000 | 36.000 |
| **7.940** | 8.000 | 79.000 | 41.000 | 36.000 |
| **8.000** | 8.000 | 79.000 | 41.000 | 36.000 |
| **8.100** | 10.000 | 89.000 | 47.000 | 40.000 |
| **8.200** | 10.000 | 89.000 | 47.000 | 40.000 |
| **8.300** | 10.000 | 89.000 | 47.000 | 40.000 |
| **8.330** | 10.000 | 89.000 | 47.000 | 40.000 |
| **8.400** | 10.000 | 89.000 | 47.000 | 40.000 |
| **8.500** | 10.000 | 89.000 | 47.000 | 40.000 |
| **8.550** | 10.000 | 89.000 | 47.000 | 40.000 |
| **8.600** | 10.000 | 89.000 | 47.000 | 40.000 |
| **8.700** | 10.000 | 89.000 | 47.000 | 40.000 |
| **8.730** | 10.000 | 89.000 | 47.000 | 40.000 |
| **8.800** | 10.000 | 89.000 | 47.000 | 40.000 |
| **8.900** | 10.000 | 89.000 | 47.000 | 40.000 |
| **9.000** | 10.000 | 89.000 | 47.000 | 40.000 |
| **9.100** | 10.000 | 89.000 | 47.000 | 40.000 |
| **9.130** | 10.000 | 89.000 | 47.000 | 40.000 |
| **9.200** | 10.000 | 89.000 | 47.000 | 40.000 |
| **9.250** | 10.000 | 89.000 | 47.000 | 40.000 |
| **9.300** | 10.000 | 89.000 | 47.000 | 40.000 |
| **9.340** | 10.000 | 89.000 | 47.000 | 40.000 |
| **9.400** | 10.000 | 89.000 | 47.000 | 40.000 |
| **9.500** | 10.000 | 89.000 | 47.000 | 40.000 |

| d1 | d2 | l1 | l2 | l3 |
|---|---|---|---|---|
| mm | mm | mm | mm | mm |
| **9.520** | 10.000 | 89.000 | 47.000 | 40.000 |
| **9.600** | 10.000 | 89.000 | 47.000 | 40.000 |
| **9.700** | 10.000 | 89.000 | 47.000 | 40.000 |
| **9.800** | 10.000 | 89.000 | 47.000 | 40.000 |
| **9.900** | 10.000 | 89.000 | 47.000 | 40.000 |
| **9.920** | 10.000 | 89.000 | 47.000 | 40.000 |
| **10.000** | 10.000 | 89.000 | 47.000 | 40.000 |
| **10.100** | 12.000 | 102.000 | 55.000 | 45.000 |
| **10.200** | 12.000 | 102.000 | 55.000 | 45.000 |
| **10.300** | 12.000 | 102.000 | 55.000 | 45.000 |
| **10.320** | 12.000 | 102.000 | 55.000 | 45.000 |
| **10.400** | 12.000 | 102.000 | 55.000 | 45.000 |
| **10.500** | 12.000 | 102.000 | 55.000 | 45.000 |
| **10.600** | 12.000 | 102.000 | 55.000 | 45.000 |
| **10.700** | 12.000 | 102.000 | 55.000 | 45.000 |
| **10.720** | 12.000 | 102.000 | 55.000 | 45.000 |
| **10.800** | 12.000 | 102.000 | 55.000 | 45.000 |
| **10.900** | 12.000 | 102.000 | 55.000 | 45.000 |
| **11.000** | 12.000 | 102.000 | 55.000 | 45.000 |
| **11.100** | 12.000 | 102.000 | 55.000 | 45.000 |
| **11.110** | 12.000 | 102.000 | 55.000 | 45.000 |
| **11.200** | 12.000 | 102.000 | 55.000 | 45.000 |
| **11.300** | 12.000 | 102.000 | 55.000 | 45.000 |
| **11.400** | 12.000 | 102.000 | 55.000 | 45.000 |
| **11.500** | 12.000 | 102.000 | 55.000 | 45.000 |
| **11.510** | 12.000 | 102.000 | 55.000 | 45.000 |
| **11.600** | 12.000 | 102.000 | 55.000 | 45.000 |
| **11.700** | 12.000 | 102.000 | 55.000 | 45.000 |
| **11.800** | 12.000 | 102.000 | 55.000 | 45.000 |
| **11.900** | 12.000 | 102.000 | 55.000 | 45.000 |
| **11.910** | 12.000 | 102.000 | 55.000 | 45.000 |
| **12.000** | 12.000 | 102.000 | 55.000 | 45.000 |
| **12.100** | 14.000 | 107.000 | 60.000 | 45.000 |
| **12.200** | 14.000 | 107.000 | 60.000 | 45.000 |
| **12.300** | 14.000 | 107.000 | 60.000 | 45.000 |
| **12.400** | 14.000 | 107.000 | 60.000 | 45.000 |
| **12.500** | 14.000 | 107.000 | 60.000 | 45.000 |
| **12.600** | 14.000 | 107.000 | 60.000 | 45.000 |
| **12.700** | 14.000 | 107.000 | 60.000 | 45.000 |
| **12.800** | 14.000 | 107.000 | 60.000 | 45.000 |
| **12.900** | 14.000 | 107.000 | 60.000 | 45.000 |
| **13.000** | 14.000 | 107.000 | 60.000 | 45.000 |
| **13.100** | 14.000 | 107.000 | 60.000 | 45.000 |
| **13.200** | 14.000 | 107.000 | 60.000 | 45.000 |
| **13.300** | 14.000 | 107.000 | 60.000 | 45.000 |
| **13.400** | 14.000 | 107.000 | 60.000 | 45.000 |
| **13.490** | 14.000 | 107.000 | 60.000 | 45.000 |
| **13.500** | 14.000 | 107.000 | 60.000 | 45.000 |
| **13.600** | 14.000 | 107.000 | 60.000 | 45.000 |
| **13.700** | 14.000 | 107.000 | 60.000 | 45.000 |
| **13.800** | 14.000 | 107.000 | 60.000 | 45.000 |
| **13.900** | 14.000 | 107.000 | 60.000 | 45.000 |
| **14.000** | 14.000 | 107.000 | 60.000 | 45.000 |
| **14.100** | 16.000 | 115.000 | 65.000 | 48.000 |
| **14.200** | 16.000 | 115.000 | 65.000 | 48.000 |
| **14.290** | 16.000 | 115.000 | 65.000 | 48.000 |
| **14.300** | 16.000 | 115.000 | 65.000 | 48.000 |
| **14.400** | 16.000 | 115.000 | 65.000 | 48.000 |
| **14.500** | 16.000 | 115.000 | 65.000 | 48.000 |
| **14.600** | 16.000 | 115.000 | 65.000 | 48.000 |

| d1 | d2 | l1 | l2 | l3 |
|---|---|---|---|---|
| mm | mm | mm | mm | mm |
| **14.680** | 16.000 | 115.000 | 65.000 | 48.000 |
| **14.700** | 16.000 | 115.000 | 65.000 | 48.000 |
| **14.800** | 16.000 | 115.000 | 65.000 | 48.000 |
| **14.900** | 16.000 | 115.000 | 65.000 | 48.000 |
| **15.000** | 16.000 | 115.000 | 65.000 | 48.000 |
| **15.080** | 16.000 | 115.000 | 65.000 | 48.000 |
| **15.100** | 16.000 | 115.000 | 65.000 | 48.000 |
| **15.200** | 16.000 | 115.000 | 65.000 | 48.000 |
| **15.300** | 16.000 | 115.000 | 65.000 | 48.000 |
| **15.400** | 16.000 | 115.000 | 65.000 | 48.000 |
| **15.480** | 16.000 | 115.000 | 65.000 | 48.000 |
| **15.500** | 16.000 | 115.000 | 65.000 | 48.000 |
| **15.600** | 16.000 | 115.000 | 65.000 | 48.000 |
| **15.700** | 16.000 | 115.000 | 65.000 | 48.000 |
| **15.800** | 16.000 | 115.000 | 65.000 | 48.000 |
| **15.870** | 16.000 | 115.000 | 65.000 | 48.000 |
| **15.900** | 16.000 | 115.000 | 65.000 | 48.000 |
| **16.000** | 16.000 | 115.000 | 65.000 | 48.000 |
| **16.100** | 18.000 | 123.000 | 73.000 | 48.000 |
| **16.200** | 18.000 | 123.000 | 73.000 | 48.000 |
| **16.270** | 18.000 | 123.000 | 73.000 | 48.000 |
| **16.500** | 18.000 | 123.000 | 73.000 | 48.000 |
| **16.670** | 18.000 | 123.000 | 73.000 | 48.000 |
| **16.900** | 18.000 | 123.000 | 73.000 | 48.000 |
| **17.000** | 18.000 | 123.000 | 73.000 | 48.000 |
| **17.070** | 18.000 | 123.000 | 73.000 | 48.000 |
| **17.200** | 18.000 | 123.000 | 73.000 | 48.000 |
| **17.300** | 18.000 | 123.000 | 73.000 | 48.000 |
| **17.400** | 18.000 | 123.000 | 73.000 | 48.000 |
| **17.460** | 18.000 | 123.000 | 73.000 | 48.000 |
| **17.500** | 18.000 | 123.000 | 73.000 | 48.000 |
| **17.600** | 18.000 | 123.000 | 73.000 | 48.000 |
| **17.700** | 18.000 | 123.000 | 73.000 | 48.000 |
| **17.860** | 18.000 | 123.000 | 73.000 | 48.000 |
| **17.900** | 18.000 | 123.000 | 73.000 | 48.000 |
| **18.000** | 18.000 | 123.000 | 73.000 | 48.000 |
| **18.260** | 20.000 | 131.000 | 79.000 | 50.000 |
| **18.300** | 20.000 | 131.000 | 79.000 | 50.000 |
| **18.500** | 20.000 | 131.000 | 79.000 | 50.000 |
| **18.900** | 20.000 | 131.000 | 79.000 | 50.000 |
| **19.000** | 20.000 | 131.000 | 79.000 | 50.000 |
| **19.050** | 20.000 | 131.000 | 79.000 | 50.000 |
| **19.250** | 20.000 | 131.000 | 79.000 | 50.000 |
| **19.300** | 20.000 | 131.000 | 79.000 | 50.000 |
| **19.446** | 20.000 | 131.000 | 79.000 | 50.000 |
| **19.500** | 20.000 | 131.000 | 79.000 | 50.000 |
| **19.840** | 20.000 | 131.000 | 79.000 | 50.000 |
| **19.900** | 20.000 | 131.000 | 79.000 | 50.000 |
| **20.000** | 20.000 | 131.000 | 79.000 | 50.000 |

# SuperV drills

## SuperV drills with internal cooling

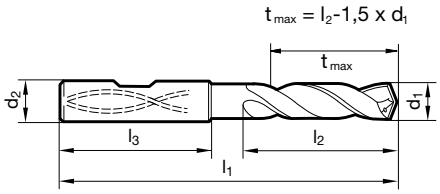
**Catalogue no. 51670**

SuperV-VA | 3xD | DIN 6537 K | VHM | AlTiN nano | 140° | m7 | R | HB

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| | ● | | | ○ | |

Application recommendations page 172

- facet point grind
- main cutting edge form straight
- optimised cutting geometry
- especially suitable for stainless steels




| d1 mm | d2 mm | l1 mm | l2 mm | l3 mm |
|---|---|---|---|---|
| **3.000** | 6.000 | 62.000 | 20.000 | 36.000 |
| **3.100** | 6.000 | 62.000 | 20.000 | 36.000 |
| **3.170** | 6.000 | 62.000 | 20.000 | 36.000 |
| **3.200** | 6.000 | 62.000 | 20.000 | 36.000 |
| **3.250** | 6.000 | 62.000 | 20.000 | 36.000 |
| **3.300** | 6.000 | 62.000 | 20.000 | 36.000 |
| **3.400** | 6.000 | 62.000 | 20.000 | 36.000 |
| **3.500** | 6.000 | 62.000 | 20.000 | 36.000 |
| **3.570** | 6.000 | 62.000 | 20.000 | 36.000 |
| **3.600** | 6.000 | 62.000 | 20.000 | 36.000 |
| **3.700** | 6.000 | 62.000 | 20.000 | 36.000 |
| **3.800** | 6.000 | 66.000 | 24.000 | 36.000 |
| **3.900** | 6.000 | 66.000 | 24.000 | 36.000 |
| **3.970** | 6.000 | 66.000 | 24.000 | 36.000 |
| **4.000** | 6.000 | 66.000 | 24.000 | 36.000 |
| **4.100** | 6.000 | 66.000 | 24.000 | 36.000 |
| **4.200** | 6.000 | 66.000 | 24.000 | 36.000 |
| **4.300** | 6.000 | 66.000 | 24.000 | 36.000 |
| **4.370** | 6.000 | 66.000 | 24.000 | 36.000 |
| **4.400** | 6.000 | 66.000 | 24.000 | 36.000 |
| **4.500** | 6.000 | 66.000 | 24.000 | 36.000 |
| **4.600** | 6.000 | 66.000 | 24.000 | 36.000 |
| **4.650** | 6.000 | 66.000 | 24.000 | 36.000 |
| **4.700** | 6.000 | 66.000 | 24.000 | 36.000 |
| **4.760** | 6.000 | 66.000 | 28.000 | 36.000 |
| **4.800** | 6.000 | 66.000 | 28.000 | 36.000 |
| **4.900** | 6.000 | 66.000 | 28.000 | 36.000 |
| **5.000** | 6.000 | 66.000 | 28.000 | 36.000 |
| **5.100** | 6.000 | 66.000 | 28.000 | 36.000 |
| **5.160** | 6.000 | 66.000 | 28.000 | 36.000 |
| **5.200** | 6.000 | 66.000 | 28.000 | 36.000 |
| **5.300** | 6.000 | 66.000 | 28.000 | 36.000 |
| **5.400** | 6.000 | 66.000 | 28.000 | 36.000 |
| **5.500** | 6.000 | 66.000 | 28.000 | 36.000 |
| **5.550** | 6.000 | 66.000 | 28.000 | 36.000 |
| **5.560** | 6.000 | 66.000 | 28.000 | 36.000 |
| **5.600** | 6.000 | 66.000 | 28.000 | 36.000 |
| **5.700** | 6.000 | 66.000 | 28.000 | 36.000 |
| **5.800** | 6.000 | 66.000 | 28.000 | 36.000 |
| **5.900** | 6.000 | 66.000 | 28.000 | 36.000 |
| **5.950** | 6.000 | 66.000 | 28.000 | 36.000 |
| **6.000** | 6.000 | 66.000 | 28.000 | 36.000 |
| **6.100** | 8.000 | 79.000 | 34.000 | 36.000 |
| **6.200** | 8.000 | 79.000 | 34.000 | 36.000 |
| **6.300** | 8.000 | 79.000 | 34.000 | 36.000 |
| **6.350** | 8.000 | 79.000 | 34.000 | 36.000 |
| **6.400** | 8.000 | 79.000 | 34.000 | 36.000 |
| **6.500** | 8.000 | 79.000 | 34.000 | 36.000 |

| d1 mm | d2 mm | l1 mm | l2 mm | l3 mm |
|---|---|---|---|---|
| **6.600** | 8.000 | 79.000 | 34.000 | 36.000 |
| **6.700** | 8.000 | 79.000 | 34.000 | 36.000 |
| **6.750** | 8.000 | 79.000 | 34.000 | 36.000 |
| **6.800** | 8.000 | 79.000 | 34.000 | 36.000 |
| **6.900** | 8.000 | 79.000 | 34.000 | 36.000 |
| **7.000** | 8.000 | 79.000 | 34.000 | 36.000 |
| **7.100** | 8.000 | 79.000 | 41.000 | 36.000 |
| **7.140** | 8.000 | 79.000 | 41.000 | 36.000 |
| **7.200** | 8.000 | 79.000 | 41.000 | 36.000 |
| **7.300** | 8.000 | 79.000 | 41.000 | 36.000 |
| **7.400** | 8.000 | 79.000 | 41.000 | 36.000 |
| **7.500** | 8.000 | 79.000 | 41.000 | 36.000 |
| **7.540** | 8.000 | 79.000 | 41.000 | 36.000 |
| **7.600** | 8.000 | 79.000 | 41.000 | 36.000 |
| **7.700** | 8.000 | 79.000 | 41.000 | 36.000 |
| **7.800** | 8.000 | 79.000 | 41.000 | 36.000 |
| **7.900** | 8.000 | 79.000 | 41.000 | 36.000 |
| **7.940** | 8.000 | 79.000 | 41.000 | 36.000 |
| **8.000** | 8.000 | 79.000 | 41.000 | 36.000 |
| **8.100** | 10.000 | 89.000 | 47.000 | 40.000 |
| **8.200** | 10.000 | 89.000 | 47.000 | 40.000 |
| **8.300** | 10.000 | 89.000 | 47.000 | 40.000 |
| **8.330** | 10.000 | 89.000 | 47.000 | 40.000 |
| **8.400** | 10.000 | 89.000 | 47.000 | 40.000 |
| **8.500** | 10.000 | 89.000 | 47.000 | 40.000 |
| **8.600** | 10.000 | 89.000 | 47.000 | 40.000 |
| **8.700** | 10.000 | 89.000 | 47.000 | 40.000 |
| **8.730** | 10.000 | 89.000 | 47.000 | 40.000 |
| **8.800** | 10.000 | 89.000 | 47.000 | 40.000 |
| **8.900** | 10.000 | 89.000 | 47.000 | 40.000 |
| **9.000** | 10.000 | 89.000 | 47.000 | 40.000 |
| **9.100** | 10.000 | 89.000 | 47.000 | 40.000 |
| **9.130** | 10.000 | 89.000 | 47.000 | 40.000 |
| **9.200** | 10.000 | 89.000 | 47.000 | 40.000 |
| **9.250** | 10.000 | 89.000 | 47.000 | 40.000 |
| **9.300** | 10.000 | 89.000 | 47.000 | 40.000 |
| **9.400** | 10.000 | 89.000 | 47.000 | 40.000 |
| **9.500** | 10.000 | 89.000 | 47.000 | 40.000 |
| **9.520** | 10.000 | 89.000 | 47.000 | 40.000 |
| **9.600** | 10.000 | 89.000 | 47.000 | 40.000 |
| **9.700** | 10.000 | 89.000 | 47.000 | 40.000 |
| **9.800** | 10.000 | 89.000 | 47.000 | 40.000 |
| **9.900** | 10.000 | 89.000 | 47.000 | 40.000 |
| **9.920** | 10.000 | 89.000 | 47.000 | 40.000 |
| **10.000** | 10.000 | 89.000 | 47.000 | 40.000 |
| **10.100** | 12.000 | 102.000 | 55.000 | 45.000 |
| **10.200** | 12.000 | 102.000 | 55.000 | 45.000 |
| **10.300** | 12.000 | 102.000 | 55.000 | 45.000 |

| **d1** | d2 | l1 | l2 | l3 |
|---|---|---|---|---|
| **mm** | mm | mm | mm | mm |
| **10.320** | 12.000 | 102.000 | 55.000 | 45.000 |
| **10.400** | 12.000 | 102.000 | 55.000 | 45.000 |
| **10.500** | 12.000 | 102.000 | 55.000 | 45.000 |
| **10.600** | 12.000 | 102.000 | 55.000 | 45.000 |
| **10.700** | 12.000 | 102.000 | 55.000 | 45.000 |
| **10.800** | 12.000 | 102.000 | 55.000 | 45.000 |
| **10.900** | 12.000 | 102.000 | 55.000 | 45.000 |
| **11.000** | 12.000 | 102.000 | 55.000 | 45.000 |
| **11.100** | 12.000 | 102.000 | 55.000 | 45.000 |
| **11.110** | 12.000 | 102.000 | 55.000 | 45.000 |
| **11.200** | 12.000 | 102.000 | 55.000 | 45.000 |
| **11.300** | 12.000 | 102.000 | 55.000 | 45.000 |
| **11.400** | 12.000 | 102.000 | 55.000 | 45.000 |
| **11.500** | 12.000 | 102.000 | 55.000 | 45.000 |
| **11.600** | 12.000 | 102.000 | 55.000 | 45.000 |
| **11.700** | 12.000 | 102.000 | 55.000 | 45.000 |
| **11.800** | 12.000 | 102.000 | 55.000 | 45.000 |
| **11.900** | 12.000 | 102.000 | 55.000 | 45.000 |
| **11.910** | 12.000 | 102.000 | 55.000 | 45.000 |
| **12.000** | 12.000 | 102.000 | 55.000 | 45.000 |
| **12.200** | 14.000 | 107.000 | 60.000 | 45.000 |
| **12.500** | 14.000 | 107.000 | 60.000 | 45.000 |
| **12.700** | 14.000 | 107.000 | 60.000 | 45.000 |
| **13.000** | 14.000 | 107.000 | 60.000 | 45.000 |

| **d1** | d2 | l1 | l2 | l3 |
|---|---|---|---|---|
| **mm** | mm | mm | mm | mm |
| **13.500** | 14.000 | 107.000 | 60.000 | 45.000 |
| **13.700** | 14.000 | 107.000 | 60.000 | 45.000 |
| **14.000** | 14.000 | 107.000 | 60.000 | 45.000 |
| **14.200** | 16.000 | 115.000 | 65.000 | 48.000 |
| **14.290** | 16.000 | 115.000 | 65.000 | 48.000 |
| **14.500** | 16.000 | 115.000 | 65.000 | 48.000 |
| **14.700** | 16.000 | 115.000 | 65.000 | 48.000 |
| **15.000** | 16.000 | 115.000 | 65.000 | 48.000 |
| **15.200** | 16.000 | 115.000 | 65.000 | 48.000 |
| **15.500** | 16.000 | 115.000 | 65.000 | 48.000 |
| **15.700** | 16.000 | 115.000 | 65.000 | 48.000 |
| **16.000** | 16.000 | 115.000 | 65.000 | 48.000 |
| **16.500** | 18.000 | 123.000 | 73.000 | 48.000 |
| **17.000** | 18.000 | 123.000 | 73.000 | 48.000 |
| **17.500** | 18.000 | 123.000 | 73.000 | 48.000 |
| **18.000** | 18.000 | 123.000 | 73.000 | 48.000 |
| **18.500** | 20.000 | 131.000 | 79.000 | 50.000 |
| **19.000** | 20.000 | 131.000 | 79.000 | 50.000 |
| **19.500** | 20.000 | 131.000 | 79.000 | 50.000 |
| **20.000** | 20.000 | 131.000 | 79.000 | 50.000 |

# SuperV drills

## SuperV drills with internal cooling

**Catalogue no. 51752**

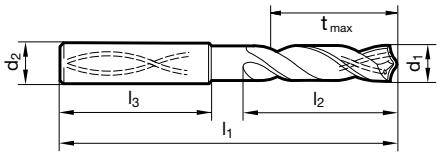
SuperV-S | 3xD | DIN 6537 K | VHM | TiAlSiN | 140° | m7 | R | HA

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ● | | | | ● | ○ |

Application recommendations page 174

- web thinning ≥ Ø 3.000
- relieved cone
- main cutting edge form concave
- very hard coating
- double margin

$t_{max} = l_2 - 1{,}5 \times d_1$




| d1 mm | d2 mm | l1 mm | l2 mm | l3 mm |
|---|---|---|---|---|
| **3.000** | 6.000 | 62.000 | 20.000 | 36.000 |
| **3.100** | 6.000 | 62.000 | 20.000 | 36.000 |
| **3.170** | 6.000 | 62.000 | 20.000 | 36.000 |
| **3.200** | 6.000 | 62.000 | 20.000 | 36.000 |
| **3.250** | 6.000 | 62.000 | 20.000 | 36.000 |
| **3.300** | 6.000 | 62.000 | 20.000 | 36.000 |
| **3.400** | 6.000 | 62.000 | 20.000 | 36.000 |
| **3.500** | 6.000 | 62.000 | 20.000 | 36.000 |
| **3.570** | 6.000 | 62.000 | 20.000 | 36.000 |
| **3.600** | 6.000 | 62.000 | 20.000 | 36.000 |
| **3.700** | 6.000 | 62.000 | 20.000 | 36.000 |
| **3.800** | 6.000 | 66.000 | 24.000 | 36.000 |
| **3.900** | 6.000 | 66.000 | 24.000 | 36.000 |
| **3.970** | 6.000 | 66.000 | 24.000 | 36.000 |
| **4.000** | 6.000 | 66.000 | 24.000 | 36.000 |
| **4.100** | 6.000 | 66.000 | 24.000 | 36.000 |
| **4.200** | 6.000 | 66.000 | 24.000 | 36.000 |
| **4.300** | 6.000 | 66.000 | 24.000 | 36.000 |
| **4.370** | 6.000 | 66.000 | 24.000 | 36.000 |
| **4.400** | 6.000 | 66.000 | 24.000 | 36.000 |
| **4.500** | 6.000 | 66.000 | 24.000 | 36.000 |
| **4.600** | 6.000 | 66.000 | 24.000 | 36.000 |
| **4.650** | 6.000 | 66.000 | 24.000 | 36.000 |
| **4.700** | 6.000 | 66.000 | 24.000 | 36.000 |
| **4.760** | 6.000 | 66.000 | 28.000 | 36.000 |
| **4.800** | 6.000 | 66.000 | 28.000 | 36.000 |
| **4.900** | 6.000 | 66.000 | 28.000 | 36.000 |
| **5.000** | 6.000 | 66.000 | 28.000 | 36.000 |
| **5.100** | 6.000 | 66.000 | 28.000 | 36.000 |
| **5.160** | 6.000 | 66.000 | 28.000 | 36.000 |
| **5.200** | 6.000 | 66.000 | 28.000 | 36.000 |
| **5.300** | 6.000 | 66.000 | 28.000 | 36.000 |
| **5.400** | 6.000 | 66.000 | 28.000 | 36.000 |
| **5.500** | 6.000 | 66.000 | 28.000 | 36.000 |
| **5.550** | 6.000 | 66.000 | 28.000 | 36.000 |
| **5.560** | 6.000 | 66.000 | 28.000 | 36.000 |
| **5.600** | 6.000 | 66.000 | 28.000 | 36.000 |
| **5.700** | 6.000 | 66.000 | 28.000 | 36.000 |
| **5.800** | 6.000 | 66.000 | 28.000 | 36.000 |
| **5.900** | 6.000 | 66.000 | 28.000 | 36.000 |
| **5.950** | 6.000 | 66.000 | 28.000 | 36.000 |
| **6.000** | 6.000 | 66.000 | 28.000 | 36.000 |
| **6.100** | 8.000 | 79.000 | 34.000 | 36.000 |
| **6.200** | 8.000 | 79.000 | 34.000 | 36.000 |
| **6.300** | 8.000 | 79.000 | 34.000 | 36.000 |
| **6.350** | 8.000 | 79.000 | 34.000 | 36.000 |
| **6.400** | 8.000 | 79.000 | 34.000 | 36.000 |
| **6.500** | 8.000 | 79.000 | 34.000 | 36.000 |

| d1 mm | d2 mm | l1 mm | l2 mm | l3 mm |
|---|---|---|---|---|
| **6.600** | 8.000 | 79.000 | 34.000 | 36.000 |
| **6.700** | 8.000 | 79.000 | 34.000 | 36.000 |
| **6.750** | 8.000 | 79.000 | 34.000 | 36.000 |
| **6.800** | 8.000 | 79.000 | 34.000 | 36.000 |
| **6.900** | 8.000 | 79.000 | 34.000 | 36.000 |
| **7.000** | 8.000 | 79.000 | 34.000 | 36.000 |
| **7.100** | 8.000 | 79.000 | 41.000 | 36.000 |
| **7.140** | 8.000 | 79.000 | 41.000 | 36.000 |
| **7.200** | 8.000 | 79.000 | 41.000 | 36.000 |
| **7.300** | 8.000 | 79.000 | 41.000 | 36.000 |
| **7.400** | 8.000 | 79.000 | 41.000 | 36.000 |
| **7.500** | 8.000 | 79.000 | 41.000 | 36.000 |
| **7.540** | 8.000 | 79.000 | 41.000 | 36.000 |
| **7.600** | 8.000 | 79.000 | 41.000 | 36.000 |
| **7.700** | 8.000 | 79.000 | 41.000 | 36.000 |
| **7.800** | 8.000 | 79.000 | 41.000 | 36.000 |
| **7.900** | 8.000 | 79.000 | 41.000 | 36.000 |
| **7.940** | 8.000 | 79.000 | 41.000 | 36.000 |
| **8.000** | 8.000 | 79.000 | 41.000 | 36.000 |
| **8.100** | 10.000 | 89.000 | 47.000 | 40.000 |
| **8.200** | 10.000 | 89.000 | 47.000 | 40.000 |
| **8.300** | 10.000 | 89.000 | 47.000 | 40.000 |
| **8.330** | 10.000 | 89.000 | 47.000 | 40.000 |
| **8.400** | 10.000 | 89.000 | 47.000 | 40.000 |
| **8.500** | 10.000 | 89.000 | 47.000 | 40.000 |
| **8.600** | 10.000 | 89.000 | 47.000 | 40.000 |
| **8.700** | 10.000 | 89.000 | 47.000 | 40.000 |
| **8.730** | 10.000 | 89.000 | 47.000 | 40.000 |
| **8.800** | 10.000 | 89.000 | 47.000 | 40.000 |
| **8.900** | 10.000 | 89.000 | 47.000 | 40.000 |
| **9.000** | 10.000 | 89.000 | 47.000 | 40.000 |
| **9.100** | 10.000 | 89.000 | 47.000 | 40.000 |
| **9.130** | 10.000 | 89.000 | 47.000 | 40.000 |
| **9.200** | 10.000 | 89.000 | 47.000 | 40.000 |
| **9.250** | 10.000 | 89.000 | 47.000 | 40.000 |
| **9.300** | 10.000 | 89.000 | 47.000 | 40.000 |
| **9.400** | 10.000 | 89.000 | 47.000 | 40.000 |
| **9.500** | 10.000 | 89.000 | 47.000 | 40.000 |
| **9.520** | 10.000 | 89.000 | 47.000 | 40.000 |
| **9.600** | 10.000 | 89.000 | 47.000 | 40.000 |
| **9.700** | 10.000 | 89.000 | 47.000 | 40.000 |
| **9.800** | 10.000 | 89.000 | 47.000 | 40.000 |
| **9.900** | 10.000 | 89.000 | 47.000 | 40.000 |
| **9.920** | 10.000 | 89.000 | 47.000 | 40.000 |
| **10.000** | 10.000 | 89.000 | 47.000 | 40.000 |
| **10.100** | 12.000 | 102.000 | 55.000 | 45.000 |
| **10.200** | 12.000 | 102.000 | 55.000 | 45.000 |
| **10.300** | 12.000 | 102.000 | 55.000 | 45.000 |

| **d1** | d2 | l1 | l2 | l3 |
|---|---|---|---|---|
| **mm** | mm | mm | mm | mm |
| **10.320** | 12.000 | 102.000 | 55.000 | 45.000 |
| **10.400** | 12.000 | 102.000 | 55.000 | 45.000 |
| **10.500** | 12.000 | 102.000 | 55.000 | 45.000 |
| **10.600** | 12.000 | 102.000 | 55.000 | 45.000 |
| **10.700** | 12.000 | 102.000 | 55.000 | 45.000 |
| **10.800** | 12.000 | 102.000 | 55.000 | 45.000 |
| **10.900** | 12.000 | 102.000 | 55.000 | 45.000 |
| **11.000** | 12.000 | 102.000 | 55.000 | 45.000 |
| **11.100** | 12.000 | 102.000 | 55.000 | 45.000 |
| **11.110** | 12.000 | 102.000 | 55.000 | 45.000 |
| **11.200** | 12.000 | 102.000 | 55.000 | 45.000 |
| **11.300** | 12.000 | 102.000 | 55.000 | 45.000 |
| **11.400** | 12.000 | 102.000 | 55.000 | 45.000 |
| **11.500** | 12.000 | 102.000 | 55.000 | 45.000 |
| **11.600** | 12.000 | 102.000 | 55.000 | 45.000 |
| **11.700** | 12.000 | 102.000 | 55.000 | 45.000 |
| **11.800** | 12.000 | 102.000 | 55.000 | 45.000 |
| **11.900** | 12.000 | 102.000 | 55.000 | 45.000 |
| **11.910** | 12.000 | 102.000 | 55.000 | 45.000 |
| **12.000** | 12.000 | 102.000 | 55.000 | 45.000 |
| **12.200** | 14.000 | 107.000 | 60.000 | 45.000 |
| **12.500** | 14.000 | 107.000 | 60.000 | 45.000 |
| **12.700** | 14.000 | 107.000 | 60.000 | 45.000 |
| **12.800** | 14.000 | 107.000 | 60.000 | 45.000 |
| **13.000** | 14.000 | 107.000 | 60.000 | 45.000 |
| **13.300** | 14.000 | 107.000 | 60.000 | 45.000 |
| **13.500** | 14.000 | 107.000 | 60.000 | 45.000 |
| **13.700** | 14.000 | 107.000 | 60.000 | 45.000 |
| **14.000** | 14.000 | 107.000 | 60.000 | 45.000 |
| **14.200** | 16.000 | 115.000 | 65.000 | 48.000 |

| **d1** | d2 | l1 | l2 | l3 |
|---|---|---|---|---|
| **mm** | mm | mm | mm | mm |
| **14.290** | 16.000 | 115.000 | 65.000 | 48.000 |
| **14.300** | 16.000 | 115.000 | 65.000 | 48.000 |
| **14.500** | 16.000 | 115.000 | 65.000 | 48.000 |
| **14.700** | 16.000 | 115.000 | 65.000 | 48.000 |
| **15.000** | 16.000 | 115.000 | 65.000 | 48.000 |
| **15.200** | 16.000 | 115.000 | 65.000 | 48.000 |
| **15.300** | 16.000 | 115.000 | 65.000 | 48.000 |
| **15.500** | 16.000 | 115.000 | 65.000 | 48.000 |
| **15.700** | 16.000 | 115.000 | 65.000 | 48.000 |
| **16.000** | 16.000 | 115.000 | 65.000 | 48.000 |
| **16.300** | 18.000 | 123.000 | 73.000 | 48.000 |
| **16.500** | 18.000 | 123.000 | 73.000 | 48.000 |
| **16.900** | 18.000 | 123.000 | 73.000 | 48.000 |
| **17.000** | 18.000 | 123.000 | 73.000 | 48.000 |
| **17.300** | 18.000 | 123.000 | 73.000 | 48.000 |
| **17.500** | 18.000 | 123.000 | 73.000 | 48.000 |
| **18.000** | 18.000 | 123.000 | 73.000 | 48.000 |
| **18.500** | 20.000 | 131.000 | 79.000 | 50.000 |
| **18.900** | 20.000 | 131.000 | 79.000 | 50.000 |
| **19.000** | 20.000 | 131.000 | 79.000 | 50.000 |
| **19.050** | 20.000 | 131.000 | 79.000 | 50.000 |
| **19.300** | 20.000 | 131.000 | 79.000 | 50.000 |
| **19.500** | 20.000 | 131.000 | 79.000 | 50.000 |
| **20.000** | 20.000 | 131.000 | 79.000 | 50.000 |

# SuperV drills

## SuperV drills with internal cooling

**Catalogue no. 51753**

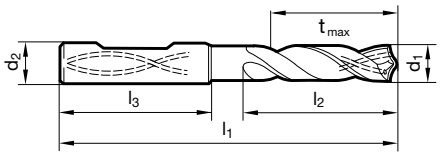
SuperV-S | 3xD | DIN 6537 K | VHM | TiAlSiN | 140° | m7 | R | HE

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ● | | | | ● | ○ |

Application recommendations page 174

- web thinning ≥ Ø 3.000
- relieved cone
- main cutting edge form concave
- very hard coating
- double margin

$t_{max} = l_2 - 1{,}5 \times d_1$




| d1 mm | d2 mm | l1 mm | l2 mm | l3 mm |
|---|---|---|---|---|
| **3.000** | 6.000 | 62.000 | 20.000 | 36.000 |
| **3.100** | 6.000 | 62.000 | 20.000 | 36.000 |
| **3.170** | 6.000 | 62.000 | 20.000 | 36.000 |
| **3.200** | 6.000 | 62.000 | 20.000 | 36.000 |
| **3.250** | 6.000 | 62.000 | 20.000 | 36.000 |
| **3.300** | 6.000 | 62.000 | 20.000 | 36.000 |
| **3.400** | 6.000 | 62.000 | 20.000 | 36.000 |
| **3.500** | 6.000 | 62.000 | 20.000 | 36.000 |
| **3.570** | 6.000 | 62.000 | 20.000 | 36.000 |
| **3.600** | 6.000 | 62.000 | 20.000 | 36.000 |
| **3.700** | 6.000 | 62.000 | 20.000 | 36.000 |
| **3.800** | 6.000 | 66.000 | 24.000 | 36.000 |
| **3.900** | 6.000 | 66.000 | 24.000 | 36.000 |
| **3.970** | 6.000 | 66.000 | 24.000 | 36.000 |
| **4.000** | 6.000 | 66.000 | 24.000 | 36.000 |
| **4.100** | 6.000 | 66.000 | 24.000 | 36.000 |
| **4.200** | 6.000 | 66.000 | 24.000 | 36.000 |
| **4.300** | 6.000 | 66.000 | 24.000 | 36.000 |
| **4.370** | 6.000 | 66.000 | 24.000 | 36.000 |
| **4.400** | 6.000 | 66.000 | 24.000 | 36.000 |
| **4.500** | 6.000 | 66.000 | 24.000 | 36.000 |
| **4.600** | 6.000 | 66.000 | 24.000 | 36.000 |
| **4.650** | 6.000 | 66.000 | 24.000 | 36.000 |
| **4.700** | 6.000 | 66.000 | 24.000 | 36.000 |
| **4.760** | 6.000 | 66.000 | 28.000 | 36.000 |
| **4.800** | 6.000 | 66.000 | 28.000 | 36.000 |
| **4.900** | 6.000 | 66.000 | 28.000 | 36.000 |
| **5.000** | 6.000 | 66.000 | 28.000 | 36.000 |
| **5.100** | 6.000 | 66.000 | 28.000 | 36.000 |
| **5.160** | 6.000 | 66.000 | 28.000 | 36.000 |
| **5.200** | 6.000 | 66.000 | 28.000 | 36.000 |
| **5.300** | 6.000 | 66.000 | 28.000 | 36.000 |
| **5.400** | 6.000 | 66.000 | 28.000 | 36.000 |
| **5.500** | 6.000 | 66.000 | 28.000 | 36.000 |
| **5.550** | 6.000 | 66.000 | 28.000 | 36.000 |
| **5.560** | 6.000 | 66.000 | 28.000 | 36.000 |
| **5.600** | 6.000 | 66.000 | 28.000 | 36.000 |
| **5.700** | 6.000 | 66.000 | 28.000 | 36.000 |
| **5.800** | 6.000 | 66.000 | 28.000 | 36.000 |
| **5.900** | 6.000 | 66.000 | 28.000 | 36.000 |
| **5.950** | 6.000 | 66.000 | 28.000 | 36.000 |
| **6.000** | 6.000 | 66.000 | 28.000 | 36.000 |
| **6.100** | 8.000 | 79.000 | 34.000 | 36.000 |
| **6.200** | 8.000 | 79.000 | 34.000 | 36.000 |
| **6.300** | 8.000 | 79.000 | 34.000 | 36.000 |
| **6.350** | 8.000 | 79.000 | 34.000 | 36.000 |
| **6.400** | 8.000 | 79.000 | 34.000 | 36.000 |
| **6.500** | 8.000 | 79.000 | 34.000 | 36.000 |

| d1 mm | d2 mm | l1 mm | l2 mm | l3 mm |
|---|---|---|---|---|
| **6.600** | 8.000 | 79.000 | 34.000 | 36.000 |
| **6.700** | 8.000 | 79.000 | 34.000 | 36.000 |
| **6.750** | 8.000 | 79.000 | 34.000 | 36.000 |
| **6.800** | 8.000 | 79.000 | 34.000 | 36.000 |
| **6.900** | 8.000 | 79.000 | 34.000 | 36.000 |
| **7.000** | 8.000 | 79.000 | 34.000 | 36.000 |
| **7.100** | 8.000 | 79.000 | 41.000 | 36.000 |
| **7.140** | 8.000 | 79.000 | 41.000 | 36.000 |
| **7.200** | 8.000 | 79.000 | 41.000 | 36.000 |
| **7.300** | 8.000 | 79.000 | 41.000 | 36.000 |
| **7.400** | 8.000 | 79.000 | 41.000 | 36.000 |
| **7.500** | 8.000 | 79.000 | 41.000 | 36.000 |
| **7.540** | 8.000 | 79.000 | 41.000 | 36.000 |
| **7.600** | 8.000 | 79.000 | 41.000 | 36.000 |
| **7.700** | 8.000 | 79.000 | 41.000 | 36.000 |
| **7.800** | 8.000 | 79.000 | 41.000 | 36.000 |
| **7.900** | 8.000 | 79.000 | 41.000 | 36.000 |
| **7.940** | 8.000 | 79.000 | 41.000 | 36.000 |
| **8.000** | 8.000 | 79.000 | 41.000 | 36.000 |
| **8.100** | 10.000 | 89.000 | 47.000 | 40.000 |
| **8.200** | 10.000 | 89.000 | 47.000 | 40.000 |
| **8.300** | 10.000 | 89.000 | 47.000 | 40.000 |
| **8.330** | 10.000 | 89.000 | 47.000 | 40.000 |
| **8.400** | 10.000 | 89.000 | 47.000 | 40.000 |
| **8.500** | 10.000 | 89.000 | 47.000 | 40.000 |
| **8.600** | 10.000 | 89.000 | 47.000 | 40.000 |
| **8.700** | 10.000 | 89.000 | 47.000 | 40.000 |
| **8.730** | 10.000 | 89.000 | 47.000 | 40.000 |
| **8.800** | 10.000 | 89.000 | 47.000 | 40.000 |
| **8.900** | 10.000 | 89.000 | 47.000 | 40.000 |
| **9.000** | 10.000 | 89.000 | 47.000 | 40.000 |
| **9.100** | 10.000 | 89.000 | 47.000 | 40.000 |
| **9.130** | 10.000 | 89.000 | 47.000 | 40.000 |
| **9.200** | 10.000 | 89.000 | 47.000 | 40.000 |
| **9.250** | 10.000 | 89.000 | 47.000 | 40.000 |
| **9.300** | 10.000 | 89.000 | 47.000 | 40.000 |
| **9.400** | 10.000 | 89.000 | 47.000 | 40.000 |
| **9.500** | 10.000 | 89.000 | 47.000 | 40.000 |
| **9.520** | 10.000 | 89.000 | 47.000 | 40.000 |
| **9.600** | 10.000 | 89.000 | 47.000 | 40.000 |
| **9.700** | 10.000 | 89.000 | 47.000 | 40.000 |
| **9.800** | 10.000 | 89.000 | 47.000 | 40.000 |
| **9.900** | 10.000 | 89.000 | 47.000 | 40.000 |
| **9.920** | 10.000 | 89.000 | 47.000 | 40.000 |
| **10.000** | 10.000 | 89.000 | 47.000 | 40.000 |
| **10.100** | 12.000 | 102.000 | 55.000 | 45.000 |
| **10.200** | 12.000 | 102.000 | 55.000 | 45.000 |
| **10.300** | 12.000 | 102.000 | 55.000 | 45.000 |

| **d1** | d2 | l1 | l2 | l3 |
|---|---|---|---|---|
| **mm** | mm | mm | mm | mm |
| **10.320** | 12.000 | 102.000 | 55.000 | 45.000 |
| **10.400** | 12.000 | 102.000 | 55.000 | 45.000 |
| **10.500** | 12.000 | 102.000 | 55.000 | 45.000 |
| **10.600** | 12.000 | 102.000 | 55.000 | 45.000 |
| **10.700** | 12.000 | 102.000 | 55.000 | 45.000 |
| **10.800** | 12.000 | 102.000 | 55.000 | 45.000 |
| **10.900** | 12.000 | 102.000 | 55.000 | 45.000 |
| **11.000** | 12.000 | 102.000 | 55.000 | 45.000 |
| **11.100** | 12.000 | 102.000 | 55.000 | 45.000 |
| **11.110** | 12.000 | 102.000 | 55.000 | 45.000 |
| **11.200** | 12.000 | 102.000 | 55.000 | 45.000 |
| **11.300** | 12.000 | 102.000 | 55.000 | 45.000 |
| **11.400** | 12.000 | 102.000 | 55.000 | 45.000 |
| **11.500** | 12.000 | 102.000 | 55.000 | 45.000 |
| **11.600** | 12.000 | 102.000 | 55.000 | 45.000 |
| **11.700** | 12.000 | 102.000 | 55.000 | 45.000 |
| **11.800** | 12.000 | 102.000 | 55.000 | 45.000 |
| **11.900** | 12.000 | 102.000 | 55.000 | 45.000 |
| **11.910** | 12.000 | 102.000 | 55.000 | 45.000 |
| **12.000** | 12.000 | 102.000 | 55.000 | 45.000 |
| **12.200** | 14.000 | 107.000 | 60.000 | 45.000 |
| **12.500** | 14.000 | 107.000 | 60.000 | 45.000 |
| **12.700** | 14.000 | 107.000 | 60.000 | 45.000 |
| **12.800** | 14.000 | 107.000 | 60.000 | 45.000 |
| **13.000** | 14.000 | 107.000 | 60.000 | 45.000 |
| **13.300** | 14.000 | 107.000 | 60.000 | 45.000 |
| **13.500** | 14.000 | 107.000 | 60.000 | 45.000 |
| **13.700** | 14.000 | 107.000 | 60.000 | 45.000 |
| **14.000** | 14.000 | 107.000 | 60.000 | 45.000 |
| **14.200** | 16.000 | 115.000 | 65.000 | 48.000 |
| **14.290** | 16.000 | 115.000 | 65.000 | 48.000 |
| **14.300** | 16.000 | 115.000 | 65.000 | 48.000 |
| **14.500** | 16.000 | 115.000 | 65.000 | 48.000 |
| **14.700** | 16.000 | 115.000 | 65.000 | 48.000 |
| **15.000** | 16.000 | 115.000 | 65.000 | 48.000 |
| **15.200** | 16.000 | 115.000 | 65.000 | 48.000 |
| **15.300** | 16.000 | 115.000 | 65.000 | 48.000 |
| **15.500** | 16.000 | 115.000 | 65.000 | 48.000 |
| **15.700** | 16.000 | 115.000 | 65.000 | 48.000 |
| **16.000** | 16.000 | 115.000 | 65.000 | 48.000 |
| **16.300** | 18.000 | 123.000 | 73.000 | 48.000 |
| **16.500** | 18.000 | 123.000 | 73.000 | 48.000 |
| **16.900** | 18.000 | 123.000 | 73.000 | 48.000 |
| **17.000** | 18.000 | 123.000 | 73.000 | 48.000 |
| **17.300** | 18.000 | 123.000 | 73.000 | 48.000 |
| **17.500** | 18.000 | 123.000 | 73.000 | 48.000 |
| **18.000** | 18.000 | 123.000 | 73.000 | 48.000 |
| **18.500** | 20.000 | 131.000 | 79.000 | 50.000 |
| **18.900** | 20.000 | 131.000 | 79.000 | 50.000 |
| **19.000** | 20.000 | 131.000 | 79.000 | 50.000 |
| **19.050** | 20.000 | 131.000 | 79.000 | 50.000 |
| **19.300** | 20.000 | 131.000 | 79.000 | 50.000 |
| **19.500** | 20.000 | 131.000 | 79.000 | 50.000 |
| **20.000** | 20.000 | 131.000 | 79.000 | 50.000 |

# SuperV drills

## SuperV drills with internal cooling

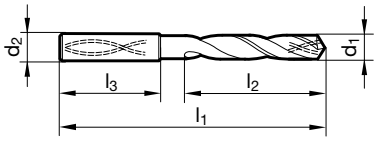
**Catalogue no. 71791**

SuperV- Al | 5xD | DIN 6537L | VHM | bright | 140° | m7 | R | HA

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| | | | ● | | |

Application recommendations page 172

- relieved cone
- main cutting edge is slightly concave
- optimised cutting geometry
- sharp cutting edges




| d1 mm | d2 mm | l1 mm | l2 mm | l3 mm |
|---|---|---|---|---|
| **3.000** | 6.000 | 66.000 | 28.000 | 36.000 |
| **3.100** | 6.000 | 66.000 | 28.000 | 36.000 |
| **3.170** | 6.000 | 66.000 | 28.000 | 36.000 |
| **3.200** | 6.000 | 66.000 | 28.000 | 36.000 |
| **3.250** | 6.000 | 66.000 | 28.000 | 36.000 |
| **3.300** | 6.000 | 66.000 | 28.000 | 36.000 |
| **3.400** | 6.000 | 66.000 | 28.000 | 36.000 |
| **3.500** | 6.000 | 66.000 | 28.000 | 36.000 |
| **3.570** | 6.000 | 66.000 | 28.000 | 36.000 |
| **3.600** | 6.000 | 66.000 | 28.000 | 36.000 |
| **3.700** | 6.000 | 66.000 | 28.000 | 36.000 |
| **3.800** | 6.000 | 74.000 | 36.000 | 36.000 |
| **3.900** | 6.000 | 74.000 | 36.000 | 36.000 |
| **3.970** | 6.000 | 74.000 | 36.000 | 36.000 |
| **4.000** | 6.000 | 74.000 | 36.000 | 36.000 |
| **4.100** | 6.000 | 74.000 | 36.000 | 36.000 |
| **4.200** | 6.000 | 74.000 | 36.000 | 36.000 |
| **4.300** | 6.000 | 74.000 | 36.000 | 36.000 |
| **4.370** | 6.000 | 74.000 | 36.000 | 36.000 |
| **4.400** | 6.000 | 74.000 | 36.000 | 36.000 |
| **4.500** | 6.000 | 74.000 | 36.000 | 36.000 |
| **4.600** | 6.000 | 74.000 | 36.000 | 36.000 |
| **4.650** | 6.000 | 74.000 | 36.000 | 36.000 |
| **4.700** | 6.000 | 74.000 | 36.000 | 36.000 |
| **4.760** | 6.000 | 82.000 | 44.000 | 36.000 |
| **4.800** | 6.000 | 82.000 | 44.000 | 36.000 |
| **4.900** | 6.000 | 82.000 | 44.000 | 36.000 |
| **5.000** | 6.000 | 82.000 | 44.000 | 36.000 |
| **5.100** | 6.000 | 82.000 | 44.000 | 36.000 |
| **5.160** | 6.000 | 82.000 | 44.000 | 36.000 |
| **5.200** | 6.000 | 82.000 | 44.000 | 36.000 |
| **5.300** | 6.000 | 82.000 | 44.000 | 36.000 |
| **5.400** | 6.000 | 82.000 | 44.000 | 36.000 |
| **5.500** | 6.000 | 82.000 | 44.000 | 36.000 |
| **5.550** | 6.000 | 82.000 | 44.000 | 36.000 |
| **5.560** | 6.000 | 82.000 | 44.000 | 36.000 |
| **5.600** | 6.000 | 82.000 | 44.000 | 36.000 |
| **5.700** | 6.000 | 82.000 | 44.000 | 36.000 |
| **5.800** | 6.000 | 82.000 | 44.000 | 36.000 |
| **5.900** | 6.000 | 82.000 | 44.000 | 36.000 |
| **5.950** | 6.000 | 82.000 | 44.000 | 36.000 |
| **6.000** | 6.000 | 82.000 | 44.000 | 36.000 |
| **6.100** | 8.000 | 91.000 | 53.000 | 36.000 |
| **6.200** | 8.000 | 91.000 | 53.000 | 36.000 |
| **6.300** | 8.000 | 91.000 | 53.000 | 36.000 |
| **6.350** | 8.000 | 91.000 | 53.000 | 36.000 |
| **6.400** | 8.000 | 91.000 | 53.000 | 36.000 |
| **6.500** | 8.000 | 91.000 | 53.000 | 36.000 |

| d1 mm | d2 mm | l1 mm | l2 mm | l3 mm |
|---|---|---|---|---|
| **6.600** | 8.000 | 91.000 | 53.000 | 36.000 |
| **6.700** | 8.000 | 91.000 | 53.000 | 36.000 |
| **6.750** | 8.000 | 91.000 | 53.000 | 36.000 |
| **6.800** | 8.000 | 91.000 | 53.000 | 36.000 |
| **6.900** | 8.000 | 91.000 | 53.000 | 36.000 |
| **7.000** | 8.000 | 91.000 | 53.000 | 36.000 |
| **7.100** | 8.000 | 91.000 | 53.000 | 36.000 |
| **7.140** | 8.000 | 91.000 | 53.000 | 36.000 |
| **7.200** | 8.000 | 91.000 | 53.000 | 36.000 |
| **7.300** | 8.000 | 91.000 | 53.000 | 36.000 |
| **7.400** | 8.000 | 91.000 | 53.000 | 36.000 |
| **7.500** | 8.000 | 91.000 | 53.000 | 36.000 |
| **7.540** | 8.000 | 91.000 | 53.000 | 36.000 |
| **7.600** | 8.000 | 91.000 | 53.000 | 36.000 |
| **7.700** | 8.000 | 91.000 | 53.000 | 36.000 |
| **7.800** | 8.000 | 91.000 | 53.000 | 36.000 |
| **7.900** | 8.000 | 91.000 | 53.000 | 36.000 |
| **7.940** | 8.000 | 91.000 | 53.000 | 36.000 |
| **8.000** | 8.000 | 91.000 | 53.000 | 36.000 |
| **8.100** | 10.000 | 103.000 | 61.000 | 40.000 |
| **8.200** | 10.000 | 103.000 | 61.000 | 40.000 |
| **8.300** | 10.000 | 103.000 | 61.000 | 40.000 |
| **8.330** | 10.000 | 103.000 | 61.000 | 40.000 |
| **8.400** | 10.000 | 103.000 | 61.000 | 40.000 |
| **8.500** | 10.000 | 103.000 | 61.000 | 40.000 |
| **8.600** | 10.000 | 103.000 | 61.000 | 40.000 |
| **8.700** | 10.000 | 103.000 | 61.000 | 40.000 |
| **8.730** | 10.000 | 103.000 | 61.000 | 40.000 |
| **8.800** | 10.000 | 103.000 | 61.000 | 40.000 |
| **8.900** | 10.000 | 103.000 | 61.000 | 40.000 |
| **9.000** | 10.000 | 103.000 | 61.000 | 40.000 |
| **9.100** | 10.000 | 103.000 | 61.000 | 40.000 |
| **9.130** | 10.000 | 103.000 | 61.000 | 40.000 |
| **9.200** | 10.000 | 103.000 | 61.000 | 40.000 |
| **9.250** | 10.000 | 103.000 | 61.000 | 40.000 |
| **9.300** | 10.000 | 103.000 | 61.000 | 40.000 |
| **9.340** | 10.000 | 103.000 | 61.000 | 40.000 |
| **9.400** | 10.000 | 103.000 | 61.000 | 40.000 |
| **9.500** | 10.000 | 103.000 | 61.000 | 40.000 |
| **9.520** | 10.000 | 103.000 | 61.000 | 40.000 |
| **9.600** | 10.000 | 103.000 | 61.000 | 40.000 |
| **9.700** | 10.000 | 103.000 | 61.000 | 40.000 |
| **9.800** | 10.000 | 103.000 | 61.000 | 40.000 |
| **9.900** | 10.000 | 103.000 | 61.000 | 40.000 |
| **9.920** | 10.000 | 103.000 | 61.000 | 40.000 |
| **10.000** | 10.000 | 103.000 | 61.000 | 40.000 |
| **10.100** | 12.000 | 118.000 | 71.000 | 45.000 |
| **10.200** | 12.000 | 118.000 | 71.000 | 45.000 |

| **d1** | d2 | l1 | l2 | l3 |
|---|---|---|---|---|
| **mm** | mm | mm | mm | mm |
| **10.300** | 12.000 | 118.000 | 71.000 | 45.000 |
| **10.320** | 12.000 | 118.000 | 71.000 | 45.000 |
| **10.400** | 12.000 | 118.000 | 71.000 | 45.000 |
| **10.500** | 12.000 | 118.000 | 71.000 | 45.000 |
| **10.600** | 12.000 | 118.000 | 71.000 | 45.000 |
| **10.700** | 12.000 | 118.000 | 71.000 | 45.000 |
| **10.800** | 12.000 | 118.000 | 71.000 | 45.000 |
| **10.900** | 12.000 | 118.000 | 71.000 | 45.000 |
| **11.000** | 12.000 | 118.000 | 71.000 | 45.000 |
| **11.100** | 12.000 | 118.000 | 71.000 | 45.000 |
| **11.110** | 12.000 | 118.000 | 71.000 | 45.000 |
| **11.200** | 12.000 | 118.000 | 71.000 | 45.000 |
| **11.300** | 12.000 | 118.000 | 71.000 | 45.000 |
| **11.400** | 12.000 | 118.000 | 71.000 | 45.000 |
| **11.500** | 12.000 | 118.000 | 71.000 | 45.000 |
| **11.600** | 12.000 | 118.000 | 71.000 | 45.000 |
| **11.700** | 12.000 | 118.000 | 71.000 | 45.000 |
| **11.800** | 12.000 | 118.000 | 71.000 | 45.000 |
| **11.900** | 12.000 | 118.000 | 71.000 | 45.000 |
| **11.910** | 12.000 | 118.000 | 71.000 | 45.000 |
| **12.000** | 12.000 | 118.000 | 71.000 | 45.000 |
| **12.100** | 14.000 | 124.000 | 77.000 | 45.000 |
| **12.200** | 14.000 | 124.000 | 77.000 | 45.000 |
| **12.500** | 14.000 | 124.000 | 77.000 | 45.000 |
| **12.600** | 14.000 | 124.000 | 77.000 | 45.000 |
| **12.700** | 14.000 | 124.000 | 77.000 | 45.000 |
| **12.800** | 14.000 | 124.000 | 77.000 | 45.000 |
| **12.900** | 14.000 | 124.000 | 77.000 | 45.000 |
| **13.000** | 14.000 | 124.000 | 77.000 | 45.000 |
| **13.100** | 14.000 | 124.000 | 77.000 | 45.000 |
| **13.300** | 14.000 | 124.000 | 77.000 | 45.000 |
| **13.400** | 14.000 | 124.000 | 77.000 | 45.000 |
| **13.500** | 14.000 | 124.000 | 77.000 | 45.000 |
| **13.700** | 14.000 | 124.000 | 77.000 | 45.000 |
| **13.800** | 14.000 | 124.000 | 77.000 | 45.000 |
| **14.000** | 14.000 | 124.000 | 77.000 | 45.000 |

| **d1** | d2 | l1 | l2 | l3 |
|---|---|---|---|---|
| **mm** | mm | mm | mm | mm |
| **14.100** | 16.000 | 133.000 | 83.000 | 48.000 |
| **14.200** | 16.000 | 133.000 | 83.000 | 48.000 |
| **14.290** | 16.000 | 133.000 | 83.000 | 48.000 |
| **14.300** | 16.000 | 133.000 | 83.000 | 48.000 |
| **14.400** | 16.000 | 133.000 | 83.000 | 48.000 |
| **14.500** | 16.000 | 133.000 | 83.000 | 48.000 |
| **14.700** | 16.000 | 133.000 | 83.000 | 48.000 |
| **14.800** | 16.000 | 133.000 | 83.000 | 48.000 |
| **15.000** | 16.000 | 133.000 | 83.000 | 48.000 |
| **15.100** | 16.000 | 133.000 | 83.000 | 48.000 |
| **15.200** | 16.000 | 133.000 | 83.000 | 48.000 |
| **15.300** | 16.000 | 133.000 | 83.000 | 48.000 |
| **15.500** | 16.000 | 133.000 | 83.000 | 48.000 |
| **15.700** | 16.000 | 133.000 | 83.000 | 48.000 |
| **15.800** | 16.000 | 133.000 | 83.000 | 48.000 |
| **16.000** | 16.000 | 133.000 | 83.000 | 48.000 |
| **16.500** | 18.000 | 143.000 | 93.000 | 48.000 |
| **16.700** | 18.000 | 143.000 | 93.000 | 48.000 |
| **16.900** | 18.000 | 143.000 | 93.000 | 48.000 |
| **17.000** | 18.000 | 143.000 | 93.000 | 48.000 |
| **17.500** | 18.000 | 143.000 | 93.000 | 48.000 |
| **17.700** | 18.000 | 143.000 | 93.000 | 48.000 |
| **18.000** | 18.000 | 143.000 | 93.000 | 48.000 |
| **18.500** | 20.000 | 153.000 | 101.000 | 50.000 |
| **18.900** | 20.000 | 153.000 | 101.000 | 50.000 |
| **19.000** | 20.000 | 153.000 | 101.000 | 50.000 |
| **19.050** | 20.000 | 153.000 | 101.000 | 50.000 |
| **19.300** | 20.000 | 153.000 | 101.000 | 50.000 |
| **19.500** | 20.000 | 153.000 | 101.000 | 50.000 |
| **20.000** | 20.000 | 153.000 | 101.000 | 50.000 |

# SuperV drills

## SuperV drills with internal cooling

**Catalogue no. 51681**

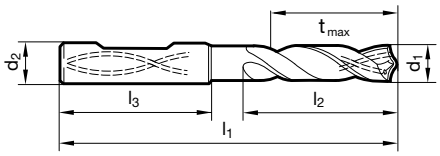
SuperV-IK-U | 5xD | DIN 6537L | VHM | TiAlN nano | 140° | m7 | R | HB

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ● | ○ | ● | ○ | ○ | ○ |

Application recommendations page 172

- facet point grind
- main cutting edge form straight
- optimised cutting geometry

$t_{max} = l_2 - 1{,}5 \times d_1$




| d1 mm | d2 mm | l1 mm | l2 mm | l3 mm |
|---|---|---|---|---|
| **3.000** | 6.000 | 66.000 | 28.000 | 36.000 |
| **3.100** | 6.000 | 66.000 | 28.000 | 36.000 |
| **3.170** | 6.000 | 66.000 | 28.000 | 36.000 |
| **3.200** | 6.000 | 66.000 | 28.000 | 36.000 |
| **3.250** | 6.000 | 66.000 | 28.000 | 36.000 |
| **3.300** | 6.000 | 66.000 | 28.000 | 36.000 |
| **3.400** | 6.000 | 66.000 | 28.000 | 36.000 |
| **3.500** | 6.000 | 66.000 | 28.000 | 36.000 |
| **3.570** | 6.000 | 66.000 | 28.000 | 36.000 |
| **3.600** | 6.000 | 66.000 | 28.000 | 36.000 |
| **3.700** | 6.000 | 66.000 | 28.000 | 36.000 |
| **3.800** | 6.000 | 74.000 | 36.000 | 36.000 |
| **3.900** | 6.000 | 74.000 | 36.000 | 36.000 |
| **3.970** | 6.000 | 74.000 | 36.000 | 36.000 |
| **4.000** | 6.000 | 74.000 | 36.000 | 36.000 |
| **4.100** | 6.000 | 74.000 | 36.000 | 36.000 |
| **4.200** | 6.000 | 74.000 | 36.000 | 36.000 |
| **4.300** | 6.000 | 74.000 | 36.000 | 36.000 |
| **4.370** | 6.000 | 74.000 | 36.000 | 36.000 |
| **4.400** | 6.000 | 74.000 | 36.000 | 36.000 |
| **4.500** | 6.000 | 74.000 | 36.000 | 36.000 |
| **4.600** | 6.000 | 74.000 | 36.000 | 36.000 |
| **4.650** | 6.000 | 74.000 | 36.000 | 36.000 |
| **4.700** | 6.000 | 74.000 | 36.000 | 36.000 |
| **4.760** | 6.000 | 82.000 | 44.000 | 36.000 |
| **4.800** | 6.000 | 82.000 | 44.000 | 36.000 |
| **4.900** | 6.000 | 82.000 | 44.000 | 36.000 |
| **5.000** | 6.000 | 82.000 | 44.000 | 36.000 |
| **5.100** | 6.000 | 82.000 | 44.000 | 36.000 |
| **5.160** | 6.000 | 82.000 | 44.000 | 36.000 |
| **5.200** | 6.000 | 82.000 | 44.000 | 36.000 |
| **5.300** | 6.000 | 82.000 | 44.000 | 36.000 |
| **5.400** | 6.000 | 82.000 | 44.000 | 36.000 |
| **5.500** | 6.000 | 82.000 | 44.000 | 36.000 |
| **5.560** | 6.000 | 82.000 | 44.000 | 36.000 |
| **5.600** | 6.000 | 82.000 | 44.000 | 36.000 |
| **5.700** | 6.000 | 82.000 | 44.000 | 36.000 |
| **5.800** | 6.000 | 82.000 | 44.000 | 36.000 |
| **5.900** | 6.000 | 82.000 | 44.000 | 36.000 |
| **5.950** | 6.000 | 82.000 | 44.000 | 36.000 |
| **6.000** | 6.000 | 82.000 | 44.000 | 36.000 |
| **6.100** | 8.000 | 91.000 | 53.000 | 36.000 |
| **6.200** | 8.000 | 91.000 | 53.000 | 36.000 |
| **6.300** | 8.000 | 91.000 | 53.000 | 36.000 |
| **6.350** | 8.000 | 91.000 | 53.000 | 36.000 |
| **6.400** | 8.000 | 91.000 | 53.000 | 36.000 |
| **6.500** | 8.000 | 91.000 | 53.000 | 36.000 |
| **6.600** | 8.000 | 91.000 | 53.000 | 36.000 |

| d1 mm | d2 mm | l1 mm | l2 mm | l3 mm |
|---|---|---|---|---|
| **6.700** | 8.000 | 91.000 | 53.000 | 36.000 |
| **6.750** | 8.000 | 91.000 | 53.000 | 36.000 |
| **6.800** | 8.000 | 91.000 | 53.000 | 36.000 |
| **6.900** | 8.000 | 91.000 | 53.000 | 36.000 |
| **7.000** | 8.000 | 91.000 | 53.000 | 36.000 |
| **7.100** | 8.000 | 91.000 | 53.000 | 36.000 |
| **7.140** | 8.000 | 91.000 | 53.000 | 36.000 |
| **7.200** | 8.000 | 91.000 | 53.000 | 36.000 |
| **7.300** | 8.000 | 91.000 | 53.000 | 36.000 |
| **7.400** | 8.000 | 91.000 | 53.000 | 36.000 |
| **7.500** | 8.000 | 91.000 | 53.000 | 36.000 |
| **7.540** | 8.000 | 91.000 | 53.000 | 36.000 |
| **7.600** | 8.000 | 91.000 | 53.000 | 36.000 |
| **7.700** | 8.000 | 91.000 | 53.000 | 36.000 |
| **7.800** | 8.000 | 91.000 | 53.000 | 36.000 |
| **7.900** | 8.000 | 91.000 | 53.000 | 36.000 |
| **7.940** | 8.000 | 91.000 | 53.000 | 36.000 |
| **8.000** | 8.000 | 91.000 | 53.000 | 36.000 |
| **8.100** | 10.000 | 103.000 | 61.000 | 40.000 |
| **8.200** | 10.000 | 103.000 | 61.000 | 40.000 |
| **8.300** | 10.000 | 103.000 | 61.000 | 40.000 |
| **8.330** | 10.000 | 103.000 | 61.000 | 40.000 |
| **8.400** | 10.000 | 103.000 | 61.000 | 40.000 |
| **8.500** | 10.000 | 103.000 | 61.000 | 40.000 |
| **8.600** | 10.000 | 103.000 | 61.000 | 40.000 |
| **8.700** | 10.000 | 103.000 | 61.000 | 40.000 |
| **8.730** | 10.000 | 103.000 | 61.000 | 40.000 |
| **8.800** | 10.000 | 103.000 | 61.000 | 40.000 |
| **8.900** | 10.000 | 103.000 | 61.000 | 40.000 |
| **9.000** | 10.000 | 103.000 | 61.000 | 40.000 |
| **9.100** | 10.000 | 103.000 | 61.000 | 40.000 |
| **9.130** | 10.000 | 103.000 | 61.000 | 40.000 |
| **9.200** | 10.000 | 103.000 | 61.000 | 40.000 |
| **9.250** | 10.000 | 103.000 | 61.000 | 40.000 |
| **9.300** | 10.000 | 103.000 | 61.000 | 40.000 |
| **9.400** | 10.000 | 103.000 | 61.000 | 40.000 |
| **9.500** | 10.000 | 103.000 | 61.000 | 40.000 |
| **9.520** | 10.000 | 103.000 | 61.000 | 40.000 |
| **9.600** | 10.000 | 103.000 | 61.000 | 40.000 |
| **9.700** | 10.000 | 103.000 | 61.000 | 40.000 |
| **9.800** | 10.000 | 103.000 | 61.000 | 40.000 |
| **9.900** | 10.000 | 103.000 | 61.000 | 40.000 |
| **9.920** | 10.000 | 103.000 | 61.000 | 40.000 |
| **10.000** | 10.000 | 103.000 | 61.000 | 40.000 |
| **10.100** | 12.000 | 118.000 | 71.000 | 45.000 |
| **10.200** | 12.000 | 118.000 | 71.000 | 45.000 |
| **10.300** | 12.000 | 118.000 | 71.000 | 45.000 |
| **10.320** | 12.000 | 118.000 | 71.000 | 45.000 |

| **d1** | d2 | l1 | l2 | l3 |
|---|---|---|---|---|
| **mm** | mm | mm | mm | mm |
| **10.400** | 12.000 | 118.000 | 71.000 | 45.000 |
| **10.500** | 12.000 | 118.000 | 71.000 | 45.000 |
| **10.600** | 12.000 | 118.000 | 71.000 | 45.000 |
| **10.700** | 12.000 | 118.000 | 71.000 | 45.000 |
| **10.800** | 12.000 | 118.000 | 71.000 | 45.000 |
| **10.900** | 12.000 | 118.000 | 71.000 | 45.000 |
| **11.000** | 12.000 | 118.000 | 71.000 | 45.000 |
| **11.100** | 12.000 | 118.000 | 71.000 | 45.000 |
| **11.110** | 12.000 | 118.000 | 71.000 | 45.000 |
| **11.200** | 12.000 | 118.000 | 71.000 | 45.000 |
| **11.300** | 12.000 | 118.000 | 71.000 | 45.000 |
| **11.400** | 12.000 | 118.000 | 71.000 | 45.000 |
| **11.500** | 12.000 | 118.000 | 71.000 | 45.000 |
| **11.600** | 12.000 | 118.000 | 71.000 | 45.000 |
| **11.700** | 12.000 | 118.000 | 71.000 | 45.000 |
| **11.800** | 12.000 | 118.000 | 71.000 | 45.000 |
| **11.900** | 12.000 | 118.000 | 71.000 | 45.000 |
| **11.910** | 12.000 | 118.000 | 71.000 | 45.000 |
| **12.000** | 12.000 | 118.000 | 71.000 | 45.000 |
| **12.200** | 14.000 | 124.000 | 77.000 | 45.000 |
| **12.500** | 14.000 | 124.000 | 77.000 | 45.000 |
| **12.700** | 14.000 | 124.000 | 77.000 | 45.000 |
| **13.000** | 14.000 | 124.000 | 77.000 | 45.000 |
| **13.500** | 14.000 | 124.000 | 77.000 | 45.000 |

| **d1** | d2 | l1 | l2 | l3 |
|---|---|---|---|---|
| **mm** | mm | mm | mm | mm |
| **13.700** | 14.000 | 124.000 | 77.000 | 45.000 |
| **14.000** | 14.000 | 124.000 | 77.000 | 45.000 |
| **14.200** | 16.000 | 133.000 | 83.000 | 48.000 |
| **14.290** | 16.000 | 133.000 | 83.000 | 48.000 |
| **14.500** | 16.000 | 133.000 | 83.000 | 48.000 |
| **14.700** | 16.000 | 133.000 | 83.000 | 48.000 |
| **15.000** | 16.000 | 133.000 | 83.000 | 48.000 |
| **15.200** | 16.000 | 133.000 | 83.000 | 48.000 |
| **15.500** | 16.000 | 133.000 | 83.000 | 48.000 |
| **15.700** | 16.000 | 133.000 | 83.000 | 48.000 |
| **16.000** | 16.000 | 133.000 | 83.000 | 48.000 |
| **16.500** | 18.000 | 143.000 | 93.000 | 48.000 |
| **17.000** | 18.000 | 143.000 | 93.000 | 48.000 |
| **17.500** | 18.000 | 143.000 | 93.000 | 48.000 |
| **18.000** | 18.000 | 143.000 | 93.000 | 48.000 |
| **18.500** | 20.000 | 153.000 | 101.000 | 50.000 |
| **19.000** | 20.000 | 153.000 | 101.000 | 50.000 |
| **19.050** | 20.000 | 153.000 | 101.000 | 50.000 |
| **19.500** | 20.000 | 153.000 | 101.000 | 50.000 |
| **20.000** | 20.000 | 153.000 | 101.000 | 50.000 |

# SuperV drills

## SuperV drills with internal cooling

**Catalogue no. 51674**

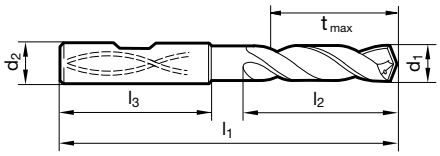
SuperV-VA | 5xD | DIN 6537L | VHM | AlTiN nano | 140° | m7 | R | HB

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| | ● | | | ○ | |

Application recommendations page 172

- facet point grind
- main cutting edge form straight
- optimised cutting geometry
- especially suitable for stainless steels

$t_{max} = l_2 - 1{,}5 \times d_1$




| d1 mm | d2 mm | l1 mm | l2 mm | l3 mm |
|---|---|---|---|---|
| **3.000** | 6.000 | 66.000 | 28.000 | 36.000 |
| **3.100** | 6.000 | 66.000 | 28.000 | 36.000 |
| **3.170** | 6.000 | 66.000 | 28.000 | 36.000 |
| **3.200** | 6.000 | 66.000 | 28.000 | 36.000 |
| **3.250** | 6.000 | 66.000 | 28.000 | 36.000 |
| **3.300** | 6.000 | 66.000 | 28.000 | 36.000 |
| **3.400** | 6.000 | 66.000 | 28.000 | 36.000 |
| **3.500** | 6.000 | 66.000 | 28.000 | 36.000 |
| **3.570** | 6.000 | 66.000 | 28.000 | 36.000 |
| **3.600** | 6.000 | 66.000 | 28.000 | 36.000 |
| **3.700** | 6.000 | 66.000 | 28.000 | 36.000 |
| **3.800** | 6.000 | 74.000 | 36.000 | 36.000 |
| **3.900** | 6.000 | 74.000 | 36.000 | 36.000 |
| **3.970** | 6.000 | 74.000 | 36.000 | 36.000 |
| **4.000** | 6.000 | 74.000 | 36.000 | 36.000 |
| **4.100** | 6.000 | 74.000 | 36.000 | 36.000 |
| **4.200** | 6.000 | 74.000 | 36.000 | 36.000 |
| **4.300** | 6.000 | 74.000 | 36.000 | 36.000 |
| **4.370** | 6.000 | 74.000 | 36.000 | 36.000 |
| **4.400** | 6.000 | 74.000 | 36.000 | 36.000 |
| **4.500** | 6.000 | 74.000 | 36.000 | 36.000 |
| **4.600** | 6.000 | 74.000 | 36.000 | 36.000 |
| **4.650** | 6.000 | 74.000 | 36.000 | 36.000 |
| **4.700** | 6.000 | 74.000 | 36.000 | 36.000 |
| **4.760** | 6.000 | 82.000 | 44.000 | 36.000 |
| **4.800** | 6.000 | 82.000 | 44.000 | 36.000 |
| **4.900** | 6.000 | 82.000 | 44.000 | 36.000 |
| **5.000** | 6.000 | 82.000 | 44.000 | 36.000 |
| **5.100** | 6.000 | 82.000 | 44.000 | 36.000 |
| **5.160** | 6.000 | 82.000 | 44.000 | 36.000 |
| **5.200** | 6.000 | 82.000 | 44.000 | 36.000 |
| **5.300** | 6.000 | 82.000 | 44.000 | 36.000 |
| **5.400** | 6.000 | 82.000 | 44.000 | 36.000 |
| **5.500** | 6.000 | 82.000 | 44.000 | 36.000 |
| **5.550** | 6.000 | 82.000 | 44.000 | 36.000 |
| **5.560** | 6.000 | 82.000 | 44.000 | 36.000 |
| **5.600** | 6.000 | 82.000 | 44.000 | 36.000 |
| **5.700** | 6.000 | 82.000 | 44.000 | 36.000 |
| **5.800** | 6.000 | 82.000 | 44.000 | 36.000 |
| **5.900** | 6.000 | 82.000 | 44.000 | 36.000 |
| **5.950** | 6.000 | 82.000 | 44.000 | 36.000 |
| **6.000** | 6.000 | 82.000 | 44.000 | 36.000 |
| **6.100** | 8.000 | 91.000 | 53.000 | 36.000 |
| **6.200** | 8.000 | 91.000 | 53.000 | 36.000 |
| **6.300** | 8.000 | 91.000 | 53.000 | 36.000 |
| **6.350** | 8.000 | 91.000 | 53.000 | 36.000 |
| **6.400** | 8.000 | 91.000 | 53.000 | 36.000 |
| **6.500** | 8.000 | 91.000 | 53.000 | 36.000 |

| d1 mm | d2 mm | l1 mm | l2 mm | l3 mm |
|---|---|---|---|---|
| **6.600** | 8.000 | 91.000 | 53.000 | 36.000 |
| **6.700** | 8.000 | 91.000 | 53.000 | 36.000 |
| **6.750** | 8.000 | 91.000 | 53.000 | 36.000 |
| **6.800** | 8.000 | 91.000 | 53.000 | 36.000 |
| **6.900** | 8.000 | 91.000 | 53.000 | 36.000 |
| **7.000** | 8.000 | 91.000 | 53.000 | 36.000 |
| **7.100** | 8.000 | 91.000 | 53.000 | 36.000 |
| **7.140** | 8.000 | 91.000 | 53.000 | 36.000 |
| **7.200** | 8.000 | 91.000 | 53.000 | 36.000 |
| **7.300** | 8.000 | 91.000 | 53.000 | 36.000 |
| **7.400** | 8.000 | 91.000 | 53.000 | 36.000 |
| **7.500** | 8.000 | 91.000 | 53.000 | 36.000 |
| **7.540** | 8.000 | 91.000 | 53.000 | 36.000 |
| **7.600** | 8.000 | 91.000 | 53.000 | 36.000 |
| **7.700** | 8.000 | 91.000 | 53.000 | 36.000 |
| **7.800** | 8.000 | 91.000 | 53.000 | 36.000 |
| **7.900** | 8.000 | 91.000 | 53.000 | 36.000 |
| **7.940** | 8.000 | 91.000 | 53.000 | 36.000 |
| **8.000** | 8.000 | 91.000 | 53.000 | 36.000 |
| **8.100** | 10.000 | 103.000 | 61.000 | 40.000 |
| **8.200** | 10.000 | 103.000 | 61.000 | 40.000 |
| **8.300** | 10.000 | 103.000 | 61.000 | 40.000 |
| **8.330** | 10.000 | 103.000 | 61.000 | 40.000 |
| **8.400** | 10.000 | 103.000 | 61.000 | 40.000 |
| **8.500** | 10.000 | 103.000 | 61.000 | 40.000 |
| **8.600** | 10.000 | 103.000 | 61.000 | 40.000 |
| **8.700** | 10.000 | 103.000 | 61.000 | 40.000 |
| **8.730** | 10.000 | 103.000 | 61.000 | 40.000 |
| **8.800** | 10.000 | 103.000 | 61.000 | 40.000 |
| **8.900** | 10.000 | 103.000 | 61.000 | 40.000 |
| **9.000** | 10.000 | 103.000 | 61.000 | 40.000 |
| **9.100** | 10.000 | 103.000 | 61.000 | 40.000 |
| **9.130** | 10.000 | 103.000 | 61.000 | 40.000 |
| **9.200** | 10.000 | 103.000 | 61.000 | 40.000 |
| **9.250** | 10.000 | 103.000 | 61.000 | 40.000 |
| **9.300** | 10.000 | 103.000 | 61.000 | 40.000 |
| **9.400** | 10.000 | 103.000 | 61.000 | 40.000 |
| **9.500** | 10.000 | 103.000 | 61.000 | 40.000 |
| **9.520** | 10.000 | 103.000 | 61.000 | 40.000 |
| **9.600** | 10.000 | 103.000 | 61.000 | 40.000 |
| **9.700** | 10.000 | 103.000 | 61.000 | 40.000 |
| **9.800** | 10.000 | 103.000 | 61.000 | 40.000 |
| **9.900** | 10.000 | 103.000 | 61.000 | 40.000 |
| **9.920** | 10.000 | 103.000 | 61.000 | 40.000 |
| **10.000** | 10.000 | 103.000 | 61.000 | 40.000 |
| **10.100** | 12.000 | 118.000 | 71.000 | 45.000 |
| **10.200** | 12.000 | 118.000 | 71.000 | 45.000 |
| **10.300** | 12.000 | 118.000 | 71.000 | 45.000 |

| **d1** | d2 | l1 | l2 | l3 |
|---|---|---|---|---|
| **mm** | mm | mm | mm | mm |
| **10.320** | 12.000 | 118.000 | 71.000 | 45.000 |
| **10.400** | 12.000 | 118.000 | 71.000 | 45.000 |
| **10.500** | 12.000 | 118.000 | 71.000 | 45.000 |
| **10.600** | 12.000 | 118.000 | 71.000 | 45.000 |
| **10.700** | 12.000 | 118.000 | 71.000 | 45.000 |
| **10.800** | 12.000 | 118.000 | 71.000 | 45.000 |
| **10.900** | 12.000 | 118.000 | 71.000 | 45.000 |
| **11.000** | 12.000 | 118.000 | 71.000 | 45.000 |
| **11.100** | 12.000 | 118.000 | 71.000 | 45.000 |
| **11.110** | 12.000 | 118.000 | 71.000 | 45.000 |
| **11.200** | 12.000 | 118.000 | 71.000 | 45.000 |
| **11.300** | 12.000 | 118.000 | 71.000 | 45.000 |
| **11.400** | 12.000 | 118.000 | 71.000 | 45.000 |
| **11.500** | 12.000 | 118.000 | 71.000 | 45.000 |
| **11.600** | 12.000 | 118.000 | 71.000 | 45.000 |
| **11.700** | 12.000 | 118.000 | 71.000 | 45.000 |
| **11.800** | 12.000 | 118.000 | 71.000 | 45.000 |
| **11.900** | 12.000 | 118.000 | 71.000 | 45.000 |
| **11.910** | 12.000 | 118.000 | 71.000 | 45.000 |
| **12.000** | 12.000 | 118.000 | 71.000 | 45.000 |
| **12.200** | 14.000 | 124.000 | 77.000 | 45.000 |
| **12.500** | 14.000 | 124.000 | 77.000 | 45.000 |
| **12.700** | 14.000 | 124.000 | 77.000 | 45.000 |
| **13.000** | 14.000 | 124.000 | 77.000 | 45.000 |

| **d1** | d2 | l1 | l2 | l3 |
|---|---|---|---|---|
| **mm** | mm | mm | mm | mm |
| **13.500** | 14.000 | 124.000 | 77.000 | 45.000 |
| **13.700** | 14.000 | 124.000 | 77.000 | 45.000 |
| **14.000** | 14.000 | 124.000 | 77.000 | 45.000 |
| **14.200** | 16.000 | 133.000 | 83.000 | 48.000 |
| **14.290** | 16.000 | 133.000 | 83.000 | 48.000 |
| **14.500** | 16.000 | 133.000 | 83.000 | 48.000 |
| **14.700** | 16.000 | 133.000 | 83.000 | 48.000 |
| **15.000** | 16.000 | 133.000 | 83.000 | 48.000 |
| **15.200** | 16.000 | 133.000 | 83.000 | 48.000 |
| **15.500** | 16.000 | 133.000 | 83.000 | 48.000 |
| **15.700** | 16.000 | 133.000 | 83.000 | 48.000 |
| **16.000** | 16.000 | 133.000 | 83.000 | 48.000 |
| **16.500** | 18.000 | 143.000 | 93.000 | 48.000 |
| **17.000** | 18.000 | 143.000 | 93.000 | 48.000 |
| **17.500** | 18.000 | 143.000 | 93.000 | 48.000 |
| **18.000** | 18.000 | 143.000 | 93.000 | 48.000 |
| **18.500** | 20.000 | 153.000 | 101.000 | 50.000 |
| **19.000** | 20.000 | 153.000 | 101.000 | 50.000 |
| **19.500** | 20.000 | 153.000 | 101.000 | 50.000 |
| **20.000** | 20.000 | 153.000 | 101.000 | 50.000 |

# SuperV drills

## SuperV drills with internal cooling

**Catalogue no. 51786**

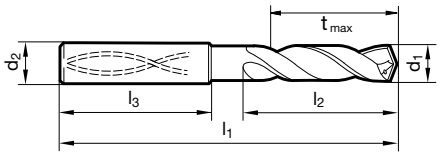
SuperV-X | 5xD | DIN 6537L | VHM | TiAlN nano | 140° | m7 | R | HA

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ● | ○ | ○ | | ○ | ○ |

Application recommendations page 176

- relieved cone
- main cutting edge form concave
- optimised cutting geometry
- double margin

$t_{max} = l_2 - 1{,}5 \times d_1$




| d1 mm | d2 mm | l1 mm | l2 mm | l3 mm |
|---|---|---|---|---|
| **3.000** | 6.000 | 66.000 | 28.000 | 36.000 |
| **3.100** | 6.000 | 66.000 | 28.000 | 36.000 |
| **3.170** | 6.000 | 66.000 | 28.000 | 36.000 |
| **3.200** | 6.000 | 66.000 | 28.000 | 36.000 |
| **3.250** | 6.000 | 66.000 | 28.000 | 36.000 |
| **3.300** | 6.000 | 66.000 | 28.000 | 36.000 |
| **3.400** | 6.000 | 66.000 | 28.000 | 36.000 |
| **3.500** | 6.000 | 66.000 | 28.000 | 36.000 |
| **3.570** | 6.000 | 66.000 | 28.000 | 36.000 |
| **3.600** | 6.000 | 66.000 | 28.000 | 36.000 |
| **3.700** | 6.000 | 66.000 | 28.000 | 36.000 |
| **3.800** | 6.000 | 74.000 | 36.000 | 36.000 |
| **3.900** | 6.000 | 74.000 | 36.000 | 36.000 |
| **3.970** | 6.000 | 74.000 | 36.000 | 36.000 |
| **4.000** | 6.000 | 74.000 | 36.000 | 36.000 |
| **4.040** | 6.000 | 74.000 | 36.000 | 36.000 |
| **4.100** | 6.000 | 74.000 | 36.000 | 36.000 |
| **4.200** | 6.000 | 74.000 | 36.000 | 36.000 |
| **4.300** | 6.000 | 74.000 | 36.000 | 36.000 |
| **4.370** | 6.000 | 74.000 | 36.000 | 36.000 |
| **4.400** | 6.000 | 74.000 | 36.000 | 36.000 |
| **4.500** | 6.000 | 74.000 | 36.000 | 36.000 |
| **4.600** | 6.000 | 74.000 | 36.000 | 36.000 |
| **4.650** | 6.000 | 74.000 | 36.000 | 36.000 |
| **4.700** | 6.000 | 74.000 | 36.000 | 36.000 |
| **4.760** | 6.000 | 82.000 | 44.000 | 36.000 |
| **4.800** | 6.000 | 82.000 | 44.000 | 36.000 |
| **4.900** | 6.000 | 82.000 | 44.000 | 36.000 |
| **5.000** | 6.000 | 82.000 | 44.000 | 36.000 |
| **5.100** | 6.000 | 82.000 | 44.000 | 36.000 |
| **5.110** | 6.000 | 82.000 | 44.000 | 36.000 |
| **5.160** | 6.000 | 82.000 | 44.000 | 36.000 |
| **5.200** | 6.000 | 82.000 | 44.000 | 36.000 |
| **5.300** | 6.000 | 82.000 | 44.000 | 36.000 |
| **5.400** | 6.000 | 82.000 | 44.000 | 36.000 |
| **5.410** | 6.000 | 82.000 | 44.000 | 36.000 |
| **5.500** | 6.000 | 82.000 | 44.000 | 36.000 |
| **5.550** | 6.000 | 82.000 | 44.000 | 36.000 |
| **5.560** | 6.000 | 82.000 | 44.000 | 36.000 |
| **5.600** | 6.000 | 82.000 | 44.000 | 36.000 |
| **5.700** | 6.000 | 82.000 | 44.000 | 36.000 |
| **5.800** | 6.000 | 82.000 | 44.000 | 36.000 |
| **5.900** | 6.000 | 82.000 | 44.000 | 36.000 |
| **5.950** | 6.000 | 82.000 | 44.000 | 36.000 |
| **6.000** | 6.000 | 82.000 | 44.000 | 36.000 |
| **6.100** | 8.000 | 91.000 | 53.000 | 36.000 |
| **6.200** | 8.000 | 91.000 | 53.000 | 36.000 |
| **6.300** | 8.000 | 91.000 | 53.000 | 36.000 |

| d1 mm | d2 mm | l1 mm | l2 mm | l3 mm |
|---|---|---|---|---|
| **6.350** | 8.000 | 91.000 | 53.000 | 36.000 |
| **6.400** | 8.000 | 91.000 | 53.000 | 36.000 |
| **6.500** | 8.000 | 91.000 | 53.000 | 36.000 |
| **6.530** | 8.000 | 91.000 | 53.000 | 36.000 |
| **6.550** | 8.000 | 91.000 | 53.000 | 36.000 |
| **6.600** | 8.000 | 91.000 | 53.000 | 36.000 |
| **6.700** | 8.000 | 91.000 | 53.000 | 36.000 |
| **6.750** | 8.000 | 91.000 | 53.000 | 36.000 |
| **6.800** | 8.000 | 91.000 | 53.000 | 36.000 |
| **6.900** | 8.000 | 91.000 | 53.000 | 36.000 |
| **7.000** | 8.000 | 91.000 | 53.000 | 36.000 |
| **7.100** | 8.000 | 91.000 | 53.000 | 36.000 |
| **7.140** | 8.000 | 91.000 | 53.000 | 36.000 |
| **7.200** | 8.000 | 91.000 | 53.000 | 36.000 |
| **7.300** | 8.000 | 91.000 | 53.000 | 36.000 |
| **7.400** | 8.000 | 91.000 | 53.000 | 36.000 |
| **7.500** | 8.000 | 91.000 | 53.000 | 36.000 |
| **7.540** | 8.000 | 91.000 | 53.000 | 36.000 |
| **7.550** | 8.000 | 91.000 | 53.000 | 36.000 |
| **7.600** | 8.000 | 91.000 | 53.000 | 36.000 |
| **7.650** | 8.000 | 91.000 | 53.000 | 36.000 |
| **7.700** | 8.000 | 91.000 | 53.000 | 36.000 |
| **7.800** | 8.000 | 91.000 | 53.000 | 36.000 |
| **7.900** | 8.000 | 91.000 | 53.000 | 36.000 |
| **7.940** | 8.000 | 91.000 | 53.000 | 36.000 |
| **8.000** | 8.000 | 91.000 | 53.000 | 36.000 |
| **8.100** | 10.000 | 103.000 | 61.000 | 40.000 |
| **8.200** | 10.000 | 103.000 | 61.000 | 40.000 |
| **8.300** | 10.000 | 103.000 | 61.000 | 40.000 |
| **8.330** | 10.000 | 103.000 | 61.000 | 40.000 |
| **8.400** | 10.000 | 103.000 | 61.000 | 40.000 |
| **8.500** | 10.000 | 103.000 | 61.000 | 40.000 |
| **8.600** | 10.000 | 103.000 | 61.000 | 40.000 |
| **8.700** | 10.000 | 103.000 | 61.000 | 40.000 |
| **8.730** | 10.000 | 103.000 | 61.000 | 40.000 |
| **8.800** | 10.000 | 103.000 | 61.000 | 40.000 |
| **8.900** | 10.000 | 103.000 | 61.000 | 40.000 |
| **9.000** | 10.000 | 103.000 | 61.000 | 40.000 |
| **9.100** | 10.000 | 103.000 | 61.000 | 40.000 |
| **9.130** | 10.000 | 103.000 | 61.000 | 40.000 |
| **9.200** | 10.000 | 103.000 | 61.000 | 40.000 |
| **9.250** | 10.000 | 103.000 | 61.000 | 40.000 |
| **9.300** | 10.000 | 103.000 | 61.000 | 40.000 |
| **9.340** | 10.000 | 103.000 | 61.000 | 40.000 |
| **9.400** | 10.000 | 103.000 | 61.000 | 40.000 |
| **9.500** | 10.000 | 103.000 | 61.000 | 40.000 |
| **9.520** | 10.000 | 103.000 | 61.000 | 40.000 |
| **9.550** | 10.000 | 103.000 | 61.000 | 40.000 |

| d1 | d2 | l1 | l2 | l3 |
|---|---|---|---|---|
| mm | mm | mm | mm | mm |
| **9.600** | 10.000 | 103.000 | 61.000 | 40.000 |
| **9.700** | 10.000 | 103.000 | 61.000 | 40.000 |
| **9.800** | 10.000 | 103.000 | 61.000 | 40.000 |
| **9.900** | 10.000 | 103.000 | 61.000 | 40.000 |
| **9.920** | 10.000 | 103.000 | 61.000 | 40.000 |
| **10.000** | 10.000 | 103.000 | 61.000 | 40.000 |
| **10.100** | 12.000 | 118.000 | 71.000 | 45.000 |
| **10.200** | 12.000 | 118.000 | 71.000 | 45.000 |
| **10.300** | 12.000 | 118.000 | 71.000 | 45.000 |
| **10.320** | 12.000 | 118.000 | 71.000 | 45.000 |
| **10.400** | 12.000 | 118.000 | 71.000 | 45.000 |
| **10.500** | 12.000 | 118.000 | 71.000 | 45.000 |
| **10.600** | 12.000 | 118.000 | 71.000 | 45.000 |
| **10.700** | 12.000 | 118.000 | 71.000 | 45.000 |
| **10.720** | 12.000 | 118.000 | 71.000 | 45.000 |
| **10.800** | 12.000 | 118.000 | 71.000 | 45.000 |
| **10.900** | 12.000 | 118.000 | 71.000 | 45.000 |
| **11.000** | 12.000 | 118.000 | 71.000 | 45.000 |
| **11.100** | 12.000 | 118.000 | 71.000 | 45.000 |
| **11.110** | 12.000 | 118.000 | 71.000 | 45.000 |
| **11.200** | 12.000 | 118.000 | 71.000 | 45.000 |
| **11.300** | 12.000 | 118.000 | 71.000 | 45.000 |
| **11.400** | 12.000 | 118.000 | 71.000 | 45.000 |
| **11.500** | 12.000 | 118.000 | 71.000 | 45.000 |
| **11.510** | 12.000 | 118.000 | 71.000 | 45.000 |
| **11.550** | 12.000 | 118.000 | 71.000 | 45.000 |
| **11.600** | 12.000 | 118.000 | 71.000 | 45.000 |
| **11.700** | 12.000 | 118.000 | 71.000 | 45.000 |
| **11.800** | 12.000 | 118.000 | 71.000 | 45.000 |
| **11.900** | 12.000 | 118.000 | 71.000 | 45.000 |
| **11.910** | 12.000 | 118.000 | 71.000 | 45.000 |
| **12.000** | 12.000 | 118.000 | 71.000 | 45.000 |
| **12.100** | 14.000 | 124.000 | 77.000 | 45.000 |
| **12.200** | 14.000 | 124.000 | 77.000 | 45.000 |
| **12.300** | 14.000 | 124.000 | 77.000 | 45.000 |
| **12.400** | 14.000 | 124.000 | 77.000 | 45.000 |
| **12.500** | 14.000 | 124.000 | 77.000 | 45.000 |
| **12.600** | 14.000 | 124.000 | 77.000 | 45.000 |
| **12.700** | 14.000 | 124.000 | 77.000 | 45.000 |
| **12.800** | 14.000 | 124.000 | 77.000 | 45.000 |
| **12.900** | 14.000 | 124.000 | 77.000 | 45.000 |
| **13.000** | 14.000 | 124.000 | 77.000 | 45.000 |
| **13.100** | 14.000 | 124.000 | 77.000 | 45.000 |
| **13.200** | 14.000 | 124.000 | 77.000 | 45.000 |
| **13.300** | 14.000 | 124.000 | 77.000 | 45.000 |
| **13.400** | 14.000 | 124.000 | 77.000 | 45.000 |
| **13.490** | 14.000 | 124.000 | 77.000 | 45.000 |
| **13.500** | 14.000 | 124.000 | 77.000 | 45.000 |
| **13.600** | 14.000 | 124.000 | 77.000 | 45.000 |
| **13.700** | 14.000 | 124.000 | 77.000 | 45.000 |
| **13.800** | 14.000 | 124.000 | 77.000 | 45.000 |
| **13.890** | 14.000 | 124.000 | 77.000 | 45.000 |
| **13.900** | 14.000 | 124.000 | 77.000 | 45.000 |
| **14.000** | 14.000 | 124.000 | 77.000 | 45.000 |
| **14.100** | 16.000 | 133.000 | 83.000 | 48.000 |
| **14.200** | 16.000 | 133.000 | 83.000 | 48.000 |
| **14.290** | 16.000 | 133.000 | 83.000 | 48.000 |
| **14.300** | 16.000 | 133.000 | 83.000 | 48.000 |
| **14.400** | 16.000 | 133.000 | 83.000 | 48.000 |
| **14.500** | 16.000 | 133.000 | 83.000 | 48.000 |

| d1 | d2 | l1 | l2 | l3 |
|---|---|---|---|---|
| mm | mm | mm | mm | mm |
| **14.600** | 16.000 | 133.000 | 83.000 | 48.000 |
| **14.680** | 16.000 | 133.000 | 83.000 | 48.000 |
| **14.700** | 16.000 | 133.000 | 83.000 | 48.000 |
| **14.800** | 16.000 | 133.000 | 83.000 | 48.000 |
| **14.900** | 16.000 | 133.000 | 83.000 | 48.000 |
| **15.000** | 16.000 | 133.000 | 83.000 | 48.000 |
| **15.080** | 16.000 | 133.000 | 83.000 | 48.000 |
| **15.100** | 16.000 | 133.000 | 83.000 | 48.000 |
| **15.200** | 16.000 | 133.000 | 83.000 | 48.000 |
| **15.300** | 16.000 | 133.000 | 83.000 | 48.000 |
| **15.400** | 16.000 | 133.000 | 83.000 | 48.000 |
| **15.480** | 16.000 | 133.000 | 83.000 | 48.000 |
| **15.500** | 16.000 | 133.000 | 83.000 | 48.000 |
| **15.550** | 16.000 | 133.000 | 83.000 | 48.000 |
| **15.600** | 16.000 | 133.000 | 83.000 | 48.000 |
| **15.700** | 16.000 | 133.000 | 83.000 | 48.000 |
| **15.800** | 16.000 | 133.000 | 83.000 | 48.000 |
| **15.870** | 16.000 | 133.000 | 83.000 | 48.000 |
| **15.900** | 16.000 | 133.000 | 83.000 | 48.000 |
| **16.000** | 16.000 | 133.000 | 83.000 | 48.000 |
| **16.270** | 18.000 | 143.000 | 93.000 | 48.000 |
| **16.300** | 18.000 | 143.000 | 93.000 | 48.000 |
| **16.500** | 18.000 | 143.000 | 93.000 | 48.000 |
| **16.670** | 18.000 | 143.000 | 93.000 | 48.000 |
| **16.700** | 18.000 | 143.000 | 93.000 | 48.000 |
| **16.900** | 18.000 | 143.000 | 93.000 | 48.000 |
| **17.000** | 18.000 | 143.000 | 93.000 | 48.000 |
| **17.070** | 18.000 | 143.000 | 93.000 | 48.000 |
| **17.460** | 18.000 | 143.000 | 93.000 | 48.000 |
| **17.500** | 18.000 | 143.000 | 93.000 | 48.000 |
| **17.550** | 18.000 | 143.000 | 93.000 | 48.000 |
| **17.700** | 18.000 | 143.000 | 93.000 | 48.000 |
| **17.860** | 18.000 | 143.000 | 93.000 | 48.000 |
| **18.000** | 18.000 | 143.000 | 93.000 | 48.000 |
| **18.260** | 20.000 | 153.000 | 101.000 | 50.000 |
| **18.500** | 20.000 | 153.000 | 101.000 | 50.000 |
| **18.700** | 20.000 | 153.000 | 101.000 | 50.000 |
| **18.900** | 20.000 | 153.000 | 101.000 | 50.000 |
| **19.000** | 20.000 | 153.000 | 101.000 | 50.000 |
| **19.050** | 20.000 | 153.000 | 101.000 | 50.000 |
| **19.250** | 20.000 | 153.000 | 101.000 | 50.000 |
| **19.300** | 20.000 | 153.000 | 101.000 | 50.000 |
| **19.450** | 20.000 | 153.000 | 101.000 | 50.000 |
| **19.500** | 20.000 | 153.000 | 101.000 | 50.000 |
| **19.550** | 20.000 | 153.000 | 101.000 | 50.000 |
| **19.700** | 20.000 | 153.000 | 101.000 | 50.000 |
| **19.800** | 20.000 | 153.000 | 101.000 | 50.000 |
| **19.840** | 20.000 | 153.000 | 101.000 | 50.000 |
| **20.000** | 20.000 | 153.000 | 101.000 | 50.000 |

# SuperV drills

## SuperV drills with internal cooling

**Catalogue no. 51754**

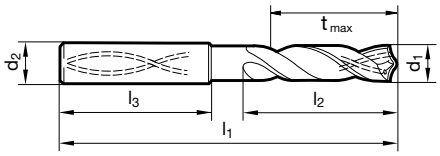
SuperV-S | 5xD | DIN 6537L | VHM | TiAlSiN | 140° | m7 | R | HA

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ● | | | | ● | ○ |

Application recommendations page 174

- web thinning ≥ Ø 3.000
- relieved cone
- main cutting edge form concave
- very hard coating
- double margin

$t_{max} = l_2 - 1{,}5 \times d_1$




| d1 mm | d2 mm | l1 mm | l2 mm | l3 mm |
|---|---|---|---|---|
| **3.000** | 6.000 | 66.000 | 28.000 | 36.000 |
| **3.100** | 6.000 | 66.000 | 28.000 | 36.000 |
| **3.170** | 6.000 | 66.000 | 28.000 | 36.000 |
| **3.200** | 6.000 | 66.000 | 28.000 | 36.000 |
| **3.250** | 6.000 | 66.000 | 28.000 | 36.000 |
| **3.300** | 6.000 | 66.000 | 28.000 | 36.000 |
| **3.400** | 6.000 | 66.000 | 28.000 | 36.000 |
| **3.500** | 6.000 | 66.000 | 28.000 | 36.000 |
| **3.570** | 6.000 | 66.000 | 28.000 | 36.000 |
| **3.600** | 6.000 | 66.000 | 28.000 | 36.000 |
| **3.700** | 6.000 | 66.000 | 28.000 | 36.000 |
| **3.800** | 6.000 | 74.000 | 36.000 | 36.000 |
| **3.900** | 6.000 | 74.000 | 36.000 | 36.000 |
| **3.970** | 6.000 | 74.000 | 36.000 | 36.000 |
| **4.000** | 6.000 | 74.000 | 36.000 | 36.000 |
| **4.100** | 6.000 | 74.000 | 36.000 | 36.000 |
| **4.200** | 6.000 | 74.000 | 36.000 | 36.000 |
| **4.300** | 6.000 | 74.000 | 36.000 | 36.000 |
| **4.370** | 6.000 | 74.000 | 36.000 | 36.000 |
| **4.400** | 6.000 | 74.000 | 36.000 | 36.000 |
| **4.500** | 6.000 | 74.000 | 36.000 | 36.000 |
| **4.600** | 6.000 | 74.000 | 36.000 | 36.000 |
| **4.650** | 6.000 | 74.000 | 36.000 | 36.000 |
| **4.700** | 6.000 | 74.000 | 36.000 | 36.000 |
| **4.760** | 6.000 | 82.000 | 44.000 | 36.000 |
| **4.800** | 6.000 | 82.000 | 44.000 | 36.000 |
| **4.900** | 6.000 | 82.000 | 44.000 | 36.000 |
| **5.000** | 6.000 | 82.000 | 44.000 | 36.000 |
| **5.100** | 6.000 | 82.000 | 44.000 | 36.000 |
| **5.160** | 6.000 | 82.000 | 44.000 | 36.000 |
| **5.200** | 6.000 | 82.000 | 44.000 | 36.000 |
| **5.300** | 6.000 | 82.000 | 44.000 | 36.000 |
| **5.400** | 6.000 | 82.000 | 44.000 | 36.000 |
| **5.500** | 6.000 | 82.000 | 44.000 | 36.000 |
| **5.550** | 6.000 | 82.000 | 44.000 | 36.000 |
| **5.560** | 6.000 | 82.000 | 44.000 | 36.000 |
| **5.600** | 6.000 | 82.000 | 44.000 | 36.000 |
| **5.700** | 6.000 | 82.000 | 44.000 | 36.000 |
| **5.800** | 6.000 | 82.000 | 44.000 | 36.000 |
| **5.900** | 6.000 | 82.000 | 44.000 | 36.000 |
| **5.950** | 6.000 | 82.000 | 44.000 | 36.000 |
| **6.000** | 6.000 | 82.000 | 44.000 | 36.000 |
| **6.100** | 8.000 | 91.000 | 53.000 | 36.000 |
| **6.200** | 8.000 | 91.000 | 53.000 | 36.000 |
| **6.300** | 8.000 | 91.000 | 53.000 | 36.000 |
| **6.350** | 8.000 | 91.000 | 53.000 | 36.000 |
| **6.400** | 8.000 | 91.000 | 53.000 | 36.000 |
| **6.500** | 8.000 | 91.000 | 53.000 | 36.000 |

| d1 mm | d2 mm | l1 mm | l2 mm | l3 mm |
|---|---|---|---|---|
| **6.600** | 8.000 | 91.000 | 53.000 | 36.000 |
| **6.700** | 8.000 | 91.000 | 53.000 | 36.000 |
| **6.750** | 8.000 | 91.000 | 53.000 | 36.000 |
| **6.800** | 8.000 | 91.000 | 53.000 | 36.000 |
| **6.900** | 8.000 | 91.000 | 53.000 | 36.000 |
| **7.000** | 8.000 | 91.000 | 53.000 | 36.000 |
| **7.100** | 8.000 | 91.000 | 53.000 | 36.000 |
| **7.140** | 8.000 | 91.000 | 53.000 | 36.000 |
| **7.200** | 8.000 | 91.000 | 53.000 | 36.000 |
| **7.300** | 8.000 | 91.000 | 53.000 | 36.000 |
| **7.400** | 8.000 | 91.000 | 53.000 | 36.000 |
| **7.500** | 8.000 | 91.000 | 53.000 | 36.000 |
| **7.540** | 8.000 | 91.000 | 53.000 | 36.000 |
| **7.600** | 8.000 | 91.000 | 53.000 | 36.000 |
| **7.700** | 8.000 | 91.000 | 53.000 | 36.000 |
| **7.800** | 8.000 | 91.000 | 53.000 | 36.000 |
| **7.900** | 8.000 | 91.000 | 53.000 | 36.000 |
| **7.940** | 8.000 | 91.000 | 53.000 | 36.000 |
| **8.000** | 8.000 | 91.000 | 53.000 | 36.000 |
| **8.100** | 10.000 | 103.000 | 61.000 | 40.000 |
| **8.200** | 10.000 | 103.000 | 61.000 | 40.000 |
| **8.300** | 10.000 | 103.000 | 61.000 | 40.000 |
| **8.330** | 10.000 | 103.000 | 61.000 | 40.000 |
| **8.400** | 10.000 | 103.000 | 61.000 | 40.000 |
| **8.500** | 10.000 | 103.000 | 61.000 | 40.000 |
| **8.600** | 10.000 | 103.000 | 61.000 | 40.000 |
| **8.700** | 10.000 | 103.000 | 61.000 | 40.000 |
| **8.730** | 10.000 | 103.000 | 61.000 | 40.000 |
| **8.800** | 10.000 | 103.000 | 61.000 | 40.000 |
| **8.900** | 10.000 | 103.000 | 61.000 | 40.000 |
| **9.000** | 10.000 | 103.000 | 61.000 | 40.000 |
| **9.100** | 10.000 | 103.000 | 61.000 | 40.000 |
| **9.130** | 10.000 | 103.000 | 61.000 | 40.000 |
| **9.200** | 10.000 | 103.000 | 61.000 | 40.000 |
| **9.250** | 10.000 | 103.000 | 61.000 | 40.000 |
| **9.300** | 10.000 | 103.000 | 61.000 | 40.000 |
| **9.400** | 10.000 | 103.000 | 61.000 | 40.000 |
| **9.500** | 10.000 | 103.000 | 61.000 | 40.000 |
| **9.520** | 10.000 | 103.000 | 61.000 | 40.000 |
| **9.600** | 10.000 | 103.000 | 61.000 | 40.000 |
| **9.700** | 10.000 | 103.000 | 61.000 | 40.000 |
| **9.800** | 10.000 | 103.000 | 61.000 | 40.000 |
| **9.900** | 10.000 | 103.000 | 61.000 | 40.000 |
| **9.920** | 10.000 | 103.000 | 61.000 | 40.000 |
| **10.000** | 10.000 | 103.000 | 61.000 | 40.000 |
| **10.100** | 12.000 | 118.000 | 71.000 | 45.000 |
| **10.200** | 12.000 | 118.000 | 71.000 | 45.000 |
| **10.300** | 12.000 | 118.000 | 71.000 | 45.000 |

| d1 mm | d2 mm | l1 mm | l2 mm | l3 mm |
|---|---|---|---|---|
| **10.320** | 12.000 | 118.000 | 71.000 | 45.000 |
| **10.400** | 12.000 | 118.000 | 71.000 | 45.000 |
| **10.500** | 12.000 | 118.000 | 71.000 | 45.000 |
| **10.600** | 12.000 | 118.000 | 71.000 | 45.000 |
| **10.700** | 12.000 | 118.000 | 71.000 | 45.000 |
| **10.800** | 12.000 | 118.000 | 71.000 | 45.000 |
| **10.900** | 12.000 | 118.000 | 71.000 | 45.000 |
| **11.000** | 12.000 | 118.000 | 71.000 | 45.000 |
| **11.100** | 12.000 | 118.000 | 71.000 | 45.000 |
| **11.110** | 12.000 | 118.000 | 71.000 | 45.000 |
| **11.200** | 12.000 | 118.000 | 71.000 | 45.000 |
| **11.300** | 12.000 | 118.000 | 71.000 | 45.000 |
| **11.400** | 12.000 | 118.000 | 71.000 | 45.000 |
| **11.500** | 12.000 | 118.000 | 71.000 | 45.000 |
| **11.600** | 12.000 | 118.000 | 71.000 | 45.000 |
| **11.700** | 12.000 | 118.000 | 71.000 | 45.000 |
| **11.800** | 12.000 | 118.000 | 71.000 | 45.000 |
| **11.900** | 12.000 | 118.000 | 71.000 | 45.000 |
| **11.910** | 12.000 | 118.000 | 71.000 | 45.000 |
| **12.000** | 12.000 | 118.000 | 71.000 | 45.000 |
| **12.200** | 14.000 | 124.000 | 77.000 | 45.000 |
| **12.500** | 14.000 | 124.000 | 77.000 | 45.000 |
| **12.700** | 14.000 | 124.000 | 77.000 | 45.000 |
| **12.800** | 14.000 | 124.000 | 77.000 | 45.000 |
| **13.000** | 14.000 | 124.000 | 77.000 | 45.000 |
| **13.300** | 14.000 | 124.000 | 77.000 | 45.000 |
| **13.500** | 14.000 | 124.000 | 77.000 | 45.000 |
| **13.700** | 14.000 | 124.000 | 77.000 | 45.000 |
| **14.000** | 14.000 | 124.000 | 77.000 | 45.000 |
| **14.200** | 16.000 | 133.000 | 83.000 | 48.000 |
| **14.290** | 16.000 | 133.000 | 83.000 | 48.000 |
| **14.300** | 16.000 | 133.000 | 83.000 | 48.000 |
| **14.500** | 16.000 | 133.000 | 83.000 | 48.000 |
| **14.700** | 16.000 | 133.000 | 83.000 | 48.000 |
| **15.000** | 16.000 | 133.000 | 83.000 | 48.000 |
| **15.200** | 16.000 | 133.000 | 83.000 | 48.000 |
| **15.300** | 16.000 | 133.000 | 83.000 | 48.000 |
| **15.500** | 16.000 | 133.000 | 83.000 | 48.000 |
| **15.700** | 16.000 | 133.000 | 83.000 | 48.000 |
| **16.000** | 16.000 | 133.000 | 83.000 | 48.000 |
| **16.300** | 18.000 | 143.000 | 93.000 | 48.000 |
| **16.500** | 18.000 | 143.000 | 93.000 | 48.000 |
| **16.900** | 18.000 | 143.000 | 93.000 | 48.000 |
| **17.000** | 18.000 | 143.000 | 93.000 | 48.000 |
| **17.300** | 18.000 | 143.000 | 93.000 | 48.000 |
| **17.500** | 18.000 | 143.000 | 93.000 | 48.000 |
| **18.000** | 18.000 | 143.000 | 93.000 | 48.000 |
| **18.500** | 20.000 | 153.000 | 101.000 | 50.000 |
| **18.900** | 20.000 | 153.000 | 101.000 | 50.000 |
| **19.000** | 20.000 | 153.000 | 101.000 | 50.000 |
| **19.050** | 20.000 | 153.000 | 101.000 | 50.000 |
| **19.300** | 20.000 | 153.000 | 101.000 | 50.000 |
| **19.500** | 20.000 | 153.000 | 101.000 | 50.000 |
| **20.000** | 20.000 | 153.000 | 101.000 | 50.000 |

# SuperV drills

## SuperV drills with internal cooling

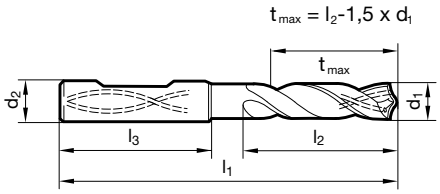
**Catalogue no. 51755**

SuperV-S | 5xD | DIN 6537L | VHM | TiAlSiN | 140° | m7 | R | HE

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ● | | | | ● | ○ |

Application recommendations page 174

- web thinning ≥ Ø 3.000
- relieved cone
- main cutting edge form concave
- very hard coating
- double margin




| d1 mm | d2 mm | l1 mm | l2 mm | l3 mm |
|---|---|---|---|---|
| **3.000** | 6.000 | 66.000 | 28.000 | 36.000 |
| **3.100** | 6.000 | 66.000 | 28.000 | 36.000 |
| **3.170** | 6.000 | 66.000 | 28.000 | 36.000 |
| **3.200** | 6.000 | 66.000 | 28.000 | 36.000 |
| **3.250** | 6.000 | 66.000 | 28.000 | 36.000 |
| **3.300** | 6.000 | 66.000 | 28.000 | 36.000 |
| **3.400** | 6.000 | 66.000 | 28.000 | 36.000 |
| **3.500** | 6.000 | 66.000 | 28.000 | 36.000 |
| **3.570** | 6.000 | 66.000 | 28.000 | 36.000 |
| **3.600** | 6.000 | 66.000 | 28.000 | 36.000 |
| **3.700** | 6.000 | 66.000 | 28.000 | 36.000 |
| **3.800** | 6.000 | 74.000 | 36.000 | 36.000 |
| **3.900** | 6.000 | 74.000 | 36.000 | 36.000 |
| **3.970** | 6.000 | 74.000 | 36.000 | 36.000 |
| **4.000** | 6.000 | 74.000 | 36.000 | 36.000 |
| **4.100** | 6.000 | 74.000 | 36.000 | 36.000 |
| **4.200** | 6.000 | 74.000 | 36.000 | 36.000 |
| **4.300** | 6.000 | 74.000 | 36.000 | 36.000 |
| **4.370** | 6.000 | 74.000 | 36.000 | 36.000 |
| **4.400** | 6.000 | 74.000 | 36.000 | 36.000 |
| **4.500** | 6.000 | 74.000 | 36.000 | 36.000 |
| **4.600** | 6.000 | 74.000 | 36.000 | 36.000 |
| **4.650** | 6.000 | 74.000 | 36.000 | 36.000 |
| **4.700** | 6.000 | 74.000 | 36.000 | 36.000 |
| **4.760** | 6.000 | 82.000 | 44.000 | 36.000 |
| **4.800** | 6.000 | 82.000 | 44.000 | 36.000 |
| **4.900** | 6.000 | 82.000 | 44.000 | 36.000 |
| **5.000** | 6.000 | 82.000 | 44.000 | 36.000 |
| **5.100** | 6.000 | 82.000 | 44.000 | 36.000 |
| **5.160** | 6.000 | 82.000 | 44.000 | 36.000 |
| **5.200** | 6.000 | 82.000 | 44.000 | 36.000 |
| **5.300** | 6.000 | 82.000 | 44.000 | 36.000 |
| **5.400** | 6.000 | 82.000 | 44.000 | 36.000 |
| **5.500** | 6.000 | 82.000 | 44.000 | 36.000 |
| **5.550** | 6.000 | 82.000 | 44.000 | 36.000 |
| **5.560** | 6.000 | 82.000 | 44.000 | 36.000 |
| **5.600** | 6.000 | 82.000 | 44.000 | 36.000 |
| **5.700** | 6.000 | 82.000 | 44.000 | 36.000 |
| **5.800** | 6.000 | 82.000 | 44.000 | 36.000 |
| **5.900** | 6.000 | 82.000 | 44.000 | 36.000 |
| **5.950** | 6.000 | 82.000 | 44.000 | 36.000 |
| **6.000** | 6.000 | 82.000 | 44.000 | 36.000 |
| **6.100** | 8.000 | 91.000 | 53.000 | 36.000 |
| **6.200** | 8.000 | 91.000 | 53.000 | 36.000 |
| **6.300** | 8.000 | 91.000 | 53.000 | 36.000 |
| **6.350** | 8.000 | 91.000 | 53.000 | 36.000 |
| **6.400** | 8.000 | 91.000 | 53.000 | 36.000 |
| **6.500** | 8.000 | 91.000 | 53.000 | 36.000 |

| d1 mm | d2 mm | l1 mm | l2 mm | l3 mm |
|---|---|---|---|---|
| **6.600** | 8.000 | 91.000 | 53.000 | 36.000 |
| **6.700** | 8.000 | 91.000 | 53.000 | 36.000 |
| **6.750** | 8.000 | 91.000 | 53.000 | 36.000 |
| **6.800** | 8.000 | 91.000 | 53.000 | 36.000 |
| **6.900** | 8.000 | 91.000 | 53.000 | 36.000 |
| **7.000** | 8.000 | 91.000 | 53.000 | 36.000 |
| **7.100** | 8.000 | 91.000 | 53.000 | 36.000 |
| **7.140** | 8.000 | 91.000 | 53.000 | 36.000 |
| **7.200** | 8.000 | 91.000 | 53.000 | 36.000 |
| **7.300** | 8.000 | 91.000 | 53.000 | 36.000 |
| **7.400** | 8.000 | 91.000 | 53.000 | 36.000 |
| **7.500** | 8.000 | 91.000 | 53.000 | 36.000 |
| **7.540** | 8.000 | 91.000 | 53.000 | 36.000 |
| **7.600** | 8.000 | 91.000 | 53.000 | 36.000 |
| **7.700** | 8.000 | 91.000 | 53.000 | 36.000 |
| **7.800** | 8.000 | 91.000 | 53.000 | 36.000 |
| **7.900** | 8.000 | 91.000 | 53.000 | 36.000 |
| **7.940** | 8.000 | 91.000 | 53.000 | 36.000 |
| **8.000** | 8.000 | 91.000 | 53.000 | 36.000 |
| **8.100** | 10.000 | 103.000 | 61.000 | 40.000 |
| **8.200** | 10.000 | 103.000 | 61.000 | 40.000 |
| **8.300** | 10.000 | 103.000 | 61.000 | 40.000 |
| **8.330** | 10.000 | 103.000 | 61.000 | 40.000 |
| **8.400** | 10.000 | 103.000 | 61.000 | 40.000 |
| **8.500** | 10.000 | 103.000 | 61.000 | 40.000 |
| **8.600** | 10.000 | 103.000 | 61.000 | 40.000 |
| **8.700** | 10.000 | 103.000 | 61.000 | 40.000 |
| **8.730** | 10.000 | 103.000 | 61.000 | 40.000 |
| **8.800** | 10.000 | 103.000 | 61.000 | 40.000 |
| **8.900** | 10.000 | 103.000 | 61.000 | 40.000 |
| **9.000** | 10.000 | 103.000 | 61.000 | 40.000 |
| **9.100** | 10.000 | 103.000 | 61.000 | 40.000 |
| **9.130** | 10.000 | 103.000 | 61.000 | 40.000 |
| **9.200** | 10.000 | 103.000 | 61.000 | 40.000 |
| **9.250** | 10.000 | 103.000 | 61.000 | 40.000 |
| **9.300** | 10.000 | 103.000 | 61.000 | 40.000 |
| **9.400** | 10.000 | 103.000 | 61.000 | 40.000 |
| **9.500** | 10.000 | 103.000 | 61.000 | 40.000 |
| **9.520** | 10.000 | 103.000 | 61.000 | 40.000 |
| **9.600** | 10.000 | 103.000 | 61.000 | 40.000 |
| **9.700** | 10.000 | 103.000 | 61.000 | 40.000 |
| **9.800** | 10.000 | 103.000 | 61.000 | 40.000 |
| **9.900** | 10.000 | 103.000 | 61.000 | 40.000 |
| **9.920** | 10.000 | 103.000 | 61.000 | 40.000 |
| **10.000** | 10.000 | 103.000 | 61.000 | 40.000 |
| **10.100** | 12.000 | 118.000 | 71.000 | 45.000 |
| **10.200** | 12.000 | 118.000 | 71.000 | 45.000 |
| **10.300** | 12.000 | 118.000 | 71.000 | 45.000 |

| **d1** | d2 | l1 | l2 | l3 |
|---|---|---|---|---|
| **mm** | mm | mm | mm | mm |
| **10.320** | 12.000 | 118.000 | 71.000 | 45.000 |
| **10.400** | 12.000 | 118.000 | 71.000 | 45.000 |
| **10.500** | 12.000 | 118.000 | 71.000 | 45.000 |
| **10.600** | 12.000 | 118.000 | 71.000 | 45.000 |
| **10.700** | 12.000 | 118.000 | 71.000 | 45.000 |
| **10.800** | 12.000 | 118.000 | 71.000 | 45.000 |
| **10.900** | 12.000 | 118.000 | 71.000 | 45.000 |
| **11.000** | 12.000 | 118.000 | 71.000 | 45.000 |
| **11.100** | 12.000 | 118.000 | 71.000 | 45.000 |
| **11.110** | 12.000 | 118.000 | 71.000 | 45.000 |
| **11.200** | 12.000 | 118.000 | 71.000 | 45.000 |
| **11.300** | 12.000 | 118.000 | 71.000 | 45.000 |
| **11.400** | 12.000 | 118.000 | 71.000 | 45.000 |
| **11.500** | 12.000 | 118.000 | 71.000 | 45.000 |
| **11.600** | 12.000 | 118.000 | 71.000 | 45.000 |
| **11.700** | 12.000 | 118.000 | 71.000 | 45.000 |
| **11.800** | 12.000 | 118.000 | 71.000 | 45.000 |
| **11.900** | 12.000 | 118.000 | 71.000 | 45.000 |
| **11.910** | 12.000 | 118.000 | 71.000 | 45.000 |
| **12.000** | 12.000 | 118.000 | 71.000 | 45.000 |
| **12.200** | 14.000 | 124.000 | 77.000 | 45.000 |
| **12.500** | 14.000 | 124.000 | 77.000 | 45.000 |
| **12.700** | 14.000 | 124.000 | 77.000 | 45.000 |
| **12.800** | 14.000 | 124.000 | 77.000 | 45.000 |
| **13.000** | 14.000 | 124.000 | 77.000 | 45.000 |
| **13.300** | 14.000 | 124.000 | 77.000 | 45.000 |
| **13.500** | 14.000 | 124.000 | 77.000 | 45.000 |
| **13.700** | 14.000 | 124.000 | 77.000 | 45.000 |
| **14.000** | 14.000 | 124.000 | 77.000 | 45.000 |
| **14.200** | 16.000 | 133.000 | 83.000 | 48.000 |
| **14.290** | 16.000 | 133.000 | 83.000 | 48.000 |
| **14.300** | 16.000 | 133.000 | 83.000 | 48.000 |
| **14.500** | 16.000 | 133.000 | 83.000 | 48.000 |
| **14.700** | 16.000 | 133.000 | 83.000 | 48.000 |
| **15.000** | 16.000 | 133.000 | 83.000 | 48.000 |
| **15.200** | 16.000 | 133.000 | 83.000 | 48.000 |
| **15.300** | 16.000 | 133.000 | 83.000 | 48.000 |
| **15.500** | 16.000 | 133.000 | 83.000 | 48.000 |
| **15.700** | 16.000 | 133.000 | 83.000 | 48.000 |
| **16.000** | 16.000 | 133.000 | 83.000 | 48.000 |
| **16.300** | 18.000 | 143.000 | 93.000 | 48.000 |
| **16.500** | 18.000 | 143.000 | 93.000 | 48.000 |
| **16.900** | 18.000 | 143.000 | 93.000 | 48.000 |
| **17.000** | 18.000 | 143.000 | 93.000 | 48.000 |
| **17.300** | 18.000 | 143.000 | 93.000 | 48.000 |
| **17.500** | 18.000 | 143.000 | 93.000 | 48.000 |
| **18.000** | 18.000 | 143.000 | 93.000 | 48.000 |
| **18.500** | 20.000 | 153.000 | 101.000 | 50.000 |
| **18.900** | 20.000 | 153.000 | 101.000 | 50.000 |
| **19.000** | 20.000 | 153.000 | 101.000 | 50.000 |
| **19.050** | 20.000 | 153.000 | 101.000 | 50.000 |
| **19.300** | 20.000 | 153.000 | 101.000 | 50.000 |
| **19.500** | 20.000 | 153.000 | 101.000 | 50.000 |
| **20.000** | 20.000 | 153.000 | 101.000 | 50.000 |

# SuperV drills

## SuperV drills with internal cooling

**Catalogue no. 51791**

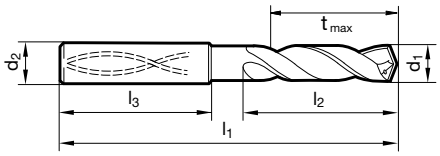
SuperV-X | 7xD | WN | VHM | TiAlN nano | 140° | m7 | R | HA

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ● | ○ | ○ | | ○ | ○ |

Application recommendations page 176

- relieved cone
- main cutting edge form concave
- optimised cutting geometry
- double margin

$t_{max} = l_2 - 1{,}5 \times d_1$




| d1 mm | d2 mm | l1 mm | l2 mm | l3 mm |
|---|---|---|---|---|
| **3.000** | 6.000 | 70.000 | 30.000 | 36.000 |
| **3.100** | 6.000 | 70.000 | 30.000 | 36.000 |
| **3.170** | 6.000 | 70.000 | 30.000 | 36.000 |
| **3.200** | 6.000 | 70.000 | 30.000 | 36.000 |
| **3.250** | 6.000 | 70.000 | 30.000 | 36.000 |
| **3.300** | 6.000 | 70.000 | 30.000 | 36.000 |
| **3.400** | 6.000 | 75.000 | 35.500 | 36.000 |
| **3.500** | 6.000 | 75.000 | 35.500 | 36.000 |
| **3.570** | 6.000 | 75.000 | 35.500 | 36.000 |
| **3.600** | 6.000 | 75.000 | 35.500 | 36.000 |
| **3.700** | 6.000 | 75.000 | 35.500 | 36.000 |
| **3.800** | 6.000 | 75.000 | 37.500 | 36.000 |
| **3.900** | 6.000 | 75.000 | 37.500 | 36.000 |
| **3.970** | 6.000 | 75.000 | 37.500 | 36.000 |
| **4.000** | 6.000 | 75.000 | 37.500 | 36.000 |
| **4.040** | 6.000 | 75.000 | 37.500 | 36.000 |
| **4.100** | 6.000 | 75.000 | 37.500 | 36.000 |
| **4.200** | 6.000 | 75.000 | 37.500 | 36.000 |
| **4.300** | 6.000 | 85.000 | 45.000 | 36.000 |
| **4.370** | 6.000 | 85.000 | 45.000 | 36.000 |
| **4.400** | 6.000 | 85.000 | 45.000 | 36.000 |
| **4.500** | 6.000 | 85.000 | 45.000 | 36.000 |
| **4.600** | 6.000 | 85.000 | 45.000 | 36.000 |
| **4.650** | 6.000 | 85.000 | 45.000 | 36.000 |
| **4.700** | 6.000 | 85.000 | 45.000 | 36.000 |
| **4.760** | 6.000 | 90.000 | 50.000 | 36.000 |
| **4.800** | 6.000 | 90.000 | 50.000 | 36.000 |
| **4.900** | 6.000 | 90.000 | 50.000 | 36.000 |
| **5.000** | 6.000 | 90.000 | 50.000 | 36.000 |
| **5.100** | 6.000 | 90.000 | 50.000 | 36.000 |
| **5.110** | 6.000 | 90.000 | 50.000 | 36.000 |
| **5.160** | 6.000 | 90.000 | 50.000 | 36.000 |
| **5.200** | 6.000 | 90.000 | 50.000 | 36.000 |
| **5.300** | 6.000 | 90.000 | 50.000 | 36.000 |
| **5.400** | 6.000 | 97.000 | 57.000 | 36.000 |
| **5.410** | 6.000 | 97.000 | 57.000 | 36.000 |
| **5.500** | 6.000 | 97.000 | 57.000 | 36.000 |
| **5.550** | 6.000 | 97.000 | 57.000 | 36.000 |
| **5.560** | 6.000 | 97.000 | 57.000 | 36.000 |
| **5.600** | 6.000 | 97.000 | 57.000 | 36.000 |
| **5.700** | 6.000 | 97.000 | 57.000 | 36.000 |
| **5.800** | 6.000 | 97.000 | 57.000 | 36.000 |
| **5.900** | 6.000 | 97.000 | 57.000 | 36.000 |
| **5.950** | 6.000 | 97.000 | 57.000 | 36.000 |
| **6.000** | 6.000 | 97.000 | 57.000 | 36.000 |
| **6.100** | 8.000 | 106.000 | 66.000 | 36.000 |
| **6.200** | 8.000 | 106.000 | 66.000 | 36.000 |
| **6.300** | 8.000 | 106.000 | 66.000 | 36.000 |

| d1 mm | d2 mm | l1 mm | l2 mm | l3 mm |
|---|---|---|---|---|
| **6.350** | 8.000 | 106.000 | 66.000 | 36.000 |
| **6.400** | 8.000 | 106.000 | 66.000 | 36.000 |
| **6.500** | 8.000 | 106.000 | 66.000 | 36.000 |
| **6.530** | 8.000 | 106.000 | 66.000 | 36.000 |
| **6.550** | 8.000 | 106.000 | 66.000 | 36.000 |
| **6.600** | 8.000 | 106.000 | 66.000 | 36.000 |
| **6.700** | 8.000 | 106.000 | 66.000 | 36.000 |
| **6.750** | 8.000 | 106.000 | 66.000 | 36.000 |
| **6.800** | 8.000 | 106.000 | 66.000 | 36.000 |
| **6.900** | 8.000 | 116.000 | 76.000 | 36.000 |
| **7.000** | 8.000 | 116.000 | 76.000 | 36.000 |
| **7.100** | 8.000 | 116.000 | 76.000 | 36.000 |
| **7.140** | 8.000 | 116.000 | 76.000 | 36.000 |
| **7.200** | 8.000 | 116.000 | 76.000 | 36.000 |
| **7.300** | 8.000 | 116.000 | 76.000 | 36.000 |
| **7.400** | 8.000 | 116.000 | 76.000 | 36.000 |
| **7.500** | 8.000 | 116.000 | 76.000 | 36.000 |
| **7.540** | 8.000 | 116.000 | 76.000 | 36.000 |
| **7.600** | 8.000 | 116.000 | 76.000 | 36.000 |
| **7.700** | 8.000 | 116.000 | 76.000 | 36.000 |
| **7.800** | 8.000 | 116.000 | 76.000 | 36.000 |
| **7.900** | 8.000 | 116.000 | 76.000 | 36.000 |
| **7.940** | 8.000 | 116.000 | 76.000 | 36.000 |
| **8.000** | 8.000 | 116.000 | 76.000 | 36.000 |
| **8.100** | 10.000 | 131.000 | 87.000 | 40.000 |
| **8.200** | 10.000 | 131.000 | 87.000 | 40.000 |
| **8.300** | 10.000 | 131.000 | 87.000 | 40.000 |
| **8.330** | 10.000 | 131.000 | 87.000 | 40.000 |
| **8.400** | 10.000 | 131.000 | 87.000 | 40.000 |
| **8.500** | 10.000 | 131.000 | 87.000 | 40.000 |
| **8.600** | 10.000 | 131.000 | 87.000 | 40.000 |
| **8.700** | 10.000 | 131.000 | 87.000 | 40.000 |
| **8.730** | 10.000 | 131.000 | 87.000 | 40.000 |
| **8.800** | 10.000 | 131.000 | 87.000 | 40.000 |
| **8.900** | 10.000 | 131.000 | 87.000 | 40.000 |
| **9.000** | 10.000 | 131.000 | 87.000 | 40.000 |
| **9.100** | 10.000 | 139.000 | 95.000 | 40.000 |
| **9.130** | 10.000 | 139.000 | 95.000 | 40.000 |
| **9.200** | 10.000 | 139.000 | 95.000 | 40.000 |
| **9.250** | 10.000 | 139.000 | 95.000 | 40.000 |
| **9.300** | 10.000 | 139.000 | 95.000 | 40.000 |
| **9.340** | 10.000 | 139.000 | 95.000 | 40.000 |
| **9.400** | 10.000 | 139.000 | 95.000 | 40.000 |
| **9.500** | 10.000 | 139.000 | 95.000 | 40.000 |
| **9.520** | 10.000 | 139.000 | 95.000 | 40.000 |
| **9.600** | 10.000 | 139.000 | 95.000 | 40.000 |
| **9.700** | 10.000 | 139.000 | 95.000 | 40.000 |
| **9.800** | 10.000 | 139.000 | 95.000 | 40.000 |

| d1 mm | d2 mm | l1 mm | l2 mm | l3 mm |
|---|---|---|---|---|
| **9.900** | 10.000 | 139.000 | 95.000 | 40.000 |
| **9.920** | 10.000 | 139.000 | 95.000 | 40.000 |
| **10.000** | 10.000 | 139.000 | 95.000 | 40.000 |
| **10.100** | 12.000 | 155.000 | 106.000 | 45.000 |
| **10.200** | 12.000 | 155.000 | 106.000 | 45.000 |
| **10.300** | 12.000 | 155.000 | 106.000 | 45.000 |
| **10.320** | 12.000 | 155.000 | 106.000 | 45.000 |
| **10.400** | 12.000 | 155.000 | 106.000 | 45.000 |
| **10.500** | 12.000 | 155.000 | 106.000 | 45.000 |
| **10.600** | 12.000 | 155.000 | 106.000 | 45.000 |
| **10.700** | 12.000 | 155.000 | 106.000 | 45.000 |
| **10.720** | 12.000 | 155.000 | 106.000 | 45.000 |
| **10.800** | 12.000 | 155.000 | 106.000 | 45.000 |
| **10.900** | 12.000 | 155.000 | 106.000 | 45.000 |
| **11.000** | 12.000 | 155.000 | 106.000 | 45.000 |
| **11.100** | 12.000 | 163.000 | 114.000 | 45.000 |
| **11.110** | 12.000 | 163.000 | 114.000 | 45.000 |
| **11.200** | 12.000 | 163.000 | 114.000 | 45.000 |
| **11.300** | 12.000 | 163.000 | 114.000 | 45.000 |
| **11.400** | 12.000 | 163.000 | 114.000 | 45.000 |
| **11.500** | 12.000 | 163.000 | 114.000 | 45.000 |
| **11.510** | 12.000 | 163.000 | 114.000 | 45.000 |
| **11.600** | 12.000 | 163.000 | 114.000 | 45.000 |
| **11.700** | 12.000 | 163.000 | 114.000 | 45.000 |
| **11.800** | 12.000 | 163.000 | 114.000 | 45.000 |
| **11.900** | 12.000 | 163.000 | 114.000 | 45.000 |
| **11.910** | 12.000 | 163.000 | 114.000 | 45.000 |
| **12.000** | 12.000 | 163.000 | 114.000 | 45.000 |
| **12.100** | 14.000 | 182.000 | 133.000 | 45.000 |
| **12.200** | 14.000 | 182.000 | 133.000 | 45.000 |
| **12.300** | 14.000 | 182.000 | 133.000 | 45.000 |
| **12.400** | 14.000 | 182.000 | 133.000 | 45.000 |
| **12.500** | 14.000 | 182.000 | 133.000 | 45.000 |
| **12.600** | 14.000 | 182.000 | 133.000 | 45.000 |
| **12.700** | 14.000 | 182.000 | 133.000 | 45.000 |
| **12.800** | 14.000 | 182.000 | 133.000 | 45.000 |
| **12.900** | 14.000 | 182.000 | 133.000 | 45.000 |
| **13.000** | 14.000 | 182.000 | 133.000 | 45.000 |
| **13.100** | 14.000 | 182.000 | 133.000 | 45.000 |
| **13.490** | 14.000 | 182.000 | 133.000 | 45.000 |
| **13.500** | 14.000 | 182.000 | 133.000 | 45.000 |
| **13.700** | 14.000 | 182.000 | 133.000 | 45.000 |

| d1 mm | d2 mm | l1 mm | l2 mm | l3 mm |
|---|---|---|---|---|
| **13.890** | 14.000 | 182.000 | 133.000 | 45.000 |
| **14.000** | 14.000 | 182.000 | 133.000 | 45.000 |
| **14.100** | 16.000 | 204.000 | 152.000 | 48.000 |
| **14.200** | 16.000 | 204.000 | 152.000 | 48.000 |
| **14.290** | 16.000 | 204.000 | 152.000 | 48.000 |
| **14.300** | 16.000 | 204.000 | 152.000 | 48.000 |
| **14.500** | 16.000 | 204.000 | 152.000 | 48.000 |
| **14.700** | 16.000 | 204.000 | 152.000 | 48.000 |
| **14.800** | 16.000 | 204.000 | 152.000 | 48.000 |
| **15.000** | 16.000 | 204.000 | 152.000 | 48.000 |
| **15.100** | 16.000 | 204.000 | 152.000 | 48.000 |
| **15.300** | 16.000 | 204.000 | 152.000 | 48.000 |
| **15.480** | 16.000 | 204.000 | 152.000 | 48.000 |
| **15.500** | 16.000 | 204.000 | 152.000 | 48.000 |
| **15.700** | 16.000 | 204.000 | 152.000 | 48.000 |
| **15.800** | 16.000 | 204.000 | 152.000 | 48.000 |
| **15.870** | 16.000 | 204.000 | 152.000 | 48.000 |
| **16.000** | 16.000 | 204.000 | 152.000 | 48.000 |
| **16.300** | 18.000 | 223.000 | 171.000 | 48.000 |
| **16.500** | 18.000 | 223.000 | 171.000 | 48.000 |
| **16.700** | 18.000 | 223.000 | 171.000 | 48.000 |
| **16.900** | 18.000 | 223.000 | 171.000 | 48.000 |
| **17.000** | 18.000 | 223.000 | 171.000 | 48.000 |
| **17.500** | 18.000 | 223.000 | 171.000 | 48.000 |
| **17.700** | 18.000 | 223.000 | 171.000 | 48.000 |
| **18.000** | 18.000 | 223.000 | 171.000 | 48.000 |
| **18.500** | 20.000 | 244.000 | 190.000 | 50.000 |
| **18.900** | 20.000 | 244.000 | 190.000 | 50.000 |
| **19.000** | 20.000 | 244.000 | 190.000 | 50.000 |
| **19.050** | 20.000 | 244.000 | 190.000 | 50.000 |
| **19.500** | 20.000 | 244.000 | 190.000 | 50.000 |
| **19.800** | 20.000 | 244.000 | 190.000 | 50.000 |
| **20.000** | 20.000 | 244.000 | 190.000 | 50.000 |

# SuperV drills

## SuperV drills with internal cooling

**Catalogue no. 51756**

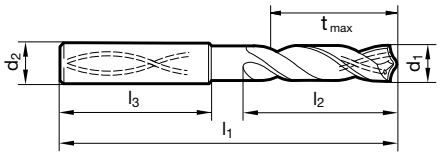
SuperV-S | 7xD | WN | VHM | TiAlSiN | 140° | m7 | R | HA

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ● | | | | ● | ○ |

Application recommendations page 174

- web thinning ≥ Ø 3.000
- relieved cone
- main cutting edge form concave
- very hard coating
- double margin

$t_{max} = l_2 - 1{,}5 \times d_1$




| **d1** mm | d2 mm | l1 mm | l2 mm | l3 mm |
|---|---|---|---|---|
| **3.000** | 6.000 | 70.000 | 30.000 | 36.000 |
| **3.250** | 6.000 | 70.000 | 30.000 | 36.000 |
| **3.300** | 6.000 | 70.000 | 30.000 | 36.000 |
| **3.400** | 6.000 | 75.000 | 35.500 | 36.000 |
| **3.500** | 6.000 | 75.000 | 35.500 | 36.000 |
| **3.700** | 6.000 | 75.000 | 35.500 | 36.000 |
| **4.000** | 6.000 | 75.000 | 37.500 | 36.000 |
| **4.200** | 6.000 | 75.000 | 37.500 | 36.000 |
| **4.300** | 6.000 | 85.000 | 45.000 | 36.000 |
| **4.500** | 6.000 | 85.000 | 45.000 | 36.000 |
| **4.650** | 6.000 | 85.000 | 45.000 | 36.000 |
| **5.000** | 6.000 | 90.000 | 50.000 | 36.000 |
| **5.100** | 6.000 | 90.000 | 50.000 | 36.000 |
| **5.200** | 6.000 | 90.000 | 50.000 | 36.000 |
| **5.500** | 6.000 | 97.000 | 57.000 | 36.000 |
| **5.550** | 6.000 | 97.000 | 57.000 | 36.000 |
| **6.000** | 6.000 | 97.000 | 57.000 | 36.000 |
| **6.500** | 8.000 | 106.000 | 66.000 | 36.000 |
| **6.750** | 8.000 | 106.000 | 66.000 | 36.000 |
| **6.800** | 8.000 | 106.000 | 66.000 | 36.000 |
| **6.900** | 8.000 | 116.000 | 76.000 | 36.000 |
| **7.000** | 8.000 | 116.000 | 76.000 | 36.000 |
| **7.400** | 8.000 | 116.000 | 76.000 | 36.000 |
| **7.500** | 8.000 | 116.000 | 76.000 | 36.000 |
| **7.800** | 8.000 | 116.000 | 76.000 | 36.000 |
| **8.000** | 8.000 | 116.000 | 76.000 | 36.000 |
| **8.500** | 10.000 | 131.000 | 87.000 | 40.000 |
| **8.600** | 10.000 | 131.000 | 87.000 | 40.000 |
| **8.800** | 10.000 | 131.000 | 87.000 | 40.000 |
| **9.000** | 10.000 | 131.000 | 87.000 | 40.000 |

| **d1** mm | d2 mm | l1 mm | l2 mm | l3 mm |
|---|---|---|---|---|
| **9.250** | 10.000 | 139.000 | 95.000 | 40.000 |
| **9.400** | 10.000 | 139.000 | 95.000 | 40.000 |
| **9.500** | 10.000 | 139.000 | 95.000 | 40.000 |
| **10.000** | 10.000 | 139.000 | 95.000 | 40.000 |
| **10.200** | 12.000 | 155.000 | 106.000 | 45.000 |
| **10.400** | 12.000 | 155.000 | 106.000 | 45.000 |
| **10.500** | 12.000 | 155.000 | 106.000 | 45.000 |
| **10.800** | 12.000 | 155.000 | 106.000 | 45.000 |
| **11.000** | 12.000 | 155.000 | 106.000 | 45.000 |
| **11.300** | 12.000 | 163.000 | 114.000 | 45.000 |
| **11.400** | 12.000 | 163.000 | 114.000 | 45.000 |
| **11.500** | 12.000 | 163.000 | 114.000 | 45.000 |
| **12.000** | 12.000 | 163.000 | 114.000 | 45.000 |
| **12.500** | 14.000 | 182.000 | 133.000 | 45.000 |
| **13.000** | 14.000 | 182.000 | 133.000 | 45.000 |
| **13.100** | 14.000 | 182.000 | 133.000 | 45.000 |
| **13.500** | 14.000 | 182.000 | 133.000 | 45.000 |
| **14.000** | 14.000 | 182.000 | 133.000 | 45.000 |
| **14.500** | 16.000 | 204.000 | 152.000 | 48.000 |
| **15.000** | 16.000 | 204.000 | 152.000 | 48.000 |
| **15.100** | 16.000 | 204.000 | 152.000 | 48.000 |
| **15.500** | 16.000 | 204.000 | 152.000 | 48.000 |
| **16.000** | 16.000 | 204.000 | 152.000 | 48.000 |

## SuperV drills

## SuperV drills with internal cooling

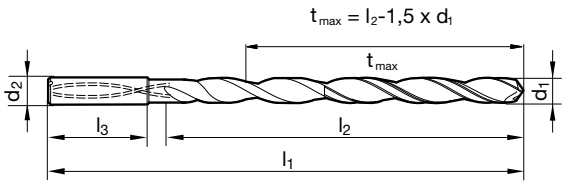
**Catalogue no. 51764**

SuperV-T | 15xD | WN | VHM | AlTiN | 135° | h7 | R | HA

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ● | ● | ● | ○ | ○ | |

Application recommendations page 176

- web thinning ≥ Ø 3.000
- relieved cone
- tip coating
- main cutting edge form concave
- optimised flute design
- maximum diameter of coolant ducts
- application in hydraulic chucks
- double margin
- observe coolant pressure (see diagram “coolant recommendations”)




| **d1** mm | d2 mm | l1 mm | l2 mm | l3 mm |
|---|---|---|---|---|
| **3.000** | 6.000 | 95.000 | 55.000 | 36.000 |
| **3.100** | 6.000 | 106.000 | 66.000 | 36.000 |
| **3.170** | 6.000 | 106.000 | 66.000 | 36.000 |
| **3.200** | 6.000 | 106.000 | 66.000 | 36.000 |
| **3.300** | 6.000 | 106.000 | 66.000 | 36.000 |
| **3.500** | 6.000 | 116.000 | 76.000 | 36.000 |
| **3.570** | 6.000 | 116.000 | 76.000 | 36.000 |
| **3.700** | 6.000 | 116.000 | 76.000 | 36.000 |
| **3.800** | 6.000 | 116.000 | 76.000 | 36.000 |
| **3.970** | 6.000 | 116.000 | 76.000 | 36.000 |
| **4.000** | 6.000 | 116.000 | 76.000 | 36.000 |
| **4.200** | 6.000 | 133.000 | 93.000 | 36.000 |
| **4.300** | 6.000 | 133.000 | 93.000 | 36.000 |
| **4.370** | 6.000 | 133.000 | 93.000 | 36.000 |
| **4.500** | 6.000 | 133.000 | 93.000 | 36.000 |
| **4.600** | 6.000 | 133.000 | 93.000 | 36.000 |
| **4.760** | 6.000 | 133.000 | 93.000 | 36.000 |
| **4.800** | 6.000 | 133.000 | 93.000 | 36.000 |
| **5.000** | 6.000 | 133.000 | 93.000 | 36.000 |
| **5.100** | 6.000 | 150.000 | 110.000 | 36.000 |
| **5.160** | 6.000 | 150.000 | 110.000 | 36.000 |
| **5.410** | 6.000 | 150.000 | 110.000 | 36.000 |
| **5.500** | 6.000 | 150.000 | 110.000 | 36.000 |
| **5.560** | 6.000 | 150.000 | 110.000 | 36.000 |
| **5.800** | 6.000 | 150.000 | 110.000 | 36.000 |
| **5.950** | 6.000 | 150.000 | 110.000 | 36.000 |
| **6.000** | 6.000 | 150.000 | 110.000 | 36.000 |
| **6.300** | 8.000 | 167.000 | 127.000 | 36.000 |
| **6.350** | 8.000 | 167.000 | 127.000 | 36.000 |
| **6.500** | 8.000 | 167.000 | 127.000 | 36.000 |
| **6.750** | 8.000 | 167.000 | 127.000 | 36.000 |
| **6.800** | 8.000 | 167.000 | 127.000 | 36.000 |
| **7.000** | 8.000 | 167.000 | 127.000 | 36.000 |
| **7.140** | 8.000 | 183.000 | 143.000 | 36.000 |
| **7.500** | 8.000 | 183.000 | 143.000 | 36.000 |
| **7.540** | 8.000 | 183.000 | 143.000 | 36.000 |

| **d1** mm | d2 mm | l1 mm | l2 mm | l3 mm |
|---|---|---|---|---|
| **7.800** | 8.000 | 183.000 | 143.000 | 36.000 |
| **7.940** | 8.000 | 183.000 | 143.000 | 36.000 |
| **8.000** | 8.000 | 183.000 | 143.000 | 36.000 |
| **8.330** | 10.000 | 204.000 | 160.000 | 40.000 |
| **8.500** | 10.000 | 204.000 | 160.000 | 40.000 |
| **8.730** | 10.000 | 204.000 | 160.000 | 40.000 |
| **8.800** | 10.000 | 204.000 | 160.000 | 40.000 |
| **9.000** | 10.000 | 204.000 | 160.000 | 40.000 |
| **9.130** | 10.000 | 221.000 | 177.000 | 40.000 |
| **9.520** | 10.000 | 221.000 | 177.000 | 40.000 |
| **9.800** | 10.000 | 221.000 | 177.000 | 40.000 |
| **9.920** | 10.000 | 221.000 | 177.000 | 40.000 |
| **10.000** | 10.000 | 221.000 | 177.000 | 40.000 |
| **10.320** | 12.000 | 247.000 | 198.000 | 45.000 |
| **10.500** | 12.000 | 247.000 | 198.000 | 45.000 |
| **10.720** | 12.000 | 247.000 | 198.000 | 45.000 |
| **11.000** | 12.000 | 247.000 | 198.000 | 45.000 |
| **11.110** | 12.000 | 263.000 | 214.000 | 45.000 |
| **11.510** | 12.000 | 263.000 | 214.000 | 45.000 |
| **11.800** | 12.000 | 263.000 | 214.000 | 45.000 |
| **11.910** | 12.000 | 263.000 | 214.000 | 45.000 |
| **12.000** | 12.000 | 263.000 | 214.000 | 45.000 |
| **12.300** | 14.000 | 297.000 | 248.000 | 45.000 |
| **12.500** | 14.000 | 297.000 | 248.000 | 45.000 |
| **12.700** | 14.000 | 297.000 | 248.000 | 45.000 |
| **13.000** | 14.000 | 297.000 | 248.000 | 45.000 |
| **13.100** | 14.000 | 297.000 | 248.000 | 45.000 |
| **13.490** | 14.000 | 297.000 | 248.000 | 45.000 |
| **13.890** | 14.000 | 297.000 | 248.000 | 45.000 |
| **14.000** | 14.000 | 297.000 | 248.000 | 45.000 |
| **14.290** | 16.000 | 333.000 | 281.000 | 48.000 |
| **15.000** | 16.000 | 333.000 | 281.000 | 48.000 |
| **15.870** | 16.000 | 333.000 | 281.000 | 48.000 |
| **16.000** | 16.000 | 333.000 | 281.000 | 48.000 |

# SuperV drills

## SuperV drills with internal cooling

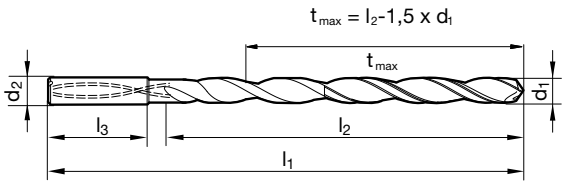
**Catalogue no. 51765**

SuperV-T | 20xD | WN | VHM | AlTiN | 135° | h7 | R | HA

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ● | ● | ● | ○ | ○ | |

Application recommendations page 176

- web thinning ≥ Ø 3.000
- relieved cone
- tip coating
- main cutting edge form concave
- optimised flute design
- maximum diameter of coolant ducts
- application in hydraulic chucks
- double margin
- observe coolant pressure (see diagram “coolant recommendations”)




| d1 mm | d2 mm | l1 mm | l2 mm | l3 mm |
|---|---|---|---|---|
| **3.000** | 6.000 | 110.000 | 70.000 | 36.000 |
| **3.100** | 6.000 | 123.000 | 83.000 | 36.000 |
| **3.200** | 6.000 | 123.000 | 83.000 | 36.000 |
| **3.300** | 6.000 | 123.000 | 83.000 | 36.000 |
| **3.500** | 6.000 | 136.000 | 96.000 | 36.000 |
| **3.570** | 6.000 | 136.000 | 96.000 | 36.000 |
| **3.700** | 6.000 | 136.000 | 96.000 | 36.000 |
| **3.800** | 6.000 | 136.000 | 96.000 | 36.000 |
| **3.970** | 6.000 | 136.000 | 96.000 | 36.000 |
| **4.000** | 6.000 | 136.000 | 96.000 | 36.000 |
| **4.200** | 6.000 | 158.000 | 118.000 | 36.000 |
| **4.300** | 6.000 | 158.000 | 118.000 | 36.000 |
| **4.370** | 6.000 | 158.000 | 118.000 | 36.000 |
| **4.500** | 6.000 | 158.000 | 118.000 | 36.000 |
| **4.600** | 6.000 | 158.000 | 118.000 | 36.000 |
| **4.760** | 6.000 | 158.000 | 118.000 | 36.000 |
| **4.800** | 6.000 | 158.000 | 118.000 | 36.000 |
| **5.000** | 6.000 | 158.000 | 118.000 | 36.000 |
| **5.100** | 6.000 | 180.000 | 140.000 | 36.000 |
| **5.160** | 6.000 | 180.000 | 140.000 | 36.000 |
| **5.410** | 6.000 | 180.000 | 140.000 | 36.000 |
| **5.500** | 6.000 | 180.000 | 140.000 | 36.000 |
| **5.560** | 6.000 | 180.000 | 140.000 | 36.000 |
| **5.800** | 6.000 | 180.000 | 140.000 | 36.000 |
| **5.950** | 6.000 | 180.000 | 140.000 | 36.000 |
| **6.000** | 6.000 | 180.000 | 140.000 | 36.000 |
| **6.350** | 8.000 | 202.000 | 162.000 | 36.000 |
| **6.500** | 8.000 | 202.000 | 162.000 | 36.000 |
| **6.750** | 8.000 | 202.000 | 162.000 | 36.000 |
| **6.800** | 8.000 | 202.000 | 162.000 | 36.000 |
| **7.000** | 8.000 | 202.000 | 162.000 | 36.000 |
| **7.140** | 8.000 | 223.000 | 183.000 | 36.000 |
| **7.500** | 8.000 | 223.000 | 183.000 | 36.000 |
| **7.540** | 8.000 | 223.000 | 183.000 | 36.000 |
| **7.800** | 8.000 | 223.000 | 183.000 | 36.000 |
| **7.940** | 8.000 | 223.000 | 183.000 | 36.000 |

| d1 mm | d2 mm | l1 mm | l2 mm | l3 mm |
|---|---|---|---|---|
| **8.000** | 8.000 | 223.000 | 183.000 | 36.000 |
| **8.330** | 10.000 | 249.000 | 205.000 | 40.000 |
| **8.500** | 10.000 | 249.000 | 205.000 | 40.000 |
| **8.730** | 10.000 | 249.000 | 205.000 | 40.000 |
| **8.800** | 10.000 | 249.000 | 205.000 | 40.000 |
| **9.000** | 10.000 | 249.000 | 205.000 | 40.000 |
| **9.130** | 10.000 | 271.000 | 227.000 | 40.000 |
| **9.520** | 10.000 | 271.000 | 227.000 | 40.000 |
| **10.000** | 10.000 | 271.000 | 227.000 | 40.000 |
| **10.200** | 12.000 | 302.000 | 253.000 | 45.000 |
| **10.320** | 12.000 | 302.000 | 253.000 | 45.000 |
| **10.500** | 12.000 | 302.000 | 253.000 | 45.000 |
| **10.720** | 12.000 | 302.000 | 253.000 | 45.000 |
| **11.000** | 12.000 | 302.000 | 253.000 | 45.000 |
| **11.110** | 12.000 | 323.000 | 274.000 | 45.000 |
| **11.510** | 12.000 | 323.000 | 274.000 | 45.000 |
| **11.800** | 12.000 | 323.000 | 274.000 | 45.000 |
| **11.910** | 12.000 | 323.000 | 274.000 | 45.000 |
| **12.000** | 12.000 | 323.000 | 274.000 | 45.000 |
| **12.500** | 14.000 | 367.000 | 318.000 | 45.000 |
| **12.700** | 14.000 | 367.000 | 318.000 | 45.000 |
| **13.000** | 14.000 | 367.000 | 318.000 | 45.000 |
| **13.490** | 14.000 | 367.000 | 318.000 | 45.000 |
| **14.000** | 14.000 | 367.000 | 318.000 | 45.000 |
| **14.290** | 16.000 | 413.000 | 361.000 | 48.000 |
| **15.000** | 16.000 | 413.000 | 361.000 | 48.000 |
| **15.870** | 16.000 | 413.000 | 361.000 | 48.000 |
| **16.000** | 16.000 | 413.000 | 361.000 | 48.000 |

## SuperV drills

## SuperV drills with internal cooling

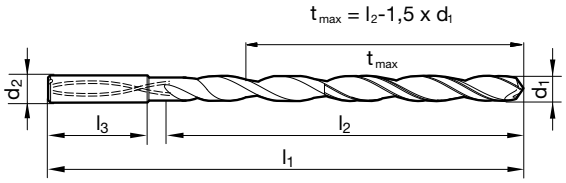
**Catalogue no. 51766**

SuperV-T | 25xD | WN | VHM | AlTiN | 135° | h7 | R | HA

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ● | ● | ● | ○ | ○ | |

Application recommendations page 176

- web thinning ≥ Ø 3.000
- relieved cone
- tip coating
- main cutting edge form concave
- optimised flute design
- maximum diameter of coolant ducts
- application in hydraulic chucks
- double margin
- observe coolant pressure (see diagram “coolant recommendations”)




| **d1** mm | d2 mm | l1 mm | l2 mm | l3 mm | **d1** mm | d2 mm | l1 mm | l2 mm | l3 mm |
|---|---|---|---|---|---|---|---|---|---|
| **3.000** | 6.000 | 125.000 | 85.000 | 36.000 | **6.800** | 8.000 | 237.000 | 197.000 | 36.000 |
| **3.100** | 6.000 | 141.000 | 101.000 | 36.000 | **7.000** | 8.000 | 237.000 | 197.000 | 36.000 |
| **3.200** | 6.000 | 141.000 | 101.000 | 36.000 | **7.140** | 8.000 | 263.000 | 223.000 | 36.000 |
| **3.300** | 6.000 | 141.000 | 101.000 | 36.000 | **7.500** | 8.000 | 263.000 | 223.000 | 36.000 |
| **3.500** | 6.000 | 156.000 | 116.000 | 36.000 | **7.540** | 8.000 | 263.000 | 223.000 | 36.000 |
| **3.570** | 6.000 | 156.000 | 116.000 | 36.000 | **7.940** | 8.000 | 263.000 | 223.000 | 36.000 |
| **3.700** | 6.000 | 156.000 | 116.000 | 36.000 | **8.000** | 8.000 | 263.000 | 223.000 | 36.000 |
| **3.800** | 6.000 | 156.000 | 116.000 | 36.000 | **8.330** | 10.000 | 294.000 | 250.000 | 40.000 |
| **3.970** | 6.000 | 156.000 | 116.000 | 36.000 | **8.500** | 10.000 | 294.000 | 250.000 | 40.000 |
| **4.000** | 6.000 | 156.000 | 116.000 | 36.000 | **8.730** | 10.000 | 294.000 | 250.000 | 40.000 |
| **4.200** | 6.000 | 183.000 | 143.000 | 36.000 | **8.800** | 10.000 | 294.000 | 250.000 | 40.000 |
| **4.300** | 6.000 | 183.000 | 143.000 | 36.000 | **9.000** | 10.000 | 294.000 | 250.000 | 40.000 |
| **4.370** | 6.000 | 183.000 | 143.000 | 36.000 | **9.130** | 10.000 | 321.000 | 277.000 | 40.000 |
| **4.500** | 6.000 | 183.000 | 143.000 | 36.000 | **9.520** | 10.000 | 321.000 | 277.000 | 40.000 |
| **4.600** | 6.000 | 183.000 | 143.000 | 36.000 | **10.000** | 10.000 | 321.000 | 277.000 | 40.000 |
| **4.760** | 6.000 | 183.000 | 143.000 | 36.000 | **10.720** | 12.000 | 359.000 | 310.000 | 45.000 |
| **4.800** | 6.000 | 183.000 | 143.000 | 36.000 | **11.000** | 12.000 | 359.000 | 310.000 | 45.000 |
| **5.000** | 6.000 | 183.000 | 143.000 | 36.000 | **11.110** | 12.000 | 386.000 | 337.000 | 45.000 |
| **5.100** | 6.000 | 210.000 | 170.000 | 36.000 | **12.000** | 12.000 | 386.000 | 337.000 | 45.000 |
| **5.160** | 6.000 | 210.000 | 170.000 | 36.000 | **12.300** | 14.000 | 437.000 | 388.000 | 45.000 |
| **5.410** | 6.000 | 210.000 | 170.000 | 36.000 | **12.700** | 14.000 | 437.000 | 388.000 | 45.000 |
| **5.500** | 6.000 | 210.000 | 170.000 | 36.000 | **13.000** | 14.000 | 437.000 | 388.000 | 45.000 |
| **5.560** | 6.000 | 210.000 | 170.000 | 36.000 | **13.100** | 14.000 | 437.000 | 388.000 | 45.000 |
| **5.800** | 6.000 | 210.000 | 170.000 | 36.000 | **13.490** | 14.000 | 437.000 | 388.000 | 45.000 |
| **5.950** | 6.000 | 210.000 | 170.000 | 36.000 | **13.890** | 14.000 | 437.000 | 388.000 | 45.000 |
| **6.000** | 6.000 | 210.000 | 170.000 | 36.000 | **14.000** | 14.000 | 437.000 | 388.000 | 45.000 |
| **6.300** | 8.000 | 237.000 | 197.000 | 36.000 | **14.290** | 16.000 | 493.000 | 441.000 | 48.000 |
| **6.350** | 8.000 | 237.000 | 197.000 | 36.000 | **15.000** | 16.000 | 493.000 | 441.000 | 48.000 |
| **6.500** | 8.000 | 237.000 | 197.000 | 36.000 | **15.870** | 16.000 | 493.000 | 441.000 | 48.000 |
| **6.750** | 8.000 | 237.000 | 197.000 | 36.000 | **16.000** | 16.000 | 493.000 | 441.000 | 48.000 |

# SuperV drills

## SuperV drills with internal cooling

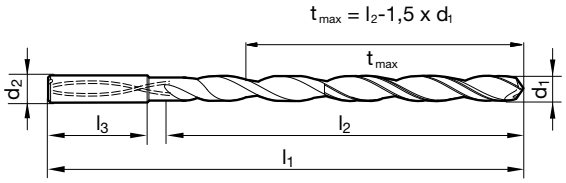
**Catalogue no. 51767**

SuperV-T | 30xD | WN | VHM | AlTiN | 135° | h7 | R | HA

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ● | ● | ● | ○ | ○ | |

Application recommendations page 176

- web thinning ≥ Ø 3.000
- relieved cone
- tip coating
- main cutting edge form concave
- optimised flute design
- maximum diameter of coolant ducts
- application in hydraulic chucks
- double margin
- observe coolant pressure (see diagram “coolant recommendations”)




| **d1** mm | d2 mm | l1 mm | l2 mm | l3 mm |
|---|---|---|---|---|
| **3.000** | 6.000 | 140.000 | 100.000 | 36.000 |
| **3.100** | 6.000 | 158.000 | 118.000 | 36.000 |
| **3.200** | 6.000 | 158.000 | 118.000 | 36.000 |
| **3.300** | 6.000 | 158.000 | 118.000 | 36.000 |
| **3.500** | 6.000 | 176.000 | 136.000 | 36.000 |
| **3.570** | 6.000 | 176.000 | 136.000 | 36.000 |
| **3.700** | 6.000 | 176.000 | 136.000 | 36.000 |
| **3.800** | 6.000 | 176.000 | 136.000 | 36.000 |
| **3.970** | 6.000 | 176.000 | 136.000 | 36.000 |
| **4.000** | 6.000 | 176.000 | 136.000 | 36.000 |
| **4.200** | 6.000 | 208.000 | 168.000 | 36.000 |
| **4.370** | 6.000 | 208.000 | 168.000 | 36.000 |
| **4.500** | 6.000 | 208.000 | 168.000 | 36.000 |
| **4.760** | 6.000 | 208.000 | 168.000 | 36.000 |
| **5.000** | 6.000 | 208.000 | 168.000 | 36.000 |
| **5.100** | 6.000 | 240.000 | 200.000 | 36.000 |
| **5.160** | 6.000 | 240.000 | 200.000 | 36.000 |
| **5.410** | 6.000 | 240.000 | 200.000 | 36.000 |
| **5.500** | 6.000 | 240.000 | 200.000 | 36.000 |
| **5.560** | 6.000 | 240.000 | 200.000 | 36.000 |
| **5.950** | 6.000 | 240.000 | 200.000 | 36.000 |
| **6.000** | 6.000 | 240.000 | 200.000 | 36.000 |
| **6.300** | 8.000 | 272.000 | 232.000 | 36.000 |
| **6.350** | 8.000 | 272.000 | 232.000 | 36.000 |
| **6.500** | 8.000 | 272.000 | 232.000 | 36.000 |
| **6.750** | 8.000 | 272.000 | 232.000 | 36.000 |
| **6.800** | 8.000 | 272.000 | 232.000 | 36.000 |
| **7.000** | 8.000 | 272.000 | 232.000 | 36.000 |
| **7.140** | 8.000 | 303.000 | 263.000 | 36.000 |
| **7.500** | 8.000 | 303.000 | 263.000 | 36.000 |

| **d1** mm | d2 mm | l1 mm | l2 mm | l3 mm |
|---|---|---|---|---|
| **7.540** | 8.000 | 303.000 | 263.000 | 36.000 |
| **7.940** | 8.000 | 303.000 | 263.000 | 36.000 |
| **8.000** | 8.000 | 303.000 | 263.000 | 36.000 |
| **8.330** | 10.000 | 339.000 | 295.000 | 40.000 |
| **8.500** | 10.000 | 339.000 | 295.000 | 40.000 |
| **8.730** | 10.000 | 339.000 | 295.000 | 40.000 |
| **8.800** | 10.000 | 339.000 | 295.000 | 40.000 |
| **9.000** | 10.000 | 339.000 | 295.000 | 40.000 |
| **9.130** | 10.000 | 371.000 | 327.000 | 40.000 |
| **9.520** | 10.000 | 371.000 | 327.000 | 40.000 |
| **10.000** | 10.000 | 371.000 | 327.000 | 40.000 |
| **10.320** | 12.000 | 412.000 | 363.000 | 45.000 |
| **10.720** | 12.000 | 412.000 | 363.000 | 45.000 |
| **11.000** | 12.000 | 412.000 | 363.000 | 45.000 |
| **11.110** | 12.000 | 443.000 | 394.000 | 45.000 |
| **11.510** | 12.000 | 443.000 | 394.000 | 45.000 |
| **11.910** | 12.000 | 443.000 | 394.000 | 45.000 |
| **12.000** | 12.000 | 443.000 | 394.000 | 45.000 |
| **12.300** | 14.000 | 507.000 | 458.000 | 45.000 |
| **12.700** | 14.000 | 507.000 | 458.000 | 45.000 |
| **13.000** | 14.000 | 507.000 | 458.000 | 45.000 |
| **13.100** | 14.000 | 507.000 | 458.000 | 45.000 |
| **13.490** | 14.000 | 507.000 | 458.000 | 45.000 |
| **13.890** | 14.000 | 507.000 | 458.000 | 45.000 |
| **14.000** | 14.000 | 507.000 | 458.000 | 45.000 |

## SuperV drills

## SuperV drills with internal cooling

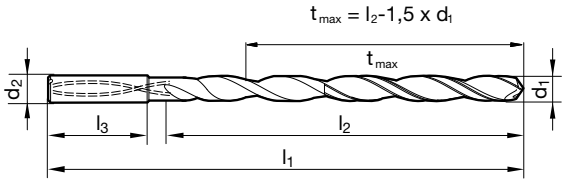
**Catalogue no. 51768**

SuperV-T | 40xD | WN | VHM | AlTiN | 135° | h7 | R | HA

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ● | ● | ● | ○ | ○ | |

Application recommendations page 176

- web thinning ≥ Ø 3.000
- relieved cone
- tip coating
- main cutting edge form concave
- optimised flute design
- maximum diameter of coolant ducts
- application in hydraulic chucks
- double margin
- observe coolant pressure (see diagram “coolant recommendations”)




| **d1** mm | d2 mm | l1 mm | l2 mm | l3 mm |
|---|---|---|---|---|
| **3.000** | 6.000 | 170.000 | 130.000 | 36.000 |
| **3.100** | 6.000 | 193.000 | 153.000 | 36.000 |
| **3.170** | 6.000 | 193.000 | 153.000 | 36.000 |
| **3.200** | 6.000 | 193.000 | 153.000 | 36.000 |
| **3.300** | 6.000 | 193.000 | 153.000 | 36.000 |
| **3.500** | 6.000 | 193.000 | 153.000 | 36.000 |
| **3.800** | 6.000 | 216.000 | 176.000 | 36.000 |
| **3.970** | 6.000 | 216.000 | 176.000 | 36.000 |
| **4.000** | 6.000 | 216.000 | 176.000 | 36.000 |
| **4.200** | 6.000 | 238.000 | 198.000 | 36.000 |
| **4.500** | 6.000 | 238.000 | 198.000 | 36.000 |
| **4.760** | 6.000 | 258.000 | 218.000 | 36.000 |
| **5.000** | 6.000 | 258.000 | 218.000 | 36.000 |
| **5.100** | 6.000 | 280.000 | 240.000 | 36.000 |
| **5.500** | 6.000 | 280.000 | 240.000 | 36.000 |
| **5.560** | 6.000 | 300.000 | 260.000 | 36.000 |
| **6.000** | 6.000 | 300.000 | 260.000 | 36.000 |
| **6.300** | 8.000 | 322.000 | 282.000 | 36.000 |

| **d1** mm | d2 mm | l1 mm | l2 mm | l3 mm |
|---|---|---|---|---|
| **6.350** | 8.000 | 322.000 | 282.000 | 36.000 |
| **6.500** | 8.000 | 322.000 | 282.000 | 36.000 |
| **6.800** | 8.000 | 342.000 | 302.000 | 36.000 |
| **7.000** | 8.000 | 342.000 | 302.000 | 36.000 |
| **7.140** | 8.000 | 363.000 | 323.000 | 36.000 |
| **7.500** | 8.000 | 363.000 | 323.000 | 36.000 |
| **8.000** | 8.000 | 383.000 | 343.000 | 36.000 |
| **8.500** | 10.000 | 409.000 | 365.000 | 40.000 |
| **9.000** | 10.000 | 429.000 | 386.000 | 40.000 |
| **10.000** | 10.000 | 471.000 | 427.000 | 40.000 |

# Carbide drills

## Jobber drills

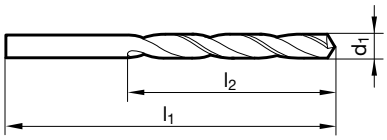
**Catalogue no. 51290**

N | WN | VHM | TiAlN nano | 118° | h7 | R | Cyl

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ○ | ○ | ○ | ● | ○ | |

Application recommendations page 178

- facet point grind
- main cutting edge form straight
- increased wear resistance
- structural and case hardened steels
- free-cutting steels, heat-treatable steels
- cast materials
- brass
- Al with high Si-content
- magnesium and magnesium alloys
- plastics and fiber reinforced plastics




| d1 mm | inch | l1 mm | l2 mm |
|---|---|---|---|
| 1.000 | | 34.000 | 12.000 |
| 1.100 | | 36.000 | 14.000 |
| 1.200 | | 38.000 | 16.000 |
| 1.300 | | 38.000 | 16.000 |
| 1.400 | | 40.000 | 18.000 |
| 1.500 | | 40.000 | 18.000 |
| 1.600 | | 43.000 | 20.000 |
| 1.700 | | 43.000 | 20.000 |
| 1.800 | | 46.000 | 22.000 |
| 1.900 | | 46.000 | 22.000 |
| 2.000 | | 49.000 | 24.000 |
| 2.100 | | 49.000 | 24.000 |
| 2.200 | | 53.000 | 27.000 |
| 2.300 | | 53.000 | 27.000 |
| 2.400 | | 57.000 | 30.000 |
| 2.500 | | 57.000 | 30.000 |
| 2.600 | | 57.000 | 30.000 |
| 2.700 | | 61.000 | 33.000 |
| 2.800 | | 61.000 | 33.000 |
| 2.900 | | 61.000 | 33.000 |
| 3.000 | | 61.000 | 33.000 |
| 3.100 | | 65.000 | 36.000 |
| 3.200 | | 65.000 | 36.000 |
| 3.300 | | 65.000 | 36.000 |
| 3.400 | | 70.000 | 39.000 |
| 3.500 | | 70.000 | 39.000 |
| 3.600 | | 70.000 | 39.000 |
| 3.700 | | 70.000 | 39.000 |
| 3.800 | | 75.000 | 43.000 |
| 3.900 | | 75.000 | 43.000 |
| 4.000 | | 75.000 | 43.000 |
| 4.100 | | 75.000 | 43.000 |
| 4.200 | | 75.000 | 43.000 |
| 4.300 | | 80.000 | 47.000 |
| 4.400 | | 80.000 | 47.000 |
| 4.500 | | 80.000 | 47.000 |
| 4.600 | | 80.000 | 47.000 |
| 4.700 | | 80.000 | 47.000 |
| 4.800 | | 86.000 | 52.000 |
| 4.900 | | 86.000 | 52.000 |
| 5.000 | | 86.000 | 52.000 |
| 5.100 | | 86.000 | 52.000 |
| 5.200 | | 86.000 | 52.000 |
| 5.300 | | 86.000 | 52.000 |
| 5.400 | | 93.000 | 57.000 |
| 5.500 | | 93.000 | 57.000 |
| 5.600 | | 93.000 | 57.000 |
| 5.700 | | 93.000 | 57.000 |

| d1 mm | inch | l1 mm | l2 mm |
|---|---|---|---|
| 5.800 | | 93.000 | 57.000 |
| 5.900 | | 93.000 | 57.000 |
| 6.000 | | 93.000 | 57.000 |
| 6.100 | | 101.000 | 63.000 |
| 6.200 | | 101.000 | 63.000 |
| 6.300 | | 101.000 | 63.000 |
| 6.400 | | 101.000 | 63.000 |
| 6.500 | | 101.000 | 63.000 |
| 6.600 | | 101.000 | 63.000 |
| 6.700 | | 101.000 | 63.000 |
| 6.800 | | 109.000 | 69.000 |
| 6.900 | | 109.000 | 69.000 |
| 7.000 | | 109.000 | 69.000 |
| 7.100 | | 109.000 | 69.000 |
| 7.200 | | 109.000 | 69.000 |
| 7.300 | | 109.000 | 69.000 |
| 7.400 | | 109.000 | 69.000 |
| 7.500 | | 109.000 | 69.000 |
| 7.600 | | 117.000 | 75.000 |
| 7.700 | | 117.000 | 75.000 |
| 7.800 | | 117.000 | 75.000 |
| 7.900 | | 117.000 | 75.000 |
| 8.000 | | 117.000 | 75.000 |
| 8.100 | | 117.000 | 75.000 |
| 8.200 | | 117.000 | 75.000 |
| 8.300 | | 117.000 | 75.000 |
| 8.400 | | 117.000 | 75.000 |
| 8.500 | | 117.000 | 75.000 |
| 8.600 | | 125.000 | 81.000 |
| 8.700 | | 125.000 | 81.000 |
| 8.800 | | 125.000 | 81.000 |
| 8.900 | | 125.000 | 81.000 |
| 9.000 | | 125.000 | 81.000 |
| 9.100 | | 125.000 | 81.000 |
| 9.200 | | 125.000 | 81.000 |
| 9.300 | | 125.000 | 81.000 |
| 9.400 | | 125.000 | 81.000 |
| 9.500 | | 125.000 | 81.000 |
| 9.600 | | 133.000 | 87.000 |
| 9.700 | | 133.000 | 87.000 |
| 9.800 | | 133.000 | 87.000 |
| 9.900 | | 133.000 | 87.000 |
| 10.000 | | 133.000 | 87.000 |
| 10.500 | | 133.000 | 87.000 |
| 11.000 | | 142.000 | 94.000 |
| 11.500 | | 142.000 | 94.000 |
| 12.000 | | 151.000 | 101.000 |

## Straight shank twist drills

### Twist drills with reinforced straight shank

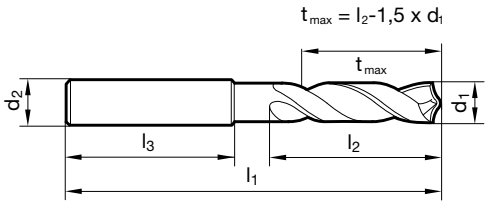
**Catalogue no. 51146**

H | ~3xD | DIN 6537 K | VHM | AlTiN | 120° | m7 | R | HA

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ○ | | ○ | | | ● |

Application recommendations page 178

- main cutting edge form straight (after correction)
- facet point grind




| **d1** mm | d2 mm | l1 mm | l2 mm | l3 mm |
|---|---|---|---|---|
| **2.600** | 6.000 | 62.000 | 20.000 | 36.000 |
| **3.000** | 6.000 | 62.000 | 20.000 | 36.000 |
| **3.400** | 6.000 | 62.000 | 20.000 | 36.000 |
| **4.000** | 6.000 | 66.000 | 24.000 | 36.000 |
| **4.300** | 6.000 | 66.000 | 24.000 | 36.000 |
| **5.000** | 6.000 | 66.000 | 28.000 | 36.000 |
| **5.100** | 6.000 | 66.000 | 28.000 | 36.000 |
| **5.600** | 6.000 | 66.000 | 28.000 | 36.000 |
| **6.000** | 6.000 | 66.000 | 28.000 | 36.000 |
| **6.900** | 8.000 | 79.000 | 34.000 | 36.000 |
| **7.100** | 8.000 | 79.000 | 41.000 | 36.000 |
| **8.000** | 8.000 | 79.000 | 41.000 | 36.000 |

| **d1** mm | d2 mm | l1 mm | l2 mm | l3 mm |
|---|---|---|---|---|
| **8.600** | 10.000 | 89.000 | 47.000 | 40.000 |
| **9.100** | 10.000 | 89.000 | 47.000 | 40.000 |
| **10.000** | 10.000 | 89.000 | 47.000 | 40.000 |
| **10.400** | 12.000 | 102.000 | 55.000 | 45.000 |
| **10.600** | 12.000 | 102.000 | 55.000 | 45.000 |
| **11.100** | 12.000 | 102.000 | 55.000 | 45.000 |
| **12.000** | 12.000 | 102.000 | 55.000 | 45.000 |
| **14.100** | 16.000 | 115.000 | 65.000 | 48.000 |

## Single-fluted gun drills

## Gun drills, type SuperT-NXL

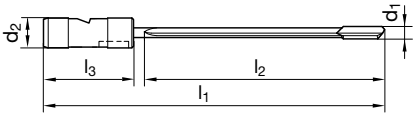
**Catalogue no. 65030**

SuperT-NXL | WN | HM | TiN | h5 | R | TBM-SEH

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ● | ○ | ● | ○ | ○ | ○ |

Application recommendations page 180

- only suitable for deep hole drilling machines
- for universal application
- head form G
- overall length 800 mm
- bright rake face for improved chip formation




| **d1** **mm** | d2 mm | l1 mm | l2 mm | l3 mm | Code no. |
|---|---|---|---|---|---|
| **5.000** | 25.000 | 800.000 | 700.000 | 70.000 | 5.000 |
| **6.000** | 25.000 | 800.000 | 700.000 | 70.000 | 6.000 |
| **7.000** | 25.000 | 800.000 | 700.000 | 70.000 | 7.000 |
| **8.000** | 25.000 | 800.000 | 700.000 | 70.000 | 8.000 |
| **9.000** | 25.000 | 800.000 | 700.000 | 70.000 | 9.000 |
| **10.000** | 25.000 | 800.000 | 700.000 | 70.000 | 10.000 |
| **11.500** | 25.000 | 800.000 | 700.000 | 70.000 | 11.500 |
| **12.000** | 25.000 | 800.000 | 700.000 | 70.000 | 12.000 |
| **15.000** | 25.000 | 800.000 | 700.000 | 70.000 | 15.000 |
| **16.000** | 25.000 | 800.000 | 700.000 | 70.000 | 16.000 |
| **18.000** | 25.000 | 800.000 | 700.000 | 70.000 | 18.000 |
| **19.000** | 25.000 | 800.000 | 700.000 | 70.000 | 19.000 |
| **20.000** | 25.000 | 800.000 | 700.000 | 70.000 | 20.000 |
| **21.000** | 25.000 | 800.000 | 700.000 | 70.000 | 21.000 |
| **22.000** | 25.000 | 800.000 | 700.000 | 70.000 | 22.000 |
| **25.000** | 25.000 | 800.000 | 700.000 | 70.000 | 25.000 |

## Single-fluted gun drills

## Gun drills, type SuperT-NXL

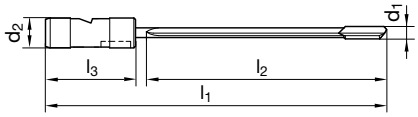
**Catalogue no. 65031**

SuperT-NXL | WN | HM | TiN | h5 | R | TBM-SEH

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ● | ○ | ● | ○ | ○ | ○ |

Application recommendations page 180

- only suitable for deep hole drilling machines
- for universal application
- head form G
- overall length 1200 mm
- bright rake face for improved chip formation




| **d1** **mm** | d2 mm | l1 mm | l2 mm | l3 mm | Code no. |
|---|---|---|---|---|---|
| **5.000** | 25.000 | 1200.000 | 1100.000 | 70.000 | 5.000 |
| **6.000** | 25.000 | 1200.000 | 1100.000 | 70.000 | 6.000 |
| **7.000** | 25.000 | 1200.000 | 1100.000 | 70.000 | 7.000 |
| **8.000** | 25.000 | 1200.000 | 1100.000 | 70.000 | 8.000 |
| **9.000** | 25.000 | 1200.000 | 1100.000 | 70.000 | 9.000 |
| **10.000** | 25.000 | 1200.000 | 1100.000 | 70.000 | 10.000 |
| **11.500** | 25.000 | 1200.000 | 1100.000 | 70.000 | 11.500 |
| **12.000** | 25.000 | 1200.000 | 1100.000 | 70.000 | 12.000 |
| **15.000** | 25.000 | 1200.000 | 1100.000 | 70.000 | 15.000 |
| **16.000** | 25.000 | 1200.000 | 1100.000 | 70.000 | 16.000 |
| **18.000** | 25.000 | 1200.000 | 1100.000 | 70.000 | 18.000 |
| **19.000** | 25.000 | 1200.000 | 1100.000 | 70.000 | 19.000 |
| **20.000** | 25.000 | 1200.000 | 1100.000 | 70.000 | 20.000 |
| **22.000** | 25.000 | 1200.000 | 1100.000 | 70.000 | 22.000 |

## Single-fluted gun drills

## Gun drills, type SuperT-NXL

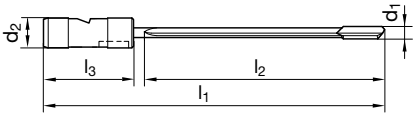
**Catalogue no. 65032**

SuperT-NXL | WN | HM | TiN | h5 | R | TBM-SEH

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ● | ○ | ● | ○ | ○ | ○ |

Application recommendations page 180

- only suitable for deep hole drilling machines
- for universal application
- head form G
- overall length 1600 mm
- bright rake face for improved chip formation




| **d1** **mm** | d2 mm | l1 mm | l2 mm | l3 mm | Code no. |
|---|---|---|---|---|---|
| **4.000** | 25.000 | 1600.000 | 1500.000 | 70.000 | 4.000 |
| **5.000** | 25.000 | 1600.000 | 1500.000 | 70.000 | 5.000 |
| **5.500** | 25.000 | 1600.000 | 1500.000 | 70.000 | 5.500 |
| **6.000** | 25.000 | 1600.000 | 1500.000 | 70.000 | 6.000 |
| **6.500** | 25.000 | 1600.000 | 1500.000 | 70.000 | 6.500 |
| **7.000** | 25.000 | 1600.000 | 1500.000 | 70.000 | 7.000 |
| **7.500** | 25.000 | 1600.000 | 1500.000 | 70.000 | 7.500 |
| **8.000** | 25.000 | 1600.000 | 1500.000 | 70.000 | 8.000 |
| **9.000** | 25.000 | 1600.000 | 1500.000 | 70.000 | 9.000 |
| **9.500** | 25.000 | 1600.000 | 1500.000 | 70.000 | 9.500 |
| **10.000** | 25.000 | 1600.000 | 1500.000 | 70.000 | 10.000 |
| **11.000** | 25.000 | 1600.000 | 1500.000 | 70.000 | 11.000 |
| **11.500** | 25.000 | 1600.000 | 1500.000 | 70.000 | 11.500 |
| **12.000** | 25.000 | 1600.000 | 1500.000 | 70.000 | 12.000 |
| **13.000** | 25.000 | 1600.000 | 1500.000 | 70.000 | 13.000 |
| **14.000** | 25.000 | 1600.000 | 1500.000 | 70.000 | 14.000 |
| **15.000** | 25.000 | 1600.000 | 1500.000 | 70.000 | 15.000 |
| **16.000** | 25.000 | 1600.000 | 1500.000 | 70.000 | 16.000 |
| **17.000** | 25.000 | 1600.000 | 1500.000 | 70.000 | 17.000 |
| **18.000** | 25.000 | 1600.000 | 1500.000 | 70.000 | 18.000 |
| **19.000** | 25.000 | 1600.000 | 1500.000 | 70.000 | 19.000 |
| **20.000** | 25.000 | 1600.000 | 1500.000 | 70.000 | 20.000 |
| **22.000** | 25.000 | 1600.000 | 1500.000 | 70.000 | 22.000 |

## Single-fluted gun drills

## Gun drills, type SuperT-NXL

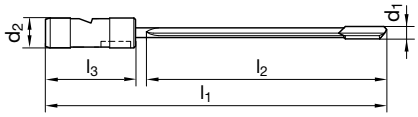
**Catalogue no. 65033**

SuperT-NXL | WN | HM | TiN | h5 | R | TBM-SEH

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ● | ○ | ● | ○ | ○ | ○ |

Application recommendations page 180

- only suitable for deep hole drilling machines
- for universal application
- head form G
- overall length 2000 mm
- bright rake face for improved chip formation




| **d1** **mm** | d2 mm | l1 mm | l2 mm | l3 mm | Code no. |
|---|---|---|---|---|---|
| **5.000** | 25.000 | 2000.000 | 1900.000 | 70.000 | 5.000 |
| **6.000** | 25.000 | 2000.000 | 1900.000 | 70.000 | 6.000 |
| **7.000** | 25.000 | 2000.000 | 1900.000 | 70.000 | 7.000 |
| **8.000** | 25.000 | 2000.000 | 1900.000 | 70.000 | 8.000 |
| **9.000** | 25.000 | 2000.000 | 1900.000 | 70.000 | 9.000 |
| **10.000** | 25.000 | 2000.000 | 1900.000 | 70.000 | 10.000 |
| **11.500** | 25.000 | 2000.000 | 1900.000 | 70.000 | 11.500 |
| **12.000** | 25.000 | 2000.000 | 1900.000 | 70.000 | 12.000 |
| **15.000** | 25.000 | 2000.000 | 1900.000 | 70.000 | 15.000 |
| **16.000** | 25.000 | 2000.000 | 1900.000 | 70.000 | 16.000 |
| **18.000** | 25.000 | 2000.000 | 1900.000 | 70.000 | 18.000 |
| **19.000** | 25.000 | 2000.000 | 1900.000 | 70.000 | 19.000 |
| **20.000** | 25.000 | 2000.000 | 1900.000 | 70.000 | 20.000 |
| **22.000** | 25.000 | 2000.000 | 1900.000 | 70.000 | 22.000 |

# Straight shank twist drills

## Stub drills

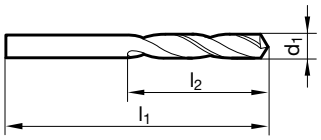
**Catalogue no. 61131**

V18 | ~3xD | DIN 1897 | HSS-Co | AlTi-ZrN | 130° | h8 | R | Cyl

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ○ | ● | ○ | ○ | ● | |

Application recommendations page 178

- web thinning ≥ Ø 1.000
- relieved cone
- wide flutes
- especially high wear resistance
- especially high rigidity




| d1 mm | inch | l1 mm | l2 mm |
|---|---|---|---|
| **1.000** | | 26.000 | 6.000 |
| **1.100** | | 28.000 | 7.000 |
| **1.200** | | 30.000 | 8.000 |
| **1.300** | | 30.000 | 8.000 |
| **1.400** | | 32.000 | 9.000 |
| **1.500** | | 32.000 | 9.000 |
| **1.600** | | 34.000 | 10.000 |
| **1.700** | | 34.000 | 10.000 |
| **1.800** | | 36.000 | 11.000 |
| **1.900** | | 36.000 | 11.000 |
| **2.000** | | 38.000 | 12.000 |
| **2.100** | | 38.000 | 12.000 |
| **2.200** | | 40.000 | 13.000 |
| **2.300** | | 40.000 | 13.000 |
| **2.400** | | 43.000 | 14.000 |
| **2.500** | | 43.000 | 14.000 |
| **2.600** | | 43.000 | 14.000 |
| **2.700** | | 46.000 | 16.000 |
| **2.800** | | 46.000 | 16.000 |
| **2.900** | | 46.000 | 16.000 |
| **3.000** | | 46.000 | 16.000 |
| **3.100** | | 49.000 | 18.000 |
| **3.200** | | 49.000 | 18.000 |
| **3.300** | | 49.000 | 18.000 |
| **3.400** | | 52.000 | 20.000 |
| **3.500** | | 52.000 | 20.000 |
| **3.600** | | 52.000 | 20.000 |
| **3.700** | | 52.000 | 20.000 |
| **3.800** | | 55.000 | 22.000 |
| **3.900** | | 55.000 | 22.000 |
| **4.000** | | 55.000 | 22.000 |
| **4.100** | | 55.000 | 22.000 |
| **4.200** | | 55.000 | 22.000 |
| **4.300** | | 58.000 | 24.000 |
| **4.400** | | 58.000 | 24.000 |
| **4.500** | | 58.000 | 24.000 |
| **4.600** | | 58.000 | 24.000 |
| **4.700** | | 58.000 | 24.000 |
| **4.800** | | 62.000 | 26.000 |
| **4.900** | | 62.000 | 26.000 |
| **5.000** | | 62.000 | 26.000 |
| **5.100** | | 62.000 | 26.000 |
| **5.200** | | 62.000 | 26.000 |
| **5.300** | | 62.000 | 26.000 |
| **5.400** | | 66.000 | 28.000 |
| **5.500** | | 66.000 | 28.000 |
| **5.600** | | 66.000 | 28.000 |
| **5.700** | | 66.000 | 28.000 |

| d1 mm | inch | l1 mm | l2 mm |
|---|---|---|---|
| **5.800** | | 66.000 | 28.000 |
| **5.900** | | 66.000 | 28.000 |
| **6.000** | | 66.000 | 28.000 |
| **6.100** | | 70.000 | 31.000 |
| **6.200** | | 70.000 | 31.000 |
| **6.300** | | 70.000 | 31.000 |
| **6.400** | | 70.000 | 31.000 |
| **6.500** | | 70.000 | 31.000 |
| **6.600** | | 70.000 | 31.000 |
| **6.700** | | 70.000 | 31.000 |
| **6.800** | | 74.000 | 34.000 |
| **6.900** | | 74.000 | 34.000 |
| **7.000** | | 74.000 | 34.000 |
| **7.100** | | 74.000 | 34.000 |
| **7.200** | | 74.000 | 34.000 |
| **7.300** | | 74.000 | 34.000 |
| **7.400** | | 74.000 | 34.000 |
| **7.500** | | 74.000 | 34.000 |
| **7.600** | | 79.000 | 37.000 |
| **7.700** | | 79.000 | 37.000 |
| **7.800** | | 79.000 | 37.000 |
| **7.900** | | 79.000 | 37.000 |
| **8.000** | | 79.000 | 37.000 |
| **8.100** | | 79.000 | 37.000 |
| **8.200** | | 79.000 | 37.000 |
| **8.300** | | 79.000 | 37.000 |
| **8.400** | | 79.000 | 37.000 |
| **8.500** | | 79.000 | 37.000 |
| **8.600** | | 84.000 | 40.000 |
| **8.700** | | 84.000 | 40.000 |
| **8.800** | | 84.000 | 40.000 |
| **8.900** | | 84.000 | 40.000 |
| **9.000** | | 84.000 | 40.000 |
| **9.100** | | 84.000 | 40.000 |
| **9.200** | | 84.000 | 40.000 |
| **9.300** | | 84.000 | 40.000 |
| **9.400** | | 84.000 | 40.000 |
| **9.500** | | 84.000 | 40.000 |
| **9.600** | | 89.000 | 43.000 |
| **9.700** | | 89.000 | 43.000 |
| **9.800** | | 89.000 | 43.000 |
| **9.900** | | 89.000 | 43.000 |
| **10.000** | | 89.000 | 43.000 |
| **10.200** | | 89.000 | 43.000 |
| **10.500** | | 89.000 | 43.000 |
| **11.000** | | 95.000 | 47.000 |
| **11.200** | | 95.000 | 47.000 |
| **11.500** | | 95.000 | 47.000 |

| d1<br>mm | inch | l1<br>mm | l2<br>mm |
|---|---|---|---|
| **11.800** | | 95.000 | 47.000 |
| **12.000** | | 102.000 | 51.000 |
| **12.500** | | 102.000 | 51.000 |
| **13.000** | | 102.000 | 51.000 |

| d1<br>mm | inch | l1<br>mm | l2<br>mm |
|---|---|---|---|

# Straight shank twist drills

## Jobber drills

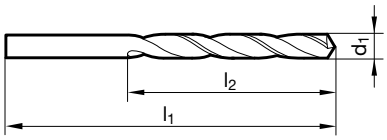
**Catalogue no. 61232**

V18 | ~5xD | DIN 338 | HSS-Co | AlTi-ZrN | 130° | h8 | R | Cyl

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ○ | ● | ○ | ○ | ● | |

Application recommendations page 178

- web thinning ≥ Ø 1.000
- relieved cone
- wide flutes
- especially high rigidity
- especially high wear resistance




| d1 mm | inch | l1 mm | l2 mm |
|---|---|---|---|
| **1.000** | | 34.000 | 12.000 |
| **1.100** | | 36.000 | 14.000 |
| **1.200** | | 38.000 | 16.000 |
| **1.300** | | 38.000 | 16.000 |
| **1.400** | | 40.000 | 18.000 |
| **1.500** | | 40.000 | 18.000 |
| **1.600** | | 43.000 | 20.000 |
| **1.700** | | 43.000 | 20.000 |
| **1.800** | | 46.000 | 22.000 |
| **1.900** | | 46.000 | 22.000 |
| **2.000** | | 49.000 | 24.000 |
| **2.100** | | 49.000 | 24.000 |
| **2.200** | | 53.000 | 27.000 |
| **2.300** | | 53.000 | 27.000 |
| **2.400** | | 57.000 | 30.000 |
| **2.500** | | 57.000 | 30.000 |
| **2.600** | | 57.000 | 30.000 |
| **2.700** | | 61.000 | 33.000 |
| **2.800** | | 61.000 | 33.000 |
| **2.900** | | 61.000 | 33.000 |
| **3.000** | | 61.000 | 33.000 |
| **3.100** | | 65.000 | 36.000 |
| **3.200** | | 65.000 | 36.000 |
| **3.300** | | 65.000 | 36.000 |
| **3.400** | | 70.000 | 39.000 |
| **3.500** | | 70.000 | 39.000 |
| **3.600** | | 70.000 | 39.000 |
| **3.700** | | 70.000 | 39.000 |
| **3.800** | | 75.000 | 43.000 |
| **3.900** | | 75.000 | 43.000 |
| **4.000** | | 75.000 | 43.000 |
| **4.100** | | 75.000 | 43.000 |
| **4.200** | | 75.000 | 43.000 |
| **4.300** | | 80.000 | 47.000 |
| **4.400** | | 80.000 | 47.000 |
| **4.500** | | 80.000 | 47.000 |
| **4.600** | | 80.000 | 47.000 |
| **4.700** | | 80.000 | 47.000 |
| **4.800** | | 86.000 | 52.000 |
| **4.900** | | 86.000 | 52.000 |
| **5.000** | | 86.000 | 52.000 |
| **5.100** | | 86.000 | 52.000 |
| **5.200** | | 86.000 | 52.000 |
| **5.300** | | 86.000 | 52.000 |
| **5.400** | | 93.000 | 57.000 |
| **5.500** | | 93.000 | 57.000 |
| **5.600** | | 93.000 | 57.000 |
| **5.700** | | 93.000 | 57.000 |

| d1 mm | inch | l1 mm | l2 mm |
|---|---|---|---|
| **5.800** | | 93.000 | 57.000 |
| **5.900** | | 93.000 | 57.000 |
| **6.000** | | 93.000 | 57.000 |
| **6.100** | | 101.000 | 63.000 |
| **6.200** | | 101.000 | 63.000 |
| **6.300** | | 101.000 | 63.000 |
| **6.400** | | 101.000 | 63.000 |
| **6.500** | | 101.000 | 63.000 |
| **6.600** | | 101.000 | 63.000 |
| **6.700** | | 101.000 | 63.000 |
| **6.800** | | 109.000 | 69.000 |
| **6.900** | | 109.000 | 69.000 |
| **7.000** | | 109.000 | 69.000 |
| **7.100** | | 109.000 | 69.000 |
| **7.200** | | 109.000 | 69.000 |
| **7.300** | | 109.000 | 69.000 |
| **7.400** | | 109.000 | 69.000 |
| **7.500** | | 109.000 | 69.000 |
| **7.600** | | 117.000 | 75.000 |
| **7.700** | | 117.000 | 75.000 |
| **7.800** | | 117.000 | 75.000 |
| **7.900** | | 117.000 | 75.000 |
| **8.000** | | 117.000 | 75.000 |
| **8.100** | | 117.000 | 75.000 |
| **8.200** | | 117.000 | 75.000 |
| **8.300** | | 117.000 | 75.000 |
| **8.400** | | 117.000 | 75.000 |
| **8.500** | | 117.000 | 75.000 |
| **8.600** | | 125.000 | 81.000 |
| **8.700** | | 125.000 | 81.000 |
| **8.800** | | 125.000 | 81.000 |
| **8.900** | | 125.000 | 81.000 |
| **9.000** | | 125.000 | 81.000 |
| **9.100** | | 125.000 | 81.000 |
| **9.200** | | 125.000 | 81.000 |
| **9.300** | | 125.000 | 81.000 |
| **9.400** | | 125.000 | 81.000 |
| **9.500** | | 125.000 | 81.000 |
| **9.600** | | 133.000 | 87.000 |
| **9.700** | | 133.000 | 87.000 |
| **9.800** | | 133.000 | 87.000 |
| **9.900** | | 133.000 | 87.000 |
| **10.000** | | 133.000 | 87.000 |
| **10.200** | | 133.000 | 87.000 |
| **10.500** | | 133.000 | 87.000 |
| **11.000** | | 142.000 | 94.000 |
| **11.200** | | 142.000 | 94.000 |
| **11.500** | | 142.000 | 94.000 |

| d1<br>mm | inch | l1<br>mm | l2<br>mm |
|---|---|---|---|
| **11.800** | | 142.000 | 94.000 |
| **12.000** | | 151.000 | 101.000 |
| **12.500** | | 151.000 | 101.000 |
| **13.000** | | 151.000 | 101.000 |

| d1<br>mm | inch | l1<br>mm | l2<br>mm |
|---|---|---|---|

## Straight shank twist drills

## V16 Twist drills

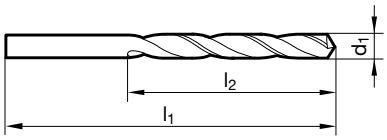
**Catalogue no. 71018**

V16 | ~5xD | DIN 338 | M42 | Bronze-VAP | 135° | h8 | R | Cyl

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ● | ● | ● | ● | ● | ○ |

Application recommendations page 178

- web thinning ≥ Ø 1.000
- optimised split point
- 8% cobalt-alloyed HSCO high speed steel for maximum tool life, high thermal resistance and hardness
- for stationary and mobile applications
- unalloyed and high-alloyed steel materials
- cast materials
- non-ferrous metals
- Titanium and Titanium alloys




| d1 mm | inch | l1 mm | l2 mm |
|---|---|---|---|
| **1.000** | | 34.000 | 12.000 |
| **1.100** | | 36.000 | 14.000 |
| **1.200** | | 38.000 | 16.000 |
| **1.300** | | 38.000 | 16.000 |
| **1.400** | | 40.000 | 18.000 |
| **1.500** | | 40.000 | 18.000 |
| **1.590** | 1/16 | 43.000 | 20.000 |
| **1.600** | | 43.000 | 20.000 |
| **1.700** | | 43.000 | 20.000 |
| **1.800** | | 46.000 | 22.000 |
| **1.900** | | 46.000 | 22.000 |
| **1.980** | 5/64 | 49.000 | 24.000 |
| **2.000** | | 49.000 | 24.000 |
| **2.100** | | 49.000 | 24.000 |
| **2.200** | | 53.000 | 27.000 |
| **2.300** | | 53.000 | 27.000 |
| **2.380** | 3/32 | 57.000 | 30.000 |
| **2.400** | | 57.000 | 30.000 |
| **2.500** | | 57.000 | 30.000 |
| **2.600** | | 57.000 | 30.000 |
| **2.700** | | 61.000 | 33.000 |
| **2.780** | 7/64 | 61.000 | 33.000 |
| **2.800** | | 61.000 | 33.000 |
| **2.900** | | 61.000 | 33.000 |
| **3.000** | | 61.000 | 33.000 |
| **3.100** | | 65.000 | 36.000 |
| **3.170** | 1/8 | 65.000 | 36.000 |
| **3.200** | | 65.000 | 36.000 |
| **3.250** | | 65.000 | 36.000 |
| **3.300** | | 65.000 | 36.000 |
| **3.400** | | 70.000 | 39.000 |
| **3.500** | | 70.000 | 39.000 |
| **3.570** | 9/64 | 70.000 | 39.000 |
| **3.600** | | 70.000 | 39.000 |
| **3.700** | | 70.000 | 39.000 |
| **3.800** | | 75.000 | 43.000 |
| **3.900** | | 75.000 | 43.000 |
| **3.970** | 5/32 | 75.000 | 43.000 |
| **4.000** | | 75.000 | 43.000 |
| **4.100** | | 75.000 | 43.000 |
| **4.200** | | 75.000 | 43.000 |
| **4.300** | | 80.000 | 47.000 |
| **4.400** | | 80.000 | 47.000 |
| **4.500** | | 80.000 | 47.000 |
| **4.600** | | 80.000 | 47.000 |
| **4.700** | | 80.000 | 47.000 |
| **4.760** | 3/16 | 86.000 | 52.000 |
| **4.800** | | 86.000 | 52.000 |

| d1 mm | inch | l1 mm | l2 mm |
|---|---|---|---|
| **4.900** | | 86.000 | 52.000 |
| **5.000** | | 86.000 | 52.000 |
| **5.100** | | 86.000 | 52.000 |
| **5.160** | 13/64 | 86.000 | 52.000 |
| **5.200** | | 86.000 | 52.000 |
| **5.300** | | 86.000 | 52.000 |
| **5.400** | | 93.000 | 57.000 |
| **5.500** | | 93.000 | 57.000 |
| **5.560** | 7/32 | 93.000 | 57.000 |
| **5.600** | | 93.000 | 57.000 |
| **5.700** | | 93.000 | 57.000 |
| **5.800** | | 93.000 | 57.000 |
| **5.900** | | 93.000 | 57.000 |
| **5.950** | 15/64 | 93.000 | 57.000 |
| **6.000** | | 93.000 | 57.000 |
| **6.100** | | 101.000 | 63.000 |
| **6.200** | | 101.000 | 63.000 |
| **6.300** | | 101.000 | 63.000 |
| **6.350** | 1/4 | 101.000 | 63.000 |
| **6.400** | | 101.000 | 63.000 |
| **6.500** | | 101.000 | 63.000 |
| **6.600** | | 101.000 | 63.000 |
| **6.700** | | 101.000 | 63.000 |
| **6.800** | | 109.000 | 69.000 |
| **6.900** | | 109.000 | 69.000 |
| **7.000** | | 109.000 | 69.000 |
| **7.100** | | 109.000 | 69.000 |
| **7.140** | 9/32 | 109.000 | 69.000 |
| **7.200** | | 109.000 | 69.000 |
| **7.300** | | 109.000 | 69.000 |
| **7.400** | | 109.000 | 69.000 |
| **7.500** | | 109.000 | 69.000 |
| **7.540** | 19/64 | 117.000 | 75.000 |
| **7.600** | | 117.000 | 75.000 |
| **7.700** | | 117.000 | 75.000 |
| **7.800** | | 117.000 | 75.000 |
| **7.900** | | 117.000 | 75.000 |
| **7.940** | 5/16 | 117.000 | 75.000 |
| **8.000** | | 117.000 | 75.000 |
| **8.100** | | 117.000 | 75.000 |
| **8.200** | | 117.000 | 75.000 |
| **8.300** | | 117.000 | 75.000 |
| **8.330** | 21/64 | 117.000 | 75.000 |
| **8.400** | | 117.000 | 75.000 |
| **8.500** | | 117.000 | 75.000 |
| **8.600** | | 125.000 | 81.000 |
| **8.700** | | 125.000 | 81.000 |
| **8.730** | 11/32 | 125.000 | 81.000 |

| d1 mm | inch | l1 mm | l2 mm |
|---|---|---|---|
| **8.800** | | 125.000 | 81.000 |
| **8.900** | | 125.000 | 81.000 |
| **9.000** | | 125.000 | 81.000 |
| **9.100** | | 125.000 | 81.000 |
| **9.130** | 23/64 | 125.000 | 81.000 |
| **9.200** | | 125.000 | 81.000 |
| **9.300** | | 125.000 | 81.000 |
| **9.500** | | 125.000 | 81.000 |
| **9.520** | 3/8 | 133.000 | 87.000 |
| **9.600** | | 133.000 | 87.000 |
| **9.700** | | 133.000 | 87.000 |
| **9.800** | | 133.000 | 87.000 |
| **9.900** | | 133.000 | 87.000 |
| **9.920** | 25/64 | 133.000 | 87.000 |
| **10.000** | | 133.000 | 87.000 |
| **10.100** | | 133.000 | 87.000 |
| **10.200** | | 133.000 | 87.000 |
| **10.300** | | 133.000 | 87.000 |

| d1 mm | inch | l1 mm | l2 mm |
|---|---|---|---|
| **10.320** | 13/32 | 133.000 | 87.000 |
| **10.500** | | 133.000 | 87.000 |
| **10.720** | 27/64 | 142.000 | 94.000 |
| **10.800** | | 142.000 | 94.000 |
| **11.000** | | 142.000 | 94.000 |
| **11.110** | 7/16 | 142.000 | 94.000 |
| **11.500** | | 142.000 | 94.000 |
| **11.510** | 29/64 | 142.000 | 94.000 |
| **11.910** | 15/32 | 151.000 | 101.000 |
| **12.000** | | 151.000 | 101.000 |
| **12.200** | | 151.000 | 101.000 |
| **12.300** | 31/64 | 151.000 | 101.000 |
| **12.500** | | 151.000 | 101.000 |
| **12.700** | 1/2 | 151.000 | 101.000 |
| **12.800** | | 151.000 | 101.000 |
| **13.000** | | 151.000 | 101.000 |

## Straight shank twist drills

## V16 Set of twist drills

**Catalogue no. 71019**

V16 | ~5xD | DIN 338 | M42 | Bronze-VAP | 135° | h8 | R | Cyl

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ● | ● | ● | ● | ● | ○ |

Application recommendations page 178

- optimised split point
- 8% cobalt-alloyed HSCO high speed steel
- for stationary and mobile applications
- Drills are available in the sets of popular sizes as shown. For more portable use the box is recommended. Other drill set compositions on request.

| Code no. | d1<br>mm | increasing by<br>mm | Pieces/set |
|---|---|---|---|
| **0.013** | 1.0-10.0 | 0.5 | 19 |
| **0.014** | 1.0-13.0 | 0.5 | 25 |

## Machine taps

### V16-Pocket set (twist drills, taps and countersinks)

N | WN | R | Cyl

- consisting of taps catalogue no. 73046 (M3 / M4 / M5 / M6 / M8 / M10), twist drills catalogue no. 71018 (Ø 2.5 / 3.3 / 4.2 / 5.0 / 6.8 / 8.5) and 90° countersinks catalogue no. 72346 (Ø 6.3 / 12.4)

**Catalogue no. 71020**

| Code no. | Pieces/set |
|---|---|
| **1.000** | 14 |

# Straight shank twist drills

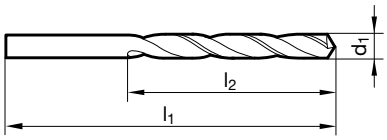
## Aircraft extension drills, 6 inches long

**Catalogue no. 71140**

| N | NAS 907 | HSS | bright | 118° | h8 | R | Cyl |
|---|---|---|---|---|---|---|---|

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ● | | ● | ● | | |

- relieved cone
- Sheets from Al alloys
- laminated plates (sandwiched materials)
- steel and cast iron




| d1 mm | inch | l1 mm | l2 mm |
|---|---|---|---|
| **1.500** | | 153.000 | 23.000 |
| **1.590** | 1/16 | 153.000 | 26.000 |
| **1.610** | | 153.000 | 26.000 |
| **1.650** | | 153.000 | 26.000 |
| **1.750** | | 153.000 | 26.000 |
| **1.780** | | 153.000 | 26.000 |
| **1.850** | | 153.000 | 26.000 |
| **1.900** | | 153.000 | 26.000 |
| **1.930** | | 153.000 | 29.000 |
| **1.980** | 5/64 | 153.000 | 29.000 |
| **1.990** | | 153.000 | 29.000 |
| **2.000** | | 153.000 | 29.000 |
| **2.080** | | 153.000 | 29.000 |
| **2.100** | | 153.000 | 29.000 |
| **2.180** | | 153.000 | 32.500 |
| **2.260** | | 153.000 | 32.500 |
| **2.300** | | 153.000 | 32.500 |
| **2.370** | | 153.000 | 37.000 |
| **2.380** | 3/32 | 153.000 | 37.000 |
| **2.400** | | 153.000 | 37.000 |
| **2.490** | | 153.000 | 37.000 |
| **2.500** | | 153.000 | 37.000 |
| **2.530** | | 153.000 | 37.000 |
| **2.580** | | 153.000 | 37.000 |
| **2.640** | | 153.000 | 37.000 |
| **2.710** | | 153.000 | 42.000 |
| **2.780** | 7/64 | 153.000 | 42.000 |
| **2.790** | | 153.000 | 42.000 |
| **2.820** | | 153.000 | 42.000 |
| **2.870** | | 153.000 | 42.000 |
| **2.950** | | 153.000 | 42.000 |
| **3.000** | | 153.000 | 42.000 |
| **3.050** | | 153.000 | 42.000 |
| **3.170** | 1/8 | 153.000 | 42.000 |
| **3.200** | | 153.000 | 42.000 |
| **3.260** | | 153.000 | 42.000 |
| **3.450** | | 154.000 | 49.000 |
| **3.500** | | 154.000 | 49.000 |
| **3.570** | 9/64 | 154.000 | 49.000 |
| **3.600** | | 154.000 | 49.000 |
| **3.660** | | 154.000 | 49.000 |
| **3.700** | | 154.000 | 49.000 |
| **3.730** | | 154.000 | 49.000 |
| **3.800** | | 154.000 | 55.000 |
| **3.860** | | 154.000 | 55.000 |
| **3.910** | | 154.000 | 55.000 |
| **3.970** | 5/32 | 154.000 | 55.000 |
| **3.990** | | 154.000 | 55.000 |

| d1 mm | inch | l1 mm | l2 mm |
|---|---|---|---|
| **4.000** | | 154.000 | 55.000 |
| **4.040** | | 154.000 | 55.000 |
| **4.090** | | 154.000 | 55.000 |
| **4.220** | | 154.000 | 55.000 |
| **4.300** | | 154.000 | 60.000 |
| **4.370** | 11/64 | 154.000 | 60.000 |
| **4.390** | | 154.000 | 60.000 |
| **4.500** | | 154.000 | 60.000 |
| **4.570** | | 154.000 | 60.000 |
| **4.700** | | 154.000 | 60.000 |
| **4.760** | 3/16 | 154.000 | 63.500 |
| **4.800** | | 154.000 | 63.500 |
| **4.850** | | 154.000 | 63.500 |
| **4.920** | | 154.000 | 63.500 |
| **4.980** | | 154.000 | 63.500 |
| **5.000** | | 154.000 | 63.500 |
| **5.110** | | 154.000 | 63.500 |
| **5.160** | 13/64 | 154.000 | 63.500 |
| **5.500** | | 154.000 | 68.500 |
| **5.560** | 7/32 | 154.000 | 68.500 |
| **5.610** | | 154.000 | 68.500 |
| **5.790** | | 154.000 | 68.500 |
| **5.800** | | 154.000 | 68.500 |
| **5.940** | | 154.000 | 68.500 |
| **5.950** | 15/64 | 154.000 | 68.500 |
| **6.040** | | 154.000 | 75.000 |
| **6.150** | | 154.000 | 75.000 |
| **6.200** | | 154.000 | 75.000 |
| **6.250** | | 154.000 | 75.000 |
| **6.350** | 1/4 | 154.000 | 75.000 |
| **6.400** | | 154.000 | 75.000 |
| **6.530** | | 154.000 | 75.000 |
| **6.630** | | 154.000 | 75.000 |
| **6.750** | 17/64 | 155.000 | 80.000 |
| **6.800** | | 155.000 | 80.000 |
| **7.000** | | 155.000 | 80.000 |
| **7.500** | | 155.000 | 80.000 |
| **7.700** | | 155.000 | 90.000 |
| **7.940** | 5/16 | 155.000 | 90.000 |
| **8.000** | | 155.000 | 90.000 |
| **8.500** | | 155.000 | 90.000 |

## Straight shank twist drills

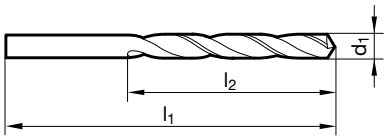
## Aircraft extension drills, 6 inches long

**Catalogue no. 71142**

| N | NAS 907 | HSS | nitrided | 135° | h8 | R | Cyl |
|---|---|---|---|---|---|---|---|

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ● | | ● | ● | | |

- relieved cone
- Sheets from Al alloys
- laminated plates (sandwiched materials)
- steel and cast iron




| d1 mm | inch | l1 mm | l2 mm |
|---|---|---|---|
| **1.500** | | 153.000 | 23.000 |
| **1.590** | 1/16 | 153.000 | 26.000 |
| **1.700** | | 153.000 | 26.000 |
| **1.750** | | 153.000 | 26.000 |
| **1.780** | | 153.000 | 26.000 |
| **1.900** | | 153.000 | 26.000 |
| **1.980** | 5/64 | 153.000 | 29.000 |
| **2.000** | | 153.000 | 29.000 |
| **2.300** | | 153.000 | 32.500 |
| **2.380** | 3/32 | 153.000 | 37.000 |
| **2.400** | | 153.000 | 37.000 |
| **2.490** | | 153.000 | 37.000 |
| **2.500** | | 153.000 | 37.000 |
| **2.530** | | 153.000 | 37.000 |
| **2.580** | | 153.000 | 37.000 |
| **2.640** | | 153.000 | 37.000 |
| **2.710** | | 153.000 | 42.000 |
| **2.780** | 7/64 | 153.000 | 42.000 |
| **2.790** | | 153.000 | 42.000 |
| **2.820** | | 153.000 | 42.000 |
| **2.870** | | 153.000 | 42.000 |
| **2.950** | | 153.000 | 42.000 |
| **3.000** | | 153.000 | 42.000 |
| **3.050** | | 153.000 | 42.000 |
| **3.170** | 1/8 | 153.000 | 42.000 |
| **3.200** | | 153.000 | 42.000 |
| **3.260** | | 153.000 | 42.000 |
| **3.450** | | 154.000 | 49.000 |
| **3.500** | | 154.000 | 49.000 |
| **3.570** | 9/64 | 154.000 | 49.000 |
| **3.600** | | 154.000 | 49.000 |
| **3.660** | | 154.000 | 49.000 |
| **3.700** | | 154.000 | 49.000 |
| **3.800** | | 154.000 | 55.000 |
| **3.970** | 5/32 | 154.000 | 55.000 |
| **3.990** | | 154.000 | 55.000 |
| **4.000** | | 154.000 | 55.000 |
| **4.040** | | 154.000 | 55.000 |
| **4.090** | | 154.000 | 55.000 |
| **4.220** | | 154.000 | 55.000 |
| **4.300** | | 154.000 | 60.000 |
| **4.370** | 11/64 | 154.000 | 60.000 |
| **4.390** | | 154.000 | 60.000 |
| **4.500** | | 154.000 | 60.000 |
| **4.570** | | 154.000 | 60.000 |
| **4.620** | | 154.000 | 60.000 |
| **4.700** | | 154.000 | 60.000 |
| **4.760** | 3/16 | 154.000 | 63.500 |
| **4.800** | | 154.000 | 63.500 |
| **4.850** | | 154.000 | 63.500 |
| **4.920** | | 154.000 | 63.500 |
| **4.980** | | 154.000 | 63.500 |
| **5.000** | | 154.000 | 63.500 |
| **5.060** | | 154.000 | 63.500 |
| **5.110** | | 154.000 | 63.500 |
| **5.160** | 13/64 | 154.000 | 63.500 |
| **5.410** | | 154.000 | 68.500 |
| **5.500** | | 154.000 | 68.500 |
| **5.560** | 7/32 | 154.000 | 68.500 |
| **5.610** | | 154.000 | 68.500 |
| **5.790** | | 154.000 | 68.500 |
| **5.800** | | 154.000 | 68.500 |
| **5.940** | | 154.000 | 68.500 |
| **5.950** | 15/64 | 154.000 | 68.500 |
| **6.040** | | 154.000 | 75.000 |
| **6.150** | | 154.000 | 75.000 |
| **6.200** | | 154.000 | 75.000 |
| **6.250** | | 154.000 | 75.000 |
| **6.350** | 1/4 | 154.000 | 75.000 |
| **6.450** | | 154.000 | 75.000 |
| **6.530** | | 154.000 | 75.000 |
| **6.750** | 17/64 | 155.000 | 80.000 |
| **6.800** | | 155.000 | 80.000 |
| **7.000** | | 155.000 | 80.000 |
| **7.700** | | 155.000 | 90.000 |
| **7.940** | 5/16 | 155.000 | 90.000 |
| **8.000** | | 155.000 | 90.000 |

# Straight shank twist drills

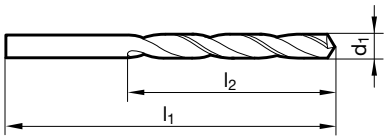
## Aircraft extension drills, 12 inches long

**Catalogue no. 71141**

N | NAS 907 | HSS | bright | 118° | h8 | R | Cyl

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ● | | ● | ● | | |

- relieved cone
- Sheets from Al alloys
- laminated plates (sandwiched materials)
- steel and cast iron




| d1 mm | inch | l1 mm | l2 mm |
|---|---|---|---|
| **1.500** | | 306.000 | 23.000 |
| **1.590** | 1/16 | 306.000 | 26.000 |
| **1.780** | | 306.000 | 26.000 |
| **1.850** | | 306.000 | 26.000 |
| **1.900** | | 306.000 | 26.000 |
| **1.930** | | 306.000 | 29.000 |
| **1.980** | 5/64 | 306.000 | 29.000 |
| **1.990** | | 306.000 | 29.000 |
| **2.000** | | 306.000 | 29.000 |
| **2.060** | | 306.000 | 29.000 |
| **2.080** | | 306.000 | 29.000 |
| **2.100** | | 306.000 | 29.000 |
| **2.180** | | 306.000 | 32.500 |
| **2.260** | | 306.000 | 32.500 |
| **2.380** | 3/32 | 306.000 | 37.000 |
| **2.440** | | 306.000 | 37.000 |
| **2.490** | | 306.000 | 37.000 |
| **2.500** | | 306.000 | 37.000 |
| **2.530** | | 306.000 | 37.000 |
| **2.580** | | 306.000 | 37.000 |
| **2.640** | | 306.000 | 37.000 |
| **2.780** | 7/64 | 306.000 | 42.000 |
| **2.790** | | 306.000 | 42.000 |
| **2.820** | | 306.000 | 42.000 |
| **2.950** | | 306.000 | 42.000 |
| **3.000** | | 306.000 | 42.000 |
| **3.050** | | 306.000 | 42.000 |
| **3.170** | 1/8 | 306.000 | 42.000 |
| **3.200** | | 306.000 | 42.000 |
| **3.260** | | 306.000 | 42.000 |
| **3.450** | | 308.000 | 49.000 |
| **3.500** | | 308.000 | 49.000 |
| **3.570** | 9/64 | 308.000 | 49.000 |
| **3.600** | | 308.000 | 49.000 |
| **3.660** | | 308.000 | 49.000 |
| **3.700** | | 308.000 | 49.000 |
| **3.800** | | 308.000 | 55.000 |
| **3.970** | 5/32 | 308.000 | 55.000 |
| **4.000** | | 308.000 | 55.000 |
| **4.040** | | 308.000 | 55.000 |
| **4.090** | | 308.000 | 55.000 |
| **4.220** | | 308.000 | 55.000 |

| d1 mm | inch | l1 mm | l2 mm |
|---|---|---|---|
| **4.300** | | 308.000 | 60.000 |
| **4.370** | 11/64 | 308.000 | 60.000 |
| **4.390** | | 308.000 | 60.000 |
| **4.500** | | 308.000 | 60.000 |
| **4.570** | | 308.000 | 60.000 |
| **4.620** | | 308.000 | 60.000 |
| **4.700** | | 308.000 | 60.000 |
| **4.760** | 3/16 | 308.000 | 63.500 |
| **4.800** | | 308.000 | 63.500 |
| **4.850** | | 308.000 | 63.500 |
| **4.920** | | 308.000 | 63.500 |
| **4.980** | | 308.000 | 63.500 |
| **5.000** | | 308.000 | 63.500 |
| **5.160** | 13/64 | 308.000 | 63.500 |
| **5.220** | | 308.000 | 63.500 |
| **5.410** | | 308.000 | 68.500 |
| **5.500** | | 308.000 | 68.500 |
| **5.560** | 7/32 | 308.000 | 68.500 |
| **5.790** | | 308.000 | 68.500 |
| **5.800** | | 308.000 | 68.500 |
| **5.950** | 15/64 | 308.000 | 68.500 |
| **6.000** | | 308.000 | 68.500 |
| **6.040** | | 308.000 | 75.000 |
| **6.150** | | 308.000 | 75.000 |
| **6.200** | | 308.000 | 75.000 |
| **6.250** | | 308.000 | 75.000 |
| **6.350** | 1/4 | 308.000 | 75.000 |
| **6.530** | | 308.000 | 75.000 |
| **7.000** | | 310.000 | 80.000 |
| **7.700** | | 310.000 | 90.000 |
| **7.940** | 5/16 | 310.000 | 90.000 |
| **8.000** | | 310.000 | 90.000 |
| **8.500** | | 310.000 | 90.000 |

## Straight shank twist drills

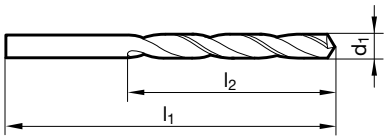
## Aircraft extension drills, 12 inches long

**Catalogue no. 71143**

| N | NAS 907 | HSS | nitrided | 135° | h8 | R | Cyl |
|---|---|---|---|---|---|---|---|

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ● | | ● | ● | | |

- relieved cone
- Sheets from Al alloys
- laminated plates (sandwiched materials)
- steel and cast iron




| d1 mm | inch | l1 mm | l2 mm |
|---|---|---|---|
| **1.500** | | 306.000 | 23.000 |
| **1.590** | 1/16 | 306.000 | 26.000 |
| **1.780** | | 306.000 | 26.000 |
| **1.900** | | 306.000 | 26.000 |
| **1.980** | 5/64 | 306.000 | 29.000 |
| **2.000** | | 306.000 | 29.000 |
| **2.300** | | 306.000 | 32.500 |
| **2.380** | 3/32 | 306.000 | 37.000 |
| **2.490** | | 306.000 | 37.000 |
| **2.500** | | 306.000 | 37.000 |
| **2.530** | | 306.000 | 37.000 |
| **2.580** | | 306.000 | 37.000 |
| **2.640** | | 306.000 | 37.000 |
| **2.710** | | 306.000 | 42.000 |
| **2.780** | 7/64 | 306.000 | 42.000 |
| **2.790** | | 306.000 | 42.000 |
| **2.820** | | 306.000 | 42.000 |
| **2.870** | | 306.000 | 42.000 |
| **2.950** | | 306.000 | 42.000 |
| **3.000** | | 306.000 | 42.000 |
| **3.050** | | 306.000 | 42.000 |
| **3.170** | 1/8 | 306.000 | 42.000 |
| **3.200** | | 306.000 | 42.000 |
| **3.260** | | 306.000 | 42.000 |
| **3.450** | | 308.000 | 49.000 |
| **3.500** | | 308.000 | 49.000 |
| **3.600** | | 308.000 | 49.000 |
| **3.660** | | 308.000 | 49.000 |
| **3.700** | | 308.000 | 49.000 |
| **3.730** | | 308.000 | 49.000 |
| **3.800** | | 308.000 | 55.000 |
| **3.970** | 5/32 | 308.000 | 55.000 |
| **3.990** | | 308.000 | 55.000 |
| **4.000** | | 308.000 | 55.000 |
| **4.040** | | 308.000 | 55.000 |
| **4.090** | | 308.000 | 55.000 |

| d1 mm | inch | l1 mm | l2 mm |
|---|---|---|---|
| **4.220** | | 308.000 | 55.000 |
| **4.290** | | 308.000 | 60.000 |
| **4.300** | | 308.000 | 60.000 |
| **4.370** | 11/64 | 308.000 | 60.000 |
| **4.390** | | 308.000 | 60.000 |
| **4.500** | | 308.000 | 60.000 |
| **4.570** | | 308.000 | 60.000 |
| **4.620** | | 308.000 | 60.000 |
| **4.700** | | 308.000 | 60.000 |
| **4.760** | 3/16 | 308.000 | 63.500 |
| **4.800** | | 308.000 | 63.500 |
| **4.850** | | 308.000 | 63.500 |
| **4.920** | | 308.000 | 63.500 |
| **4.980** | | 308.000 | 63.500 |
| **5.000** | | 308.000 | 63.500 |
| **5.060** | | 308.000 | 63.500 |
| **5.110** | | 308.000 | 63.500 |
| **5.160** | 13/64 | 308.000 | 63.500 |
| **5.500** | | 308.000 | 68.500 |
| **5.560** | 7/32 | 308.000 | 68.500 |
| **5.790** | | 308.000 | 68.500 |
| **5.940** | | 308.000 | 68.500 |
| **5.950** | 15/64 | 308.000 | 68.500 |
| **6.000** | | 308.000 | 68.500 |
| **6.040** | | 308.000 | 75.000 |
| **6.150** | | 308.000 | 75.000 |
| **6.200** | | 308.000 | 75.000 |
| **6.250** | | 308.000 | 75.000 |
| **6.350** | 1/4 | 308.000 | 75.000 |
| **6.530** | | 308.000 | 75.000 |
| **6.800** | | 310.000 | 80.000 |
| **7.000** | | 310.000 | 80.000 |
| **7.700** | | 310.000 | 90.000 |
| **7.940** | 5/16 | 310.000 | 90.000 |
| **8.000** | | 310.000 | 90.000 |

## Machine taps

## Taps for ISO metric threads

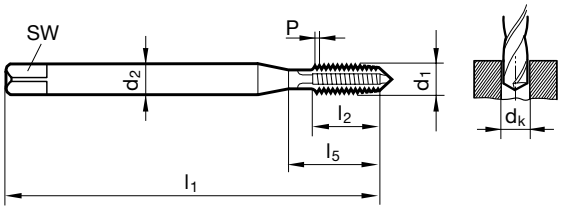
**Catalogue no. 53733**

Produktiv N-X | ~DIN 371/376 | B | HSS-E | AlTiZrN | R | 6HX

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ● | ● | ● | ○ | ● | |

Application recommendations page 182-203

- for through holes
- with spiral point
- chip evacuation in feed direction
- for universal application
- steel materials up to 1200 N/mm²
- acid resist./stainless steels
- non-ferrous metals
- cast materials




| d1 | P<br>mm | d2<br>mm | SW<br>mm | dk<br>mm | l1<br>mm | l2<br>mm | l5<br>mm |
|---|---|---|---|---|---|---|---|
| **M2** | 0.400 | 2.800 | 2.100 | 1.60 | 45.000 | 8.000 | 13.500 |
| **M2,5** | 0.450 | 2.800 | 2.100 | 2.05 | 50.000 | 9.000 | 14.500 |
| **M3** | 0.500 | 3.500 | 2.700 | 2.50 | 56.000 | 10.000 | 18.000 |
| **M4** | 0.700 | 4.500 | 3.400 | 3.30 | 63.000 | 12.000 | 21.000 |
| **M4,5** | 0.750 | 6.000 | 4.900 | 3.70 | 70.000 | 14.000 | 25.000 |
| **M5** | 0.800 | 6.000 | 4.900 | 4.20 | 70.000 | 14.000 | 25.000 |
| **M6** | 1.000 | 6.000 | 4.900 | 5.00 | 80.000 | 16.000 | 30.000 |
| **M7** | 1.000 | 7.000 | 5.500 | 6.00 | 80.000 | 16.000 | 30.000 |
| **M8** | 1.250 | 8.000 | 6.200 | 6.80 | 90.000 | 17.000 | 35.000 |
| **M9** | 1.250 | 9.000 | 7.000 | 7.80 | 90.000 | 17.000 | 35.000 |
| **M10** | 1.500 | 10.000 | 8.000 | 8.50 | 100.000 | 20.000 | 39.000 |
| **M11** | 1.500 | 8.000 | 6.200 | 9.50 | 100.000 | 20.000 | 42.000 |
| **M12** | 1.750 | 9.000 | 7.000 | 10.20 | 110.000 | 24.000 | 49.000 |
| **M14** | 2.000 | 11.000 | 9.000 | 12.00 | 110.000 | 26.000 | 53.000 |
| **M16** | 2.000 | 12.000 | 9.000 | 14.00 | 110.000 | 26.000 | 54.000 |
| **M18** | 2.500 | 14.000 | 11.000 | 15.50 | 125.000 | 30.000 | 62.000 |
| **M20** | 2.500 | 16.000 | 12.000 | 17.50 | 140.000 | 32.000 | 62.000 |
| **M22** | 2.500 | 18.000 | 14.500 | 19.50 | 140.000 | 32.000 | 62.000 |
| **M24** | 3.000 | 18.000 | 14.500 | 21.00 | 160.000 | 36.000 | 73.000 |
| **M30** | 3.500 | 22.000 | 18.000 | 26.50 | 180.000 | 40.000 | 85.000 |
| **M33** | 3.500 | 25.000 | 20.000 | 29.50 | 180.000 | 40.000 | 91.000 |
| **M36** | 4.000 | 28.000 | 22.000 | 32.00 | 200.000 | 50.000 | 102.000 |
| **M39** | 4.000 | 32.000 | 24.000 | 35.00 | 200.000 | 50.000 | 107.000 |
| **M42** | 4.500 | 32.000 | 24.000 | 37.50 | 200.000 | 56.000 | 112.000 |

## Machine taps

## Taps for ISO metric threads

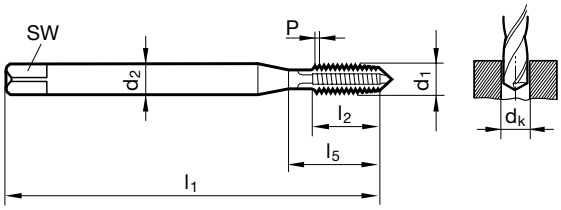
**Catalogue no. 53734**

Produktiv N-X LH | DIN 371/376 | B | HSS-E | AlTiZrN | L | 6HX

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ● | ● | ○ | ○ | ○ | |

Application recommendations page 182-203

- for through holes
- with spiral point
- chip evacuation in feed direction
- for universal application
- steel materials up to 1200 N/mm²
- acid resist./stainless steels
- non-ferrous metals
- cast materials




| d1 | P<br>mm | d2<br>mm | SW<br>mm | dk<br>mm | l1<br>mm | l2<br>mm | l5<br>mm |
|---|---|---|---|---|---|---|---|
| **M2** | 0.400 | 2.800 | 2.100 | 1.60 | 45.000 | 8.000 | 13.500 |
| **M2,5** | 0.450 | 2.800 | 2.100 | 2.05 | 50.000 | 9.000 | 14.500 |
| **M3** | 0.500 | 3.500 | 2.700 | 2.50 | 56.000 | 10.000 | 18.000 |
| **M4** | 0.700 | 4.500 | 3.400 | 3.30 | 63.000 | 12.000 | 21.000 |
| **M5** | 0.800 | 6.000 | 4.900 | 4.20 | 70.000 | 14.000 | 25.000 |
| **M6** | 1.000 | 6.000 | 4.900 | 5.00 | 80.000 | 16.000 | 30.000 |
| **M8** | 1.250 | 8.000 | 6.200 | 6.80 | 90.000 | 17.000 | 35.000 |
| **M10** | 1.500 | 10.000 | 8.000 | 8.50 | 100.000 | 20.000 | 39.000 |
| **M12** | 1.750 | 9.000 | 7.000 | 10.20 | 110.000 | 24.000 | 49.000 |
| **M14** | 2.000 | 11.000 | 9.000 | 12.00 | 110.000 | 26.000 | 53.000 |
| **M16** | 2.000 | 12.000 | 9.000 | 14.00 | 110.000 | 26.000 | 54.000 |
| **M18** | 2.500 | 14.000 | 11.000 | 15.50 | 125.000 | 30.000 | 62.000 |
| **M20** | 2.500 | 16.000 | 12.000 | 17.50 | 140.000 | 32.000 | 62.000 |
| **M24** | 3.000 | 18.000 | 14.500 | 21.00 | 160.000 | 36.000 | 73.000 |
| **M30** | 3.500 | 22.000 | 18.000 | 26.50 | 180.000 | 40.000 | 85.000 |

## Machine taps

## Taps for ISO metric threads

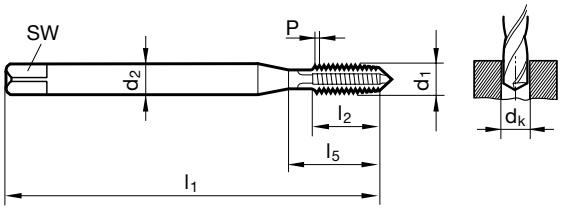
**Catalogue no. 53735**

| Produktiv N-X | DIN 371/376 | B | HSS-E-PM | AlTiZrN | R | 6HX |
|---|---|---|---|---|---|---|

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ● | ● | ○ | ○ | ○ | |

Application recommendations page 182-203

- for through holes
- with spiral point
- chip evacuation in feed direction
- for universal application
- steel materials up to 1200 N/mm²
- acid resist./stainless steels
- non-ferrous metals
- cast materials




| d1 | P mm | d2 mm | SW mm | dk mm | l1 mm | l2 mm | l5 mm |
|---|---|---|---|---|---|---|---|
| **M3** | 0.500 | 3.500 | 2.700 | 2.50 | 56.000 | 10.000 | 18.000 |
| **M4** | 0.700 | 4.500 | 3.400 | 3.30 | 63.000 | 12.000 | 21.000 |
| **M5** | 0.800 | 6.000 | 4.900 | 4.20 | 70.000 | 14.000 | 25.000 |
| **M6** | 1.000 | 6.000 | 4.900 | 5.00 | 80.000 | 16.000 | 30.000 |
| **M8** | 1.250 | 8.000 | 6.200 | 6.80 | 90.000 | 17.000 | 35.000 |
| **M10** | 1.500 | 10.000 | 8.000 | 8.50 | 100.000 | 20.000 | 39.000 |
| **M12** | 1.750 | 9.000 | 7.000 | 10.20 | 110.000 | 24.000 | 49.000 |
| **M14** | 2.000 | 11.000 | 9.000 | 12.00 | 110.000 | 26.000 | 53.000 |
| **M16** | 2.000 | 12.000 | 9.000 | 14.00 | 110.000 | 26.000 | 54.000 |
| **M20** | 2.500 | 16.000 | 12.000 | 17.50 | 140.000 | 32.000 | 62.000 |

## Machine taps

## Taps for ISO metric threads

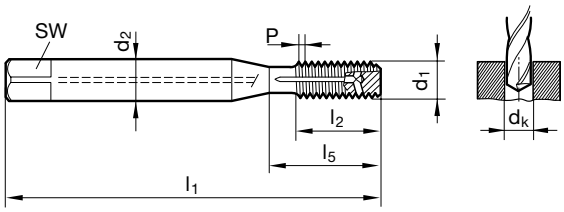
**Catalogue no. 53736**

Produktiv N-X | DIN 371/376 | B | HSS-E-PM | AlTiZrN | R | 6HX

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ● | ● | ○ | ○ | ○ | |

Application recommendations page 182-203

- for through holes
- with spiral point
- radial coolant exit
- chip evacuation in feed direction
- for universal application
- steel materials up to 1200 N/mm²
- acid resist./stainless steels
- non-ferrous metals
- cast materials




| d1 | P<br>mm | d2<br>mm | SW<br>mm | dk<br>mm | l1<br>mm | l2<br>mm | l5<br>mm |
|---|---|---|---|---|---|---|---|
| **M5** | 0.800 | 6.000 | 4.900 | 4.20 | 70.000 | 14.000 | 25.000 |
| **M6** | 1.000 | 6.000 | 4.900 | 5.00 | 80.000 | 16.000 | 30.000 |
| **M8** | 1.250 | 8.000 | 6.200 | 6.80 | 90.000 | 17.000 | 35.000 |
| **M10** | 1.500 | 10.000 | 8.000 | 8.50 | 100.000 | 20.000 | 39.000 |
| **M12** | 1.750 | 9.000 | 7.000 | 10.20 | 110.000 | 24.000 | 49.000 |
| **M14** | 2.000 | 11.000 | 9.000 | 12.00 | 110.000 | 26.000 | 53.000 |
| **M16** | 2.000 | 12.000 | 9.000 | 14.00 | 110.000 | 26.000 | 54.000 |
| **M20** | 2.500 | 16.000 | 12.000 | 17.50 | 140.000 | 32.000 | 62.000 |
| **M24** | 3.000 | 18.000 | 14.500 | 21.00 | 160.000 | 36.000 | 73.000 |
| **M30** | 3.500 | 22.000 | 18.000 | 26.50 | 180.000 | 40.000 | 85.000 |

# Machine taps

## Taps for ISO metric threads

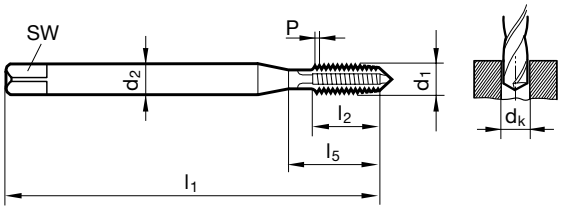
**Catalogue no. 53737**

Produktiv N-X | DIN 371/376 | B | HSS-E | AlTiZrN | R | 6H +0,1

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ● | ● | ○ | ○ | ○ | |

Application recommendations page 182-203

- for through holes
- with spiral point
- chip evacuation in feed direction
- for universal application
- steel materials up to 1200 N/mm²
- acid resist./stainless steels
- non-ferrous metals
- cast materials




| d1 | P mm | d2 mm | SW mm | dk mm | l1 mm | l2 mm | l5 mm |
|---|---|---|---|---|---|---|---|
| **M2** | 0.400 | 2.800 | 2.100 | 1.60 | 45.000 | 8.000 | 13.500 |
| **M2,5** | 0.450 | 2.800 | 2.100 | 2.05 | 50.000 | 9.000 | 14.500 |
| **M3** | 0.500 | 3.500 | 2.700 | 2.50 | 56.000 | 10.000 | 18.000 |
| **M4** | 0.700 | 4.500 | 3.400 | 3.30 | 63.000 | 12.000 | 21.000 |
| **M5** | 0.800 | 6.000 | 4.900 | 4.20 | 70.000 | 14.000 | 25.000 |
| **M6** | 1.000 | 6.000 | 4.900 | 5.00 | 80.000 | 16.000 | 30.000 |
| **M8** | 1.250 | 8.000 | 6.200 | 6.80 | 90.000 | 17.000 | 35.000 |
| **M10** | 1.500 | 10.000 | 8.000 | 8.50 | 100.000 | 20.000 | 39.000 |
| **M12** | 1.750 | 9.000 | 7.000 | 10.20 | 110.000 | 24.000 | 49.000 |
| **M14** | 2.000 | 11.000 | 9.000 | 12.00 | 110.000 | 26.000 | 53.000 |
| **M16** | 2.000 | 12.000 | 9.000 | 14.00 | 110.000 | 26.000 | 54.000 |
| **M18** | 2.500 | 14.000 | 11.000 | 15.50 | 125.000 | 30.000 | 62.000 |
| **M20** | 2.500 | 16.000 | 12.000 | 17.50 | 140.000 | 32.000 | 62.000 |
| **M24** | 3.000 | 18.000 | 14.500 | 21.00 | 160.000 | 36.000 | 73.000 |
| **M30** | 3.500 | 22.000 | 18.000 | 26.50 | 180.000 | 40.000 | 85.000 |

## Machine taps

## Taps for ISO metric threads

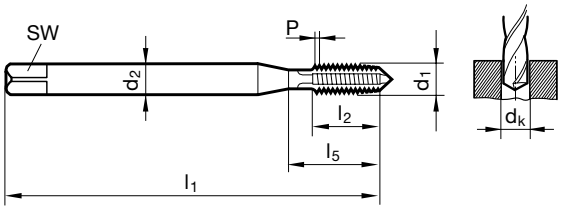
**Catalogue no. 53738**

| Produktiv N-X | DIN 371/376 | B | HSS-E | AlTiZrN | R | 6GX |
|---|---|---|---|---|---|---|

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ● | ● | ○ | ○ | ○ | |

Application recommendations page 182-203

- for through holes
- with spiral point
- chip evacuation in feed direction
- for universal application
- steel materials up to 1200 N/mm²
- acid resist./stainless steels
- non-ferrous metals
- cast materials



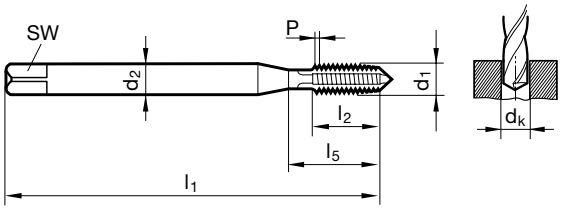

| d1 | P mm | d2 mm | SW mm | dk mm | l1 mm | l2 mm | l5 mm |
|---|---|---|---|---|---|---|---|
| **M2** | 0.400 | 2.800 | 2.100 | 1.60 | 45.000 | 8.000 | 13.500 |
| **M2,5** | 0.450 | 2.800 | 2.100 | 2.05 | 50.000 | 9.000 | 14.500 |
| **M3** | 0.500 | 3.500 | 2.700 | 2.50 | 56.000 | 10.000 | 18.000 |
| **M4** | 0.700 | 4.500 | 3.400 | 3.30 | 63.000 | 12.000 | 21.000 |
| **M5** | 0.800 | 6.000 | 4.900 | 4.20 | 70.000 | 14.000 | 25.000 |
| **M6** | 1.000 | 6.000 | 4.900 | 5.00 | 80.000 | 16.000 | 30.000 |
| **M8** | 1.250 | 8.000 | 6.200 | 6.80 | 90.000 | 17.000 | 35.000 |
| **M10** | 1.500 | 10.000 | 8.000 | 8.50 | 100.000 | 20.000 | 39.000 |
| **M12** | 1.750 | 9.000 | 7.000 | 10.20 | 110.000 | 24.000 | 49.000 |
| **M14** | 2.000 | 11.000 | 9.000 | 12.00 | 110.000 | 26.000 | 53.000 |
| **M16** | 2.000 | 12.000 | 9.000 | 14.00 | 110.000 | 26.000 | 54.000 |
| **M18** | 2.500 | 14.000 | 11.000 | 15.50 | 125.000 | 30.000 | 62.000 |
| **M20** | 2.500 | 16.000 | 12.000 | 17.50 | 140.000 | 32.000 | 62.000 |
| **M24** | 3.000 | 18.000 | 14.500 | 21.00 | 160.000 | 36.000 | 73.000 |
| **M30** | 3.500 | 22.000 | 18.000 | 26.50 | 180.000 | 40.000 | 85.000 |

# Machine taps

## Taps for ISO metric threads

**Catalogue no. 53739**






Produktiv N-X | WN | B | HSS-E | AlTiZrN | R | 6HX

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ● | ● | ○ | ○ | ○ | |

Application recommendations page 182-203

- for through holes
- with spiral point
- chip evacuation in feed direction
- extra length
- for universal application
- steel materials up to 1200 N/mm²
- acid resist./stainless steels
- non-ferrous metals
- cast materials

| d1 | P<br>mm | d2<br>mm | SW<br>mm | dk<br>mm | l1<br>mm | l2<br>mm | l5<br>mm |
|---|---|---|---|---|---|---|---|
| **M3** | 0.500 | 3.500 | 2.700 | 2.50 | 90.000 | 10.000 | 18.000 |
| **M4** | 0.700 | 4.500 | 3.400 | 3.30 | 125.000 | 12.000 | 21.000 |
| **M5** | 0.800 | 6.000 | 4.900 | 4.20 | 140.000 | 14.000 | 25.000 |
| **M6** | 1.000 | 6.000 | 4.900 | 5.00 | 160.000 | 16.000 | 30.000 |
| **M8** | 1.250 | 8.000 | 6.200 | 6.80 | 180.000 | 17.000 | 35.000 |
| **M10** | 1.500 | 10.000 | 8.000 | 8.50 | 200.000 | 20.000 | 39.000 |
| **M12** | 1.750 | 9.000 | 7.000 | 10.20 | 220.000 | 24.000 | 158.000 |
| **M14** | 2.000 | 11.000 | 9.000 | 12.00 | 220.000 | 26.000 | 160.000 |
| **M16** | 2.000 | 12.000 | 9.000 | 14.00 | 220.000 | 26.000 | 160.000 |
| **M20** | 2.500 | 16.000 | 12.000 | 17.50 | 280.000 | 32.000 | 217.000 |

## Machine taps

## Taps for ISO metric threads

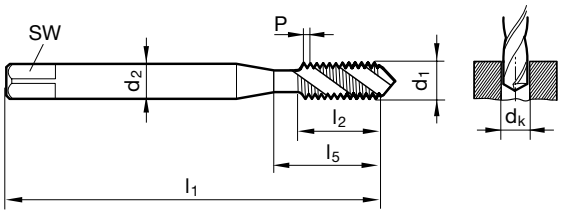
**Catalogue no. 53746**

Intensiv N-X | ~DIN 371/376 | C | HSS-E | TiAlN-H | R | 6HX

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ● | ● | ● | ○ | ○ | |

Application recommendations page 182-203

- for blind holes
- flutes with appr. 45° right-hand helix
- chip evacuation in shank direction
- for universal application
- steel materials up to 1200 N/mm²
- acid resist./stainless steels
- non-ferrous metals
- cast materials




| d1 | P<br>mm | d2<br>mm | SW<br>mm | dk<br>mm | l1<br>mm | l2<br>mm | l5<br>mm |
|---|---|---|---|---|---|---|---|
| **M2** | 0.400 | 2.800 | 2.100 | 1.60 | 45.000 | 4.500 | 13.500 |
| **M2,5** | 0.450 | 2.800 | 2.100 | 2.05 | 50.000 | 5.000 | 14.500 |
| **M3** | 0.500 | 3.500 | 2.700 | 2.50 | 56.000 | 6.000 | 18.000 |
| **M3,5** | 0.600 | 4.000 | 3.000 | 2.90 | 56.000 | 7.000 | 20.000 |
| **M4** | 0.700 | 4.500 | 3.400 | 3.30 | 63.000 | 7.500 | 21.000 |
| **M4,5** | 0.750 | 6.000 | 4.900 | 3.70 | 70.000 | 8.500 | 25.000 |
| **M5** | 0.800 | 6.000 | 4.900 | 4.20 | 70.000 | 8.500 | 25.000 |
| **M6** | 1.000 | 6.000 | 4.900 | 5.00 | 80.000 | 11.000 | 30.000 |
| **M7** | 1.000 | 7.000 | 5.500 | 6.00 | 80.000 | 11.000 | 30.000 |
| **M8** | 1.250 | 8.000 | 6.200 | 6.80 | 90.000 | 14.000 | 35.000 |
| **M9** | 1.250 | 9.000 | 7.000 | 7.80 | 90.000 | 14.000 | 35.000 |
| **M10** | 1.500 | 10.000 | 8.000 | 8.50 | 100.000 | 16.000 | 39.000 |
| **M11** | 1.500 | 8.000 | 6.200 | 9.50 | 100.000 | 16.000 | 42.000 |
| **M12** | 1.750 | 9.000 | 7.000 | 10.20 | 110.000 | 18.500 | 49.000 |
| **M14** | 2.000 | 11.000 | 9.000 | 12.00 | 110.000 | 20.000 | 53.000 |
| **M16** | 2.000 | 12.000 | 9.000 | 14.00 | 110.000 | 20.000 | 54.000 |
| **M18** | 2.500 | 14.000 | 11.000 | 15.50 | 125.000 | 25.000 | 62.000 |
| **M20** | 2.500 | 16.000 | 12.000 | 17.50 | 140.000 | 25.000 | 62.000 |
| **M22** | 2.500 | 18.000 | 14.500 | 19.50 | 140.000 | 27.000 | 62.000 |
| **M24** | 3.000 | 18.000 | 14.500 | 21.00 | 160.000 | 30.000 | 73.000 |
| **M27** | 3.000 | 20.000 | 16.000 | 24.00 | 160.000 | 30.000 | 73.000 |
| **M30** | 3.500 | 22.000 | 18.000 | 26.50 | 180.000 | 35.000 | 85.000 |
| **M33** | 3.500 | 25.000 | 20.000 | 29.50 | 180.000 | 40.000 | 91.000 |
| **M36** | 4.000 | 28.000 | 22.000 | 32.00 | 200.000 | 40.000 | 102.000 |
| **M39** | 4.000 | 32.000 | 24.000 | 35.00 | 200.000 | 50.000 | 107.000 |
| **M42** | 4.500 | 32.000 | 24.000 | 37.50 | 200.000 | 45.000 | 112.000 |

## Taps for ISO metric threads

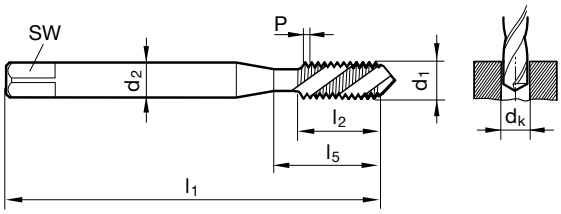
**Catalogue no. 53747**

Intensiv N-X LH | DIN 371/376 | C | HSS-E | TiAlN-H | L | 6HX

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ● | ● | ○ | ○ | ○ | |

Application recommendations page 182-203

- for blind holes
- flutes with appr. 45° right-hand helix
- chip evacuation in shank direction
- for universal application
- steel materials up to 1200 N/mm²
- acid resist./stainless steels
- non-ferrous metals
- cast materials




| d1 | P<br>mm | d2<br>mm | SW<br>mm | dk<br>mm | l1<br>mm | l2<br>mm | l5<br>mm |
|---|---|---|---|---|---|---|---|
| **M2** | 0.400 | 2.800 | 2.100 | 1.60 | 45.000 | 4.500 | 13.500 |
| **M2,5** | 0.450 | 2.800 | 2.100 | 2.05 | 50.000 | 5.000 | 14.500 |
| **M3** | 0.500 | 3.500 | 2.700 | 2.50 | 56.000 | 6.000 | 18.000 |
| **M4** | 0.700 | 4.500 | 3.400 | 3.30 | 63.000 | 7.500 | 21.000 |
| **M5** | 0.800 | 6.000 | 4.900 | 4.20 | 70.000 | 8.500 | 25.000 |
| **M6** | 1.000 | 6.000 | 4.900 | 5.00 | 80.000 | 11.000 | 30.000 |
| **M8** | 1.250 | 8.000 | 6.200 | 6.80 | 90.000 | 14.000 | 35.000 |
| **M10** | 1.500 | 10.000 | 8.000 | 8.50 | 100.000 | 16.000 | 39.000 |
| **M12** | 1.750 | 9.000 | 7.000 | 10.20 | 110.000 | 18.500 | 49.000 |
| **M14** | 2.000 | 11.000 | 9.000 | 12.00 | 110.000 | 20.000 | 53.000 |
| **M16** | 2.000 | 12.000 | 9.000 | 14.00 | 110.000 | 20.000 | 54.000 |
| **M18** | 2.500 | 14.000 | 11.000 | 15.50 | 125.000 | 25.000 | 62.000 |
| **M20** | 2.500 | 16.000 | 12.000 | 17.50 | 140.000 | 25.000 | 62.000 |
| **M24** | 3.000 | 18.000 | 14.500 | 21.00 | 160.000 | 30.000 | 73.000 |
| **M30** | 3.500 | 22.000 | 18.000 | 26.50 | 180.000 | 35.000 | 85.000 |

## Machine taps

## Taps for ISO metric threads

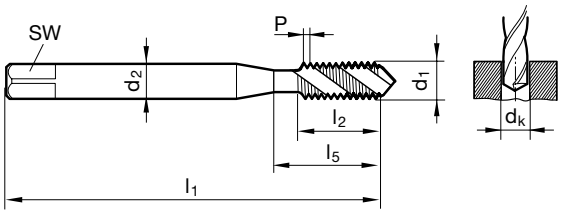
**Catalogue no. 53748**

| Intensiv N-X | DIN 371/376 | C | HSS-E-PM | TiAlN-H | R | 6HX |
|---|---|---|---|---|---|---|

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ● | ● | ○ | ○ | ○ | |

Application recommendations page 182-203

- for blind holes
- flutes with appr. 45° right-hand helix
- chip evacuation in shank direction
- for universal application
- steel materials up to 1200 N/mm²
- acid resist./stainless steels
- non-ferrous metals
- cast materials




| d1 | P mm | d2 mm | SW mm | dk mm | l1 mm | l2 mm | l5 mm |
|---|---|---|---|---|---|---|---|
| **M3** | 0.500 | 3.500 | 2.700 | 2.50 | 56.000 | 6.000 | 18.000 |
| **M4** | 0.700 | 4.500 | 3.400 | 3.30 | 63.000 | 7.500 | 21.000 |
| **M5** | 0.800 | 6.000 | 4.900 | 4.20 | 70.000 | 8.500 | 25.000 |
| **M6** | 1.000 | 6.000 | 4.900 | 5.00 | 80.000 | 11.000 | 30.000 |
| **M8** | 1.250 | 8.000 | 6.200 | 6.80 | 90.000 | 14.000 | 35.000 |
| **M10** | 1.500 | 10.000 | 8.000 | 8.50 | 100.000 | 16.000 | 39.000 |
| **M12** | 1.750 | 9.000 | 7.000 | 10.20 | 110.000 | 18.500 | 49.000 |
| **M14** | 2.000 | 11.000 | 9.000 | 12.00 | 110.000 | 20.000 | 53.000 |
| **M16** | 2.000 | 12.000 | 9.000 | 14.00 | 110.000 | 20.000 | 54.000 |
| **M20** | 2.500 | 16.000 | 12.000 | 17.50 | 140.000 | 25.000 | 62.000 |

# Machine taps

## Taps for ISO metric threads

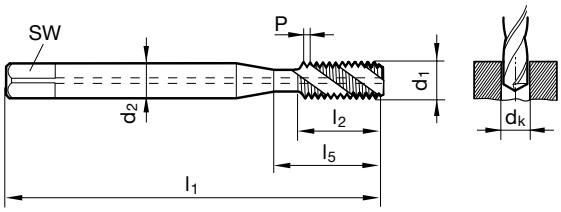
**Catalogue no. 53749**

Intensiv N-X | DIN 371/376 | C | HSS-E-PM | TiAlN-H | R | 6HX

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ● | ● | ○ | ○ | ○ | |

Application recommendations page 182-203

- for blind holes
- flutes with appr. 45° right-hand helix
- chip evacuation in shank direction
- with axial coolant duct
- for universal application
- steel materials up to 1200 N/mm²
- acid resist./stainless steels
- non-ferrous metals
- cast materials




| d1 | P<br>mm | d2<br>mm | SW<br>mm | dk<br>mm | l1<br>mm | l2<br>mm | l5<br>mm |
|---|---|---|---|---|---|---|---|
| **M5** | 0.800 | 6.000 | 4.900 | 4.20 | 70.000 | 8.500 | 25.000 |
| **M6** | 1.000 | 6.000 | 4.900 | 5.00 | 80.000 | 11.000 | 30.000 |
| **M8** | 1.250 | 8.000 | 6.200 | 6.80 | 90.000 | 14.000 | 35.000 |
| **M10** | 1.500 | 10.000 | 8.000 | 8.50 | 100.000 | 16.000 | 39.000 |
| **M12** | 1.750 | 9.000 | 7.000 | 10.20 | 110.000 | 18.500 | 49.000 |
| **M14** | 2.000 | 11.000 | 9.000 | 12.00 | 110.000 | 20.000 | 53.000 |
| **M16** | 2.000 | 12.000 | 9.000 | 14.00 | 110.000 | 20.000 | 54.000 |
| **M20** | 2.500 | 16.000 | 12.000 | 17.50 | 140.000 | 25.000 | 62.000 |
| **M24** | 3.000 | 18.000 | 14.500 | 21.00 | 160.000 | 30.000 | 73.000 |
| **M30** | 3.500 | 22.000 | 18.000 | 26.50 | 180.000 | 35.000 | 85.000 |

## Machine taps

## Taps for ISO metric threads

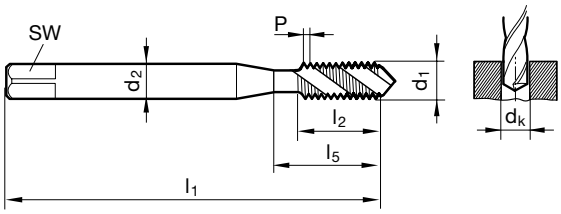
**Catalogue no. 53760**

| Intensiv N-X | DIN 371/376 | E | HSS-E | TiAlN-H | R | 6HX |
|---|---|---|---|---|---|---|

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ● | ● | ○ | ○ | ○ | |

Application recommendations page 182-203

- for blind holes
- flutes with appr. 45° right-hand helix
- chip evacuation in shank direction
- short chamfer for thread depths close to bottom of the hole
- for universal application
- steel materials up to 1200 N/mm²
- acid resist./stainless steels
- non-ferrous metals
- cast materials




| d1 | P mm | d2 mm | SW mm | dk mm | l1 mm | l2 mm | l5 mm |
|---|---|---|---|---|---|---|---|
| **M2** | 0.400 | 2.800 | 2.100 | 1.60 | 45.000 | 4.500 | 13.500 |
| **M2,5** | 0.450 | 2.800 | 2.100 | 2.05 | 50.000 | 5.000 | 14.500 |
| **M3** | 0.500 | 3.500 | 2.700 | 2.50 | 56.000 | 6.000 | 18.000 |
| **M4** | 0.700 | 4.500 | 3.400 | 3.30 | 63.000 | 7.500 | 21.000 |
| **M5** | 0.800 | 6.000 | 4.900 | 4.20 | 70.000 | 8.500 | 25.000 |
| **M6** | 1.000 | 6.000 | 4.900 | 5.00 | 80.000 | 11.000 | 30.000 |
| **M8** | 1.250 | 8.000 | 6.200 | 6.80 | 90.000 | 14.000 | 35.000 |
| **M10** | 1.500 | 10.000 | 8.000 | 8.50 | 100.000 | 16.000 | 39.000 |
| **M12** | 1.750 | 9.000 | 7.000 | 10.20 | 110.000 | 18.500 | 49.000 |
| **M14** | 2.000 | 11.000 | 9.000 | 12.00 | 110.000 | 20.000 | 53.000 |
| **M16** | 2.000 | 12.000 | 9.000 | 14.00 | 110.000 | 20.000 | 54.000 |
| **M18** | 2.500 | 14.000 | 11.000 | 15.50 | 125.000 | 25.000 | 62.000 |
| **M20** | 2.500 | 16.000 | 12.000 | 17.50 | 140.000 | 25.000 | 62.000 |
| **M24** | 3.000 | 18.000 | 14.500 | 21.00 | 160.000 | 30.000 | 73.000 |
| **M30** | 3.500 | 22.000 | 18.000 | 26.50 | 180.000 | 35.000 | 85.000 |

## Machine taps

## Taps for ISO metric threads

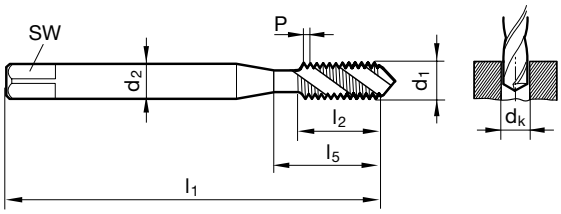
**Catalogue no. 53750**

| Intensiv N-X | DIN 371/376 | C | HSS-E | TiAlN-H | R | 6H +0,1 |
|---|---|---|---|---|---|---|

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ● | ● | ○ | ○ | ○ | |

Application recommendations page 182-203

- for blind holes
- flutes with appr. 45° right-hand helix
- chip evacuation in shank direction
- for universal application
- steel materials up to 1200 N/mm²
- acid resist./stainless steels
- non-ferrous metals
- cast materials




| d1 | P mm | d2 mm | SW mm | dk mm | l1 mm | l2 mm | l5 mm |
|---|---|---|---|---|---|---|---|
| **M2** | 0.400 | 2.800 | 2.100 | 1.60 | 45.000 | 4.500 | 13.500 |
| **M2,5** | 0.450 | 2.800 | 2.100 | 2.05 | 50.000 | 5.000 | 14.500 |
| **M3** | 0.500 | 3.500 | 2.700 | 2.50 | 56.000 | 6.000 | 18.000 |
| **M4** | 0.700 | 4.500 | 3.400 | 3.30 | 63.000 | 7.500 | 21.000 |
| **M5** | 0.800 | 6.000 | 4.900 | 4.20 | 70.000 | 8.500 | 25.000 |
| **M6** | 1.000 | 6.000 | 4.900 | 5.00 | 80.000 | 11.000 | 30.000 |
| **M8** | 1.250 | 8.000 | 6.200 | 6.80 | 90.000 | 14.000 | 35.000 |
| **M10** | 1.500 | 10.000 | 8.000 | 8.50 | 100.000 | 16.000 | 39.000 |
| **M12** | 1.750 | 9.000 | 7.000 | 10.20 | 110.000 | 18.500 | 49.000 |
| **M14** | 2.000 | 11.000 | 9.000 | 12.00 | 110.000 | 20.000 | 53.000 |
| **M16** | 2.000 | 12.000 | 9.000 | 14.00 | 110.000 | 20.000 | 54.000 |
| **M18** | 2.500 | 14.000 | 11.000 | 15.50 | 125.000 | 25.000 | 62.000 |
| **M20** | 2.500 | 16.000 | 12.000 | 17.50 | 140.000 | 25.000 | 62.000 |
| **M24** | 3.000 | 18.000 | 14.500 | 21.00 | 160.000 | 30.000 | 73.000 |
| **M30** | 3.500 | 22.000 | 18.000 | 26.50 | 180.000 | 35.000 | 85.000 |

## Machine taps

## Taps for ISO metric threads

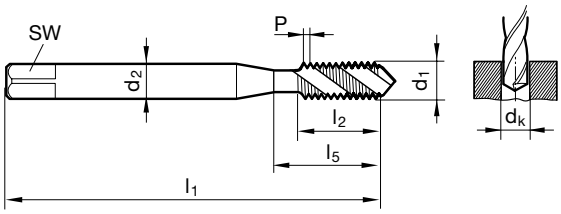
**Catalogue no. 53751**

| Intensiv N-X | DIN 371/376 | C | HSS-E | TiAlN-H | R | 6GX |
|---|---|---|---|---|---|---|

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ● | ● | ○ | ○ | ○ | |

Application recommendations page 182-203

- for blind holes
- flutes with appr. 45° right-hand helix
- chip evacuation in shank direction
- for universal application
- steel materials up to 1200 N/mm²
- acid resist./stainless steels
- non-ferrous metals
- cast materials

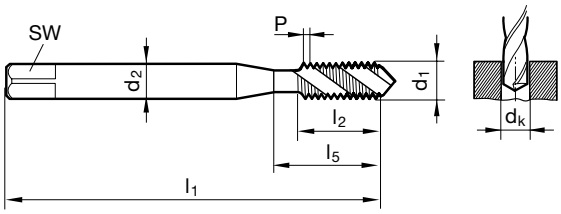



| d1 | P<br>mm | d2<br>mm | SW<br>mm | dk<br>mm | l1<br>mm | l2<br>mm | l5<br>mm |
|---|---|---|---|---|---|---|---|
| **M2** | 0.400 | 2.800 | 2.100 | 1.60 | 45.000 | 4.500 | 13.500 |
| **M2,5** | 0.450 | 2.800 | 2.100 | 2.05 | 50.000 | 5.000 | 14.500 |
| **M3** | 0.500 | 3.500 | 2.700 | 2.50 | 56.000 | 6.000 | 18.000 |
| **M4** | 0.700 | 4.500 | 3.400 | 3.30 | 63.000 | 7.500 | 21.000 |
| **M5** | 0.800 | 6.000 | 4.900 | 4.20 | 70.000 | 8.500 | 25.000 |
| **M6** | 1.000 | 6.000 | 4.900 | 5.00 | 80.000 | 11.000 | 30.000 |
| **M8** | 1.250 | 8.000 | 6.200 | 6.80 | 90.000 | 14.000 | 35.000 |
| **M10** | 1.500 | 10.000 | 8.000 | 8.50 | 100.000 | 16.000 | 39.000 |
| **M12** | 1.750 | 9.000 | 7.000 | 10.20 | 110.000 | 18.500 | 49.000 |
| **M14** | 2.000 | 11.000 | 9.000 | 12.00 | 110.000 | 20.000 | 53.000 |
| **M16** | 2.000 | 12.000 | 9.000 | 14.00 | 110.000 | 20.000 | 54.000 |
| **M18** | 2.500 | 14.000 | 11.000 | 15.50 | 125.000 | 25.000 | 62.000 |
| **M20** | 2.500 | 16.000 | 12.000 | 17.50 | 140.000 | 25.000 | 62.000 |
| **M24** | 3.000 | 18.000 | 14.500 | 21.00 | 160.000 | 30.000 | 73.000 |
| **M30** | 3.500 | 22.000 | 18.000 | 26.50 | 180.000 | 35.000 | 85.000 |

# Machine taps

## Taps for ISO metric threads

**Catalogue no. 53752**




| Intensiv N-X | WN | C | HSS-E | TiAlN-H | R | 6HX |
|---|---|---|---|---|---|---|

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ● | ● | ○ | ○ | ○ | |

Application recommendations page 182-203

- for blind holes
- flutes with appr. 45° right-hand helix
- chip evacuation in shank direction
- extra length
- for universal application
- steel materials up to 1200 N/mm²
- acid resist./stainless steels
- non-ferrous metals
- cast materials

| d1 | P<br>mm | d2<br>mm | SW<br>mm | dk<br>mm | l1<br>mm | l2<br>mm | l5<br>mm |
|---|---|---|---|---|---|---|---|
| **M3** | 0.500 | 3.500 | 2.700 | 2.50 | 90.000 | 6.000 | 18.000 |
| **M4** | 0.700 | 4.500 | 3.400 | 3.30 | 125.000 | 7.500 | 21.000 |
| **M5** | 0.800 | 6.000 | 4.900 | 4.20 | 140.000 | 8.500 | 25.000 |
| **M6** | 1.000 | 6.000 | 4.900 | 5.00 | 160.000 | 11.000 | 30.000 |
| **M8** | 1.250 | 8.000 | 6.200 | 6.80 | 180.000 | 14.000 | 35.000 |
| **M10** | 1.500 | 10.000 | 8.000 | 8.50 | 200.000 | 16.000 | 39.000 |
| **M12** | 1.750 | 9.000 | 7.000 | 10.20 | 220.000 | 18.500 | 158.000 |
| **M14** | 2.000 | 11.000 | 9.000 | 12.00 | 220.000 | 20.000 | 160.000 |
| **M16** | 2.000 | 12.000 | 9.000 | 14.00 | 220.000 | 20.000 | 160.000 |
| **M20** | 2.500 | 16.000 | 12.000 | 17.50 | 280.000 | 25.000 | 217.000 |

## Machine taps

## Taps for ISO metric threads

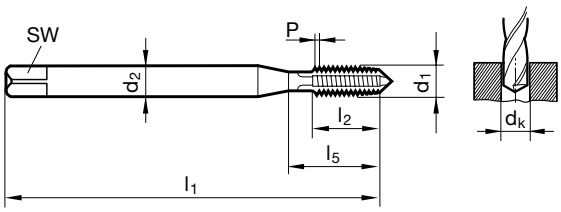
**Catalogue no. 63033**

Produktiv N | DIN 371/376 | B | HSS-E | TiN | R | ISO2/6H

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ● | ○ | ○ | ○ | | |

Application recommendations page 182-203

- for through holes
- with spiral point
- chip evacuation in feed direction
- for universal application
- steel materials up to 1100 N/mm²




| d1 | P<br>mm | d2<br>mm | SW<br>mm | dk<br>mm | l1<br>mm | l2<br>mm | l5<br>mm |
|---|---|---|---|---|---|---|---|
| **M3** | 0.500 | 3.500 | 2.700 | 2.50 | 56.000 | 10.000 | 18.000 |
| **M4** | 0.700 | 4.500 | 3.400 | 3.30 | 63.000 | 12.000 | 21.000 |
| **M5** | 0.800 | 6.000 | 4.900 | 4.20 | 70.000 | 14.000 | 25.000 |
| **M6** | 1.000 | 6.000 | 4.900 | 5.00 | 80.000 | 16.000 | 30.000 |
| **M8** | 1.250 | 8.000 | 6.200 | 6.80 | 90.000 | 17.000 | 35.000 |
| **M10** | 1.500 | 10.000 | 8.000 | 8.50 | 100.000 | 20.000 | 39.000 |
| **M12** | 1.750 | 9.000 | 7.000 | 10.20 | 110.000 | 24.000 | 49.000 |
| **M16** | 2.000 | 12.000 | 9.000 | 14.00 | 110.000 | 26.000 | 54.000 |
| **M20** | 2.500 | 16.000 | 12.000 | 17.50 | 140.000 | 32.000 | 62.000 |

# Machine taps

## Taps for ISO metric threads

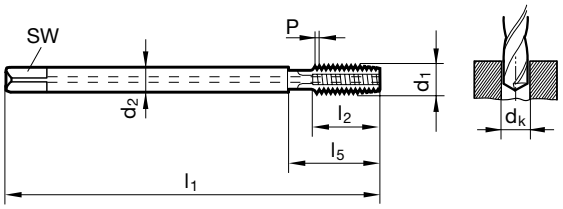
**Catalogue no. 53646**

| H | DIN 376 | C | HSS-E | TiCN | R | 6HX |
|---|---|---|---|---|---|---|

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ● | | ● | ○ | | |

Application recommendations page 182-203

- for large threads
- for through and blind holes
- steel materials of up to 1200 N/mm²
- for cast materials
- for Al-alloys with Si content > 7%
- with axial coolant duct




| d1 | P mm | d2 mm | SW mm | dk mm | l1 mm | l2 mm | l5 mm |
|---|---|---|---|---|---|---|---|
| **M16** | 2.000 | 12.000 | 9.000 | 14.00 | 110.000 | 26.000 | 54.000 |
| **M20** | 2.500 | 16.000 | 12.000 | 17.50 | 140.000 | 32.000 | 62.000 |
| **M24** | 3.000 | 18.000 | 14.500 | 21.00 | 160.000 | 36.000 | 73.000 |
| **M27** | 3.000 | 20.000 | 16.000 | 24.00 | 160.000 | 36.000 | 73.000 |
| **M30** | 3.500 | 22.000 | 18.000 | 26.50 | 180.000 | 40.000 | 85.000 |
| **M33** | 3.500 | 25.000 | 20.000 | 29.50 | 180.000 | 40.000 | 91.000 |
| **M36** | 4.000 | 28.000 | 22.000 | 32.00 | 200.000 | 50.000 | 102.000 |
| **M39** | 4.000 | 32.000 | 24.000 | 35.00 | 200.000 | 50.000 | 107.000 |

## Machine taps

## Taps for ISO metric threads

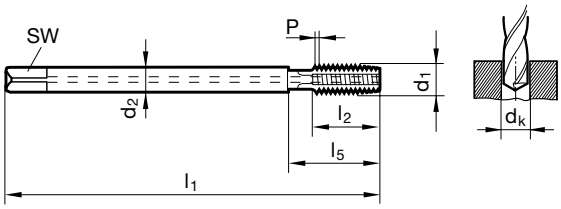
**Catalogue no. 53647**

| H | ~DIN 376 | C | HSS-E | TiCN | R | 6HX |
|---|---|---|---|---|---|---|

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ● | | ● | ○ | | |

Application recommendations page 182-203

- for large threads
- for through and blind holes
- steel materials of up to 1200 N/mm²
- for cast materials
- for Al-alloys with Si content > 7%
- with axial coolant duct
- for large thread depths




| d1 | P mm | d2 mm | SW mm | dk mm | l1 mm | l2 mm | l5 mm |
|---|---|---|---|---|---|---|---|
| **M16** | 2.000 | 12.000 | 9.000 | 14.00 | 160.000 | 26.000 | 54.000 |
| **M20** | 2.500 | 16.000 | 12.000 | 17.50 | 180.000 | 32.000 | 62.000 |
| **M24** | 3.000 | 18.000 | 14.500 | 21.00 | 200.000 | 36.000 | 73.000 |
| **M27** | 3.000 | 20.000 | 16.000 | 24.00 | 225.000 | 36.000 | 73.000 |
| **M30** | 3.500 | 22.000 | 18.000 | 26.50 | 250.000 | 40.000 | 85.000 |
| **M33** | 3.500 | 25.000 | 20.000 | 29.50 | 275.000 | 40.000 | 91.000 |
| **M36** | 4.000 | 28.000 | 22.000 | 32.00 | 300.000 | 50.000 | 102.000 |
| **M39** | 4.000 | 32.000 | 24.000 | 35.00 | 325.000 | 50.000 | 107.000 |

# Machine taps

## Taps for ISO metric threads

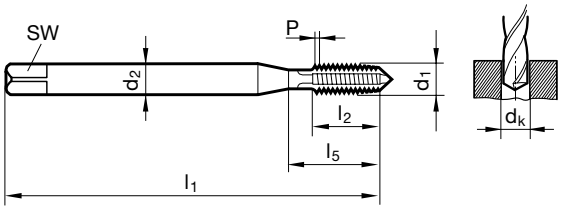
**Catalogue no. 53642**

Produktiv H | DIN 371/376 | B | HSS-E | TiCN | R | ISO2/6H

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ● | | ○ | | | |

Application recommendations page 182-203

- for through holes
- with spiral point
- chip evacuation in feed direction
- high tensile steels




| d1 | P<br>mm | d2<br>mm | SW<br>mm | dk<br>mm | l1<br>mm | l2<br>mm | l5<br>mm |
|---|---|---|---|---|---|---|---|
| **M2** | 0.400 | 2.800 | 2.100 | 1.60 | 45.000 | 8.000 | 13.500 |
| **M3** | 0.500 | 3.500 | 2.700 | 2.50 | 56.000 | 10.000 | 18.000 |
| **M4** | 0.700 | 4.500 | 3.400 | 3.30 | 63.000 | 12.000 | 21.000 |
| **M5** | 0.800 | 6.000 | 4.900 | 4.20 | 70.000 | 14.000 | 25.000 |
| **M6** | 1.000 | 6.000 | 4.900 | 5.00 | 80.000 | 16.000 | 30.000 |
| **M8** | 1.250 | 8.000 | 6.200 | 6.80 | 90.000 | 17.000 | 35.000 |
| **M10** | 1.500 | 10.000 | 8.000 | 8.50 | 100.000 | 20.000 | 39.000 |

## Machine taps

## Taps for ISO metric threads

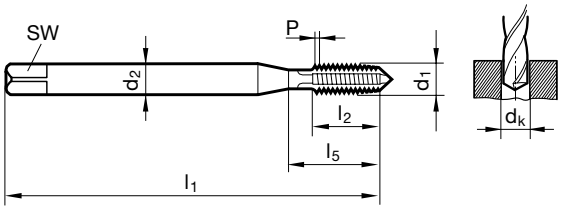
**Catalogue no. 53640**

Produktiv H | DIN 371/376 | B | HSS-E-PM | TiCN | R | ISO2/6H

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ● | | ○ | | | |

Application recommendations page 182-203

- for through holes
- with spiral point
- chip evacuation in feed direction
- high tensile steels




| d1 | P<br>mm | d2<br>mm | SW<br>mm | dk<br>mm | l1<br>mm | l2<br>mm | l5<br>mm |
|---|---|---|---|---|---|---|---|
| **M3** | 0.500 | 3.500 | 2.700 | 2.50 | 56.000 | 10.000 | 18.000 |
| **M4** | 0.700 | 4.500 | 3.400 | 3.30 | 63.000 | 12.000 | 21.000 |
| **M5** | 0.800 | 6.000 | 4.900 | 4.20 | 70.000 | 14.000 | 25.000 |
| **M6** | 1.000 | 6.000 | 4.900 | 5.00 | 80.000 | 16.000 | 30.000 |
| **M8** | 1.250 | 8.000 | 6.200 | 6.80 | 90.000 | 17.000 | 35.000 |
| **M10** | 1.500 | 10.000 | 8.000 | 8.50 | 100.000 | 20.000 | 39.000 |
| **M12** | 1.750 | 9.000 | 7.000 | 10.20 | 110.000 | 24.000 | 49.000 |
| **M14** | 2.000 | 11.000 | 9.000 | 12.00 | 110.000 | 26.000 | 53.000 |
| **M16** | 2.000 | 12.000 | 9.000 | 14.00 | 110.000 | 26.000 | 54.000 |

## Machine taps

## Taps for ISO metric threads

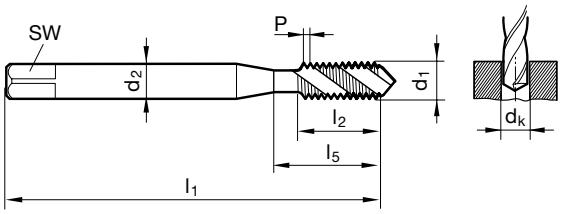
**Catalogue no. 73661**

Intensiv H | DIN 371 | C | HSS-E | nitrided | R | ISO2/6H

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ● | | ○ | | | |

Application recommendations page 182-203

- for blind holes
- flutes with appr. 40° right-hand helix
- chip evacuation in shank direction
- high tensile steels




| d1 | P<br>mm | d2<br>mm | SW<br>mm | dk<br>mm | l1<br>mm | l2<br>mm | l5<br>mm |
|---|---|---|---|---|---|---|---|
| **M3** | 0.500 | 3.500 | 2.700 | 2.50 | 56.000 | 6.000 | 18.000 |
| **M4** | 0.700 | 4.500 | 3.400 | 3.30 | 63.000 | 7.500 | 21.000 |
| **M5** | 0.800 | 6.000 | 4.900 | 4.20 | 70.000 | 8.500 | 25.000 |
| **M6** | 1.000 | 6.000 | 4.900 | 5.00 | 80.000 | 11.000 | 30.000 |
| **M8** | 1.250 | 8.000 | 6.200 | 6.80 | 90.000 | 14.000 | 35.000 |
| **M10** | 1.500 | 10.000 | 8.000 | 8.50 | 100.000 | 16.000 | 39.000 |

## Machine taps

## Taps for ISO metric threads

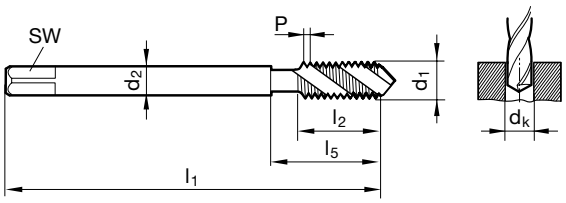
**Catalogue no. 73664**

| Intensiv H | DIN 376 | C | HSS-E | nitrided | R | ISO2/6H |
|---|---|---|---|---|---|---|

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ● | | ○ | | | |

Application recommendations page 182-203

- for blind holes
- flutes with appr. 40° right-hand helix
- chip evacuation in shank direction
- high tensile steels




| d1 | P<br>mm | d2<br>mm | SW<br>mm | dk<br>mm | l1<br>mm | l2<br>mm | l5<br>mm |
|---|---|---|---|---|---|---|---|
| **M12** | 1.750 | 9.000 | 7.000 | 10.20 | 110.000 | 18.500 | 49.000 |
| **M14** | 2.000 | 11.000 | 9.000 | 12.00 | 110.000 | 20.000 | 53.000 |
| **M16** | 2.000 | 12.000 | 9.000 | 14.00 | 110.000 | 20.000 | 54.000 |
| **M20** | 2.500 | 16.000 | 12.000 | 17.50 | 140.000 | 25.000 | 62.000 |

# Machine taps

## Taps for ISO metric threads

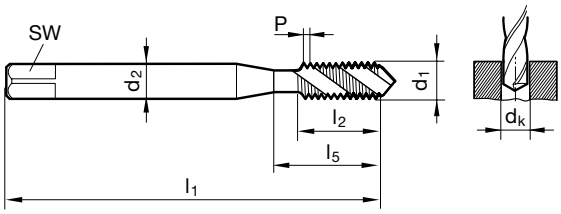
**Catalogue no. 53661**

Intensiv H | DIN 371/376 | C | HSS-E | TiCN | R | ISO2/6H

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ● | | ○ | | | |

Application recommendations page 182-203

- for blind holes
- flutes with appr. 40° right-hand helix
- chip evacuation in shank direction
- high tensile steels




| d1 | P<br>mm | d2<br>mm | SW<br>mm | dk<br>mm | l1<br>mm | l2<br>mm | l5<br>mm |
|---|---|---|---|---|---|---|---|
| **M2** | 0.400 | 2.800 | 2.100 | 1.60 | 45.000 | 4.500 | 13.500 |
| **M3** | 0.500 | 3.500 | 2.700 | 2.50 | 56.000 | 6.000 | 18.000 |
| **M4** | 0.700 | 4.500 | 3.400 | 3.30 | 63.000 | 7.500 | 21.000 |
| **M5** | 0.800 | 6.000 | 4.900 | 4.20 | 70.000 | 8.500 | 25.000 |
| **M6** | 1.000 | 6.000 | 4.900 | 5.00 | 80.000 | 11.000 | 30.000 |
| **M8** | 1.250 | 8.000 | 6.200 | 6.80 | 90.000 | 14.000 | 35.000 |
| **M10** | 1.500 | 10.000 | 8.000 | 8.50 | 100.000 | 16.000 | 39.000 |
| **M12** | 1.750 | 9.000 | 7.000 | 10.20 | 110.000 | 18.500 | 49.000 |
| **M14** | 2.000 | 11.000 | 9.000 | 12.00 | 110.000 | 20.000 | 53.000 |
| **M16** | 2.000 | 12.000 | 9.000 | 14.00 | 110.000 | 20.000 | 54.000 |

## Machine taps

## Taps for ISO metric threads

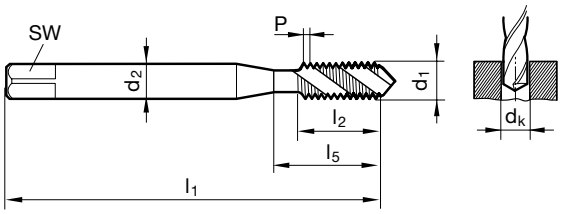
**Catalogue no. 53664**

| Intensiv H | DIN 371/376 | C | HSS-E-PM | TiAlN | R | ISO2/6H |
|---|---|---|---|---|---|---|

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ● | | ○ | | | |

Application recommendations page 182-203

- for blind holes
- flutes with appr. 15° right-hand helix
- chip evacuation in shank direction
- high tensile steels




| d1 | P mm | d2 mm | SW mm | dk mm | l1 mm | l2 mm | l5 mm |
|---|---|---|---|---|---|---|---|
| **M4** | 0.700 | 4.500 | 3.400 | 3.30 | 63.000 | 7.500 | 25.000 |
| **M5** | 0.800 | 6.000 | 4.900 | 4.20 | 70.000 | 8.500 | 25.000 |
| **M6** | 1.000 | 6.000 | 4.900 | 5.00 | 80.000 | 11.000 | 30.000 |
| **M8** | 1.250 | 8.000 | 6.200 | 6.80 | 90.000 | 14.000 | 35.000 |
| **M10** | 1.500 | 10.000 | 8.000 | 8.50 | 100.000 | 16.000 | 39.000 |
| **M12** | 1.750 | 9.000 | 7.000 | 10.20 | 110.000 | 18.500 | 49.000 |
| **M16** | 2.000 | 12.000 | 9.000 | 14.00 | 110.000 | 20.000 | 54.000 |
| **M20** | 2.500 | 16.000 | 12.000 | 17.50 | 140.000 | 25.000 | 62.000 |

## Machine taps

## Taps for ISO metric threads

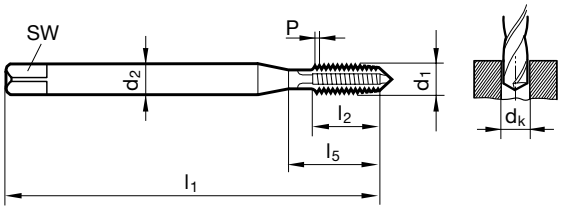
**Catalogue no. 53676**

H | DIN 371/376 | D | HSS-E-PM | TiCN | R | 6HX

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| | | | | | ○ |

Application recommendations page 182-203

- for through and blind holes
- for thread depths up to 1.5xD
- for materials between 45 - 55 HRC




| d1 | P mm | d2 mm | SW mm | dk mm | l1 mm | l2 mm | l5 mm |
|---|---|---|---|---|---|---|---|
| **M3** | 0.500 | 3.500 | 2.700 | 2.60 | 56.000 | 10.000 | 18.000 |
| **M4** | 0.700 | 4.500 | 3.400 | 3.40 | 63.000 | 12.000 | 21.000 |
| **M5** | 0.800 | 6.000 | 4.900 | 4.30 | 70.000 | 14.000 | 25.000 |
| **M6** | 1.000 | 6.000 | 4.900 | 5.10 | 80.000 | 16.000 | 30.000 |
| **M8** | 1.250 | 8.000 | 6.200 | 6.90 | 90.000 | 17.000 | 35.000 |
| **M10** | 1.500 | 10.000 | 8.000 | 8.60 | 100.000 | 20.000 | 39.000 |
| **M12** | 1.750 | 12.000 | 9.000 | 10.40 | 110.000 | 24.000 | 49.000 |
| **M14** | 2.000 | 14.000 | 11.000 | 12.10 | 110.000 | 26.000 | 53.000 |
| **M16** | 2.000 | 16.000 | 12.000 | 14.10 | 110.000 | 26.000 | 54.000 |

## Machine taps

### Taps for ISO metric fine threads

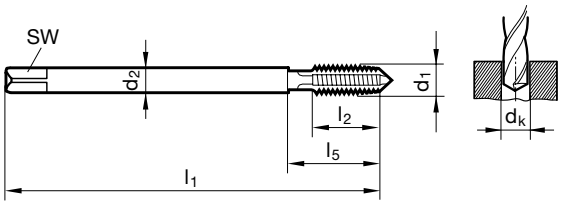
**Catalogue no. 53778**

| Produktiv N-X | DIN 374 | B | HSS-E | AlTiZrN | R | 6HX |
|---|---|---|---|---|---|---|

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ● | ● | ● | ○ | ○ | |

Application recommendations page 182-203

- for through holes
- with spiral point
- chip evacuation in feed direction
- for universal application
- steel from 600 to 1300 N/mm²
- acid resist./stainless steels
- non-ferrous metals
- cast materials






| Code no. | d1 | d2 mm | SW mm | dk mm | l1 mm | l2 mm | l5 mm |
|---|---|---|---|---|---|---|---|
| **3.002** | M3 x 0,35 | 2.200 | 1.800 | 2.65 | 56.000 | 7.000 | 18.000 |
| **4.002** | M4 x 0,35 | 2.800 | 2.100 | 3.65 | 63.000 | 8.000 | 21.000 |
| **4.003** | M4 x 0,5 | 2.800 | 2.100 | 3.50 | 63.000 | 8.000 | 21.000 |
| **5.003** | M5 x 0,5 | 3.500 | 2.700 | 4.50 | 70.000 | 10.000 | 25.000 |
| **6.003** | M6 x 0,5 | 4.500 | 3.400 | 5.50 | 80.000 | 13.000 | 30.000 |
| **6.004** | M6 x 0,75 | 4.500 | 3.400 | 5.20 | 80.000 | 13.000 | 30.000 |
| **8.004** | M8 x 0,75 | 6.000 | 4.900 | 7.20 | 80.000 | 14.000 | 30.000 |
| **8.005** | M8 x 1 | 6.000 | 4.900 | 7.00 | 90.000 | 17.000 | 35.000 |
| **9.005** | M9 x 1 | 7.000 | 5.500 | 8.00 | 90.000 | 16.000 | 35.000 |
| **10.004** | M10 x 0,75 | 7.000 | 5.500 | 9.20 | 90.000 | 16.000 | 35.000 |
| **10.005** | M10 x 1 | 7.000 | 5.500 | 9.00 | 90.000 | 16.000 | 35.000 |
| **10.006** | M10 x 1,25 | 7.000 | 5.500 | 8.80 | 100.000 | 20.000 | 39.000 |
| **11.005** | M11 x 1 | 8.000 | 6.200 | 10.00 | 90.000 | 20.000 | 33.000 |
| **12.005** | M12 x 1 | 9.000 | 7.000 | 11.00 | 100.000 | 20.000 | 40.000 |
| **12.006** | M12 x 1,25 | 9.000 | 7.000 | 10.80 | 100.000 | 20.000 | 40.000 |
| **12.007** | M12 x 1,5 | 9.000 | 7.000 | 10.50 | 100.000 | 20.000 | 40.000 |
| **14.005** | M14 x 1 | 11.000 | 9.000 | 13.00 | 100.000 | 20.000 | 40.000 |
| **14.006** | M14 x 1,25 | 11.000 | 9.000 | 12.80 | 100.000 | 20.000 | 40.000 |
| **14.007** | M14 x 1,5 | 11.000 | 9.000 | 12.50 | 100.000 | 20.000 | 40.000 |
| **16.005** | M16 x 1 | 12.000 | 9.000 | 15.00 | 100.000 | 22.000 | 44.000 |
| **16.007** | M16 x 1,5 | 12.000 | 9.000 | 14.50 | 100.000 | 22.000 | 44.000 |
| **18.005** | M18 x 1 | 14.000 | 11.000 | 17.00 | 110.000 | 25.000 | 44.000 |
| **18.007** | M18 x 1,5 | 14.000 | 11.000 | 16.50 | 110.000 | 25.000 | 44.000 |
| **18.008** | M18 x 2 | 14.000 | 11.000 | 16.00 | 125.000 | 30.000 | 58.000 |
| **20.005** | M20 x 1 | 16.000 | 12.000 | 19.00 | 125.000 | 25.000 | 44.000 |
| **20.007** | M20 x 1,5 | 16.000 | 12.000 | 18.50 | 125.000 | 25.000 | 44.000 |
| **20.008** | M20 x 2 | 16.000 | 12.000 | 18.00 | 140.000 | 32.000 | 60.000 |
| **22.005** | M22 x 1 | 18.000 | 14.500 | 21.00 | 125.000 | 25.000 | 44.000 |
| **22.007** | M22 x 1,5 | 18.000 | 14.500 | 20.50 | 125.000 | 25.000 | 44.000 |
| **22.008** | M22 x 2 | 18.000 | 14.500 | 20.00 | 140.000 | 32.000 | 62.000 |
| **24.005** | M24 x 1 | 18.000 | 14.500 | 23.00 | 140.000 | 28.000 | 48.000 |
| **24.007** | M24 x 1,5 | 18.000 | 14.500 | 22.50 | 140.000 | 28.000 | 48.000 |
| **24.008** | M24 x 2 | 18.000 | 14.500 | 22.00 | 140.000 | 28.000 | 48.000 |

## Machine taps

## Taps for ISO metric fine threads

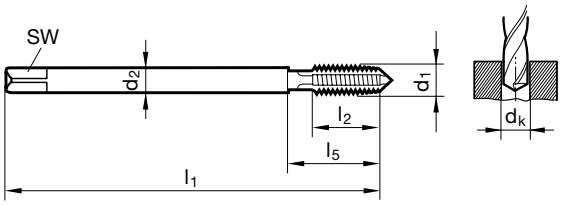
**Catalogue no. 53789**

Produktiv N-X | DIN 374 | B | HSS-E-PM | AlTiZrN | R | 6HX

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ● | ● | ○ | ○ | ○ | |

Application recommendations page 182-203

- for through holes
- with spiral point
- chip evacuation in feed direction
- steel materials up to 1200 N/mm²
- acid resist./stainless steels
- non-ferrous metals
- cast materials




| Code no. | d1 | d2<br>mm | SW<br>mm | dk<br>mm | l1<br>mm | l2<br>mm | l5<br>mm |
|---|---|---|---|---|---|---|---|
| **8.005** | M8 x 1 | 6.000 | 4.900 | 7.00 | 90.000 | 17.000 | 35.000 |
| **10.005** | M10 x 1 | 7.000 | 5.500 | 9.00 | 90.000 | 16.000 | 35.000 |
| **10.006** | M10 x 1,25 | 7.000 | 5.500 | 8.80 | 100.000 | 20.000 | 39.000 |
| **12.005** | M12 x 1 | 9.000 | 7.000 | 11.00 | 100.000 | 20.000 | 40.000 |
| **12.006** | M12 x 1,25 | 9.000 | 7.000 | 10.80 | 100.000 | 20.000 | 40.000 |
| **12.007** | M12 x 1,5 | 9.000 | 7.000 | 10.50 | 100.000 | 20.000 | 40.000 |
| **14.007** | M14 x 1,5 | 11.000 | 9.000 | 12.50 | 100.000 | 20.000 | 40.000 |
| **16.007** | M16 x 1,5 | 12.000 | 9.000 | 14.50 | 100.000 | 22.000 | 44.000 |
| **18.007** | M18 x 1,5 | 14.000 | 11.000 | 16.50 | 110.000 | 25.000 | 44.000 |
| **20.007** | M20 x 1,5 | 16.000 | 12.000 | 18.50 | 125.000 | 25.000 | 44.000 |
| **24.007** | M24 x 1,5 | 18.000 | 14.500 | 22.50 | 140.000 | 28.000 | 48.000 |

## Machine taps

## Taps for ISO metric fine threads

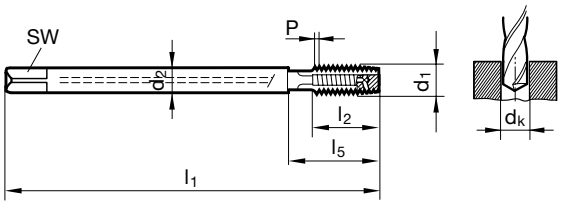
**Catalogue no. 53790**

Produktiv N-X | DIN 374 | B | HSS-E-PM | AlTiZrN | R | 6HX

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ● | ● | ○ | ○ | ○ | |

Application recommendations page 182-203

- for through holes
- with spiral point
- chip evacuation in feed direction
- radial coolant exit
- for universal application
- steel materials up to 1200 N/mm²
- acid resist./stainless steels
- non-ferrous metals
- cast materials




| Code no. | d1 | d2 mm | SW mm | dk mm | l1 mm | l2 mm | l5 mm |
|---|---|---|---|---|---|---|---|
| **8.005** | M8 x 1 | 6.000 | 4.900 | 7.00 | 90.000 | 17.000 | 35.000 |
| **10.005** | M10 x 1 | 7.000 | 5.500 | 9.00 | 90.000 | 16.000 | 35.000 |
| **10.006** | M10 x 1,25 | 7.000 | 5.500 | 8.80 | 100.000 | 20.000 | 39.000 |
| **12.005** | M12 x 1 | 9.000 | 7.000 | 11.00 | 100.000 | 20.000 | 40.000 |
| **12.006** | M12 x 1,25 | 9.000 | 7.000 | 10.80 | 100.000 | 20.000 | 40.000 |
| **12.007** | M12 x 1,5 | 9.000 | 7.000 | 10.50 | 100.000 | 20.000 | 40.000 |
| **14.007** | M14 x 1,5 | 11.000 | 9.000 | 12.50 | 100.000 | 20.000 | 40.000 |
| **16.007** | M16 x 1,5 | 12.000 | 9.000 | 14.50 | 100.000 | 22.000 | 44.000 |
| **18.007** | M18 x 1,5 | 14.000 | 11.000 | 16.50 | 110.000 | 25.000 | 44.000 |
| **20.007** | M20 x 1,5 | 16.000 | 12.000 | 18.50 | 125.000 | 25.000 | 44.000 |
| **24.007** | M24 x 1,5 | 18.000 | 14.500 | 22.50 | 140.000 | 28.000 | 48.000 |

## Taps for ISO metric fine threads

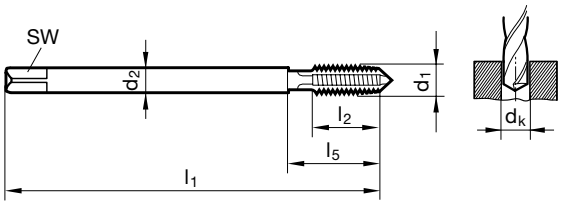
**Catalogue no. 53779**

Produktiv N-X | DIN 374 | B | HSS-E | AlTiZrN | R | 6GX

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ● | ● | ○ | ○ | ○ | |

Application recommendations page 182-203

- for through holes
- with spiral point
- chip evacuation in feed direction
- for universal application
- steel materials up to 1200 N/mm²
- acid resist./stainless steels
- non-ferrous metals
- cast materials




| Code no. | d1 | d2<br>mm | SW<br>mm | dk<br>mm | l1<br>mm | l2<br>mm | l5<br>mm |
|---|---|---|---|---|---|---|---|
| **6.004** | M6 x 0,75 | 4.500 | 3.400 | 5.20 | 80.000 | 13.000 | 30.000 |
| **8.004** | M8 x 0,75 | 6.000 | 4.900 | 7.20 | 80.000 | 14.000 | 30.000 |
| **8.005** | M8 x 1 | 6.000 | 4.900 | 7.00 | 90.000 | 17.000 | 35.000 |
| **10.005** | M10 x 1 | 7.000 | 5.500 | 9.00 | 90.000 | 16.000 | 35.000 |
| **10.006** | M10 x 1,25 | 7.000 | 5.500 | 8.80 | 100.000 | 20.000 | 39.000 |
| **12.005** | M12 x 1 | 9.000 | 7.000 | 11.00 | 100.000 | 20.000 | 40.000 |
| **12.006** | M12 x 1,25 | 9.000 | 7.000 | 10.80 | 100.000 | 20.000 | 40.000 |
| **12.007** | M12 x 1,5 | 9.000 | 7.000 | 10.50 | 100.000 | 20.000 | 40.000 |
| **14.007** | M14 x 1,5 | 11.000 | 9.000 | 12.50 | 100.000 | 20.000 | 40.000 |
| **16.007** | M16 x 1,5 | 12.000 | 9.000 | 14.50 | 100.000 | 22.000 | 44.000 |
| **18.007** | M18 x 1,5 | 14.000 | 11.000 | 16.50 | 110.000 | 25.000 | 44.000 |
| **20.007** | M20 x 1,5 | 16.000 | 12.000 | 18.50 | 125.000 | 25.000 | 44.000 |
| **24.007** | M24 x 1,5 | 18.000 | 14.500 | 22.50 | 140.000 | 28.000 | 48.000 |

## Machine taps

## Taps for ISO metric fine threads

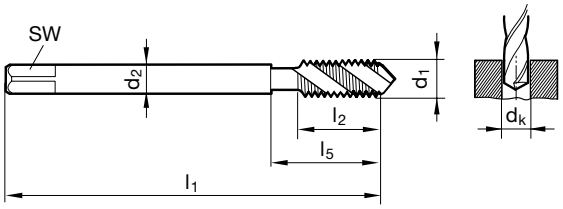
**Catalogue no. 53780**

| Intensiv N-X | DIN 374 | C | HSS-E | TiAlN-H | R | 6HX |
|---|---|---|---|---|---|---|

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ● | ● | ● | ○ | ○ | |

Application recommendations page 182-203

- for blind holes
- flutes with appr. 45° right-hand helix
- chip evacuation in shank direction
- for universal application
- steel from 600 to 1300 N/mm²
- acid resist./stainless steels
- non-ferrous metals
- cast materials




| Code no. | d1 | d2 mm | SW mm | dk mm | l1 mm | l2 mm | l5 mm |
|---|---|---|---|---|---|---|---|
| **3.002** | M3 x 0,35 | 2.200 | 1.800 | 2.65 | 56.000 | 4.000 | 18.000 |
| **4.002** | M4 x 0,35 | 2.800 | 2.100 | 3.65 | 63.000 | 5.000 | 21.000 |
| **4.003** | M4 x 0,5 | 2.800 | 2.100 | 3.50 | 63.000 | 5.000 | 21.000 |
| **5.003** | M5 x 0,5 | 3.500 | 2.700 | 4.50 | 70.000 | 5.000 | 25.000 |
| **6.003** | M6 x 0,5 | 4.500 | 3.400 | 5.50 | 80.000 | 5.000 | 30.000 |
| **6.004** | M6 x 0,75 | 4.500 | 3.400 | 5.20 | 80.000 | 8.000 | 30.000 |
| **8.004** | M8 x 0,75 | 6.000 | 4.900 | 7.20 | 80.000 | 8.000 | 30.000 |
| **8.005** | M8 x 1 | 6.000 | 4.900 | 7.00 | 90.000 | 11.000 | 35.000 |
| **9.005** | M9 x 1 | 7.000 | 5.500 | 8.00 | 90.000 | 11.000 | 35.000 |
| **10.004** | M10 x 0,75 | 7.000 | 5.500 | 9.20 | 90.000 | 11.000 | 35.000 |
| **10.005** | M10 x 1 | 7.000 | 5.500 | 9.00 | 90.000 | 11.000 | 35.000 |
| **10.006** | M10 x 1,25 | 7.000 | 5.500 | 8.80 | 100.000 | 14.000 | 39.000 |
| **11.005** | M11 x 1 | 8.000 | 6.200 | 10.00 | 90.000 | 11.000 | 33.000 |
| **12.005** | M12 x 1 | 9.000 | 7.000 | 11.00 | 100.000 | 11.000 | 40.000 |
| **12.006** | M12 x 1,25 | 9.000 | 7.000 | 10.80 | 100.000 | 15.000 | 40.000 |
| **12.007** | M12 x 1,5 | 9.000 | 7.000 | 10.50 | 100.000 | 15.000 | 40.000 |
| **14.005** | M14 x 1 | 11.000 | 9.000 | 13.00 | 100.000 | 11.000 | 40.000 |
| **14.006** | M14 x 1,25 | 11.000 | 9.000 | 12.80 | 100.000 | 15.000 | 40.000 |
| **14.007** | M14 x 1,5 | 11.000 | 9.000 | 12.50 | 100.000 | 15.000 | 40.000 |
| **16.005** | M16 x 1 | 12.000 | 9.000 | 15.00 | 100.000 | 11.000 | 44.000 |
| **16.007** | M16 x 1,5 | 12.000 | 9.000 | 14.50 | 100.000 | 15.000 | 44.000 |
| **18.005** | M18 x 1 | 14.000 | 11.000 | 17.00 | 110.000 | 12.000 | 44.000 |
| **18.007** | M18 x 1,5 | 14.000 | 11.000 | 16.50 | 110.000 | 16.000 | 44.000 |
| **18.008** | M18 x 2 | 14.000 | 11.000 | 16.00 | 125.000 | 20.000 | 58.000 |
| **20.005** | M20 x 1 | 16.000 | 12.000 | 19.00 | 125.000 | 12.000 | 44.000 |
| **20.007** | M20 x 1,5 | 16.000 | 12.000 | 18.50 | 125.000 | 16.000 | 44.000 |
| **20.008** | M20 x 2 | 16.000 | 12.000 | 18.00 | 140.000 | 20.000 | 60.000 |
| **22.005** | M22 x 1 | 18.000 | 14.500 | 21.00 | 125.000 | 12.000 | 44.000 |
| **22.007** | M22 x 1,5 | 18.000 | 14.500 | 20.50 | 125.000 | 16.000 | 44.000 |
| **22.008** | M22 x 2 | 18.000 | 14.500 | 20.00 | 140.000 | 22.000 | 62.000 |
| **24.005** | M24 x 1 | 18.000 | 14.500 | 23.00 | 140.000 | 15.000 | 48.000 |
| **24.007** | M24 x 1,5 | 18.000 | 14.500 | 22.50 | 140.000 | 16.000 | 48.000 |
| **24.008** | M24 x 2 | 18.000 | 14.500 | 22.00 | 140.000 | 22.000 | 48.000 |

## Machine taps

## Taps for ISO metric fine threads

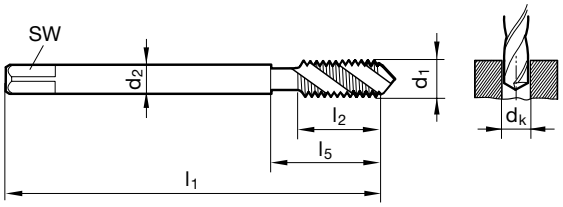
**Catalogue no. 53791**

Intensiv N-X | DIN 374 | C | HSS-E-PM | TiAlN-H | R | 6HX

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ● | ● | ○ | ○ | ○ | |

Application recommendations page 182-203

- for blind holes
- flutes with appr. 45° right-hand helix
- chip evacuation in shank direction
- for universal application
- steel materials up to 1200 N/mm²
- acid resist./stainless steels
- non-ferrous metals
- cast materials




| Code no. | d1 | d2 mm | SW mm | dk mm | l1 mm | l2 mm | l5 mm |
|---|---|---|---|---|---|---|---|
| **8.005** | M8 x 1 | 6.000 | 4.900 | 7.00 | 90.000 | 11.000 | 35.000 |
| **10.005** | M10 x 1 | 7.000 | 5.500 | 9.00 | 90.000 | 11.000 | 35.000 |
| **10.006** | M10 x 1,25 | 7.000 | 5.500 | 8.80 | 100.000 | 14.000 | 39.000 |
| **12.005** | M12 x 1 | 9.000 | 7.000 | 11.00 | 100.000 | 11.000 | 40.000 |
| **12.006** | M12 x 1,25 | 9.000 | 7.000 | 10.80 | 100.000 | 16.000 | 40.000 |
| **12.007** | M12 x 1,5 | 9.000 | 7.000 | 10.50 | 100.000 | 16.000 | 40.000 |
| **14.007** | M14 x 1,5 | 11.000 | 9.000 | 12.50 | 100.000 | 15.000 | 40.000 |
| **16.007** | M16 x 1,5 | 12.000 | 9.000 | 14.50 | 100.000 | 15.000 | 44.000 |
| **18.007** | M18 x 1,5 | 14.000 | 11.000 | 16.50 | 110.000 | 16.000 | 44.000 |
| **20.007** | M20 x 1,5 | 16.000 | 12.000 | 18.50 | 125.000 | 16.000 | 44.000 |
| **24.007** | M24 x 1,5 | 18.000 | 14.500 | 22.50 | 140.000 | 16.000 | 48.000 |

## Machine taps

## Taps for ISO metric fine threads

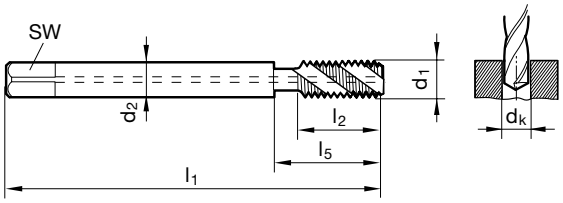
**Catalogue no. 53792**

| Intensiv N-X | DIN 374 | C | HSS-E-PM | TiAlN-H | R | 6HX |
|---|---|---|---|---|---|---|

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ● | ● | ○ | ○ | ○ | |

Application recommendations page 182-203

- for blind holes
- flutes with appr. 45° right-hand helix
- chip evacuation in shank direction
- with axial coolant duct
- for universal application
- steel materials up to 1200 N/mm²
- acid resist./stainless steels
- non-ferrous metals
- cast materials




| Code no. | d1 | d2 mm | SW mm | dk mm | l1 mm | l2 mm | l5 mm |
|---|---|---|---|---|---|---|---|
| **8.005** | M8 x 1 | 6.000 | 4.900 | 7.00 | 90.000 | 11.000 | 35.000 |
| **10.005** | M10 x 1 | 7.000 | 5.500 | 9.00 | 90.000 | 11.000 | 35.000 |
| **10.006** | M10 x 1,25 | 7.000 | 5.500 | 8.80 | 100.000 | 14.000 | 39.000 |
| **12.005** | M12 x 1 | 9.000 | 7.000 | 11.00 | 100.000 | 11.000 | 40.000 |
| **12.006** | M12 x 1,25 | 9.000 | 7.000 | 10.80 | 100.000 | 16.000 | 40.000 |
| **12.007** | M12 x 1,5 | 9.000 | 7.000 | 10.50 | 100.000 | 16.000 | 40.000 |
| **14.007** | M14 x 1,5 | 11.000 | 9.000 | 12.50 | 100.000 | 15.000 | 40.000 |
| **16.007** | M16 x 1,5 | 12.000 | 9.000 | 14.50 | 100.000 | 15.000 | 44.000 |
| **18.007** | M18 x 1,5 | 14.000 | 11.000 | 16.50 | 110.000 | 16.000 | 44.000 |
| **20.007** | M20 x 1,5 | 16.000 | 12.000 | 18.50 | 125.000 | 16.000 | 44.000 |
| **24.007** | M24 x 1,5 | 18.000 | 14.500 | 22.50 | 140.000 | 16.000 | 48.000 |

# Machine taps

## Taps for ISO metric fine threads

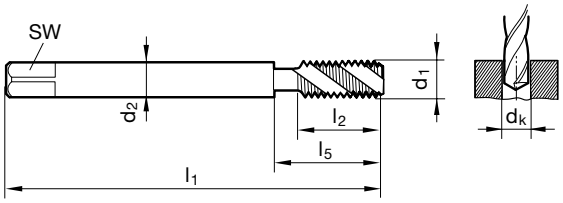
**Catalogue no. 53770**

| Intensiv N-X | DIN 374 | E | HSS-E | TiAlN-H | R | 6HX |
|---|---|---|---|---|---|---|

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ● | ● | ○ | ○ | ○ | |

Application recommendations page 182-203

- for blind holes
- flutes with appr. 45° right-hand helix
- chip evacuation in shank direction
- short chamfer for thread depths close to bottom of the hole
- for universal application
- steel materials up to 1200 N/mm²
- acid resist./stainless steels
- non-ferrous metals
- cast materials




| Code no. | d1 | d2 mm | SW mm | dk mm | l1 mm | l2 mm | l5 mm |
|---|---|---|---|---|---|---|---|
| **6.004** | M6 x 0,75 | 4.500 | 3.400 | 5.20 | 80.000 | 8.000 | 30.000 |
| **8.004** | M8 x 0,75 | 6.000 | 4.900 | 7.20 | 80.000 | 8.000 | 30.000 |
| **8.005** | M8 x 1 | 6.000 | 4.900 | 7.00 | 90.000 | 11.000 | 35.000 |
| **10.005** | M10 x 1 | 7.000 | 5.500 | 9.00 | 90.000 | 11.000 | 35.000 |
| **10.006** | M10 x 1,25 | 7.000 | 5.500 | 8.80 | 100.000 | 14.000 | 39.000 |
| **12.005** | M12 x 1 | 9.000 | 7.000 | 11.00 | 100.000 | 11.000 | 40.000 |
| **12.006** | M12 x 1,25 | 9.000 | 7.000 | 10.80 | 100.000 | 16.000 | 40.000 |
| **12.007** | M12 x 1,5 | 9.000 | 7.000 | 10.50 | 100.000 | 16.000 | 40.000 |
| **14.007** | M14 x 1,5 | 11.000 | 9.000 | 12.50 | 100.000 | 15.000 | 40.000 |
| **16.007** | M16 x 1,5 | 12.000 | 9.000 | 14.50 | 100.000 | 15.000 | 44.000 |
| **18.007** | M18 x 1,5 | 14.000 | 11.000 | 16.50 | 110.000 | 16.000 | 44.000 |
| **20.007** | M20 x 1,5 | 16.000 | 12.000 | 18.50 | 125.000 | 16.000 | 44.000 |
| **24.007** | M24 x 1,5 | 18.000 | 14.500 | 22.50 | 140.000 | 16.000 | 48.000 |

## Machine taps

## Taps for ISO metric fine threads

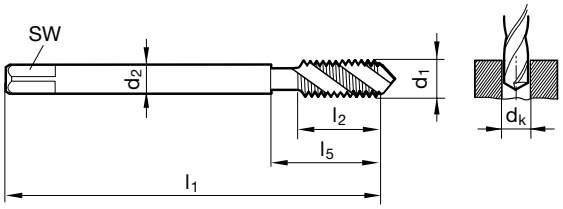
**Catalogue no. 53781**

Intensiv N-X | DIN 374 | C | HSS-E | TiAlN-H | R | 6GX

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ● | ● | ○ | ○ | ○ | |

Application recommendations page 182-203

- for blind holes
- flutes with appr. 45° right-hand helix
- chip evacuation in shank direction
- for universal application
- steel materials up to 1200 N/mm²
- acid resist./stainless steels
- non-ferrous metals
- cast materials




| Code no. | d1 | d2 mm | SW mm | dk mm | l1 mm | l2 mm | l5 mm |
|---|---|---|---|---|---|---|---|
| **6.004** | M6 x 0,75 | 4.500 | 3.400 | 5.20 | 80.000 | 8.000 | 30.000 |
| **8.004** | M8 x 0,75 | 6.000 | 4.900 | 7.20 | 80.000 | 8.000 | 30.000 |
| **8.005** | M8 x 1 | 6.000 | 4.900 | 7.00 | 90.000 | 11.000 | 35.000 |
| **10.005** | M10 x 1 | 7.000 | 5.500 | 9.00 | 90.000 | 11.000 | 35.000 |
| **10.006** | M10 x 1,25 | 7.000 | 5.500 | 8.80 | 100.000 | 14.000 | 39.000 |
| **12.005** | M12 x 1 | 9.000 | 7.000 | 11.00 | 100.000 | 11.000 | 40.000 |
| **12.006** | M12 x 1,25 | 9.000 | 7.000 | 10.80 | 100.000 | 16.000 | 40.000 |
| **12.007** | M12 x 1,5 | 9.000 | 7.000 | 10.50 | 100.000 | 16.000 | 40.000 |
| **14.007** | M14 x 1,5 | 11.000 | 9.000 | 12.50 | 100.000 | 15.000 | 40.000 |
| **16.007** | M16 x 1,5 | 12.000 | 9.000 | 14.50 | 100.000 | 15.000 | 44.000 |
| **18.007** | M18 x 1,5 | 14.000 | 11.000 | 16.50 | 110.000 | 16.000 | 44.000 |
| **20.007** | M20 x 1,5 | 16.000 | 12.000 | 18.50 | 125.000 | 16.000 | 44.000 |
| **24.007** | M24 x 1,5 | 18.000 | 14.500 | 22.50 | 140.000 | 16.000 | 48.000 |

## Machine taps

## Taps for ISO metric fine threads

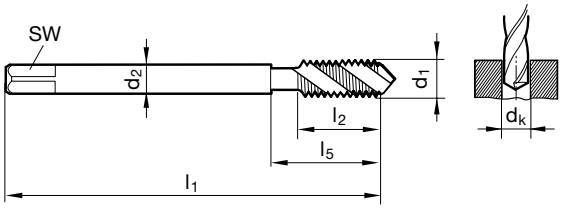
**Catalogue no. 73647**

Intensiv H | DIN 374 | C | HSS-E | nitrided | R | ISO2/6H

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ≤ 1200 | | | | | |

Application recommendations page 182-203

- for blind holes
- flutes with appr. 45° right-hand helix
- chip evacuation in shank direction
- high tensile steels
- steel from 1100 to 1200 N/mm²




| Code no. | d1 | d2 mm | SW mm | dk mm | l1 mm | l2 mm | l5 mm |
|---|---|---|---|---|---|---|---|
| **8.004** | M8 x 0,75 | 6.000 | 4.900 | 7.20 | 80.000 | 8.000 | 30.000 |
| **8.005** | M8 x 1 | 6.000 | 4.900 | 7.00 | 90.000 | 11.000 | 35.000 |
| **10.005** | M10 x 1 | 7.000 | 5.500 | 9.00 | 90.000 | 11.000 | 35.000 |
| **12.005** | M12 x 1 | 9.000 | 7.000 | 11.00 | 100.000 | 11.000 | 40.000 |
| **12.007** | M12 x 1,5 | 9.000 | 7.000 | 10.50 | 100.000 | 15.000 | 40.000 |
| **14.007** | M14 x 1,5 | 11.000 | 9.000 | 12.50 | 100.000 | 15.000 | 40.000 |
| **16.007** | M16 x 1,5 | 12.000 | 9.000 | 14.50 | 100.000 | 15.000 | 44.000 |
| **18.007** | M18 x 1,5 | 14.000 | 11.000 | 16.50 | 110.000 | 16.000 | 44.000 |
| **20.007** | M20 x 1,5 | 16.000 | 12.000 | 18.50 | 125.000 | 16.000 | 44.000 |
| **22.007** | M22 x 1,5 | 18.000 | 14.500 | 20.50 | 125.000 | 16.000 | 44.000 |
| **24.007** | M24 x 1,5 | 18.000 | 14.500 | 22.50 | 140.000 | 16.000 | 48.000 |

## Machine taps

## Taps for UNC threads

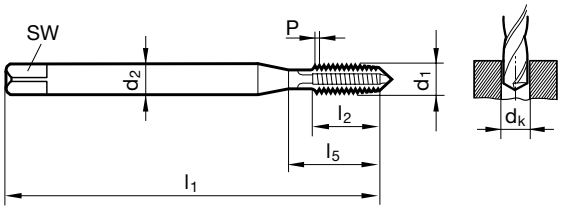
**Catalogue no. 53782**

Produktiv N-X | DIN 371/376 | B | HSS-E | AlTiZrN | R | 2BX

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ● | ● | ○ | ○ | ○ | |

Application recommendations page 182-203

- for through holes
- with spiral point
- chip evacuation in feed direction
- for universal application
- steel materials up to 1200 N/mm²
- acid resist./stainless steels
- non-ferrous metals
- cast materials




| Code no. | d1 | d2 mm | SW mm | dk mm | l1 mm | l2 mm | l5 mm |
|---|---|---|---|---|---|---|---|
| **2.184** | 2 - 56 | 2.800 | 2.100 | 1.85 | 45.000 | 9.000 | 14.500 |
| **2.845** | 4 - 40 | 3.500 | 2.700 | 2.35 | 56.000 | 11.000 | 18.000 |
| **3.505** | 6 - 32 | 4.000 | 3.000 | 2.85 | 56.000 | 12.000 | 20.000 |
| **4.166** | 8 - 32 | 4.500 | 3.400 | 3.50 | 63.000 | 12.000 | 21.000 |
| **4.826** | 10 - 24 | 6.000 | 4.900 | 3.90 | 70.000 | 14.000 | 25.000 |
| **5.486** | 12 - 24 | 6.000 | 4.900 | 4.50 | 80.000 | 16.000 | 30.000 |
| **6.350** | 1/4 - 20 | 7.000 | 5.500 | 5.10 | 80.000 | 16.000 | 30.000 |
| **7.938** | 5/16 - 18 | 8.000 | 6.200 | 6.60 | 90.000 | 18.000 | 35.000 |
| **9.525** | 3/8 - 16 | 10.000 | 8.000 | 8.00 | 100.000 | 20.000 | 39.000 |
| **11.113** | 7/16 - 14 | 8.000 | 6.200 | 9.40 | 100.000 | 22.000 | 42.000 |
| **12.700** | 1/2 - 13 | 9.000 | 7.000 | 10.80 | 110.000 | 25.000 | 49.000 |
| **14.288** | 9/16 - 12 | 11.000 | 9.000 | 12.20 | 110.000 | 28.000 | 53.000 |
| **15.875** | 5/8 - 11 | 12.000 | 9.000 | 13.50 | 110.000 | 30.000 | 53.000 |
| **19.050** | 3/4 - 10 | 14.000 | 11.000 | 16.50 | 125.000 | 33.000 | 62.000 |
| **22.225** | 7/8 - 9 | 18.000 | 14.500 | 19.50 | 140.000 | 35.000 | 62.000 |
| **25.400** | 1 - 8 | 18.000 | 14.500 | 22.25 | 160.000 | 38.000 | 73.000 |

## Taps for UNC threads

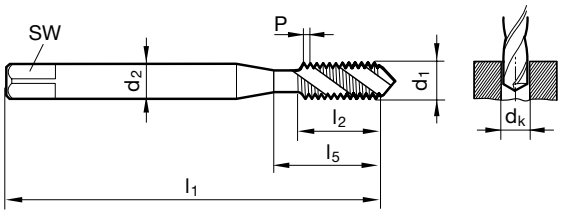
**Catalogue no. 53783**

Intensiv N-X | DIN 371/376 | C | HSS-E | TiAlN-H | R | 2BX

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ● | ● | ○ | ○ | ○ | |

Application recommendations page 182-203

- for blind holes
- flutes with appr. 45° right-hand helix
- chip evacuation in shank direction
- for universal application
- steel materials up to 1200 N/mm²
- acid resist./stainless steels
- non-ferrous metals
- cast materials




| Code no. | d1 | d2 mm | SW mm | dk mm | l1 mm | l2 mm | l5 mm |
|---|---|---|---|---|---|---|---|
| **2.184** | 2 - 56 | 2.800 | 2.100 | 1.85 | 45.000 | 5.000 | 14.500 |
| **2.845** | 4 - 40 | 3.500 | 2.700 | 2.35 | 56.000 | 7.000 | 18.000 |
| **3.505** | 6 - 32 | 4.000 | 3.000 | 2.85 | 56.000 | 8.000 | 20.000 |
| **4.166** | 8 - 32 | 4.500 | 3.400 | 3.50 | 63.000 | 8.000 | 21.000 |
| **4.826** | 10 - 24 | 6.000 | 4.900 | 3.90 | 70.000 | 11.000 | 25.000 |
| **5.486** | 12 - 24 | 6.000 | 4.900 | 4.50 | 80.000 | 11.000 | 30.000 |
| **6.350** | 1/4 - 20 | 7.000 | 5.500 | 5.10 | 80.000 | 13.000 | 30.000 |
| **7.938** | 5/16 - 18 | 8.000 | 6.200 | 6.60 | 90.000 | 14.000 | 35.000 |
| **9.525** | 3/8 - 16 | 10.000 | 8.000 | 8.00 | 100.000 | 16.000 | 39.000 |
| **11.113** | 7/16 - 14 | 8.000 | 6.200 | 9.40 | 100.000 | 18.000 | 42.000 |
| **12.700** | 1/2 - 13 | 9.000 | 7.000 | 10.80 | 110.000 | 20.000 | 49.000 |
| **14.288** | 9/16 - 12 | 11.000 | 9.000 | 12.20 | 110.000 | 21.000 | 53.000 |
| **15.875** | 5/8 - 11 | 12.000 | 9.000 | 13.50 | 110.000 | 24.000 | 53.000 |
| **19.050** | 3/4 - 10 | 14.000 | 11.000 | 16.50 | 125.000 | 25.000 | 62.000 |
| **22.225** | 7/8 - 9 | 18.000 | 14.500 | 19.50 | 140.000 | 28.000 | 62.000 |
| **25.400** | 1 - 8 | 18.000 | 14.500 | 22.25 | 160.000 | 32.000 | 73.000 |

## Machine taps

## Taps for UNF threads

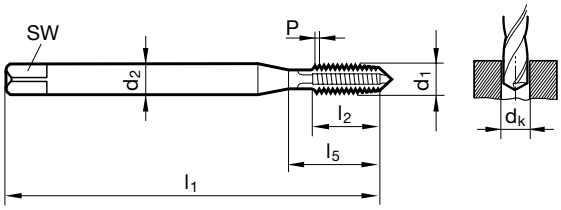
**Catalogue no. 53784**

Produktiv N-X | ~DIN 371/374 | B | HSS-E | AlTiZrN | R | 2BX

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ● | ● | ○ | ○ | ○ | |

Application recommendations page 182-203

- for through holes
- with spiral point
- chip evacuation in feed direction
- for universal application
- steel materials up to 1200 N/mm²
- acid resist./stainless steels
- non-ferrous metals
- cast materials




| Code no. | d1 | d2 mm | SW mm | dk mm | l1 mm | l2 mm | l5 mm |
|---|---|---|---|---|---|---|---|
| **2.184** | 2 - 64 | 2.800 | 2.100 | 1.85 | 45.000 | 9.000 | 14.500 |
| **2.845** | 4 - 48 | 3.500 | 2.700 | 2.40 | 56.000 | 10.000 | 18.000 |
| **3.505** | 6 - 40 | 4.000 | 3.000 | 2.95 | 56.000 | 11.000 | 20.000 |
| **4.166** | 8 - 36 | 4.500 | 3.400 | 3.50 | 63.000 | 12.000 | 21.000 |
| **4.826** | 10 - 32 | 6.000 | 4.900 | 4.10 | 70.000 | 14.000 | 25.000 |
| **5.486** | 12 - 28 | 6.000 | 4.900 | 4.60 | 80.000 | 16.000 | 30.000 |
| **6.350** | 1/4 - 28 | 7.000 | 5.500 | 5.50 | 80.000 | 16.000 | 30.000 |
| **7.938** | 5/16 - 24 | 8.000 | 6.200 | 6.90 | 90.000 | 17.000 | 35.000 |
| **9.525** | 3/8 - 24 | 10.000 | 8.000 | 8.50 | 90.000 | 18.000 | 35.000 |
| **11.113** | 7/16 - 20 | 8.000 | 6.200 | 9.90 | 100.000 | 22.000 | 42.000 |
| **12.700** | 1/2 - 20 | 9.000 | 7.000 | 11.50 | 100.000 | 20.000 | 40.000 |
| **14.288** | 9/16 - 18 | 11.000 | 9.000 | 12.90 | 100.000 | 22.000 | 40.000 |
| **15.875** | 5/8 - 18 | 12.000 | 9.000 | 14.50 | 100.000 | 22.000 | 44.000 |
| **19.050** | 3/4 - 16 | 14.000 | 11.000 | 17.50 | 110.000 | 25.000 | 44.000 |
| **22.225** | 7/8 - 14 | 18.000 | 14.500 | 20.40 | 125.000 | 25.000 | 44.000 |
| **25.400** | 1 - 12 | 18.000 | 14.500 | 23.25 | 140.000 | 28.000 | 50.000 |

## Taps for UNF threads

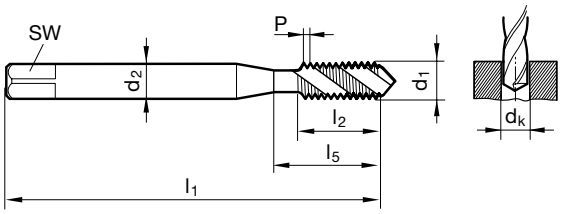
**Catalogue no. 53785**

Intensiv N-X | ~DIN 371/374 | C | HSS-E | TiAlN-H | R | 2BX

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ● | ● | ○ | ○ | ○ | |

Application recommendations page 182-203

- for blind holes
- flutes with appr. 45° right-hand helix
- chip evacuation in shank direction
- for universal application
- steel materials up to 1200 N/mm²
- acid resist./stainless steels
- non-ferrous metals
- cast materials




| Code no. | d1 | d2<br>mm | SW<br>mm | dk<br>mm | l1<br>mm | l2<br>mm | l5<br>mm |
|---|---|---|---|---|---|---|---|
| **2.184** | 2 - 64 | 2.800 | 2.100 | 1.85 | 45.000 | 5.000 | 14.500 |
| **2.845** | 4 - 48 | 3.500 | 2.700 | 2.40 | 56.000 | 6.000 | 18.000 |
| **3.505** | 6 - 40 | 4.000 | 3.000 | 2.95 | 56.000 | 6.500 | 20.000 |
| **4.166** | 8 - 36 | 4.500 | 3.400 | 3.50 | 63.000 | 7.000 | 21.000 |
| **4.826** | 10 - 32 | 6.000 | 4.900 | 4.10 | 70.000 | 8.500 | 25.000 |
| **5.486** | 12 - 28 | 6.000 | 4.900 | 4.60 | 80.000 | 9.500 | 30.000 |
| **6.350** | 1/4 - 28 | 7.000 | 5.500 | 5.50 | 80.000 | 9.500 | 30.000 |
| **7.938** | 5/16 - 24 | 8.000 | 6.200 | 6.90 | 90.000 | 11.500 | 35.000 |
| **9.525** | 3/8 - 24 | 10.000 | 8.000 | 8.50 | 90.000 | 11.500 | 35.000 |
| **11.113** | 7/16 - 20 | 8.000 | 6.200 | 9.90 | 100.000 | 13.000 | 42.000 |
| **12.700** | 1/2 - 20 | 9.000 | 7.000 | 11.50 | 100.000 | 13.000 | 40.000 |
| **14.288** | 9/16 - 18 | 11.000 | 9.000 | 12.90 | 100.000 | 14.000 | 40.000 |
| **15.875** | 5/8 - 18 | 12.000 | 9.000 | 14.50 | 100.000 | 15.000 | 44.000 |
| **19.050** | 3/4 - 16 | 14.000 | 11.000 | 17.50 | 110.000 | 16.000 | 44.000 |
| **22.225** | 7/8 - 14 | 18.000 | 14.500 | 20.40 | 125.000 | 19.000 | 44.000 |
| **25.400** | 1 - 12 | 18.000 | 14.500 | 23.25 | 140.000 | 22.000 | 50.000 |

## Machine taps

## Taps for BSP threads

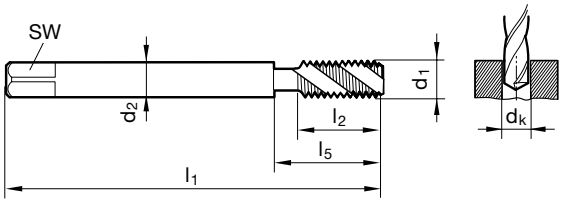
**Catalogue no. 53775**

Intensiv N-X | DIN 5156 | E | HSS-E | TiAlN-H | R

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ● | ● | ○ | ○ | ○ | |

Application recommendations page 182-203

- for blind holes
- flutes with appr. 45° right-hand helix
- chip evacuation in shank direction
- short chamfer for thread depths close to bottom of the hole
- for universal application
- steel materials up to 1200 N/mm²
- acid resist./stainless steels
- non-ferrous metals
- cast materials




| Code no. | d1 | P G/inch | d2 mm | SW mm | dk mm | l1 mm | l2 mm | l5 mm |
|---|---|---|---|---|---|---|---|---|
| **7.723** | G1/16 | 28 | 6.000 | 4.900 | 6.80 | 90.000 | 11.000 | 30.000 |
| **9.728** | G1/8 | 28 | 7.000 | 5.500 | 8.80 | 90.000 | 11.000 | 35.000 |
| **13.157** | G1/4 | 19 | 11.000 | 9.000 | 11.80 | 100.000 | 14.000 | 40.000 |
| **16.662** | G3/8 | 19 | 12.000 | 9.000 | 15.25 | 100.000 | 14.000 | 44.000 |
| **20.955** | G1/2 | 14 | 16.000 | 12.000 | 19.00 | 125.000 | 18.000 | 44.000 |
| **22.911** | G5/8 | 14 | 18.000 | 14.500 | 21.00 | 125.000 | 18.000 | 48.000 |
| **26.441** | G3/4 | 14 | 20.000 | 16.000 | 24.50 | 140.000 | 20.000 | 53.000 |
| **30.201** | G7/8 | 14 | 22.000 | 18.000 | 28.25 | 150.000 | 22.000 | 53.000 |
| **33.249** | G1 | 11 | 25.000 | 20.000 | 30.75 | 160.000 | 24.000 | 56.000 |

## Fluteless taps with oil grooves

## Fluteless taps for ISO metric threads

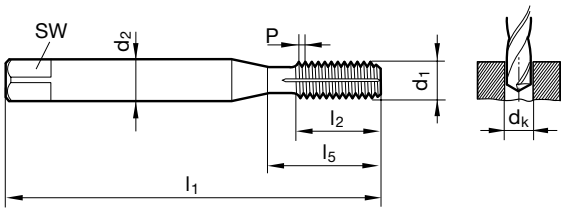
**Catalogue no. 53630**

Durativ N-X | ~DIN 371/376 | C | HSS-E-PM | TiCN | R | 4HX/6HX

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ● | ● | ● | ○ | ● | |

Application recommendations page 182-203

- for through and blind holes
- steel materials of up to 1200 N/mm²
- acid resist./stainless steels
- malleable cast materials
- malleable non-ferrous metals
- special alloys




| d1 | P<br>mm | d2<br>mm | SW<br>mm | dk<br>mm | l1<br>mm | l2<br>mm | l5<br>mm |
|---|---|---|---|---|---|---|---|
| **M1** | 0.250 | 2.500 | 2.100 | 0.90 | 40.000 | 4.000 | 4.000 |
| **M1,2** | 0.250 | 2.500 | 2.100 | 1.10 | 40.000 | 4.800 | 4.800 |
| **M1,4** | 0.300 | 2.500 | 2.100 | 1.25 | 40.000 | 5.600 | 5.600 |
| **M1,6** | 0.350 | 2.500 | 2.100 | 1.45 | 40.000 | 6.400 | 6.400 |
| **M1,7** | 0.350 | 2.500 | 2.100 | 1.55 | 40.000 | 6.800 | 6.800 |
| **M1,8** | 0.350 | 2.500 | 2.100 | 1.65 | 40.000 | 7.300 | 7.300 |
| **M2** | 0.400 | 2.800 | 2.100 | 1.85 | 45.000 | 8.000 | 13.500 |
| **M2,5** | 0.450 | 2.800 | 2.100 | 2.30 | 50.000 | 9.000 | 14.500 |
| **M3** | 0.500 | 3.500 | 2.700 | 2.80 | 56.000 | 10.000 | 18.000 |
| **M3,5** | 0.600 | 4.000 | 3.000 | 3.25 | 56.000 | 12.000 | 20.000 |
| **M4** | 0.700 | 4.500 | 3.400 | 3.70 | 63.000 | 12.000 | 21.000 |
| **M4,5** | 0.750 | 6.000 | 4.900 | 4.20 | 70.000 | 14.000 | 25.000 |
| **M5** | 0.800 | 6.000 | 4.900 | 4.65 | 70.000 | 14.000 | 25.000 |
| **M6** | 1.000 | 6.000 | 4.900 | 5.55 | 80.000 | 16.000 | 30.000 |
| **M7** | 1.000 | 7.000 | 5.500 | 6.55 | 80.000 | 16.000 | 30.000 |
| **M8** | 1.250 | 8.000 | 6.200 | 7.40 | 90.000 | 17.000 | 35.000 |
| **M9** | 1.250 | 9.000 | 7.000 | 8.40 | 90.000 | 17.000 | 35.000 |
| **M10** | 1.500 | 10.000 | 8.000 | 9.30 | 100.000 | 20.000 | 39.000 |
| **M11** | 1.500 | 8.000 | 6.200 | 10.30 | 100.000 | 20.000 | 42.000 |
| **M12** | 1.750 | 9.000 | 7.000 | 11.20 | 110.000 | 24.000 | 49.000 |
| **M14** | 2.000 | 11.000 | 9.000 | 13.10 | 110.000 | 26.000 | 53.000 |
| **M16** | 2.000 | 12.000 | 9.000 | 15.10 | 110.000 | 26.000 | 54.000 |
| **M20** | 2.500 | 16.000 | 12.000 | 18.90 | 140.000 | 32.000 | 62.000 |

## Fluteless taps with oil grooves

## Fluteless taps for ISO metric threads

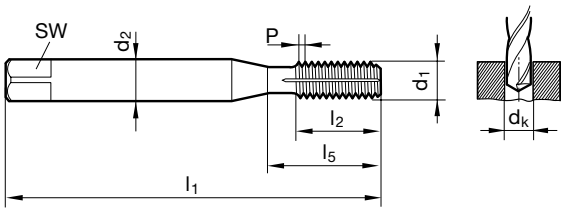
**Catalogue no. 53631**

Durativ N-X | ~DIN 371/376 | C | HSS-E-PM | TiCN | R | 6GX

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ● | ● | ● | ○ | ● | |

Application recommendations page 182-203

- for through and blind holes
- steel materials of up to 1200 N/mm²
- acid resist./stainless steels
- malleable cast materials
- malleable non-ferrous metals
- special alloys




| d1 | P<br>mm | d2<br>mm | SW<br>mm | dk<br>mm | l1<br>mm | l2<br>mm | l5<br>mm |
|---|---|---|---|---|---|---|---|
| **M2** | 0.400 | 2.800 | 2.100 | 1.85 | 45.000 | 8.000 | 13.500 |
| **M2,5** | 0.450 | 2.800 | 2.100 | 2.30 | 50.000 | 9.000 | 14.500 |
| **M3** | 0.500 | 3.500 | 2.700 | 2.80 | 56.000 | 10.000 | 18.000 |
| **M4** | 0.700 | 4.500 | 3.400 | 3.70 | 63.000 | 12.000 | 21.000 |
| **M5** | 0.800 | 6.000 | 4.900 | 4.65 | 70.000 | 14.000 | 25.000 |
| **M6** | 1.000 | 6.000 | 4.900 | 5.55 | 80.000 | 16.000 | 30.000 |
| **M8** | 1.250 | 8.000 | 6.200 | 7.40 | 90.000 | 17.000 | 35.000 |
| **M10** | 1.500 | 10.000 | 8.000 | 9.30 | 100.000 | 20.000 | 39.000 |
| **M12** | 1.750 | 9.000 | 7.000 | 11.20 | 110.000 | 24.000 | 49.000 |
| **M14** | 2.000 | 11.000 | 9.000 | 13.10 | 110.000 | 26.000 | 53.000 |
| **M16** | 2.000 | 12.000 | 9.000 | 15.10 | 110.000 | 26.000 | 54.000 |
| **M20** | 2.500 | 16.000 | 12.000 | 18.90 | 140.000 | 32.000 | 62.000 |

## Fluteless taps with oil grooves

## Fluteless taps for ISO metric fine threads

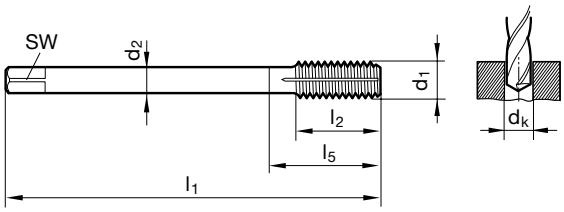
**Catalogue no. 53632**

Durativ N-X | ~DIN 374 | C | HSS-E-PM | TiCN | R | 6HX

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ● | ● | ● | ○ | ● | |

Application recommendations page 182-203

- for through and blind holes
- steel materials of up to 1200 N/mm²
- acid resist./stainless steels
- malleable cast materials
- malleable non-ferrous metals
- special alloys






| Code no. | d1 | d2 mm | SW mm | dk mm | l1 mm | l2 mm | l5 mm |
|---|---|---|---|---|---|---|---|
| **3.002** | M3 x 0,35 | 2.200 | 1.800 | 2.85 | 56.000 | 7.000 | 18.000 |
| **4.002** | M4 x 0,35 | 2.800 | 2.100 | 3.85 | 63.000 | 8.000 | 21.000 |
| **4.003** | M4 x 0,5 | 2.800 | 2.100 | 3.80 | 63.000 | 8.000 | 21.000 |
| **5.003** | M5 x 0,5 | 3.500 | 2.700 | 4.80 | 70.000 | 10.000 | 25.000 |
| **6.003** | M6 x 0,5 | 4.500 | 3.400 | 5.75 | 80.000 | 13.000 | 30.000 |
| **6.004** | M6 x 0,75 | 4.500 | 3.400 | 5.65 | 80.000 | 13.000 | 30.000 |
| **8.004** | M8 x 0,75 | 6.000 | 4.900 | 7.65 | 80.000 | 14.000 | 30.000 |
| **8.005** | M8 x 1 | 6.000 | 4.900 | 7.55 | 90.000 | 17.000 | 35.000 |
| **9.005** | M9 x 1 | 7.000 | 5.500 | 8.55 | 90.000 | 16.000 | 35.000 |
| **10.004** | M10 x 0,75 | 7.000 | 5.500 | 9.65 | 90.000 | 16.000 | 35.000 |
| **10.005** | M10 x 1 | 7.000 | 5.500 | 9.55 | 90.000 | 16.000 | 35.000 |
| **10.006** | M10 x 1,25 | 7.000 | 5.500 | 9.40 | 100.000 | 20.000 | 39.000 |
| **11.005** | M11 x 1 | 8.000 | 6.200 | 10.55 | 90.000 | 20.000 | 33.000 |
| **12.005** | M12 x 1 | 9.000 | 7.000 | 11.55 | 100.000 | 20.000 | 40.000 |
| **12.006** | M12 x 1,25 | 9.000 | 7.000 | 11.40 | 100.000 | 20.000 | 40.000 |
| **12.007** | M12 x 1,5 | 9.000 | 7.000 | 11.30 | 100.000 | 20.000 | 40.000 |
| **14.005** | M14 x 1 | 11.000 | 9.000 | 13.55 | 100.000 | 20.000 | 40.000 |
| **14.006** | M14 x 1,25 | 11.000 | 9.000 | 13.40 | 100.000 | 20.000 | 40.000 |
| **14.007** | M14 x 1,5 | 11.000 | 9.000 | 13.30 | 100.000 | 20.000 | 40.000 |
| **16.005** | M16 x 1 | 12.000 | 9.000 | 15.55 | 100.000 | 22.000 | 44.000 |
| **16.007** | M16 x 1,5 | 12.000 | 9.000 | 15.30 | 100.000 | 22.000 | 44.000 |
| **18.005** | M18 x 1 | 14.000 | 11.000 | 17.55 | 110.000 | 25.000 | 44.000 |
| **18.007** | M18 x 1,5 | 14.000 | 11.000 | 17.30 | 110.000 | 25.000 | 44.000 |
| **18.008** | M18 x 2 | 14.000 | 11.000 | 17.10 | 125.000 | 30.000 | 58.000 |
| **20.005** | M20 x 1 | 16.000 | 12.000 | 19.55 | 125.000 | 25.000 | 44.000 |
| **20.007** | M20 x 1,5 | 16.000 | 12.000 | 19.30 | 125.000 | 25.000 | 44.000 |
| **20.008** | M20 x 2 | 16.000 | 12.000 | 19.10 | 140.000 | 32.000 | 60.000 |
| **22.005** | M22 x 1 | 18.000 | 14.500 | 21.55 | 125.000 | 25.000 | 44.000 |
| **22.007** | M22 x 1,5 | 18.000 | 14.500 | 21.30 | 125.000 | 25.000 | 44.000 |
| **22.008** | M22 x 2 | 18.000 | 14.500 | 21.10 | 140.000 | 32.000 | 62.000 |
| **24.005** | M24 x 1 | 18.000 | 14.500 | 23.55 | 140.000 | 28.000 | 48.000 |
| **24.007** | M24 x 1,5 | 18.000 | 14.500 | 23.30 | 140.000 | 28.000 | 48.000 |
| **24.008** | M24 x 2 | 18.000 | 14.500 | 23.10 | 140.000 | 28.000 | 48.000 |

## Fluteless taps with oil grooves

## Fluteless taps for UNC threads

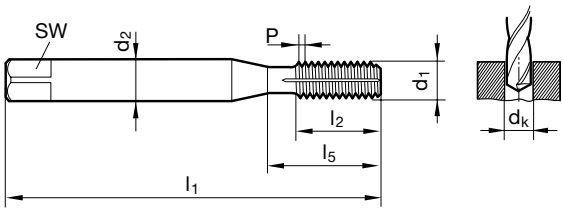
**Catalogue no. 53633**

Durativ N-X | ~DIN 371/376 | C | HSS-E-PM | TiCN | R | 2BX

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ● | ● | ● | ○ | ● | |

Application recommendations page 182-203

- for through and blind holes
- steel materials of up to 1200 N/mm²
- acid resist./stainless steels
- malleable cast materials
- malleable non-ferrous metals
- special alloys




| Code no. | d1 | d2 mm | SW mm | dk mm | l1 mm | l2 mm | l5 mm |
|---|---|---|---|---|---|---|---|
| **2.845** | 4 - 40 | 3.500 | 2.700 | 2.55 | 56.000 | 11.000 | 18.000 |
| **3.505** | 6 - 32 | 4.000 | 3.000 | 3.15 | 56.000 | 12.000 | 20.000 |
| **4.166** | 8 - 32 | 4.500 | 3.400 | 3.80 | 63.000 | 12.000 | 21.000 |
| **4.826** | 10 - 24 | 6.000 | 4.900 | 4.35 | 70.000 | 14.000 | 25.000 |
| **5.486** | 12 - 24 | 6.000 | 4.900 | 5.00 | 80.000 | 16.000 | 30.000 |
| **6.350** | 1/4 - 20 | 7.000 | 5.500 | 5.75 | 80.000 | 16.000 | 30.000 |
| **7.938** | 5/16 - 18 | 8.000 | 6.200 | 7.30 | 90.000 | 18.000 | 35.000 |
| **9.525** | 3/8 - 16 | 10.000 | 8.000 | 8.80 | 90.000 | 20.000 | 35.000 |
| **11.113** | 7/16 - 14 | 8.000 | 6.200 | 10.30 | 100.000 | 22.000 | 42.000 |
| **12.700** | 1/2 - 13 | 9.000 | 7.000 | 11.80 | 100.000 | 25.000 | 40.000 |
| **14.288** | 9/16 - 12 | 11.000 | 9.000 | 13.30 | 100.000 | 28.000 | 40.000 |
| **15.875** | 5/8 - 11 | 12.000 | 9.000 | 14.80 | 100.000 | 30.000 | 44.000 |
| **19.050** | 3/4 - 10 | 14.000 | 11.000 | 17.90 | 110.000 | 33.000 | 44.000 |

## Fluteless taps with oil grooves

## Fluteless taps for UNF threads

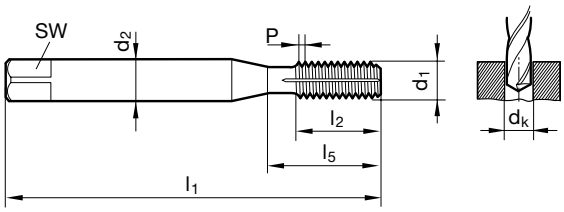
**Catalogue no. 53634**

Durativ N-X | ~DIN 371/374 | C | HSS-E-PM | TiCN | R | 2BX

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ● | ● | ● | ○ | ● | |

Application recommendations page 182-203

- for through and blind holes
- steel materials of up to 1200 N/mm²
- acid resist./stainless steels
- malleable cast materials
- malleable non-ferrous metals
- special alloys




| Code no. | d1 | d2 mm | SW mm | dk mm | l1 mm | l2 mm | l5 mm |
|---|---|---|---|---|---|---|---|
| **2.845** | 4 - 48 | 3.500 | 2.700 | 2.60 | 56.000 | 10.000 | 18.000 |
| **3.505** | 6 - 40 | 4.000 | 3.000 | 3.20 | 56.000 | 11.000 | 20.000 |
| **4.166** | 8 - 36 | 4.500 | 3.400 | 3.85 | 63.000 | 12.000 | 21.000 |
| **4.826** | 10 - 32 | 6.000 | 4.900 | 4.45 | 70.000 | 14.000 | 25.000 |
| **5.486** | 12 - 28 | 6.000 | 4.900 | 5.10 | 80.000 | 16.000 | 30.000 |
| **6.350** | 1/4 - 28 | 7.000 | 5.500 | 5.95 | 80.000 | 16.000 | 30.000 |
| **7.938** | 5/16 - 24 | 8.000 | 6.200 | 7.45 | 90.000 | 18.000 | 35.000 |
| **9.525** | 3/8 - 24 | 10.000 | 8.000 | 9.05 | 100.000 | 18.000 | 39.000 |
| **11.113** | 7/16 - 20 | 8.000 | 6.200 | 10.55 | 100.000 | 22.000 | 42.000 |
| **12.700** | 1/2 - 20 | 9.000 | 7.000 | 12.10 | 100.000 | 20.000 | 40.000 |
| **14.288** | 9/16 - 18 | 11.000 | 9.000 | 13.65 | 100.000 | 22.000 | 40.000 |
| **15.875** | 5/8 - 18 | 12.000 | 9.000 | 15.25 | 100.000 | 22.000 | 44.000 |
| **19.050** | 3/4 - 16 | 14.000 | 11.000 | 18.35 | 110.000 | 25.000 | 44.000 |

## Fluteless taps w/o oil grooves

## Fluteless taps for BSP threads

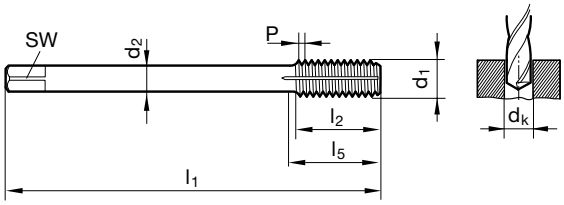
**Catalogue no. 53635**

Durativ N-X | DIN 2189 | C | HSS-E-PM | TiCN | R

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ● | ● | ● | ○ | ● | |

Application recommendations page 182-203

- for through and blind holes
- steel materials of up to 1200 N/mm²
- acid resist./stainless steels
- malleable cast materials
- malleable non-ferrous metals
- special alloys




| Code no. | d1 | P G/inch | d2 mm | SW mm | dk mm | l1 mm | l2 mm | l5 mm |
|---|---|---|---|---|---|---|---|---|
| **9.728** | G1/8 | 28 | 7.000 | 5.500 | 9.30 | 90.000 | 18.000 | 35.000 |
| **13.157** | G1/4 | 19 | 11.000 | 9.000 | 12.50 | 100.000 | 20.000 | 40.000 |
| **16.662** | G3/8 | 19 | 12.000 | 9.000 | 16.00 | 100.000 | 22.000 | 44.000 |
| **20.955** | G1/2 | 14 | 16.000 | 12.000 | 20.00 | 125.000 | 25.000 | 44.000 |

## Fluteless taps with oil grooves

## Fluteless taps with coolant ducts for metric ISO threads

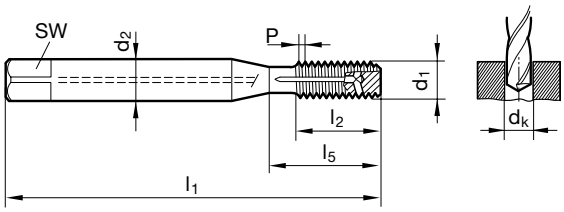
**Catalogue no. 53610**

Durativ **N-X** | ~DIN **371/376** | **C** | **HSS-E-PM** | **TiCN** | **R** | **6HX**

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ● | ● | ● | ○ | ● | |

Application recommendations page 182-203

- for through and blind holes
- steel materials of up to 1200 N/mm²
- acid resist./stainless steels
- malleable cast materials
- malleable non-ferrous metals
- special alloys
- radial coolant exit




| d1 | P<br>mm | d2<br>mm | SW<br>mm | dk<br>mm | l1<br>mm | l2<br>mm | l5<br>mm |
|---|---|---|---|---|---|---|---|
| **M5** | 0.800 | 6.000 | 4.900 | 4.65 | 70.000 | 8.500 | 25.000 |
| **M6** | 1.000 | 6.000 | 4.900 | 5.55 | 80.000 | 11.000 | 30.000 |
| **M8** | 1.250 | 8.000 | 6.200 | 7.40 | 90.000 | 14.000 | 35.000 |
| **M10** | 1.500 | 10.000 | 8.000 | 9.30 | 100.000 | 16.000 | 39.000 |
| **M12** | 1.750 | 9.000 | 7.000 | 11.20 | 110.000 | 18.500 | 49.000 |
| **M14** | 2.000 | 11.000 | 9.000 | 13.10 | 110.000 | 20.000 | 53.000 |
| **M16** | 2.000 | 12.000 | 9.000 | 15.10 | 110.000 | 20.000 | 54.000 |
| **M20** | 2.500 | 16.000 | 12.000 | 18.90 | 140.000 | 25.000 | 62.000 |

## Fluteless taps with oil grooves

## Fluteless taps with coolant ducts for metric ISO threads

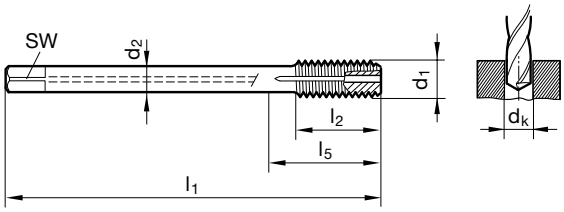
**Catalogue no. 53618**

Durativ N-X | ~DIN 371/376 | E | HSS-E-PM | TiCN | R | 6HX

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ● | ● | ● | ○ | ● | |

Application recommendations page 182-203

- for through and blind holes
- steel materials of up to 1200 N/mm²
- acid resist./stainless steels
- malleable cast materials
- malleable non-ferrous metals
- special alloys
- with internal coolant duct ≥ M5
- short chamfer for thread depths close to bottom of the hole




| d1 | P<br>mm | d2<br>mm | SW<br>mm | dk<br>mm | l1<br>mm | l2<br>mm | l5<br>mm |
|---|---|---|---|---|---|---|---|
| **M2** | 0.400 | 2.800 | 2.100 | 1.85 | 45.000 | 8.000 | 13.500 |
| **M2,5** | 0.450 | 2.800 | 2.100 | 2.30 | 50.000 | 9.000 | 14.500 |
| **M3** | 0.500 | 3.500 | 2.700 | 2.80 | 56.000 | 10.000 | 18.000 |
| **M4** | 0.700 | 4.500 | 3.400 | 3.70 | 63.000 | 12.000 | 21.000 |
| **M5** | 0.800 | 6.000 | 4.900 | 4.65 | 70.000 | 8.500 | 25.000 |
| **M6** | 1.000 | 6.000 | 4.900 | 5.55 | 80.000 | 11.000 | 30.000 |
| **M8** | 1.250 | 8.000 | 6.200 | 7.40 | 90.000 | 14.000 | 35.000 |
| **M10** | 1.500 | 10.000 | 8.000 | 9.30 | 100.000 | 16.000 | 39.000 |
| **M12** | 1.750 | 9.000 | 7.000 | 11.20 | 110.000 | 18.500 | 49.000 |
| **M14** | 2.000 | 11.000 | 9.000 | 13.10 | 110.000 | 20.000 | 53.000 |
| **M16** | 2.000 | 12.000 | 9.000 | 15.10 | 110.000 | 20.000 | 54.000 |
| **M20** | 2.500 | 16.000 | 12.000 | 18.90 | 140.000 | 25.000 | 62.000 |

## Fluteless taps with oil grooves

## Fluteless taps with coolant ducts for ISO metric fine threads

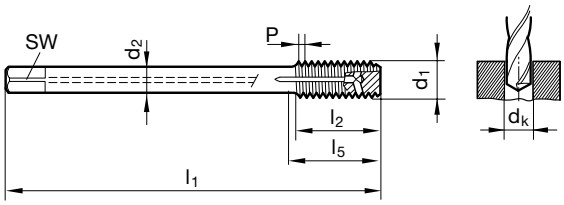
**Catalogue no. 53612**

Durativ **N-X** | ~DIN **374** | **C** | **HSS-E-PM** | **TiCN** | **R** | **6HX**

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ● | ● | ● | ○ | ● | |

Application recommendations page 182-203

- for through and blind holes
- steel materials of up to 1200 N/mm²
- acid resist./stainless steels
- malleable cast materials
- malleable non-ferrous metals
- special alloys
- radial coolant exit




| Code no. | d1 | d2 mm | SW mm | dk mm | l1 mm | l2 mm | l5 mm |
|---|---|---|---|---|---|---|---|
| **8.005** | M8 x 1 | 6.000 | 4.900 | 7.55 | 90.000 | 11.000 | 35.000 |
| **10.005** | M10 x 1 | 7.000 | 5.500 | 9.55 | 90.000 | 11.000 | 35.000 |
| **10.006** | M10 x 1,25 | 7.000 | 5.500 | 9.40 | 100.000 | 14.000 | 39.000 |
| **12.006** | M12 x 1,25 | 9.000 | 7.000 | 11.40 | 100.000 | 16.000 | 40.000 |
| **12.007** | M12 x 1,5 | 9.000 | 7.000 | 11.30 | 100.000 | 16.000 | 40.000 |
| **14.006** | M14 x 1,25 | 11.000 | 9.000 | 13.40 | 100.000 | 15.000 | 40.000 |
| **14.007** | M14 x 1,5 | 11.000 | 9.000 | 13.30 | 100.000 | 15.000 | 40.000 |
| **16.007** | M16 x 1,5 | 12.000 | 9.000 | 15.30 | 100.000 | 15.000 | 44.000 |
| **20.007** | M20 x 1,5 | 16.000 | 12.000 | 19.30 | 125.000 | 16.000 | 44.000 |

## Fluteless taps with oil grooves

## Fluteless taps with coolant ducts for ISO metric fine threads

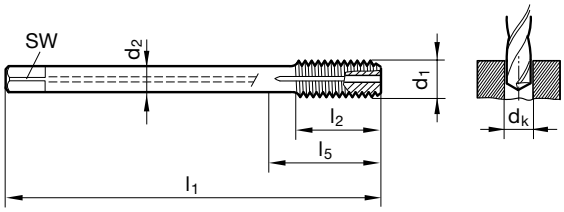
**Catalogue no. 53619**

| Durativ N-X | ~DIN 374 | E | HSS-E-PM | TiCN | R | 6HX |
|---|---|---|---|---|---|---|

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ● | ● | ● | ○ | ● | |

Application recommendations page 182-203

- for through and blind holes
- steel materials of up to 1200 N/mm²
- acid resist./stainless steels
- malleable cast materials
- malleable non-ferrous metals
- special alloys
- with axial coolant duct




| Code no. | d1 | d2 mm | SW mm | dk mm | l1 mm | l2 mm | l5 mm |
|---|---|---|---|---|---|---|---|
| **8.005** | M8 x 1 | 6.000 | 4.900 | 7.55 | 90.000 | 11.000 | 35.000 |
| **10.005** | M10 x 1 | 7.000 | 5.500 | 9.55 | 90.000 | 11.000 | 35.000 |
| **10.006** | M10 x 1,25 | 7.000 | 5.500 | 9.40 | 100.000 | 14.000 | 39.000 |
| **12.006** | M12 x 1,25 | 9.000 | 7.000 | 11.40 | 100.000 | 16.000 | 40.000 |
| **12.007** | M12 x 1,5 | 9.000 | 7.000 | 11.30 | 100.000 | 16.000 | 40.000 |
| **14.006** | M14 x 1,25 | 11.000 | 9.000 | 13.40 | 100.000 | 15.000 | 40.000 |
| **14.007** | M14 x 1,5 | 11.000 | 9.000 | 13.30 | 100.000 | 15.000 | 40.000 |
| **16.007** | M16 x 1,5 | 12.000 | 9.000 | 15.30 | 100.000 | 15.000 | 44.000 |
| **20.007** | M20 x 1,5 | 16.000 | 12.000 | 19.30 | 125.000 | 16.000 | 44.000 |

## Drill thread milling cutters for ISO metric threads

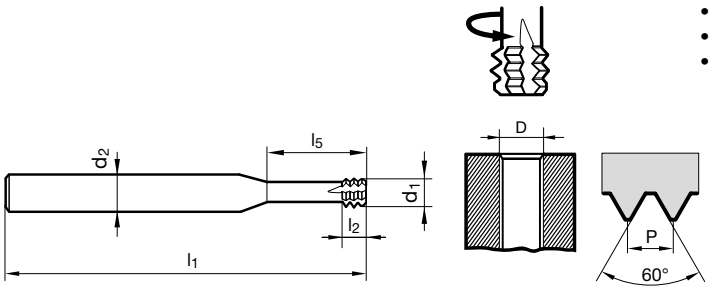
**Catalogue no. 53948**

TMD-NX | 2,5xD | WN | VHM | TiSiN | L | ~HB

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ● | ● | ● | ● | ● | ≤ 66 |

Application recommendations page 182-203

- helical drill thread milling, core hole and thread production in one step
- for universal application and also hardened steels up to 66 HRC
- left-hand cutting tool for highest stability during the climb milling process
- oil grooves at the shank




| Code no. | D | P mm | d1 mm | d2 mm | l1 mm | l2 mm | l5 mm | Z | PR |
|---|---|---|---|---|---|---|---|---|---|
| **2.000** | M2 | 0.400 | 1.400 | 3.000 | 39.000 | 1.200 | 5.000 | 4 | 0.67 |
| **2.500** | M2,5 | 0.450 | 1.800 | 3.000 | 39.000 | 1.300 | 6.500 | 4 | 0.87 |
| **3.000** | M3 | 0.500 | 2.400 | 6.000 | 58.000 | 1.500 | 7.500 | 4 | 1.17 |
| **3.500** | M3,5 | 0.600 | 2.700 | 6.000 | 58.000 | 1.800 | 9.000 | 4 | 1.32 |
| **4.000** | M4 | 0.700 | 3.100 | 6.000 | 58.000 | 2.100 | 10.000 | 4 | 1.52 |
| **5.000** | M5 | 0.800 | 3.800 | 6.000 | 58.000 | 2.400 | 12.500 | 4 | 1.87 |
| **6.000** | M6 | 1.000 | 4.600 | 8.000 | 64.000 | 3.000 | 15.000 | 4 | 2.27 |
| **6.003** | M6 x 0,5 | 0.500 | 3.800 | 8.000 | 64.000 | 2.400 | 15.000 | 4 | 1.87 |
| **8.000** | M8 | 1.250 | 6.200 | 8.000 | 64.000 | 3.600 | 20.000 | 4 | 3.07 |
| **8.004** | M8 x 0,75 | 0.750 | 4.600 | 8.000 | 64.000 | 3.000 | 20.000 | 4 | 2.27 |
| **10.000** | M10 | 1.500 | 7.500 | 10.000 | 73.000 | 4.500 | 25.000 | 4 | 3.69 |
| **12.000** | M12 | 1.750 | 9.000 | 10.000 | 73.000 | 5.200 | 30.000 | 4 | 4.44 |
| **12.005** | M12 x 1 | 1.000 | 7.500 | 10.000 | 73.000 | 3.000 | 25.000 | 4 | 3.72 |
| **16.000** | M16 | 2.000 | 11.500 | 12.000 | 90.000 | 6.000 | 40.000 | 4 | 5.69 |
| **16.007** | M16 x 1,5 | 1.500 | 11.500 | 12.000 | 90.000 | 4.500 | 40.000 | 4 | 5.69 |

## Drill thread milling cutters

## Drill thread milling cutters for UNC/UNF threads

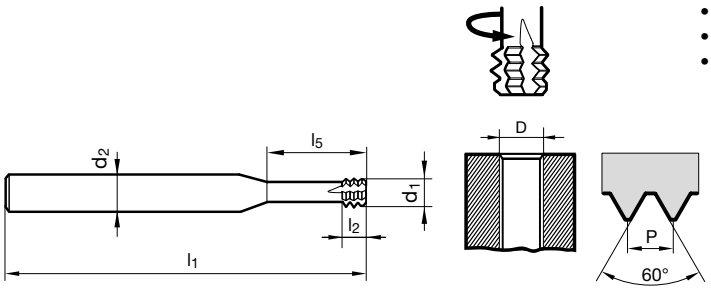
**Catalogue no. 53949**

TMD-NX | 2,5xD | WN | VHM | TiSiN | L | HA/HB

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ● | ● | ● | ● | ● | ≤ 66 |

Application recommendations page 182-203

- helical drill thread milling, core hole and thread production in one step
- for universal application and also hardened steels up to 66 HRC
- left-hand cutting tool for highest stability during the climb milling process
- oil grooves at the shank




| Code no. | D | P G/inch | d1 mm | d2 mm | l1 mm | l2 mm | l5 mm | Z | PR |
|---|---|---|---|---|---|---|---|---|---|
| **1.853** | UNF No 1 | 72 | 1.400 | 3.000 | 39.000 | 1.100 | 5.000 | 4 | 0.67 |
| **1.854** | UNC No 1+UNF No 2 | 64 | 1.400 | 3.000 | 39.000 | 1.200 | 5.000 | 4 | 0.67 |
| **2.184** | UNC No 2+UNF No 3 | 56 | 1.600 | 3.000 | 39.000 | 1.400 | 5.500 | 4 | 0.77 |
| **2.515** | UNC No 3+UNF No 4 | 48 | 1.900 | 3.000 | 39.000 | 1.600 | 6.500 | 4 | 0.92 |
| **2.845** | UNC No 4 | 40 | 2.100 | 6.000 | 58.000 | 1.900 | 7.500 | 4 | 1.02 |
| **3.175** | UNC No 5+UNF No 6 | 40 | 2.400 | 6.000 | 58.000 | 1.900 | 8.000 | 4 | 1.17 |
| **3.505** | UNC No 6 | 32 | 2.600 | 6.000 | 58.000 | 2.400 | 9.000 | 4 | 1.27 |
| **4.165** | UNF No 8 | 36 | 3.200 | 6.000 | 58.000 | 2.100 | 10.500 | 4 | 1.57 |
| **4.166** | UNC No 8 | 32 | 3.100 | 6.000 | 58.000 | 2.400 | 10.500 | 4 | 1.52 |
| **4.825** | UNF No10 | 32 | 3.600 | 6.000 | 58.000 | 2.400 | 12.500 | 4 | 1.77 |
| **4.826** | UNC No10+UNC No12 | 24 | 3.600 | 6.000 | 58.000 | 3.200 | 12.500 | 4 | 1.77 |
| **5.485** | UNF No12 | 28 | 4.100 | 6.000 | 58.000 | 2.700 | 14.000 | 4 | 2.02 |
| **6.349** | UNF 1/4 | 28 | 4.800 | 6.000 | 58.000 | 2.700 | 16.000 | 4 | 2.37 |
| **6.350** | UNC 1/4 | 20 | 4.800 | 6.000 | 58.000 | 3.800 | 16.000 | 4 | 2.34 |
| **7.937** | UNF 5/16+UNF 3/8 | 24 | 6.300 | 8.000 | 64.000 | 3.200 | 20.000 | 4 | 3.12 |
| **7.938** | UNC 5/16 | 18 | 6.300 | 8.000 | 64.000 | 4.200 | 20.000 | 4 | 3.09 |
| **9.525** | UNC 3/8 | 16 | 7.200 | 8.000 | 64.000 | 4.800 | 24.000 | 4 | 3.54 |
| **11.112** | UNF 7/16 | 20 | 8.300 | 10.000 | 73.000 | 3.800 | 28.000 | 4 | 4.09 |
| **11.113** | UNC 7/16 | 14 | 8.300 | 10.000 | 73.000 | 5.400 | 28.000 | 4 | 4.09 |
| **12.700** | UNF 1/2 | 20 | 9.700 | 10.000 | 73.000 | 3.800 | 31.000 | 4 | 4.79 |
| **15.874** | UNF 5/8 | 18 | 11.800 | 12.000 | 90.000 | 4.200 | 40.000 | 4 | 5.84 |

## Drill thread milling cutters for BSP threads

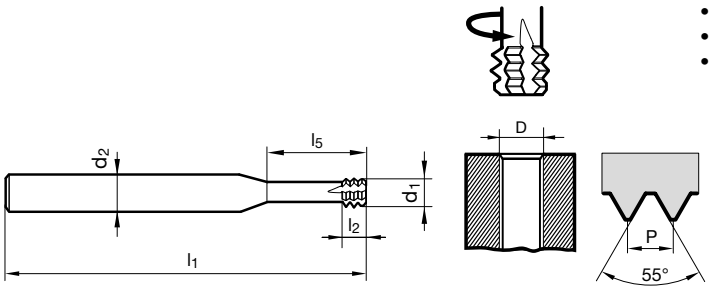
**Catalogue no. 53950**

TMD-NX | 2,5xD | WN | VHM | TiSiN | L | ~HB

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ● | ● | ● | ● | ● | ≤ 66 |

Application recommendations page 182-203

- helical drill thread milling, core hole and thread production in one step
- for universal application and also hardened steels up to 66 HRC
- left-hand cutting tool for highest stability during the climb milling process
- oil grooves at the shank




| Code no. | D | P G/inch | d1 mm | d2 mm | l1 mm | l2 mm | l5 mm | Z | PR |
|---|---|---|---|---|---|---|---|---|---|
| **9.728** | G1/16-G1/8 | 28 | 6.100 | 8.000 | 64.000 | 2.700 | 24.000 | 4 | 3.02 |
| **16.662** | G1/4-G3/8 | 19 | 10.300 | 12.000 | 90.000 | 4.000 | 40.000 | 4 | 5.09 |
| **26.441** | G1/2-G5/8-G3/4 | 14 | 15.700 | 16.000 | 105.000 | 5.400 | 50.000 | 4 | 7.79 |

## Thread milling cutters

## Thread milling cutters with chamfer for ISO metric threads

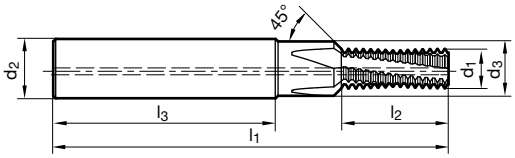
**Catalogue no. 53890**

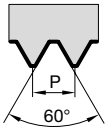
TMC-NX SP | 2xD | WN | VHM | AlCrN | R | HB

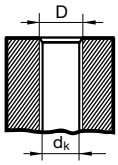
| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ● | ● | ● | ○ | ○ | |

Application recommendations page 182-203

- for universal application
- with internal coolant ≥ M4
- increased number of cutting edges for shortest machining times
- very high process reliability thanks to new geometry




| Code no. | D | P mm | d1 mm | d2 mm | d3 mm | dk mm | l1 mm | l2 mm | l3 mm | Z |
|---|---|---|---|---|---|---|---|---|---|---|
| **3.000** | M3 | 0.500 | 2.300 | 6.000 | 3.400 | 2.50 | 48.000 | 6.800 | 36.000 | 5 |
| **4.000** | M4 | 0.700 | 3.100 | 6.000 | 4.500 | 3.30 | 48.000 | 8.800 | 36.000 | 5 |
| **4.003** | M4 x 0,5 | 0.500 | 3.100 | 6.000 | 4.500 | 3.50 | 48.000 | 8.800 | 36.000 | 5 |
| **5.000** | M5 | 0.800 | 4.000 | 6.000 | 5.500 | 4.20 | 54.000 | 10.800 | 36.000 | 5 |
| **5.003** | M5 x 0,5 | 0.500 | 4.000 | 6.000 | 5.500 | 4.50 | 54.000 | 10.800 | 36.000 | 5 |
| **6.000** | M6 | 1.000 | 4.700 | 8.000 | 6.600 | 5.00 | 62.000 | 13.500 | 36.000 | 6 |
| **6.003** | M6 x 0,5 | 0.500 | 4.700 | 8.000 | 6.600 | 5.50 | 62.000 | 12.800 | 36.000 | 6 |
| **6.004** | M6 x 0,75 | 0.750 | 4.700 | 8.000 | 6.600 | 5.20 | 62.000 | 13.100 | 36.000 | 6 |
| **8.000** | M8 | 1.250 | 6.300 | 10.000 | 9.000 | 6.80 | 74.000 | 18.100 | 40.000 | 7 |
| **8.005** | M8 x 1 | 1.000 | 6.300 | 10.000 | 9.000 | 7.00 | 74.000 | 17.500 | 40.000 | 7 |
| **10.000** | M10 | 1.500 | 7.800 | 12.000 | 11.000 | 8.50 | 80.000 | 21.800 | 45.000 | 7 |
| **10.005** | M10 x 1 | 1.000 | 7.800 | 12.000 | 11.000 | 9.00 | 80.000 | 21.500 | 45.000 | 7 |
| **10.006** | M10 x 1,25 | 1.250 | 7.800 | 12.000 | 11.000 | 8.80 | 80.000 | 21.900 | 45.000 | 7 |
| **12.000** | M12 | 1.750 | 9.500 | 14.000 | 13.500 | 10.20 | 90.000 | 25.400 | 45.000 | 7 |
| **12.005** | M12 x 1 | 1.000 | 9.500 | 14.000 | 13.500 | 11.00 | 90.000 | 25.500 | 45.000 | 7 |
| **12.007** | M12 x 1,5 | 1.500 | 9.500 | 14.000 | 13.500 | 10.50 | 90.000 | 26.300 | 45.000 | 7 |
| **14.000** | M14 | 2.000 | 10.800 | 16.000 | 15.500 | 12.00 | 102.000 | 31.000 | 48.000 | 7 |
| **14.007** | M14 x 1,5 | 1.500 | 10.800 | 16.000 | 15.500 | 12.50 | 102.000 | 30.800 | 48.000 | 7 |
| **16.000** | M16 | 2.000 | 12.700 | 18.000 | 17.500 | 14.00 | 102.000 | 35.000 | 48.000 | 8 |
| **16.007** | M16 x 1,5 | 1.500 | 12.700 | 18.000 | 17.500 | 14.50 | 102.000 | 33.800 | 48.000 | 8 |

## Thread milling cutters

## Thread milling cutters without chamfer for ISO metric threads

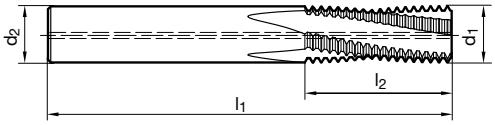
**Catalogue no. 53860**

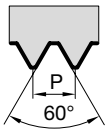
TM SP | 2,5xD | WN | VHM | TiCN | R | HB

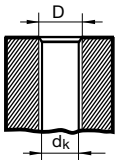
| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ● | ○ | ● | ● | ○ | ≤ 55 |

Application recommendations page 182-203

- thread milling cutter without chamfer, with spiral flute and internal coolant (axial)
- for universal application
- extra long version for thread depths up to 2.5xD




| Code no. | D | P mm | d1 mm | d2 mm | dk mm | l1 mm | l2 mm | Z |
|---|---|---|---|---|---|---|---|---|
| **6.000** | M6 | 1.000 | 4.800 | 6.000 | 5.00 | 54.000 | 16.500 | 3 |
| **8.000** | M8 | 1.250 | 6.400 | 8.000 | 6.80 | 62.000 | 21.900 | 3 |
| **10.000** | M10 | 1.500 | 7.950 | 10.000 | 8.50 | 74.000 | 26.300 | 3 |
| **12.000** | M12 | 1.750 | 9.950 | 10.000 | 10.20 | 74.000 | 32.400 | 4 |
| **14.000** | M14 | 2.000 | 11.200 | 12.000 | 12.00 | 90.000 | 37.000 | 4 |
| **16.000** | M16 | 2.000 | 12.800 | 14.000 | 14.00 | 90.000 | 43.000 | 4 |
| **20.000** | M20 | 2.500 | 14.950 | 16.000 | 17.50 | 102.000 | 48.800 | 4 |

## Thread milling cutters

## Thread milling cutters without chamfer for ISO metric threads

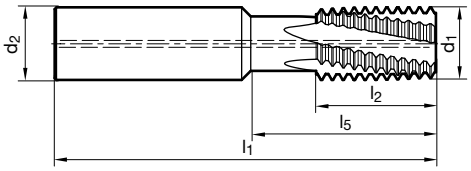
**Catalogue no. 73830**

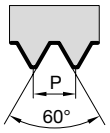
TMU SP | 2xD | WN | VHM | TiCN | R | HB

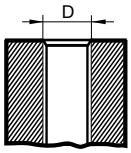
| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ● | ● | ● | ● | ● | ≤ 55 |

Application recommendations page 182-203

- thread milling cutter without chamfer, with spiral flute and internal coolant (axial)
- universal thread milling cutters for internal threads M / MF




| Code no. | D | P<br>mm | d1<br>mm | d2<br>mm | l1<br>mm | l2<br>mm | l5<br>mm | Z |
|---|---|---|---|---|---|---|---|---|
| **8.050** | > 10 | 0.500 | 7.950 | 8.000 | 64.000 | 20.000 | 20.000 | 4 |
| **10.100** | > 12 | 1.000 | 9.950 | 10.000 | 70.000 | 16.000 | 25.000 | 4 |
| **10.125** | > 14 | 1.250 | 9.950 | 10.000 | 70.000 | 16.000 | 25.000 | 4 |
| **10.150** | > 14 | 1.500 | 9.950 | 10.000 | 70.000 | 16.000 | 25.000 | 4 |
| **12.100** | > 16 | 1.000 | 11.950 | 12.000 | 80.000 | 20.000 | 31.000 | 4 |
| **12.125** | > 16 | 1.250 | 11.950 | 12.000 | 80.000 | 20.000 | 31.000 | 4 |
| **12.150** | > 16 | 1.500 | 11.950 | 12.000 | 80.000 | 20.000 | 31.000 | 4 |
| **16.100** | > 18 | 1.000 | 15.950 | 16.000 | 90.000 | 25.000 | 40.000 | 5 |
| **16.150** | > 20 | 1.500 | 15.950 | 16.000 | 90.000 | 25.000 | 40.000 | 5 |
| **16.200** | > 22 | 2.000 | 15.950 | 16.000 | 90.000 | 25.000 | 40.000 | 5 |
| **18.300** | > 24 | 3.000 | 17.950 | 18.000 | 102.000 | 33.000 | 50.000 | 5 |
| **20.100** | > 24 | 1.000 | 19.950 | 20.000 | 105.000 | 33.000 | 50.000 | 5 |
| **20.150** | > 26 | 1.500 | 19.950 | 20.000 | 105.000 | 33.000 | 50.000 | 5 |
| **20.200** | > 26 | 2.000 | 19.950 | 20.000 | 105.000 | 33.000 | 50.000 | 5 |
| **20.250** | > 26 | 2.500 | 19.950 | 20.000 | 105.000 | 33.000 | 50.000 | 5 |
| **20.300** | > 27 | 3.000 | 19.950 | 20.000 | 105.000 | 33.000 | 50.000 | 5 |
| **20.350** | > 30 | 3.500 | 19.950 | 20.000 | 105.000 | 33.000 | 50.000 | 5 |

## Thread milling cutters

## Thread milling cutters without chamfer for BSP threads

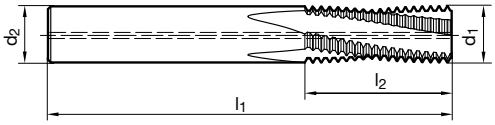
**Catalogue no. 53831**

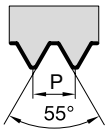
TM SP | 2xD | WN | VHM | TiCN | R | ~HB

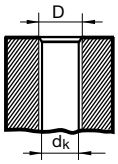
| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ● | ○ | ● | ● | ○ | ≤ 55 |

Application recommendations page 182-203

- thread milling cutter without chamfer, with spiral flute and internal coolant (axial)
- for universal application
- for thread depths up to 2xD




| Code no. | D | P<br>G/inch | d1<br>mm | d2<br>mm | dk<br>mm | l1<br>mm | l2<br>mm | Z |
|---|---|---|---|---|---|---|---|---|
| **9.728** | G1/8 | 28 | 7.950 | 8.000 | 8.80 | 64.000 | 21.300 | 3 |
| **13.157** | G1/4 | 19 | 10.500 | 12.000 | 11.80 | 90.000 | 28.700 | 4 |
| **16.662** | G3/8 | 19 | 13.600 | 14.000 | 15.25 | 90.000 | 35.400 | 4 |

## Thread milling cutters

## Universal thread milling cutters for BSP threads

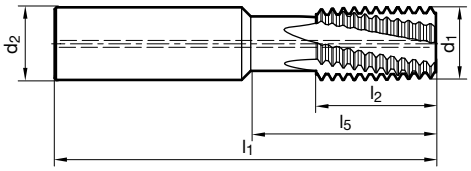
**Catalogue no. 53832**

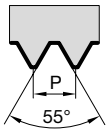
TMU SP | 2xD | WN | VHM | TiCN | R | ~HB

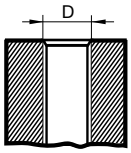
| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ● | ● | ● | ● | ● | ≤ 55 |

Application recommendations page 182-203

- thread milling cutter without chamfer, with spiral flute and internal coolant (axial)




| Code no. | D | P<br>G/inch | d1<br>mm | d2<br>mm | l1<br>mm | l5<br>mm | l2<br>mm | Z |
|---|---|---|---|---|---|---|---|---|
| **10.190** | ≥ 1/4 | 19 | 9.950 | 10.000 | 70.000 | 25.000 | 16.000 | 4 |
| **16.140** | ≥ 1/2 | 14 | 15.950 | 16.000 | 90.000 | 40.000 | 25.000 | 5 |
| **20.110** | ≥ 1 | 11 | 19.950 | 20.000 | 105.000 | 50.000 | 33.000 | 5 |

## Thread milling cutters

## Micro thread milling cutters for ISO metric threads

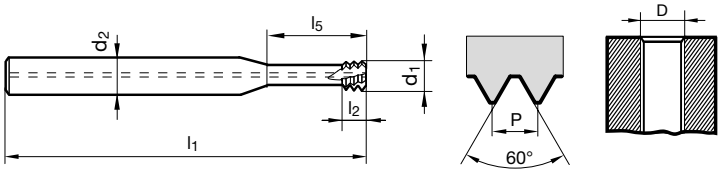
**Catalogue no. 53892**

MTM-NX SP | 2,5xD | WN | VHM | TiCN | L | -HA

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ● | ● | ● | ● | ● | ≤ 55 |

Application recommendations page 182-203

- for universal application
- M1.6 - M3 with 2 cooling grooves
- with internal coolant ≥ M3.5
- left hand cutting geometry
- increased number of cutting edges for shortest machining times




| Code no. | D | P mm | d1 mm | d2 mm | dk mm | l1 mm | l2 mm | l5 mm | Z |
|---|---|---|---|---|---|---|---|---|---|
| **1.600** | M1,6 | 0.350 | 1.200 | 3.000 | 1.25 | 39.000 | 1.100 | 4.000 | 3 |
| **1.800** | M1,8 | 0.350 | 1.400 | 3.000 | 1.45 | 39.000 | 1.100 | 4.500 | 4 |
| **2.000** | M2 | 0.400 | 1.550 | 3.000 | 1.60 | 39.000 | 1.200 | 5.000 | 4 |
| **2.500** | M2,5 | 0.450 | 1.950 | 3.000 | 2.05 | 39.000 | 1.400 | 6.500 | 4 |
| **3.000** | M3 | 0.500 | 2.400 | 3.000 | 2.50 | 39.000 | 1.500 | 8.000 | 5 |
| **3.500** | M3,5 | 0.600 | 2.800 | 6.000 | 2.90 | 58.000 | 1.800 | 9.000 | 5 |
| **4.000** | M4 | 0.700 | 3.200 | 6.000 | 3.30 | 58.000 | 2.100 | 11.000 | 5 |
| **5.000** | M5 | 0.800 | 4.000 | 6.000 | 4.20 | 58.000 | 2.400 | 13.500 | 6 |
| **6.000** | M6 | 1.000 | 4.800 | 6.000 | 5.00 | 58.000 | 3.000 | 16.000 | 6 |
| **8.000** | M8 | 1.250 | 5.950 | 6.000 | 6.80 | 58.000 | 3.800 | 21.000 | 7 |
| **10.000** | M10 | 1.500 | 7.800 | 8.000 | 8.50 | 73.000 | 4.500 | 26.000 | 7 |
| **12.000** | M12 | 1.750 | 9.000 | 10.000 | 10.20 | 84.000 | 5.300 | 31.000 | 7 |
| **16.000** | M16 | 2.000 | 11.800 | 12.000 | 14.00 | 90.000 | 6.000 | 41.000 | 8 |
| **20.000** | M20 | 2.500 | 15.000 | 16.000 | 17.50 | 105.000 | 7.500 | 51.000 | 8 |

## Thread milling cutters

## Micro thread milling cutters for ISO metric threads

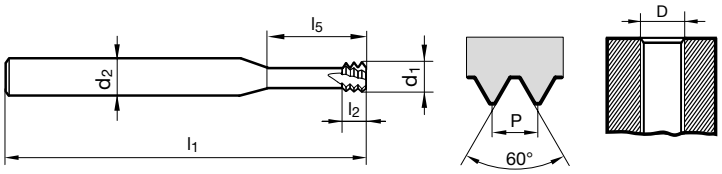
**Catalogue no. 53840**

TM SP | 3xD | WN | VHM | TiCN | R | ~HA

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ● | ● | ● | ● | ● | |

Application recommendations page 182-203

- for universal application
- long version




| Code no. | D | P mm | d1 mm | d2 mm | dk mm | l1 mm | l2 mm | l5 mm | Z |
|---|---|---|---|---|---|---|---|---|---|
| **1.600** | M1,6 | 0.350 | 1.200 | 3.000 | 1.25 | 39.000 | 1.100 | 4.800 | 3 |
| **1.800** | M1,8 | 0.350 | 1.400 | 3.000 | 1.45 | 39.000 | 1.100 | 5.400 | 3 |
| **2.000** | M2 | 0.400 | 1.550 | 3.000 | 1.60 | 39.000 | 1.200 | 6.000 | 4 |
| **2.500** | M2,5 | 0.450 | 1.950 | 3.000 | 2.05 | 39.000 | 1.400 | 7.500 | 4 |
| **3.000** | M3 | 0.500 | 2.400 | 6.000 | 2.50 | 58.000 | 1.500 | 9.500 | 4 |
| **3.500** | M3,5 | 0.600 | 2.800 | 6.000 | 2.90 | 58.000 | 1.800 | 11.000 | 4 |
| **4.000** | M4 | 0.700 | 3.200 | 6.000 | 3.30 | 58.000 | 2.100 | 12.500 | 4 |
| **5.000** | M5 | 0.800 | 4.000 | 6.000 | 4.20 | 58.000 | 2.400 | 16.000 | 4 |
| **6.000** | M6 | 1.000 | 4.800 | 6.000 | 5.00 | 58.000 | 3.000 | 20.000 | 4 |
| **8.000** | M8 | 1.250 | 5.950 | 6.000 | 6.80 | 58.000 | 3.800 | 24.000 | 4 |
| **10.000** | M10 | 1.500 | 7.800 | 8.000 | 8.50 | 73.000 | 4.500 | 33.000 | 4 |
| **12.000** | M12 | 1.750 | 9.000 | 10.000 | 10.20 | 84.000 | 5.300 | 38.000 | 4 |
| **16.000** | M16 | 2.000 | 11.800 | 12.000 | 14.00 | 84.000 | 6.000 | 35.000 | 5 |

## Thread milling cutters

## Micro thread milling cutters for ISO metric threads

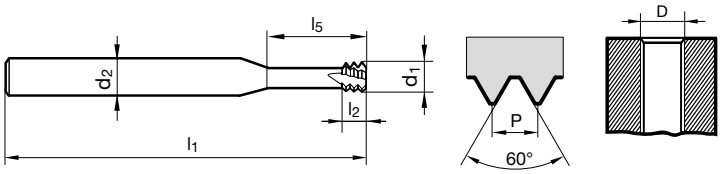
**Catalogue no. 53850**

TM SP | 3xD | WN | VHM | TiAlN | R | ~HA

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| | | | | ○ | ● |

Application recommendations page 182-203

- for hard machining 45-65 HRC
- long version




| Code no. | D | P mm | d1 mm | d2 mm | dk mm | l1 mm | l2 mm | l5 mm | Z |
|---|---|---|---|---|---|---|---|---|---|
| **2.000** | M2 | 0.400 | 1.550 | 3.000 | 1.60 | 39.000 | 1.200 | 6.000 | 4 |
| **2.500** | M2,5 | 0.450 | 1.950 | 3.000 | 2.05 | 39.000 | 1.400 | 7.500 | 4 |
| **3.000** | M3 | 0.500 | 2.350 | 6.000 | 2.50 | 58.000 | 1.500 | 9.500 | 4 |
| **4.000** | M4 | 0.700 | 3.100 | 6.000 | 3.30 | 58.000 | 2.100 | 12.500 | 4 |
| **5.000** | M5 | 0.800 | 3.800 | 6.000 | 4.20 | 58.000 | 2.400 | 16.000 | 4 |
| **6.000** | M6 | 1.000 | 4.800 | 6.000 | 5.00 | 58.000 | 3.000 | 20.000 | 4 |
| **8.000** | M8 | 1.250 | 5.950 | 6.000 | 6.80 | 58.000 | 3.800 | 24.000 | 4 |
| **10.000** | M10 | 1.500 | 7.800 | 8.000 | 8.50 | 64.000 | 4.500 | 23.000 | 4 |
| **12.000** | M12 | 1.750 | 9.000 | 10.000 | 10.20 | 73.000 | 5.300 | 26.000 | 5 |

## Thread milling cutters

## Micro thread milling cutters for BSP-threads

**Catalogue no. 53841**

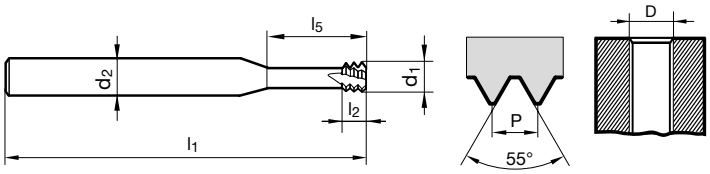
TM SP | 3xD | WN | VHM | TiCN | R | ~HA

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ● | ● | ● | ● | ● | |

Application recommendations page 182-203

- for universal application
- long version



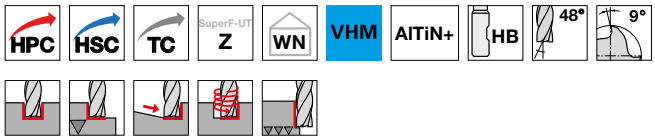



| Code no. | D | P<br>G/inch | d1<br>mm | d2<br>mm | dk<br>mm | l1<br>mm | l2<br>mm | l5<br>mm | Z |
|---|---|---|---|---|---|---|---|---|---|
| **9.728** | G1/16-G1/8 | 28 | 6.200 | 8.000 | 8.80 | 64.000 | 2.700 | 19.500 | 4 |
| **16.662** | G1/4-G3/8 | 19 | 9.950 | 10.000 | 15.25 | 73.000 | 4.000 | 25.000 | 4 |
| **30.201** | G1/2-G7/8 | 14 | 11.950 | 12.000 | 28.25 | 84.000 | 5.400 | 37.000 | 4 |
| **59.614** | G1-G2 | 11 | 15.950 | 16.000 | 57.00 | 105.000 | 6.900 | 44.000 | 5 |

# SuperF-UT end mills

## SuperF-UT end mills Z

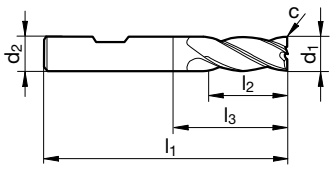
**Catalogue no. 54577**




| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ● | ● | | | ● | |

Application recommendations page 204-217

- particularly stable thanks to re-inforced core
- for universal application
- for materials up to 1400 N/mm²
- micro-corner protection
- centre cutting
- unequal flute spacing
- HPC machining of tough, low- and high-alloyed steels and difficult to machine special materials
- also available as kit 78882 1.000 and 78882 2.000



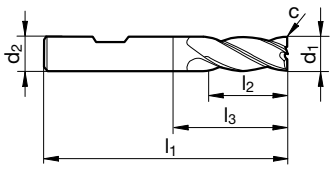

| d1 h10 mm | d2 h6 mm | l1 mm | l2 mm | l3 mm | c mm x 45° | Z | Code no. |
|---|---|---|---|---|---|---|---|
| 3.000 | 6.000 | 57.000 | 8.000 | 10.900 | 0.060 | 4 | **3.000** |
| 4.000 | 6.000 | 57.000 | 11.000 | 13.900 | 0.080 | 4 | **4.000** |
| 5.000 | 6.000 | 57.000 | 13.000 | 15.900 | 0.100 | 4 | **5.000** |
| 6.000 | 6.000 | 57.000 | 15.000 | 21.000 | 0.120 | 4 | **6.000** |
| 8.000 | 8.000 | 63.000 | 20.000 | 27.000 | 0.160 | 4 | **8.000** |
| 10.000 | 10.000 | 72.000 | 24.000 | 32.000 | 0.200 | 4 | **10.000** |
| 12.000 | 12.000 | 83.000 | 28.000 | 38.000 | 0.240 | 4 | **12.000** |
| 16.000 | 16.000 | 92.000 | 36.000 | 44.000 | 0.320 | 4 | **16.000** |
| 20.000 | 20.000 | 104.000 | 45.000 | 54.000 | 0.400 | 4 | **20.000** |

| ISO | Hardness | $v_c$ | $f_z$ (mm/z) / Ø | | | | | | | $v_c$ | $f_z$ (mm/z) / Ø | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 3 | 6 | 8 | 10 | 12 | 16 | 20 | | 3 | 6 | 8 | 10 | 12 | 16 | 20 |
| | | | $a_p$ = l2 | | HPC | HSC | | $a_e$ max = 0,10xD | | | $a_p$ = l2 | | | | $a_e$ max = 0,02xD | | |
| P | ≤ 850 N/mm² | **340** | 0,036 | 0,072 | 0,096 | 0,138 | 0,17 | 0,22 | 0,28 | **360** | 0,017 | 0,034 | 0,046 | 0,066 | 0,08 | 0,11 | 0,13 |
| | ≥ 850 N/mm² | **250** | 0,031 | 0,062 | 0,083 | 0,115 | 0,14 | 0,18 | 0,23 | **270** | 0,015 | 0,030 | 0,040 | 0,055 | 0,07 | 0,09 | 0,11 |
| M | ≤ 750 N/mm² | **220** | 0,031 | 0,062 | 0,083 | 0,115 | 0,14 | 0,18 | 0,23 | **240** | 0,015 | 0,030 | 0,040 | 0,055 | 0,07 | 0,09 | 0,11 |
| | ≥ 750 N/mm² | **110** | 0,024 | 0,048 | 0,064 | 0,092 | 0,11 | 0,15 | 0,18 | **120** | 0,011 | 0,021 | 0,028 | 0,040 | 0,05 | 0,06 | 0,08 |
| S | Ni-based | **60** | 0,019 | 0,039 | 0,052 | 0,074 | 0,09 | 0,12 | 0,15 | **60** | 0,008 | 0,017 | 0,022 | 0,032 | 0,04 | 0,05 | 0,06 |
| | Ti-based | **110** | 0,028 | 0,055 | 0,074 | 0,104 | 0,12 | 0,17 | 0,21 | **120** | 0,013 | 0,026 | 0,035 | 0,050 | 0,06 | 0,08 | 0,10 |

# SuperF-UT end mills

## SuperF-UT end mills ZS

**Catalogue no. 54578**




HPC | HSC | TC | SuperF-UT ZS | WN | VHM | AlTiN+ | HB | 48° | 9°

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ● | ● | | | ● | |

Application recommendations page 204-217

- particularly stable thanks to re-inforced core
- with chip breaker
- for universal application
- for materials up to 1400 N/mm²
- micro-corner protection
- centre cutting
- unequal flute spacing
- HPC machining of tough, low- and high-alloyed steels and difficult to machine special materials

| d1 h10 mm | d2 h6 mm | l1 mm | l2 mm | l3 mm | c mm x 45° | Z | Code no. |
|---|---|---|---|---|---|---|---|
| 3.000 | 6.000 | 57.000 | 12.000 | 14.900 | 0.060 | 4 | **3.000** |
| 4.000 | 6.000 | 65.000 | 16.000 | 18.900 | 0.080 | 4 | **4.000** |
| 5.000 | 6.000 | 65.000 | 20.000 | 22.900 | 0.100 | 4 | **5.000** |
| 6.000 | 6.000 | 65.000 | 24.000 | 29.000 | 0.120 | 4 | **6.000** |
| 8.000 | 8.000 | 75.000 | 32.000 | 39.000 | 0.160 | 4 | **8.000** |
| 10.000 | 10.000 | 90.000 | 40.000 | 50.000 | 0.200 | 4 | **10.000** |
| 12.000 | 12.000 | 100.000 | 46.000 | 55.000 | 0.240 | 4 | **12.000** |
| 16.000 | 16.000 | 108.000 | 55.000 | 60.000 | 0.320 | 4 | **16.000** |
| 20.000 | 20.000 | 126.000 | 65.000 | 76.000 | 0.400 | 4 | **20.000** |

| ISO | Hardness | $v_c$ | $f_z$ (mm/z) / Ø | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | 3 | 6 | 8 | 10 | 12 | 16 | 20 |
| | | | $a_p$ = l2 | | HPC | HSC | | $a_e$ max = 0,10xD | |
| P | ≤ 850 N/mm² | **340** | 0,036 | 0,072 | 0,096 | 0,138 | 0,17 | 0,22 | 0,28 |
| | ≥ 850 N/mm² | **250** | 0,031 | 0,062 | 0,083 | 0,115 | 0,14 | 0,18 | 0,23 |
| M | ≤ 750 N/mm² | **220** | 0,031 | 0,062 | 0,083 | 0,115 | 0,14 | 0,18 | 0,23 |
| | ≥ 750 N/mm² | **110** | 0,024 | 0,048 | 0,064 | 0,092 | 0,11 | 0,15 | 0,18 |
| S | Ni-based | **60** | 0,019 | 0,039 | 0,052 | 0,074 | 0,09 | 0,12 | 0,15 |
| | Ti-based | **110** | 0,028 | 0,055 | 0,074 | 0,104 | 0,12 | 0,17 | 0,21 |

| $v_c$ | $f_z$ (mm/z) / Ø | | | | | | |
|---|---|---|---|---|---|---|---|
| | 3 | 6 | 8 | 10 | 12 | 16 | 20 |
| | $a_p$ = l2 | | | | $a_e$ max = 0,02xD | | |
| **360** | 0,017 | 0,034 | 0,046 | 0,066 | 0,08 | 0,11 | 0,13 |
| **270** | 0,015 | 0,030 | 0,040 | 0,055 | 0,07 | 0,09 | 0,11 |
| **240** | 0,015 | 0,030 | 0,040 | 0,055 | 0,07 | 0,09 | 0,11 |
| **120** | 0,011 | 0,021 | 0,028 | 0,040 | 0,05 | 0,06 | 0,08 |
| **60** | 0,008 | 0,017 | 0,022 | 0,032 | 0,04 | 0,05 | 0,06 |
| **120** | 0,013 | 0,026 | 0,035 | 0,050 | 0,06 | 0,08 | 0,10 |

## SuperF-UT end mills

## SuperF-UT milling cutter ZS-r

**Catalogue no. 54555**

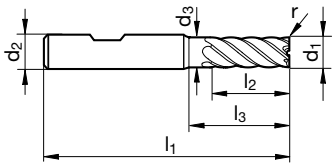
HPC | HSC | TC | SuperF-UT ZS-r | WN | VHM | AlTiN+ | HB | 38° | 9°

R ±0,05

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ● | ● | ● | ○ | ● | |

Application recommendations page 204-217

- with chip breaker
- for universal application
- for materials up to 1400 N/mm²
- with defined corner radii
- without centre cutting
- unequal flute spacing
- neck clearance




| d1 h10 mm | d2 h6 mm | d3 mm | l1 mm | l2 mm | l3 mm | r | Z | Code no. |
|---|---|---|---|---|---|---|---|---|
| 6.000 | 6.000 | 5.700 | 65.000 | 20.000 | 28.000 | 0.200 | 5 | **6.002** |
| 6.000 | 6.000 | 5.700 | 65.000 | 20.000 | 28.000 | 0.500 | 5 | **6.005** |
| 6.000 | 6.000 | 5.700 | 65.000 | 20.000 | 28.000 | 1.000 | 5 | **6.010** |
| 8.000 | 8.000 | 7.700 | 75.000 | 26.000 | 38.000 | 0.300 | 5 | **8.003** |
| 8.000 | 8.000 | 7.700 | 75.000 | 26.000 | 38.000 | 0.500 | 5 | **8.005** |
| 8.000 | 8.000 | 7.700 | 75.000 | 26.000 | 38.000 | 1.000 | 5 | **8.010** |
| 8.000 | 8.000 | 7.700 | 75.000 | 26.000 | 38.000 | 1.500 | 5 | **8.015** |
| 10.000 | 10.000 | 9.500 | 80.000 | 32.000 | 38.000 | 0.500 | 5 | **10.005** |
| 10.000 | 10.000 | 9.500 | 80.000 | 32.000 | 38.000 | 1.000 | 5 | **10.010** |
| 10.000 | 10.000 | 9.500 | 80.000 | 32.000 | 38.000 | 1.500 | 5 | **10.015** |
| 10.000 | 10.000 | 9.500 | 80.000 | 32.000 | 38.000 | 2.000 | 5 | **10.020** |
| 12.000 | 12.000 | 11.500 | 93.000 | 40.000 | 46.000 | 0.500 | 5 | **12.005** |
| 12.000 | 12.000 | 11.500 | 93.000 | 40.000 | 46.000 | 1.000 | 5 | **12.010** |
| 12.000 | 12.000 | 11.500 | 93.000 | 40.000 | 46.000 | 1.500 | 5 | **12.015** |
| 12.000 | 12.000 | 11.500 | 93.000 | 40.000 | 46.000 | 2.000 | 5 | **12.020** |
| 16.000 | 16.000 | 15.500 | 108.000 | 50.000 | 58.000 | 0.500 | 5 | **16.005** |
| 16.000 | 16.000 | 15.500 | 108.000 | 50.000 | 58.000 | 1.000 | 5 | **16.010** |
| 16.000 | 16.000 | 15.500 | 108.000 | 50.000 | 58.000 | 1.500 | 5 | **16.015** |
| 16.000 | 16.000 | 15.500 | 108.000 | 50.000 | 58.000 | 2.000 | 5 | **16.020** |
| 16.000 | 16.000 | 15.500 | 108.000 | 50.000 | 58.000 | 3.000 | 5 | **16.030** |
| 20.000 | 20.000 | 19.500 | 126.000 | 62.000 | 74.000 | 1.000 | 5 | **20.010** |
| 20.000 | 20.000 | 19.500 | 126.000 | 62.000 | 74.000 | 1.500 | 5 | **20.015** |
| 20.000 | 20.000 | 19.500 | 126.000 | 62.000 | 74.000 | 2.000 | 5 | **20.020** |
| 20.000 | 20.000 | 19.500 | 126.000 | 62.000 | 74.000 | 3.000 | 5 | **20.030** |

| ISO | Hardness | $v_c$ | $f_z$ (mm/z) / Ø 3 | 6 | 8 | 10 | 12 | 16 | 20 |
|---|---|---|---|---|---|---|---|---|---|
| | | | $a_p = l2$ | | HPC | HSC | | $a_e$ max = 0,10xD | |
| **P** | ≤ 850 N/mm² | **340** | 0,036 | 0,072 | 0,096 | 0,138 | 0,17 | 0,22 | 0,28 |
| | ≥ 850 N/mm² | **250** | 0,031 | 0,062 | 0,083 | 0,115 | 0,14 | 0,18 | 0,23 |
| **M** | ≤ 750 N/mm² | **220** | 0,031 | 0,062 | 0,083 | 0,115 | 0,14 | 0,18 | 0,23 |
| | ≥ 750 N/mm² | **110** | 0,024 | 0,048 | 0,064 | 0,092 | 0,11 | 0,15 | 0,18 |
| **S** | Ni-based | **60** | 0,019 | 0,039 | 0,052 | 0,074 | 0,09 | 0,12 | 0,15 |
| | Ti-based | **110** | 0,028 | 0,055 | 0,074 | 0,104 | 0,12 | 0,17 | 0,21 |

| $v_c$ | $f_z$ (mm/z) / Ø 3 | 6 | 8 | 10 | 12 | 16 | 20 |
|---|---|---|---|---|---|---|---|
| | $a_p = l2$ | | | | $a_e$ max = 0,02xD | | |
| **360** | 0,017 | 0,034 | 0,046 | 0,066 | 0,08 | 0,11 | 0,13 |
| **270** | 0,015 | 0,030 | 0,040 | 0,055 | 0,07 | 0,09 | 0,11 |
| **240** | 0,015 | 0,030 | 0,040 | 0,055 | 0,07 | 0,09 | 0,11 |
| **120** | 0,011 | 0,021 | 0,028 | 0,040 | 0,05 | 0,06 | 0,08 |
| **60** | 0,008 | 0,017 | 0,022 | 0,032 | 0,04 | 0,05 | 0,06 |
| **120** | 0,013 | 0,026 | 0,035 | 0,050 | 0,06 | 0,08 | 0,10 |

# SuperF-UT end mills

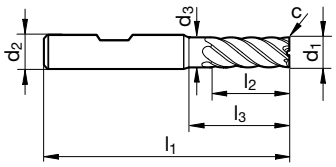
## SuperF-UT end mills ZS-7

**Catalogue no. 54581**

HPC | HSC | TC | SuperF-UT ZS-7 | WN | VHM | AlTiN+ | HB | 32° | 9°

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ● | ● | ● | ○ | ● | |

Application recommendations page 204-217




- neck clearance
- with chip breaker
- for universal application
- for materials up to 1400 N/mm²
- micro-corner protection
- without centre cutting
- unequal flute spacing
- HPC machining of tough, low- and high-alloyed steels and difficult to machine special materials

| d1 h10 mm | d2 h6 mm | d3 mm | l1 mm | l2 mm | l3 mm | c mm x 45° | Z | Code no. |
|---|---|---|---|---|---|---|---|---|
| 6.000 | 6.000 | 5.700 | 65.000 | 20.000 | 28.000 | 0.120 | 7 | **6.000** |
| 8.000 | 8.000 | 7.700 | 75.000 | 26.000 | 38.000 | 0.160 | 7 | **8.000** |
| 10.000 | 10.000 | 9.500 | 80.000 | 32.000 | 38.000 | 0.200 | 7 | **10.000** |
| 12.000 | 12.000 | 11.500 | 93.000 | 40.000 | 46.000 | 0.240 | 7 | **12.000** |
| 16.000 | 16.000 | 15.500 | 108.000 | 50.000 | 58.000 | 0.320 | 7 | **16.000** |
| 20.000 | 20.000 | 19.500 | 126.000 | 62.000 | 74.000 | 0.400 | 7 | **20.000** |

| ISO | Hardness | $v_c$ | $f_z$ (mm/z) / Ø | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | 3 | 6 | 8 | 10 | 12 | 16 | 20 |
| | | | $a_p$ = l2 | | HPC | HSC | | $a_e$ max = 0,10xD | |
| P | ≤ 850 N/mm² | **340** | 0,036 | 0,072 | 0,096 | 0,138 | 0,17 | 0,22 | 0,28 |
| | ≥ 850 N/mm² | **250** | 0,031 | 0,062 | 0,083 | 0,115 | 0,14 | 0,18 | 0,23 |
| M | ≤ 750 N/mm² | **220** | 0,031 | 0,062 | 0,083 | 0,115 | 0,14 | 0,18 | 0,23 |
| | ≥ 750 N/mm² | **110** | 0,024 | 0,048 | 0,064 | 0,092 | 0,11 | 0,15 | 0,18 |
| S | Ni-based | **60** | 0,019 | 0,039 | 0,052 | 0,074 | 0,09 | 0,12 | 0,15 |
| | Ti-based | **110** | 0,028 | 0,055 | 0,074 | 0,104 | 0,12 | 0,17 | 0,21 |

| $v_c$ | $f_z$ (mm/z) / Ø | | | | | | |
|---|---|---|---|---|---|---|---|
| | 3 | 6 | 8 | 10 | 12 | 16 | 20 |
| | $a_p$ = l2 | | | | $a_e$ max = 0,02xD | | |
| **360** | 0,017 | 0,034 | 0,046 | 0,066 | 0,08 | 0,11 | 0,13 |
| **270** | 0,015 | 0,030 | 0,040 | 0,055 | 0,07 | 0,09 | 0,11 |
| **240** | 0,015 | 0,030 | 0,040 | 0,055 | 0,07 | 0,09 | 0,11 |
| **120** | 0,011 | 0,021 | 0,028 | 0,040 | 0,05 | 0,06 | 0,08 |
| **60** | 0,008 | 0,017 | 0,022 | 0,032 | 0,04 | 0,05 | 0,06 |
| **120** | 0,013 | 0,026 | 0,035 | 0,050 | 0,06 | 0,08 | 0,10 |

# SuperF-UT end mills

## SuperF-UT end mills N-5

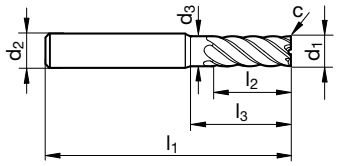
**Catalogue no. 54583**

HPC | HSC | TC | SuperF-UT N-5 | WN | VHM | TiAlN | HA | 45° | 7°

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ● | ● | ● | ● | ● | |

Application recommendations page 204-217

- greatest possible advantages with finishing and semi-roughing operations specially under HPC conditions
- unequal flute spacing
- up to 1600 N/mm²
- micro-corner protection
- neck clearance
- centre cutting




| d1 h10 mm | d2 h6 mm | d3 mm | l1 mm | l2 mm | l3 mm | c mm x 45° | Z | Code no. |
|---|---|---|---|---|---|---|---|---|
| 4.000 | 6.000 | 3.800 | 57.000 | 11.000 | 18.000 | 0.050 | 5 | **4.000** |
| 5.000 | 6.000 | 4.800 | 57.000 | 13.000 | 18.000 | 0.050 | 5 | **5.000** |
| 6.000 | 6.000 | 5.700 | 57.000 | 13.000 | 20.000 | 0.050 | 5 | **6.000** |
| 8.000 | 8.000 | 7.700 | 63.000 | 19.000 | 26.000 | 0.100 | 5 | **8.000** |
| 10.000 | 10.000 | 9.500 | 72.000 | 22.000 | 30.000 | 0.100 | 5 | **10.000** |
| 12.000 | 12.000 | 11.500 | 83.000 | 26.000 | 36.000 | 0.100 | 5 | **12.000** |
| 16.000 | 16.000 | 15.500 | 92.000 | 32.000 | 42.000 | 0.150 | 5 | **16.000** |
| 20.000 | 20.000 | 19.500 | 104.000 | 38.000 | 52.000 | 0.150 | 5 | **20.000** |

| ISO | Hardness | $v_c$ | $f_z$ (mm/z) / Ø | | | | | | | $v_c$ | $f_z$ (mm/z) / Ø | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 3 | 6 | 8 | 10 | 12 | 16 | 20 | | 3 | 6 | 8 | 10 | 12 | 16 | 20 |
| | | | $a_p$ = l2 | | HPC | HSC | | $a_e$ max = 0,10xD | | | $a_p$ = l2 | | | | $a_e$ max = 0,02xD | | |
| P | ≤ 850 N/mm² | **340** | 0,036 | 0,072 | 0,096 | 0,138 | 0,17 | 0,22 | 0,28 | **360** | 0,017 | 0,034 | 0,046 | 0,066 | 0,08 | 0,11 | 0,13 |
| | ≥ 850 N/mm² | **250** | 0,031 | 0,062 | 0,083 | 0,115 | 0,14 | 0,18 | 0,23 | **270** | 0,015 | 0,030 | 0,040 | 0,055 | 0,07 | 0,09 | 0,11 |
| M | ≤ 750 N/mm² | **220** | 0,031 | 0,062 | 0,083 | 0,115 | 0,14 | 0,18 | 0,23 | **240** | 0,015 | 0,030 | 0,040 | 0,055 | 0,07 | 0,09 | 0,11 |
| | ≥ 750 N/mm² | **110** | 0,024 | 0,048 | 0,064 | 0,092 | 0,11 | 0,15 | 0,18 | **120** | 0,011 | 0,021 | 0,028 | 0,040 | 0,05 | 0,06 | 0,08 |
| S | Ni-based | **60** | 0,019 | 0,039 | 0,052 | 0,074 | 0,09 | 0,12 | 0,15 | **60** | 0,008 | 0,017 | 0,022 | 0,032 | 0,04 | 0,05 | 0,06 |
| | Ti-based | **110** | 0,028 | 0,055 | 0,074 | 0,104 | 0,12 | 0,17 | 0,21 | **120** | 0,013 | 0,026 | 0,035 | 0,050 | 0,06 | 0,08 | 0,10 |
| K | ≤ 240 HB | **300** | 0,038 | 0,076 | 0,101 | 0,150 | 0,18 | 0,24 | 0,30 | **320** | 0,018 | 0,036 | 0,048 | 0,072 | 0,09 | 0,11 | 0,14 |
| | ≥ 240 HB | **260** | 0,035 | 0,069 | 0,092 | 0,127 | 0,15 | 0,20 | 0,25 | **280** | 0,017 | 0,033 | 0,044 | 0,061 | 0,07 | 0,10 | 0,12 |
| N | ≤ 7 % Si | **900** | 0,045 | 0,090 | 0,120 | 0,184 | 0,22 | 0,29 | 0,37 | **1000** | 0,021 | 0,043 | 0,057 | 0,088 | 0,11 | 0,14 | 0,18 |
| | ≥ 7 % Si | **430** | 0,038 | 0,076 | 0,101 | 0,138 | 0,17 | 0,22 | 0,28 | **460** | 0,018 | 0,036 | 0,048 | 0,066 | 0,08 | 0,11 | 0,13 |

# SuperF-UT end mills

## SuperF-UT end mills N-5

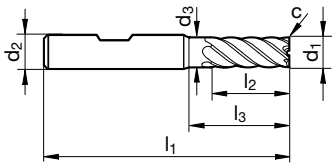
**Catalogue no. 54584**

HPC | HSC | TC | SuperF-UT N-5 | WN | VHM | TiAlN | HB | 45° | 7°

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ● | ● | ● | ● | ● | |

Application recommendations page 204-217

- greatest possible advantages with finishing and semi-roughing operations specially under HPC conditions
- unequal flute spacing
- up to 1600 N/mm²
- micro-corner protection
- neck clearance
- centre cutting




| d1 h10 mm | d2 h6 mm | d3 mm | l1 mm | l2 mm | l3 mm | c mm x 45° | Z | Code no. |
|---|---|---|---|---|---|---|---|---|
| 4.000 | 6.000 | 3.800 | 57.000 | 11.000 | 18.000 | 0.050 | 5 | **4.000** |
| 5.000 | 6.000 | 4.800 | 57.000 | 13.000 | 18.000 | 0.050 | 5 | **5.000** |
| 6.000 | 6.000 | 5.700 | 57.000 | 13.000 | 20.000 | 0.050 | 5 | **6.000** |
| 8.000 | 8.000 | 7.700 | 63.000 | 19.000 | 26.000 | 0.100 | 5 | **8.000** |
| 10.000 | 10.000 | 9.500 | 72.000 | 22.000 | 30.000 | 0.100 | 5 | **10.000** |
| 12.000 | 12.000 | 11.500 | 83.000 | 26.000 | 36.000 | 0.100 | 5 | **12.000** |
| 16.000 | 16.000 | 15.500 | 92.000 | 32.000 | 42.000 | 0.150 | 5 | **16.000** |
| 20.000 | 20.000 | 19.500 | 104.000 | 38.000 | 52.000 | 0.150 | 5 | **20.000** |



| ISO | Hardness | $v_c$ | $f_z$ (mm/z) / Ø | | | | | | | $v_c$ | $f_z$ (mm/z) / Ø | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 3 | 6 | 8 | 10 | 12 | 16 | 20 | | 3 | 6 | 8 | 10 | 12 | 16 | 20 |
| | | | $a_p$ = l2 | | HPC | HSC | | $a_e$ max = 0,10xD | | | $a_p$ = l2 | | | | $a_e$ max = 0,02xD | | |
| P | ≤ 850 N/mm² | **340** | 0,036 | 0,072 | 0,096 | 0,138 | 0,17 | 0,22 | 0,28 | **360** | 0,017 | 0,034 | 0,046 | 0,066 | 0,08 | 0,11 | 0,13 |
| | ≥ 850 N/mm² | **250** | 0,031 | 0,062 | 0,083 | 0,115 | 0,14 | 0,18 | 0,23 | **270** | 0,015 | 0,030 | 0,040 | 0,055 | 0,07 | 0,09 | 0,11 |
| M | ≤ 750 N/mm² | **220** | 0,031 | 0,062 | 0,083 | 0,115 | 0,14 | 0,18 | 0,23 | **240** | 0,015 | 0,030 | 0,040 | 0,055 | 0,07 | 0,09 | 0,11 |
| | ≥ 750 N/mm² | **110** | 0,024 | 0,048 | 0,064 | 0,092 | 0,11 | 0,15 | 0,18 | **120** | 0,011 | 0,021 | 0,028 | 0,040 | 0,05 | 0,06 | 0,08 |
| S | Ni-based | **60** | 0,019 | 0,039 | 0,052 | 0,074 | 0,09 | 0,12 | 0,15 | **60** | 0,008 | 0,017 | 0,022 | 0,032 | 0,04 | 0,05 | 0,06 |
| | Ti-based | **110** | 0,028 | 0,055 | 0,074 | 0,104 | 0,12 | 0,17 | 0,21 | **120** | 0,013 | 0,026 | 0,035 | 0,050 | 0,06 | 0,08 | 0,10 |
| K | ≤ 240 HB | **300** | 0,038 | 0,076 | 0,101 | 0,150 | 0,18 | 0,24 | 0,30 | **320** | 0,018 | 0,036 | 0,048 | 0,072 | 0,09 | 0,11 | 0,14 |
| | ≥ 240 HB | **260** | 0,035 | 0,069 | 0,092 | 0,127 | 0,15 | 0,20 | 0,25 | **280** | 0,017 | 0,033 | 0,044 | 0,061 | 0,07 | 0,10 | 0,12 |
| N | ≤ 7 % Si | **900** | 0,045 | 0,090 | 0,120 | 0,184 | 0,22 | 0,29 | 0,37 | **1000** | 0,021 | 0,043 | 0,057 | 0,088 | 0,11 | 0,14 | 0,18 |
| | ≥ 7 % Si | **430** | 0,038 | 0,076 | 0,101 | 0,138 | 0,17 | 0,22 | 0,28 | **460** | 0,018 | 0,036 | 0,048 | 0,066 | 0,08 | 0,11 | 0,13 |

# SuperF-UT end mills

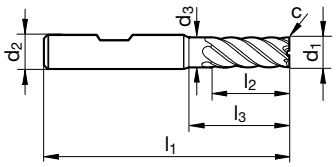
## SuperF-UT-milling cutter FS²

**Catalogue no. 64560**

HPC | HSC | TC | SuperF-UT FS² | WN | VHM | TiAlZrN | HB | 44° 45° 46° | 7°

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ○ | ● | ○ | ● | ● | ○ |

Application recommendations page 204-217




- neck clearance
- centre cutting
- greatest possible advantages with finishing and semi-roughing operations specially under HPC conditions
- suitable for fine-finishing in materials up to 50 HRC
- micro-corner protection
- the unequal helix achieves smooth, chatter-free operation

| d1 h10 mm | d2 h6 mm | d3 mm | l1 mm | l2 mm | l3 mm | c mm x 45° | Z | **Code no.** |
|---|---|---|---|---|---|---|---|---|
| 8.000 | 8.000 | 7.700 | 63.000 | 19.000 | 26.000 | 0.100 | 6 | **8.000** |
| 10.000 | 10.000 | 9.500 | 72.000 | 22.000 | 30.000 | 0.100 | 6 | **10.000** |
| 12.000 | 12.000 | 11.500 | 83.000 | 26.000 | 36.000 | 0.100 | 6 | **12.000** |
| 16.000 | 16.000 | 15.500 | 92.000 | 32.000 | 42.000 | 0.150 | 6 | **16.000** |
| 20.000 | 20.000 | 19.500 | 104.000 | 38.000 | 52.000 | 0.150 | 6 | **20.000** |

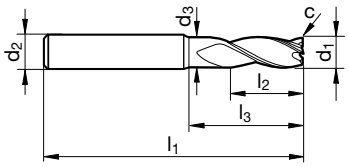
| ISO | Hardness | $v_c$ | $f_z$ (mm/z) / Ø | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | 3 | 6 | 8 | 10 | 12 | 16 | 20 |
| | | | $a_p$ = l2 | | HPC | HSC | | $a_e$ max = 0,10xD | |
| **P** | ≤ 850 N/mm² | **340** | 0,036 | 0,072 | 0,096 | 0,138 | 0,17 | 0,22 | 0,28 |
| | ≥ 850 N/mm² | **250** | 0,031 | 0,062 | 0,083 | 0,115 | 0,14 | 0,18 | 0,23 |
| **M** | ≤ 750 N/mm² | **220** | 0,031 | 0,062 | 0,083 | 0,115 | 0,14 | 0,18 | 0,23 |
| | ≥ 750 N/mm² | **110** | 0,024 | 0,048 | 0,064 | 0,092 | 0,11 | 0,15 | 0,18 |
| **S** | Ni-based | **60** | 0,019 | 0,039 | 0,052 | 0,074 | 0,09 | 0,12 | 0,15 |
| | Ti-based | **110** | 0,028 | 0,055 | 0,074 | 0,104 | 0,12 | 0,17 | 0,21 |
| **N** | ≤ 7 % Si | **900** | 0,045 | 0,090 | 0,120 | 0,184 | 0,22 | 0,29 | 0,37 |
| | ≥ 7 % Si | **430** | 0,038 | 0,076 | 0,101 | 0,138 | 0,17 | 0,22 | 0,28 |

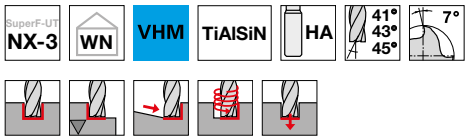
| $v_c$ | $f_z$ (mm/z) / Ø | | | | | | |
|---|---|---|---|---|---|---|---|
| | 3 | 6 | 8 | 10 | 12 | 16 | 20 |
| | $a_p$ = l2 | | | | $a_e$ max = 0,02xD | | |
| **360** | 0,017 | 0,034 | 0,046 | 0,066 | 0,08 | 0,11 | 0,13 |
| **270** | 0,015 | 0,030 | 0,040 | 0,055 | 0,07 | 0,09 | 0,11 |
| **240** | 0,015 | 0,030 | 0,040 | 0,055 | 0,07 | 0,09 | 0,11 |
| **120** | 0,011 | 0,021 | 0,028 | 0,040 | 0,05 | 0,06 | 0,08 |
| **60** | 0,008 | 0,017 | 0,022 | 0,032 | 0,04 | 0,05 | 0,06 |
| **120** | 0,013 | 0,026 | 0,035 | 0,050 | 0,06 | 0,08 | 0,10 |
| **1000** | 0,021 | 0,043 | 0,057 | 0,088 | 0,11 | 0,14 | 0,18 |
| **460** | 0,018 | 0,036 | 0,048 | 0,066 | 0,08 | 0,11 | 0,13 |

## SuperF-UT end mills

## SuperF-UT end mills NX-3

**Catalogue no. 54586**




| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ● | ● | ● | ● | ● | |

Application recommendations page 204-217

- adapted face and flute geometry for maximum cutting rates and optimal chip evacuation
- ramping up to 45° is possible
- long tool life thanks to extremely hard coating
- 3-fluted with increased flute space
- for materials up to 1400 N/mm²
- micro-corner protection
- neck clearance
- centre cutting

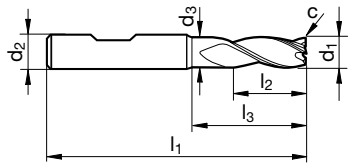
| d1 e8<br>mm | d2 h6<br>mm | d3<br>mm | l1<br>mm | l2<br>mm | l3<br>mm | c<br>mm x 45° | Z | **Code no.** |
|---|---|---|---|---|---|---|---|---|
| 3.000 | 6.000 | 2.800 | 57.000 | 8.000 | 15.000 | 0.050 | 3 | **3.000** |
| 3.500 | 6.000 | 3.300 | 57.000 | 10.000 | 15.000 | 0.050 | 3 | **3.500** |
| 3.700 | 6.000 | 3.500 | 57.000 | 11.000 | 15.000 | 0.060 | 3 | **3.700** |
| 4.000 | 6.000 | 3.800 | 57.000 | 11.000 | 18.000 | 0.060 | 3 | **4.000** |
| 4.500 | 6.000 | 4.300 | 57.000 | 11.000 | 18.000 | 0.070 | 3 | **4.500** |
| 4.700 | 6.000 | 4.500 | 57.000 | 13.000 | 18.000 | 0.070 | 3 | **4.700** |
| 5.000 | 6.000 | 4.800 | 57.000 | 13.000 | 18.000 | 0.080 | 3 | **5.000** |
| 5.500 | 6.000 | 5.300 | 57.000 | 13.000 | 19.400 | 0.080 | 3 | **5.500** |
| 5.700 | 6.000 | 5.500 | 57.000 | 13.000 | 19.600 | 0.090 | 3 | **5.700** |
| 6.000 | 6.000 | 5.700 | 57.000 | 13.000 | 20.000 | 0.090 | 3 | **6.000** |
| 6.500 | 8.000 | 6.200 | 63.000 | 16.000 | 24.400 | 0.100 | 3 | **6.500** |
| 7.000 | 8.000 | 6.700 | 63.000 | 16.000 | 24.900 | 0.110 | 3 | **7.000** |
| 7.500 | 8.000 | 7.200 | 63.000 | 19.000 | 25.300 | 0.110 | 3 | **7.500** |
| 8.000 | 8.000 | 7.700 | 63.000 | 19.000 | 26.000 | 0.120 | 3 | **8.000** |
| 8.500 | 10.000 | 8.200 | 72.000 | 19.000 | 29.400 | 0.130 | 3 | **8.500** |
| 9.000 | 10.000 | 8.700 | 72.000 | 19.000 | 29.900 | 0.140 | 3 | **9.000** |
| 9.500 | 10.000 | 9.200 | 72.000 | 22.000 | 30.300 | 0.140 | 3 | **9.500** |
| 10.000 | 10.000 | 9.500 | 72.000 | 22.000 | 30.000 | 0.150 | 3 | **10.000** |
| 12.000 | 12.000 | 11.500 | 83.000 | 26.000 | 36.000 | 0.180 | 3 | **12.000** |
| 16.000 | 16.000 | 15.500 | 92.000 | 32.000 | 42.000 | 0.190 | 3 | **16.000** |
| 20.000 | 20.000 | 19.500 | 104.000 | 38.000 | 52.000 | 0.240 | 3 | **20.000** |

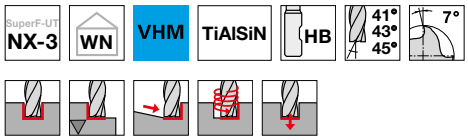
| ISO | Hardness | $v_c$ | $f_z$ (mm/z) / Ø | | | | | | | $v_c$ | $f_z$ (mm/z) / Ø | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 3 | 6 | 8 | 10 | 12 | 16 | 20 | | 3 | 6 | 8 | 10 | 12 | 16 | 20 |
| | | | $a_p$ = 1,0xD | | | | | $a_e$ = 1,0xD | | | $a_p$ = 1,5xD | | | | | $a_{e\ max}$ = 0,33xD | |
| **P** | ≤ 850 N/mm² | **270** | 0,017 | 0,025 | 0,034 | 0,050 | 0,060 | 0,080 | 0,100 | **350** | 0,021 | 0,032 | 0,042 | 0,063 | 0,075 | 0,100 | 0,125 |
| | ≥ 850 N/mm² | **180** | 0,014 | 0,021 | 0,028 | 0,045 | 0,054 | 0,072 | 0,090 | **260** | 0,018 | 0,027 | 0,036 | 0,059 | 0,070 | 0,094 | 0,117 |
| **M** | ≤ 750 N/mm² | **120** | 0,014 | 0,021 | 0,028 | 0,045 | 0,054 | 0,072 | 0,090 | **160** | 0,018 | 0,027 | 0,036 | 0,059 | 0,070 | 0,094 | 0,117 |
| | ≥ 750 N/mm² | **80** | 0,013 | 0,019 | 0,026 | 0,040 | 0,048 | 0,064 | 0,080 | **120** | 0,019 | 0,029 | 0,038 | 0,060 | 0,072 | 0,096 | 0,120 |
| **S** | Ti-based | **60** | 0,013 | 0,019 | 0,026 | 0,040 | 0,048 | 0,064 | 0,080 | **110** | 0,017 | 0,025 | 0,033 | 0,052 | 0,062 | 0,083 | 0,104 |
| **K** | ≤ 240 HB | **150** | 0,017 | 0,025 | 0,034 | 0,050 | 0,060 | 0,080 | 0,100 | **190** | 0,021 | 0,032 | 0,042 | 0,063 | 0,075 | 0,100 | 0,125 |
| **N** | ≥ 7 % Si | **340** | 0,018 | 0,027 | 0,036 | 0,055 | 0,066 | 0,088 | 0,110 | **440** | 0,023 | 0,034 | 0,045 | 0,069 | 0,083 | 0,110 | 0,138 |

# SuperF-UT end mills

## SuperF-UT end mills NX-3

**Catalogue no. 54587**




| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ● | ● | ● | ● | ● | |

Application recommendations page 204-217

- adapted face and flute geometry for maximum cutting rates and optimal chip evacuation
- ramping up to 45° is possible
- long tool life thanks to extremely hard coating
- 3-fluted with increased flute space
- for materials up to 1400 N/mm²
- micro-corner protection
- neck clearance
- centre cutting

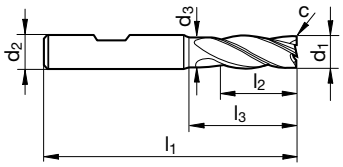
| d1 e8<br>mm | d2 h6<br>mm | d3<br>mm | l1<br>mm | l2<br>mm | l3<br>mm | c<br>mm x 45° | Z | **Code no.** |
|---|---|---|---|---|---|---|---|---|
| 3.000 | 6.000 | 2.800 | 57.000 | 8.000 | 15.000 | 0.050 | 3 | **3.000** |
| 3.500 | 6.000 | 3.300 | 57.000 | 10.000 | 15.000 | 0.050 | 3 | **3.500** |
| 3.700 | 6.000 | 3.500 | 57.000 | 11.000 | 15.000 | 0.060 | 3 | **3.700** |
| 4.000 | 6.000 | 3.800 | 57.000 | 11.000 | 18.000 | 0.060 | 3 | **4.000** |
| 4.500 | 6.000 | 4.300 | 57.000 | 11.000 | 18.000 | 0.070 | 3 | **4.500** |
| 4.700 | 6.000 | 4.500 | 57.000 | 13.000 | 18.000 | 0.070 | 3 | **4.700** |
| 5.000 | 6.000 | 4.800 | 57.000 | 13.000 | 18.000 | 0.080 | 3 | **5.000** |
| 5.500 | 6.000 | 5.300 | 57.000 | 13.000 | 19.400 | 0.080 | 3 | **5.500** |
| 5.700 | 6.000 | 5.500 | 57.000 | 13.000 | 19.600 | 0.090 | 3 | **5.700** |
| 6.000 | 6.000 | 5.700 | 57.000 | 13.000 | 20.000 | 0.090 | 3 | **6.000** |
| 6.500 | 8.000 | 6.200 | 63.000 | 16.000 | 24.400 | 0.100 | 3 | **6.500** |
| 7.000 | 8.000 | 6.700 | 63.000 | 16.000 | 24.900 | 0.110 | 3 | **7.000** |
| 7.500 | 8.000 | 7.200 | 63.000 | 19.000 | 25.300 | 0.110 | 3 | **7.500** |
| 8.000 | 8.000 | 7.700 | 63.000 | 19.000 | 26.000 | 0.120 | 3 | **8.000** |
| 8.500 | 10.000 | 8.200 | 72.000 | 19.000 | 29.400 | 0.130 | 3 | **8.500** |
| 9.000 | 10.000 | 8.700 | 72.000 | 19.000 | 29.900 | 0.140 | 3 | **9.000** |
| 9.500 | 10.000 | 9.200 | 72.000 | 22.000 | 30.300 | 0.140 | 3 | **9.500** |
| 10.000 | 10.000 | 9.500 | 72.000 | 22.000 | 30.000 | 0.150 | 3 | **10.000** |
| 12.000 | 12.000 | 11.500 | 83.000 | 26.000 | 36.000 | 0.180 | 3 | **12.000** |
| 16.000 | 16.000 | 15.500 | 92.000 | 32.000 | 42.000 | 0.190 | 3 | **16.000** |
| 20.000 | 20.000 | 19.500 | 104.000 | 38.000 | 52.000 | 0.240 | 3 | **20.000** |

| ISO | Hardness | $v_c$ | $f_z$ (mm/z) / Ø | | | | | | | $v_c$ | $f_z$ (mm/z) / Ø | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 3 | 6 | 8 | 10 | 12 | 16 | 20 | | 3 | 6 | 8 | 10 | 12 | 16 | 20 |
| | | | $a_p$ = 1,0xD | | | | | $a_e$ = 1,0xD | | | $a_p$ = 1,5xD | | | | | $a_{e\ max}$ = 0,33xD | |
| **P** | ≤ 850 N/mm² | **270** | 0,017 | 0,025 | 0,034 | 0,050 | 0,060 | 0,080 | 0,100 | **350** | 0,021 | 0,032 | 0,042 | 0,063 | 0,075 | 0,100 | 0,125 |
| | ≥ 850 N/mm² | **180** | 0,014 | 0,021 | 0,028 | 0,045 | 0,054 | 0,072 | 0,090 | **260** | 0,018 | 0,027 | 0,036 | 0,059 | 0,070 | 0,094 | 0,117 |
| **M** | ≤ 750 N/mm² | **120** | 0,014 | 0,021 | 0,028 | 0,045 | 0,054 | 0,072 | 0,090 | **160** | 0,018 | 0,027 | 0,036 | 0,059 | 0,070 | 0,094 | 0,117 |
| | ≥ 750 N/mm² | **80** | 0,013 | 0,019 | 0,026 | 0,040 | 0,048 | 0,064 | 0,080 | **120** | 0,019 | 0,029 | 0,038 | 0,060 | 0,072 | 0,096 | 0,120 |
| **S** | Ti-based | **60** | 0,013 | 0,019 | 0,026 | 0,040 | 0,048 | 0,064 | 0,080 | **110** | 0,017 | 0,025 | 0,033 | 0,052 | 0,062 | 0,083 | 0,104 |
| **K** | ≤ 240 HB | **150** | 0,017 | 0,025 | 0,034 | 0,050 | 0,060 | 0,080 | 0,100 | **190** | 0,021 | 0,032 | 0,042 | 0,063 | 0,075 | 0,100 | 0,125 |
| **N** | ≥ 7 % Si | **340** | 0,018 | 0,027 | 0,036 | 0,055 | 0,066 | 0,088 | 0,110 | **440** | 0,023 | 0,034 | 0,045 | 0,069 | 0,083 | 0,110 | 0,138 |

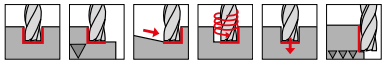
## SuperF-UT end mills

## SuperF-UT end mills NX

**Catalogue no. 54589**




HPC | HSC | SuperF-UT NX | DIN 6527K | VHM | TiAlSiN | HB | 36° 38° 37° | 7°



| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ● | ● | ● | ● | ● | |

Application recommendations page 204-217

- short stable design
- adapted face and flute geometry for maximum cutting rates and optimal chip evacuation
- ramping up to 45° is possible
- long tool life thanks to extremely hard coating
- high process reliability with simultaneous reduction of machining times
- for materials up to 1400 N/mm²
- micro-corner protection
- neck clearance
- centre cutting

| d1 h10 mm | d2 h6 mm | d3 mm | l1 mm | l2 mm | l3 mm | c mm x 45° | Z | Code no. |
|---|---|---|---|---|---|---|---|---|
| 3.000 | 6.000 | 2.800 | 50.000 | 5.000 | 12.000 | 0.030 | 4 | **3.000** |
| 3.700 | 6.000 | 3.500 | 54.000 | 8.000 | 12.000 | 0.040 | 4 | **3.700** |
| 4.000 | 6.000 | 3.800 | 54.000 | 8.000 | 15.000 | 0.040 | 4 | **4.000** |
| 4.700 | 6.000 | 4.500 | 54.000 | 9.000 | 15.000 | 0.050 | 4 | **4.700** |
| 5.000 | 6.000 | 4.800 | 54.000 | 9.000 | 15.000 | 0.050 | 4 | **5.000** |
| 5.700 | 6.000 | 5.500 | 54.000 | 10.000 | 16.600 | 0.060 | 4 | **5.700** |
| 6.000 | 6.000 | 5.700 | 54.000 | 10.000 | 17.000 | 0.060 | 4 | **6.000** |
| 7.000 | 8.000 | 6.700 | 58.000 | 11.000 | 19.900 | 0.070 | 4 | **7.000** |
| 7.700 | 8.000 | 7.400 | 58.000 | 12.000 | 20.500 | 0.080 | 4 | **7.700** |
| 8.000 | 8.000 | 7.700 | 58.000 | 12.000 | 21.000 | 0.080 | 4 | **8.000** |
| 9.000 | 10.000 | 8.700 | 66.000 | 13.000 | 23.900 | 0.090 | 4 | **9.000** |
| 9.700 | 10.000 | 9.400 | 66.000 | 14.000 | 24.500 | 0.100 | 4 | **9.700** |
| 10.000 | 10.000 | 9.500 | 66.000 | 14.000 | 24.000 | 0.100 | 4 | **10.000** |
| 11.700 | 12.000 | 11.200 | 73.000 | 16.000 | 25.300 | 0.120 | 4 | **11.700** |
| 12.000 | 12.000 | 11.500 | 73.000 | 16.000 | 26.000 | 0.120 | 4 | **12.000** |
| 15.600 | 16.000 | 15.100 | 82.000 | 22.000 | 31.200 | 0.160 | 4 | **15.600** |
| 16.000 | 16.000 | 15.500 | 82.000 | 22.000 | 32.000 | 0.160 | 4 | **16.000** |
| 19.000 | 20.000 | 18.500 | 92.000 | 26.000 | 38.700 | 0.190 | 4 | **19.000** |
| 20.000 | 20.000 | 19.500 | 92.000 | 26.000 | 40.000 | 0.200 | 4 | **20.000** |

| ISO | Hardness | $v_c$ | $f_z$ (mm/z) / Ø | | | | | | | $v_c$ | $f_z$ (mm/z) / Ø | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 3 | 6 | 8 | 10 | 12 | 16 | 20 | | 3 | 6 | 8 | 10 | 12 | 16 | 20 |
| | | | $a_p$ = 1,0xD | | | | | $a_e$ = 1,0xD | | | $a_p$ = l2 | | | HPC | | $a_e$ max = 0,20xD | |
| **P** | ≤ 850 N/mm² | **270** | 0,017 | 0,025 | 0,034 | 0,050 | 0,060 | 0,080 | 0,100 | **450** | 0,027 | 0,040 | 0,054 | 0,080 | 0,10 | 0,13 | 0,16 |
| | ≥ 850 N/mm² | **180** | 0,014 | 0,021 | 0,028 | 0,045 | 0,054 | 0,072 | 0,090 | **300** | 0,022 | 0,034 | 0,045 | 0,072 | 0,09 | 0,12 | 0,14 |
| **M** | ≤ 750 N/mm² | **120** | 0,014 | 0,021 | 0,028 | 0,045 | 0,054 | 0,072 | 0,090 | **200** | 0,022 | 0,034 | 0,045 | 0,072 | 0,09 | 0,12 | 0,14 |
| | ≥ 750 N/mm² | **80** | 0,013 | 0,019 | 0,026 | 0,040 | 0,048 | 0,064 | 0,080 | **140** | 0,020 | 0,031 | 0,041 | 0,064 | 0,08 | 0,10 | 0,13 |
| **S** | Ti-based | **60** | 0,013 | 0,019 | 0,026 | 0,040 | 0,048 | 0,064 | 0,080 | **110** | 0,020 | 0,031 | 0,041 | 0,064 | 0,08 | 0,10 | 0,13 |
| **K** | ≤ 240 HB | **150** | 0,017 | 0,025 | 0,034 | 0,050 | 0,060 | 0,080 | 0,100 | **250** | 0,027 | 0,040 | 0,054 | 0,080 | 0,10 | 0,13 | 0,16 |
| **N** | ≥ 7 % Si | **340** | 0,018 | 0,027 | 0,036 | 0,055 | 0,066 | 0,088 | 0,110 | **570** | 0,029 | 0,043 | 0,058 | 0,088 | 0,11 | 0,14 | 0,18 |

# SuperF-UT end mills

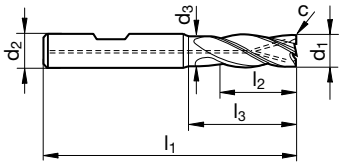
## SuperF-UT milling cutter NX-IK

**Catalogue no. 54585**

HPC | HSC | SuperF-UT NX-IK | DIN 6527 L | VHM | TiAlSiN | HB | 36° 38° 37° | 7°

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ● | ● | ● | ● | ● | |

Application recommendations page 204-217




- adapted cutting edge geometry and coating
- with internal coolant: Radial and axial exits
- ramping up to 45° is possible
- long tool life thanks to extremely hard coating
- high process reliability with simultaneous reduction of machining times
- for materials up to 1400 N/mm²
- micro-corner protection
- neck clearance
- centre cutting
- the unequal helix achieves smooth, chatter-free operation

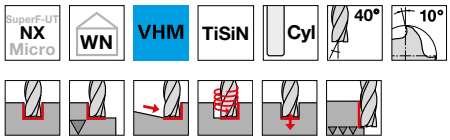
| d1 h10 mm | d2 h6 mm | d3 mm | l1 mm | l2 mm | l3 mm | c mm x 45° | Z | Code no. |
|---|---|---|---|---|---|---|---|---|
| 6.000 | 6.000 | 5.700 | 57.000 | 13.000 | 20.000 | 0.060 | 4 | **6.000** |
| 8.000 | 8.000 | 7.700 | 63.000 | 19.000 | 26.000 | 0.080 | 4 | **8.000** |
| 10.000 | 10.000 | 9.500 | 72.000 | 22.000 | 30.000 | 0.100 | 4 | **10.000** |
| 12.000 | 12.000 | 11.500 | 83.000 | 26.000 | 36.000 | 0.120 | 4 | **12.000** |
| 16.000 | 16.000 | 15.500 | 92.000 | 32.000 | 42.000 | 0.160 | 4 | **16.000** |
| 20.000 | 20.000 | 19.500 | 104.000 | 38.000 | 52.000 | 0.200 | 4 | **20.000** |
| 25.000 | 25.000 | 24.000 | 121.000 | 45.000 | 63.000 | 0.250 | 4 | **25.000** |

| ISO | Hardness | $v_c$ | $f_z$ (mm/z) / Ø | | | | | | | $v_c$ | $f_z$ (mm/z) / Ø | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 4 | 6 | 8 | 10 | 12 | 16 | 20 | | 4 | 6 | 8 | 10 | 12 | 16 | 20 |
| | | | $a_p$ = 1,0xD | | | | | $a_e$ = 1,0xD | | | $a_p$ = 1,0xD | | | | | $a_e$ = 1,0xD | |
| **P** | ≤ 850 N/mm² | **270** | 0,017 | 0,025 | 0,034 | 0,050 | 0,060 | 0,080 | 0,100 | **270** | 0,014 | 0,021 | 0,028 | 0,040 | 0,048 | 0,064 | 0,080 |
| | ≥ 850 N/mm² | **180** | 0,014 | 0,021 | 0,028 | 0,045 | 0,054 | 0,072 | 0,090 | **180** | 0,008 | 0,012 | 0,016 | 0,025 | 0,030 | 0,040 | 0,050 |
| **M** | ≤ 750 N/mm² | **120** | 0,014 | 0,021 | 0,028 | 0,045 | 0,054 | 0,072 | 0,090 | **90** | 0,007 | 0,011 | 0,014 | 0,023 | 0,027 | 0,036 | 0,045 |
| | ≥ 750 N/mm² | **80** | 0,013 | 0,019 | 0,026 | 0,040 | 0,048 | 0,064 | 0,080 | **60** | 0,006 | 0,010 | 0,013 | 0,020 | 0,024 | 0,032 | 0,040 |
| **S** | Ti-based | **60** | 0,013 | 0,019 | 0,026 | 0,040 | 0,048 | 0,064 | 0,080 | **50** | 0,006 | 0,010 | 0,013 | 0,020 | 0,024 | 0,032 | 0,040 |
| **K** | ≤ 240 HB | **150** | 0,017 | 0,025 | 0,034 | 0,050 | 0,060 | 0,080 | 0,100 | **150** | 0,014 | 0,021 | 0,028 | 0,040 | 0,048 | 0,064 | 0,080 |
| **N** | ≥ 7 % Si | **340** | 0,018 | 0,027 | 0,036 | 0,055 | 0,066 | 0,088 | 0,110 | **340** | 0,014 | 0,021 | 0,028 | 0,040 | 0,048 | 0,064 | 0,080 |

# SuperF-UT end mills

## SuperF-UT end mills NX Micro

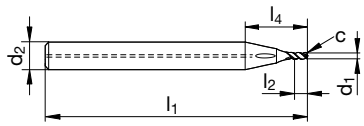
**Catalogue no. 54594**




| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ● | ● | ● | ● | ● | ○ |

Application recommendations page 204-217

- for extreme cutting values and cutting performance
- with internal cooling: peripheral cooling with 4 or 6 exits
- centre cutting
- improved face geometry
- 2.5xD cutting edge length



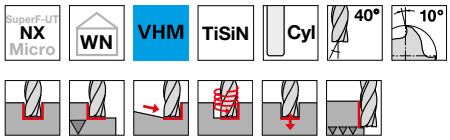

| d1 h8<br>mm | d2 h5<br>mm | l1<br>mm | l2<br>mm | l4<br>mm | c<br>mm x 45° | Z | **Code no.** |
|---|---|---|---|---|---|---|---|
| 0.800 | 4.000 | 38.000 | 2.000 | 9.500 | 0.016 | 3 | **0.800** |
| 1.000 | 4.000 | 38.000 | 2.500 | 9.300 | 0.020 | 3 | **1.000** |
| 1.200 | 4.000 | 38.000 | 3.000 | 9.400 | 0.024 | 3 | **1.200** |
| 1.500 | 4.000 | 45.000 | 3.750 | 9.700 | 0.030 | 3 | **1.500** |
| 1.800 | 4.000 | 45.000 | 4.500 | 10.200 | 0.036 | 3 | **1.800** |
| 2.000 | 6.000 | 50.000 | 5.000 | 14.600 | 0.040 | 3 | **2.000** |
| 2.200 | 6.000 | 50.000 | 5.500 | 14.900 | 0.044 | 3 | **2.200** |
| 2.500 | 6.000 | 50.000 | 6.250 | 15.300 | 0.050 | 3 | **2.500** |
| 2.800 | 6.000 | 50.000 | 7.000 | 15.900 | 0.056 | 3 | **2.800** |
| 3.000 | 6.000 | 50.000 | 7.500 | 16.200 | 0.060 | 3 | **3.000** |

| ISO | Hardness | $a_p$ | Ø1,0 | | Ø1,5 | | Ø2,0 | | Ø2,5 | | Ø3,0 | | $a_e$ | $a_p$ | Ø1,0 | | Ø1,5 | | Ø2,0 | | Ø2,5 | | Ø3,0 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | $v_c$ | $f_z$ | $v_c$ | $f_z$ | $v_c$ | $f_z$ | $v_c$ | $f_z$ | $v_c$ | $f_z$ | | | $v_c$ | $f_z$ | $v_c$ | $f_z$ | $v_c$ | $f_z$ | $v_c$ | $f_z$ | $v_c$ | $f_z$ |
| P | ≤850 N/mm² | **1,00xØ** | 140 | 0,009 | 168 | 0,014 | 182 | 0,018 | 182 | 0,023 | 196 | 0,027 | **0,25xØ** | **2,0xØ** | 170 | 0,014 | 204 | 0,021 | 221 | 0,028 | 221 | 0,035 | 238 | 0,043 |
| | ≥850 N/mm² | **0,75xØ** | 140 | 0,006 | 168 | 0,009 | 182 | 0,012 | 182 | 0,015 | 196 | 0,018 | **0,20xØ** | **2,0xØ** | 170 | 0,009 | 204 | 0,014 | 221 | 0,019 | 221 | 0,024 | 238 | 0,028 |
| M | ≤750 N/mm² | **1,00xØ** | 140 | 0,008 | 168 | 0,012 | 182 | 0,016 | 182 | 0,020 | 196 | 0,024 | **0,25xØ** | **2,0xØ** | 170 | 0,013 | 204 | 0,019 | 221 | 0,025 | 221 | 0,032 | 238 | 0,038 |
| | ≥750 N/mm² | **0,75xØ** | 90 | 0,006 | 108 | 0,009 | 117 | 0,012 | 117 | 0,015 | 126 | 0,018 | **0,20xØ** | **2,0xØ** | 105 | 0,010 | 126 | 0,014 | 137 | 0,019 | 137 | 0,024 | 147 | 0,029 |
| S | Ni-based | **0,50xØ** | 60 | 0,004 | 72 | 0,005 | 78 | 0,007 | 78 | 0,009 | 84 | 0,011 | **0,15xØ** | **2,0xØ** | 70 | 0,006 | 84 | 0,009 | 91 | 0,012 | 91 | 0,014 | 98 | 0,017 |
| | Ti-based | **0,75xØ** | 100 | 0,008 | 120 | 0,011 | 130 | 0,015 | 130 | 0,019 | 140 | 0,023 | **0,20xØ** | **2,0xØ** | 115 | 0,012 | 138 | 0,018 | 150 | 0,024 | 150 | 0,030 | 161 | 0,035 |
| K | ≤240 HB | **1,00xØ** | 120 | 0,007 | 144 | 0,011 | 156 | 0,014 | 156 | 0,018 | 168 | 0,021 | **0,25xØ** | **2,0xØ** | 145 | 0,011 | 174 | 0,017 | 189 | 0,022 | 189 | 0,028 | 203 | 0,033 |
| | ≥240 HB | **1,00xØ** | 100 | 0,006 | 120 | 0,009 | 130 | 0,012 | 130 | 0,016 | 140 | 0,019 | **0,25xØ** | **2,0xØ** | 120 | 0,010 | 144 | 0,015 | 156 | 0,020 | 156 | 0,024 | 168 | 0,029 |
| N | Al | **1,00xØ** | 170 | 0,012 | 204 | 0,018 | 221 | 0,024 | 221 | 0,030 | 238 | 0,036 | **0,25xØ** | **2,0xØ** | 200 | 0,019 | 240 | 0,028 | 260 | 0,038 | 260 | 0,047 | 280 | 0,057 |
| | NF | **1,00xØ** | 125 | 0,011 | 150 | 0,017 | 162,5 | 0,022 | 162,5 | 0,028 | 175 | 0,033 | **0,25xØ** | **2,0xØ** | 150 | 0,017 | 180 | 0,026 | 195 | 0,035 | 195 | 0,044 | 210 | 0,052 |

# SuperF-UT end mills

## SuperF-UT end mills NX Micro

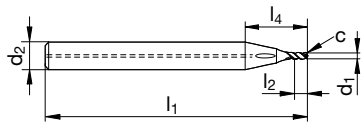
**Catalogue no. 54595**




| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ● | ● | ● | ● | ● | ○ |

Application recommendations page 204-217

- for extreme cutting values and cutting performance
- with internal cooling: peripheral cooling with 4 or 6 exits
- centre cutting
- improved face geometry
- 5xD cutting edge length




| d1 h8<br>mm | d2 h5<br>mm | l1<br>mm | l2<br>mm | l4<br>mm | c<br>mm x 45° | Z | **Code no.** |
|---|---|---|---|---|---|---|---|
| 1.000 | 4.000 | 45.000 | 5.000 | 11.800 | 0.020 | 3 | **1.000** |
| 1.500 | 4.000 | 50.000 | 7.500 | 13.500 | 0.030 | 3 | **1.500** |
| 2.000 | 6.000 | 57.000 | 10.000 | 19.600 | 0.040 | 3 | **2.000** |
| 2.500 | 6.000 | 57.000 | 12.500 | 21.500 | 0.050 | 3 | **2.500** |
| 3.000 | 6.000 | 57.000 | 15.000 | 23.700 | 0.060 | 3 | **3.000** |

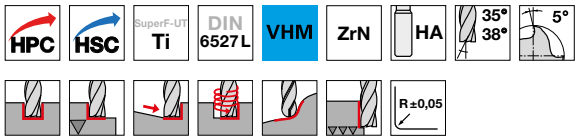
| ISO | Hardness | $a_p$ | Ø1,0 | | Ø1,5 | | Ø2,0 | | Ø2,5 | | Ø3,0 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | $v_c$ | $f_z$ | $v_c$ | $f_z$ | $v_c$ | $f_z$ | $v_c$ | $f_z$ | $v_c$ | $f_z$ |
| P | ≤850 N/mm² | **0,50xØ** | 112 | 0,008 | 134 | 0,012 | 146 | 0,016 | 146 | 0,020 | 157 | 0,024 |
| | ≥850 N/mm² | **0,25xØ** | 112 | 0,005 | 134 | 0,008 | 146 | 0,011 | 146 | 0,014 | 157 | 0,016 |
| M | ≤750 N/mm² | **0,25xØ** | 112 | 0,007 | 134 | 0,011 | 146 | 0,014 | 146 | 0,018 | 157 | 0,022 |
| | ≥750 N/mm² | **0,25xØ** | 71 | 0,006 | 85 | 0,008 | 92 | 0,011 | 92 | 0,014 | 99 | 0,017 |
| S | Ni-based | **0,25xØ** | 46 | 0,003 | 55 | 0,005 | 60 | 0,007 | 60 | 0,008 | 64 | 0,010 |
| | Ti-based | **0,25xØ** | 72 | 0,007 | 86 | 0,010 | 94 | 0,014 | 94 | 0,017 | 101 | 0,020 |
| K | ≤240 HB | **0,50xØ** | 96 | 0,006 | 115 | 0,009 | 125 | 0,013 | 125 | 0,016 | 134 | 0,019 |
| | ≥240 HB | **0,50xØ** | 80 | 0,006 | 96 | 0,008 | 104 | 0,011 | 104 | 0,014 | 112 | 0,017 |
| N | Al | **0,50xØ** | 136 | 0,011 | 163 | 0,016 | 177 | 0,022 | 177 | 0,027 | 190 | 0,032 |
| | NF | **0,50xØ** | 100 | 0,010 | 120 | 0,015 | 130 | 0,020 | 130 | 0,025 | 140 | 0,030 |

| $a_e$ | $a_p$ | Ø1,0 | | Ø1,5 | | Ø2,0 | | Ø2,5 | | Ø3,0 | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | $v_c$ | $f_z$ | $v_c$ | $f_z$ | $v_c$ | $f_z$ | $v_c$ | $f_z$ | $v_c$ | $f_z$ |
| **0,10xØ** | **5,0xØ** | 134 | 0,013 | 161 | 0,019 | 174 | 0,026 | 174 | 0,032 | 188 | 0,038 |
| **0,08xØ** | **5,0xØ** | 134 | 0,009 | 161 | 0,013 | 174 | 0,017 | 174 | 0,021 | 188 | 0,026 |
| **0,10xØ** | **5,0xØ** | 134 | 0,011 | 161 | 0,017 | 174 | 0,023 | 174 | 0,028 | 188 | 0,034 |
| **0,05xØ** | **5,0xØ** | 86 | 0,009 | 103 | 0,013 | 112 | 0,017 | 112 | 0,022 | 120 | 0,026 |
| **0,05xØ** | **5,0xØ** | 55 | 0,005 | 66 | 0,008 | 72 | 0,010 | 72 | 0,013 | 77 | 0,016 |
| **0,08xØ** | **5,0xØ** | 86 | 0,011 | 103 | 0,016 | 112 | 0,021 | 112 | 0,027 | 120 | 0,032 |
| **0,10xØ** | **5,0xØ** | 115 | 0,010 | 138 | 0,015 | 150 | 0,020 | 150 | 0,025 | 161 | 0,030 |
| **0,10xØ** | **5,0xØ** | 96 | 0,009 | 115 | 0,013 | 125 | 0,018 | 125 | 0,022 | 134 | 0,026 |
| **0,15xØ** | **5,0xØ** | 163 | 0,017 | 196 | 0,026 | 212 | 0,034 | 212 | 0,043 | 228 | 0,051 |
| **0,12xØ** | **5,0xØ** | 120 | 0,016 | 144 | 0,023 | 156 | 0,031 | 156 | 0,039 | 168 | 0,047 |

## SuperF-UT end mills

## SuperF-UT end mills Ti

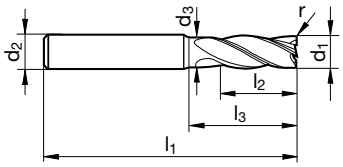
**Catalogue no. 54560**




| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ○ | ○ | | | ● | |

Application recommendations page 204-217

- optimised cutting edge design for high-strength titanium-alloys and special alloys
- with defined corner radii
- neck clearance
- centre cutting
- the unequal helix achieves smooth, chatter-free operation




| d1 h10 mm | d2 h6 mm | d3 mm | l1 mm | l2 mm | l3 mm | r | Z | Code no. |
|---|---|---|---|---|---|---|---|---|
| 6.000 | 6.000 | 5.700 | 57.000 | 13.000 | 20.000 | 0.500 | 4 | **6.005** |
| 6.000 | 6.000 | 5.700 | 57.000 | 13.000 | 20.000 | 0.800 | 4 | **6.008** |
| 6.000 | 6.000 | 5.700 | 57.000 | 13.000 | 20.000 | 1.000 | 4 | **6.010** |
| 6.000 | 6.000 | 5.700 | 57.000 | 13.000 | 20.000 | 1.500 | 4 | **6.015** |
| 6.000 | 6.000 | 5.700 | 57.000 | 13.000 | 20.000 | 2.000 | 4 | **6.020** |
| 8.000 | 8.000 | 7.700 | 63.000 | 19.000 | 26.000 | 0.500 | 4 | **8.005** |
| 8.000 | 8.000 | 7.700 | 63.000 | 19.000 | 26.000 | 0.800 | 4 | **8.008** |
| 8.000 | 8.000 | 7.700 | 63.000 | 19.000 | 26.000 | 1.000 | 4 | **8.010** |
| 8.000 | 8.000 | 7.700 | 63.000 | 19.000 | 26.000 | 1.500 | 4 | **8.015** |
| 8.000 | 8.000 | 7.700 | 63.000 | 19.000 | 26.000 | 2.000 | 4 | **8.020** |
| 10.000 | 10.000 | 9.500 | 72.000 | 22.000 | 30.000 | 0.500 | 4 | **10.005** |
| 10.000 | 10.000 | 9.500 | 72.000 | 22.000 | 30.000 | 0.800 | 4 | **10.008** |
| 10.000 | 10.000 | 9.500 | 72.000 | 22.000 | 30.000 | 1.000 | 4 | **10.010** |
| 10.000 | 10.000 | 9.500 | 72.000 | 22.000 | 30.000 | 1.500 | 4 | **10.015** |
| 10.000 | 10.000 | 9.500 | 72.000 | 22.000 | 30.000 | 2.000 | 4 | **10.020** |
| 12.000 | 12.000 | 11.500 | 83.000 | 26.000 | 36.000 | 0.500 | 4 | **12.005** |
| 12.000 | 12.000 | 11.500 | 83.000 | 26.000 | 36.000 | 0.800 | 4 | **12.008** |
| 12.000 | 12.000 | 11.500 | 83.000 | 26.000 | 36.000 | 1.000 | 4 | **12.010** |
| 12.000 | 12.000 | 11.500 | 83.000 | 26.000 | 36.000 | 1.500 | 4 | **12.015** |
| 12.000 | 12.000 | 11.500 | 83.000 | 26.000 | 36.000 | 2.000 | 4 | **12.020** |
| 12.000 | 12.000 | 11.500 | 83.000 | 26.000 | 36.000 | 2.500 | 4 | **12.025** |
| 12.000 | 12.000 | 11.500 | 83.000 | 26.000 | 36.000 | 3.000 | 4 | **12.030** |
| 12.000 | 12.000 | 11.500 | 83.000 | 26.000 | 36.000 | 4.000 | 4 | **12.040** |
| 16.000 | 16.000 | 15.500 | 92.000 | 32.000 | 42.000 | 0.500 | 4 | **16.005** |
| 16.000 | 16.000 | 15.500 | 92.000 | 32.000 | 42.000 | 0.800 | 4 | **16.008** |
| 16.000 | 16.000 | 15.500 | 92.000 | 32.000 | 42.000 | 1.000 | 4 | **16.010** |
| 16.000 | 16.000 | 15.500 | 92.000 | 32.000 | 42.000 | 1.500 | 4 | **16.015** |
| 16.000 | 16.000 | 15.500 | 92.000 | 32.000 | 42.000 | 2.000 | 4 | **16.020** |
| 16.000 | 16.000 | 15.500 | 92.000 | 32.000 | 42.000 | 2.500 | 4 | **16.025** |
| 16.000 | 16.000 | 15.500 | 92.000 | 32.000 | 42.000 | 3.000 | 4 | **16.030** |
| 16.000 | 16.000 | 15.500 | 92.000 | 32.000 | 42.000 | 4.000 | 4 | **16.040** |
| 20.000 | 20.000 | 19.500 | 104.000 | 38.000 | 52.000 | 1.000 | 4 | **20.010** |
| 20.000 | 20.000 | 19.500 | 104.000 | 38.000 | 52.000 | 2.000 | 4 | **20.020** |
| 20.000 | 20.000 | 19.500 | 104.000 | 38.000 | 52.000 | 4.000 | 4 | **20.040** |

| ISO | Hardness | $v_c$ | $f_z$ (mm/z) / Ø 3 | 6 | 8 | 10 | 12 | 16 | 20 |
|---|---|---|---|---|---|---|---|---|---|
| | | | $a_p$ = l2 | | HPC | HSC | | $a_e$ max = 0,10xD | |
| P | ≤ 850 N/mm² | **340** | 0,036 | 0,072 | 0,096 | 0,138 | 0,17 | 0,22 | 0,28 |
| | ≥ 850 N/mm² | **250** | 0,031 | 0,062 | 0,083 | 0,115 | 0,14 | 0,18 | 0,23 |
| M | ≤ 750 N/mm² | **220** | 0,031 | 0,062 | 0,083 | 0,115 | 0,14 | 0,18 | 0,23 |
| | ≥ 750 N/mm² | **110** | 0,024 | 0,048 | 0,064 | 0,092 | 0,11 | 0,15 | 0,18 |
| S | Ni-based | **60** | 0,019 | 0,039 | 0,052 | 0,074 | 0,09 | 0,12 | 0,15 |
| | Ti-based | **110** | 0,028 | 0,055 | 0,074 | 0,104 | 0,12 | 0,17 | 0,21 |
| N | ≤ 7 % Si | **900** | 0,045 | 0,090 | 0,120 | 0,184 | 0,22 | 0,29 | 0,37 |
| | ≥ 7 % Si | **430** | 0,038 | 0,076 | 0,101 | 0,138 | 0,17 | 0,22 | 0,28 |

| $v_c$ | $f_z$ (mm/z) / Ø 3 | 6 | 8 | 10 | 12 | 16 | 20 |
|---|---|---|---|---|---|---|---|
| | $a_p$ = l2 | | | | $a_e$ max = 0,02xD | | |
| **360** | 0,017 | 0,034 | 0,046 | 0,066 | 0,08 | 0,11 | 0,13 |
| **270** | 0,015 | 0,030 | 0,040 | 0,055 | 0,07 | 0,09 | 0,11 |
| **240** | 0,015 | 0,030 | 0,040 | 0,055 | 0,07 | 0,09 | 0,11 |
| **120** | 0,011 | 0,021 | 0,028 | 0,040 | 0,05 | 0,06 | 0,08 |
| **60** | 0,008 | 0,017 | 0,022 | 0,032 | 0,04 | 0,05 | 0,06 |
| **120** | 0,013 | 0,026 | 0,035 | 0,050 | 0,06 | 0,08 | 0,10 |
| **1000** | 0,021 | 0,043 | 0,057 | 0,088 | 0,11 | 0,14 | 0,18 |
| **460** | 0,018 | 0,036 | 0,048 | 0,066 | 0,08 | 0,11 | 0,13 |

# SuperF-UT end mills

## SuperF-UT end mills Ti

**Catalogue no. 54561**

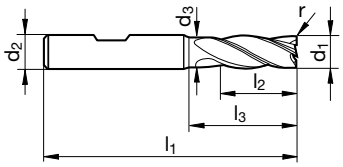
HPC | HSC | SuperF-UT Ti | DIN 6527 L | VHM | ZrN | HB | 35° 38° | 5°

R ±0,05

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ○ | ○ | | | ● | |

Application recommendations page 204-217

- optimised cutting edge design for high-strength titanium-alloys and special alloys
- with defined corner radii
- neck clearance
- centre cutting
- the unequal helix achieves smooth, chatter-free operation




| d1 h10 mm | d2 h6 mm | d3 mm | l1 mm | l2 mm | l3 mm | r | Z | Code no. |
|---|---|---|---|---|---|---|---|---|
| 6.000 | 6.000 | 5.700 | 57.000 | 13.000 | 20.000 | 0.500 | 4 | **6.005** |
| 6.000 | 6.000 | 5.700 | 57.000 | 13.000 | 20.000 | 0.800 | 4 | **6.008** |
| 6.000 | 6.000 | 5.700 | 57.000 | 13.000 | 20.000 | 1.000 | 4 | **6.010** |
| 6.000 | 6.000 | 5.700 | 57.000 | 13.000 | 20.000 | 1.500 | 4 | **6.015** |
| 6.000 | 6.000 | 5.700 | 57.000 | 13.000 | 20.000 | 2.000 | 4 | **6.020** |
| 8.000 | 8.000 | 7.700 | 63.000 | 19.000 | 26.000 | 0.500 | 4 | **8.005** |
| 8.000 | 8.000 | 7.700 | 63.000 | 19.000 | 26.000 | 0.800 | 4 | **8.008** |
| 8.000 | 8.000 | 7.700 | 63.000 | 19.000 | 26.000 | 1.000 | 4 | **8.010** |
| 8.000 | 8.000 | 7.700 | 63.000 | 19.000 | 26.000 | 1.500 | 4 | **8.015** |
| 8.000 | 8.000 | 7.700 | 63.000 | 19.000 | 26.000 | 2.000 | 4 | **8.020** |
| 10.000 | 10.000 | 9.500 | 72.000 | 22.000 | 30.000 | 0.500 | 4 | **10.005** |
| 10.000 | 10.000 | 9.500 | 72.000 | 22.000 | 30.000 | 0.800 | 4 | **10.008** |
| 10.000 | 10.000 | 9.500 | 72.000 | 22.000 | 30.000 | 1.000 | 4 | **10.010** |
| 10.000 | 10.000 | 9.500 | 72.000 | 22.000 | 30.000 | 2.000 | 4 | **10.020** |
| 12.000 | 12.000 | 11.500 | 83.000 | 26.000 | 36.000 | 0.500 | 4 | **12.005** |
| 12.000 | 12.000 | 11.500 | 83.000 | 26.000 | 36.000 | 0.800 | 4 | **12.008** |
| 12.000 | 12.000 | 11.500 | 83.000 | 26.000 | 36.000 | 1.000 | 4 | **12.010** |
| 12.000 | 12.000 | 11.500 | 83.000 | 26.000 | 36.000 | 1.500 | 4 | **12.015** |
| 12.000 | 12.000 | 11.500 | 83.000 | 26.000 | 36.000 | 2.000 | 4 | **12.020** |
| 12.000 | 12.000 | 11.500 | 83.000 | 26.000 | 36.000 | 2.500 | 4 | **12.025** |
| 12.000 | 12.000 | 11.500 | 83.000 | 26.000 | 36.000 | 3.000 | 4 | **12.030** |
| 12.000 | 12.000 | 11.500 | 83.000 | 26.000 | 36.000 | 4.000 | 4 | **12.040** |
| 16.000 | 16.000 | 15.500 | 92.000 | 32.000 | 42.000 | 0.500 | 4 | **16.005** |
| 16.000 | 16.000 | 15.500 | 92.000 | 32.000 | 42.000 | 0.800 | 4 | **16.008** |
| 16.000 | 16.000 | 15.500 | 92.000 | 32.000 | 42.000 | 1.000 | 4 | **16.010** |
| 16.000 | 16.000 | 15.500 | 92.000 | 32.000 | 42.000 | 1.500 | 4 | **16.015** |
| 16.000 | 16.000 | 15.500 | 92.000 | 32.000 | 42.000 | 2.000 | 4 | **16.020** |
| 16.000 | 16.000 | 15.500 | 92.000 | 32.000 | 42.000 | 2.500 | 4 | **16.025** |
| 16.000 | 16.000 | 15.500 | 92.000 | 32.000 | 42.000 | 3.000 | 4 | **16.030** |
| 16.000 | 16.000 | 15.500 | 92.000 | 32.000 | 42.000 | 4.000 | 4 | **16.040** |
| 20.000 | 20.000 | 19.500 | 104.000 | 38.000 | 52.000 | 1.000 | 4 | **20.010** |
| 20.000 | 20.000 | 19.500 | 104.000 | 38.000 | 52.000 | 2.000 | 4 | **20.020** |
| 20.000 | 20.000 | 19.500 | 104.000 | 38.000 | 52.000 | 4.000 | 4 | **20.040** |

| ISO | Hardness | $v_c$ | $f_z$ (mm/z) / Ø | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | 3 | 6 | 8 | 10 | 12 | 16 | 20 |
| | | | $a_p = l2$ | | HPC | HSC | | $a_e$ max = 0,10xD | |
| P | ≤ 850 N/mm² | **340** | 0,036 | 0,072 | 0,096 | 0,138 | 0,17 | 0,22 | 0,28 |
| | ≥ 850 N/mm² | **250** | 0,031 | 0,062 | 0,083 | 0,115 | 0,14 | 0,18 | 0,23 |
| M | ≤ 750 N/mm² | **220** | 0,031 | 0,062 | 0,083 | 0,115 | 0,14 | 0,18 | 0,23 |
| | ≥ 750 N/mm² | **110** | 0,024 | 0,048 | 0,064 | 0,092 | 0,11 | 0,15 | 0,18 |
| S | Ni-based | **60** | 0,019 | 0,039 | 0,052 | 0,074 | 0,09 | 0,12 | 0,15 |
| | Ti-based | **110** | 0,028 | 0,055 | 0,074 | 0,104 | 0,12 | 0,17 | 0,21 |
| N | ≤ 7 % Si | **900** | 0,045 | 0,090 | 0,120 | 0,184 | 0,22 | 0,29 | 0,37 |
| | ≥ 7 % Si | **430** | 0,038 | 0,076 | 0,101 | 0,138 | 0,17 | 0,22 | 0,28 |

| $v_c$ | $f_z$ (mm/z) / Ø | | | | | | |
|---|---|---|---|---|---|---|---|
| | 3 | 6 | 8 | 10 | 12 | 16 | 20 |
| | $a_p = l2$ | | | | $a_e$ max = 0,02xD | | |
| **360** | 0,017 | 0,034 | 0,046 | 0,066 | 0,08 | 0,11 | 0,13 |
| **270** | 0,015 | 0,030 | 0,040 | 0,055 | 0,07 | 0,09 | 0,11 |
| **240** | 0,015 | 0,030 | 0,040 | 0,055 | 0,07 | 0,09 | 0,11 |
| **120** | 0,011 | 0,021 | 0,028 | 0,040 | 0,05 | 0,06 | 0,08 |
| **60** | 0,008 | 0,017 | 0,022 | 0,032 | 0,04 | 0,05 | 0,06 |
| **120** | 0,013 | 0,026 | 0,035 | 0,050 | 0,06 | 0,08 | 0,10 |
| **1000** | 0,021 | 0,043 | 0,057 | 0,088 | 0,11 | 0,14 | 0,18 |
| **460** | 0,018 | 0,036 | 0,048 | 0,066 | 0,08 | 0,11 | 0,13 |

# SuperF-UT end mills

## SuperF-UT end mills S

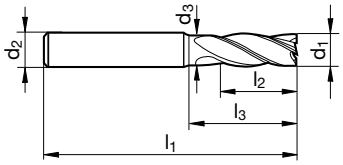
**Catalogue no. 54556**

SuperF-UT S | DIN 6527 L | VHM | AlTiN nano | HA | 40° 42° | 9°

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ○ | ○ | ○ | ○ | ○ | |

Application recommendations page 204-217

- without corner protection chamfer
- for fine-finishing operations
- up to 1600 N/mm²
- neck clearance
- centre cutting
- the unequal helix achieves smooth, chatter-free operation
- HB surface clamping available on request




| d1 h10 mm | d2 h6 mm | d3 mm | l1 mm | l2 mm | l3 mm | Z | Code no. |
|---|---|---|---|---|---|---|---|
| 3.000 | 6.000 | 2.800 | 57.000 | 8.000 | 15.000 | 4 | **3.000** |
| 4.000 | 6.000 | 3.800 | 57.000 | 11.000 | 18.000 | 4 | **4.000** |
| 5.000 | 6.000 | 4.800 | 57.000 | 13.000 | 18.000 | 4 | **5.000** |
| 6.000 | 6.000 | 5.700 | 57.000 | 13.000 | 20.000 | 4 | **6.000** |
| 8.000 | 8.000 | 7.700 | 63.000 | 19.000 | 26.000 | 4 | **8.000** |
| 10.000 | 10.000 | 9.500 | 72.000 | 22.000 | 30.000 | 4 | **10.000** |
| 12.000 | 12.000 | 11.500 | 83.000 | 26.000 | 36.000 | 4 | **12.000** |
| 16.000 | 16.000 | 15.500 | 92.000 | 32.000 | 42.000 | 4 | **16.000** |
| 20.000 | 20.000 | 19.500 | 104.000 | 38.000 | 52.000 | 4 | **20.000** |

| ISO | Hardness | $v_c$ | $f_z$ (mm/z) / Ø | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | 3 | 6 | 8 | 10 | 12 | 16 | 20 |
| | | | $a_p = l2$ | | | | $a_e$ max = 0,02xD | | |
| **P** | ≤ 850 N/mm² | **360** | 0,017 | 0,034 | 0,046 | 0,066 | 0,08 | 0,11 | 0,13 |
| | ≥ 850 N/mm² | **270** | 0,015 | 0,030 | 0,040 | 0,055 | 0,07 | 0,09 | 0,11 |
| **M** | ≤ 750 N/mm² | **240** | 0,015 | 0,030 | 0,040 | 0,055 | 0,07 | 0,09 | 0,11 |
| | ≥ 750 N/mm² | **120** | 0,011 | 0,021 | 0,028 | 0,040 | 0,05 | 0,06 | 0,08 |
| **S** | Ni-based | **60** | 0,008 | 0,017 | 0,022 | 0,032 | 0,04 | 0,05 | 0,06 |
| | Ti-based | **120** | 0,013 | 0,026 | 0,035 | 0,050 | 0,06 | 0,08 | 0,10 |

# SuperF-UT end mills

## SuperF-UT end mills N²

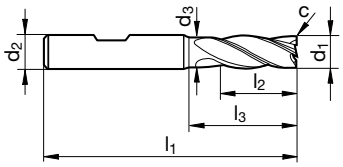
**Catalogue no. 64552**

HPC | HSC | SuperF-UT N² | DIN 6527 L | VHM | TiAlZrN | HB | 35° 38° | 4°

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ● | ○ | ● | ○ | ○ | ○ |

Application recommendations page 204-217

- wide material spectrum = for universal application
- extremely long tool life thanks to highly hard TiAlZrN coating
- up to 1600 N/mm²
- micro-corner protection
- neck clearance
- centre cutting
- the unequal helix achieves smooth, chatter-free operation
- also available as kit 78883 1.00




| d1 h10 mm | d2 h6 mm | d3 mm | l1 mm | l2 mm | l3 mm | c mm x 45° | Z | Code no. |
|---|---|---|---|---|---|---|---|---|
| 3.000 | 6.000 | 2.800 | 57.000 | 8.000 | 15.000 | 0.100 | 4 | **3.000** |
| 4.000 | 6.000 | 3.800 | 57.000 | 11.000 | 18.000 | 0.100 | 4 | **4.000** |
| 5.000 | 6.000 | 4.800 | 57.000 | 13.000 | 18.000 | 0.100 | 4 | **5.000** |
| 6.000 | 6.000 | 5.700 | 57.000 | 13.000 | 20.000 | 0.150 | 4 | **6.000** |
| 8.000 | 8.000 | 7.700 | 63.000 | 19.000 | 26.000 | 0.150 | 4 | **8.000** |
| 10.000 | 10.000 | 9.500 | 72.000 | 22.000 | 30.000 | 0.200 | 4 | **10.000** |
| 12.000 | 12.000 | 11.500 | 83.000 | 26.000 | 36.000 | 0.200 | 4 | **12.000** |
| 16.000 | 16.000 | 15.500 | 92.000 | 32.000 | 42.000 | 0.350 | 4 | **16.000** |
| 20.000 | 20.000 | 19.500 | 104.000 | 38.000 | 52.000 | 0.450 | 4 | **20.000** |
| 25.000 | 25.000 | 24.000 | 121.000 | 45.000 | 63.000 | 0.600 | 4 | **25.000** |

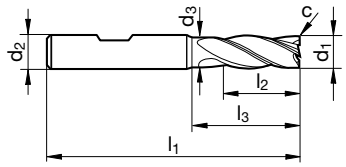
| ISO | Hardness | $v_c$ | $f_z$ (mm/z) / Ø | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | 3 | 6 | 8 | 10 | 12 | 16 | 20 |
| | | | $a_p$ = 1,0xD | | | | | $a_e$ = 1,0xD | |
| P | ≤ 850 N/mm² | **180** | 0,016 | 0,031 | 0,042 | 0,060 | 0,07 | 0,10 | 0,12 |
| | ≥ 850 N/mm² | **135** | 0,014 | 0,027 | 0,036 | 0,050 | 0,06 | 0,08 | 0,10 |
| K | ≤ 240 HB | **160** | 0,017 | 0,033 | 0,044 | 0,065 | 0,08 | 0,10 | 0,13 |
| | ≥ 240 HB | **140** | 0,015 | 0,030 | 0,040 | 0,055 | 0,07 | 0,09 | 0,11 |

| $v_c$ | $f_z$ (mm/z) / Ø | | | | | | |
|---|---|---|---|---|---|---|---|
| | 3 | 6 | 8 | 10 | 12 | 16 | 20 |
| | $a_p$ = l2 | | HPC | HSC | | $a_e$ max = 0,2xD | |
| **305** | 0,025 | 0,050 | 0,067 | 0,096 | 0,12 | 0,15 | 0,19 |
| **230** | 0,022 | 0,043 | 0,058 | 0,080 | 0,10 | 0,13 | 0,16 |
| **270** | 0,026 | 0,053 | 0,070 | 0,104 | 0,12 | 0,17 | 0,21 |
| **240** | 0,024 | 0,048 | 0,064 | 0,088 | 0,11 | 0,14 | 0,18 |

# SuperF-UT end mills

## SuperF-UT end mills NL

**Catalogue no. 54553**




HPC | HSC | SuperF-UT NL | WN | VHM | TiAlN | HB | 38° | 4°

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ● | ○ | ● | ○ | ○ | ○ |

Application recommendations page 204-217

- for universal application
- up to 1600 N/mm²
- micro-corner protection
- neck clearance
- centre cutting
- HSC finishing up to 4xD cutting edge length
- unequal flute spacing, equal helix

| d1 h10 mm | d2 h6 mm | d3 mm | l1 mm | l2 mm | l3 mm | c mm x 45° | Z | Code no. |
|---|---|---|---|---|---|---|---|---|
| 6.000 | 6.000 | 5.700 | 65.000 | 24.000 | 28.000 | 0.120 | 4 | **6.000** |
| 8.000 | 8.000 | 7.700 | 75.000 | 32.000 | 38.000 | 0.160 | 4 | **8.000** |
| 10.000 | 10.000 | 9.500 | 100.000 | 40.000 | 58.000 | 0.200 | 4 | **10.000** |
| 12.000 | 12.000 | 11.500 | 100.000 | 48.000 | 53.000 | 0.240 | 4 | **12.000** |
| 16.000 | 16.000 | 15.500 | 125.000 | 64.000 | 75.000 | 0.320 | 4 | **16.000** |
| 20.000 | 20.000 | 19.500 | 150.000 | 80.000 | 98.000 | 0.400 | 4 | **20.000** |
| 25.000 | 25.000 | 24.000 | 175.000 | 100.000 | 117.000 | 0.500 | 4 | **25.000** |



| ISO | Hardness | $v_c$ | $f_z$ (mm/z) / Ø 3 | 6 | 8 | 10 | 12 | 16 | 20 |
|---|---|---|---|---|---|---|---|---|---|
| | | | $a_p$ = l2 | | HPC | HSC | | $a_e$ max = 0,10xD | |
| P | ≤ 850 N/mm² | **130** | 0,013 | 0,025 | 0,012 | 0,048 | 0,06 | 0,08 | 0,10 |
| | ≥ 850 N/mm² | **100** | 0,011 | 0,022 | 0,029 | 0,040 | 0,05 | 0,06 | 0,08 |
| K | ≤ 240 HB | **120** | 0,013 | 0,027 | 0,035 | 0,052 | 0,06 | 0,08 | 0,10 |
| | ≥ 240 HB | **100** | 0,012 | 0,024 | 0,032 | 0,044 | 0,05 | 0,07 | 0,09 |

| $v_c$ | $f_z$ (mm/z) / Ø 3 | 6 | 8 | 10 | 12 | 16 | 20 |
|---|---|---|---|---|---|---|---|
| | $a_p$ = l2 | | | | $a_e$ max = 0,02xD | | |
| **160** | 0,009 | 0,017 | 0,023 | 0,033 | 0,04 | 0,05 | 0,07 |
| **120** | 0,007 | 0,015 | 0,020 | 0,028 | 0,03 | 0,04 | 0,06 |
| **140** | 0,009 | 0,018 | 0,024 | 0,036 | 0,04 | 0,06 | 0,07 |
| **120** | 0,008 | 0,017 | 0,022 | 0,030 | 0,04 | 0,05 | 0,06 |

# SuperF-UT end mills

## SuperF-UT end mills N-r

**Catalogue no. 54550**

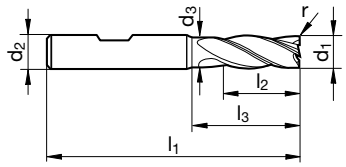
HPC | HSC | SuperF-UT N-r | DIN 6527 L | VHM | AlCrN | HB | 38° 40° | 12°

R±0,05

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ● | ○ | | ● | ● | |

Application recommendations page 204-217

- wide material spectrum = for universal application
- optimised for milling strategies, e.g. HPC and HSC
- with defined corner radii
- neck clearance
- centre cutting
- the unequal helix achieves smooth, chatter-free operation




| d1 h10 mm | d2 h6 mm | d3 mm | l1 mm | l2 mm | l3 mm | r | Z | Code no. |
|---|---|---|---|---|---|---|---|---|
| 3.000 | 6.000 | 2.800 | 57.000 | 8.000 | 15.000 | 0.200 | 4 | **3.002** |
| 3.000 | 6.000 | 2.800 | 57.000 | 8.000 | 15.000 | 0.500 | 4 | **3.005** |
| 4.000 | 6.000 | 3.800 | 57.000 | 11.000 | 18.000 | 0.200 | 4 | **4.002** |
| 4.000 | 6.000 | 3.800 | 57.000 | 11.000 | 18.000 | 0.500 | 4 | **4.005** |
| 4.000 | 6.000 | 3.800 | 57.000 | 11.000 | 18.000 | 1.000 | 4 | **4.010** |
| 5.000 | 6.000 | 4.800 | 57.000 | 13.000 | 18.000 | 0.200 | 4 | **5.002** |
| 5.000 | 6.000 | 4.800 | 57.000 | 13.000 | 18.000 | 0.500 | 4 | **5.005** |
| 5.000 | 6.000 | 4.800 | 57.000 | 13.000 | 18.000 | 1.000 | 4 | **5.010** |
| 6.000 | 6.000 | 5.700 | 57.000 | 13.000 | 20.000 | 0.200 | 4 | **6.002** |
| 6.000 | 6.000 | 5.700 | 57.000 | 13.000 | 20.000 | 0.500 | 4 | **6.005** |
| 6.000 | 6.000 | 5.700 | 57.000 | 13.000 | 20.000 | 1.000 | 4 | **6.010** |
| 6.000 | 6.000 | 5.700 | 57.000 | 13.000 | 20.000 | 1.500 | 4 | **6.015** |
| 8.000 | 8.000 | 7.700 | 63.000 | 19.000 | 26.000 | 0.300 | 4 | **8.003** |
| 8.000 | 8.000 | 7.700 | 63.000 | 19.000 | 26.000 | 0.500 | 4 | **8.005** |
| 8.000 | 8.000 | 7.700 | 63.000 | 19.000 | 26.000 | 1.000 | 4 | **8.010** |
| 8.000 | 8.000 | 7.700 | 63.000 | 19.000 | 26.000 | 1.500 | 4 | **8.015** |
| 8.000 | 8.000 | 7.700 | 63.000 | 19.000 | 26.000 | 2.000 | 4 | **8.020** |
| 10.000 | 10.000 | 9.500 | 72.000 | 22.000 | 30.000 | 0.300 | 4 | **10.003** |
| 10.000 | 10.000 | 9.500 | 72.000 | 22.000 | 30.000 | 0.500 | 4 | **10.005** |
| 10.000 | 10.000 | 9.500 | 72.000 | 22.000 | 30.000 | 1.000 | 4 | **10.010** |
| 10.000 | 10.000 | 9.500 | 72.000 | 22.000 | 30.000 | 1.500 | 4 | **10.015** |
| 10.000 | 10.000 | 9.500 | 72.000 | 22.000 | 30.000 | 2.000 | 4 | **10.020** |
| 10.000 | 10.000 | 9.500 | 72.000 | 22.000 | 30.000 | 2.500 | 4 | **10.025** |
| 12.000 | 12.000 | 11.500 | 83.000 | 26.000 | 36.000 | 0.300 | 4 | **12.003** |
| 12.000 | 12.000 | 11.500 | 83.000 | 26.000 | 36.000 | 0.500 | 4 | **12.005** |
| 12.000 | 12.000 | 11.500 | 83.000 | 26.000 | 36.000 | 1.000 | 4 | **12.010** |
| 12.000 | 12.000 | 11.500 | 83.000 | 26.000 | 36.000 | 1.500 | 4 | **12.015** |
| 12.000 | 12.000 | 11.500 | 83.000 | 26.000 | 36.000 | 2.000 | 4 | **12.020** |
| 12.000 | 12.000 | 11.500 | 83.000 | 26.000 | 36.000 | 2.500 | 4 | **12.025** |
| 12.000 | 12.000 | 11.500 | 83.000 | 26.000 | 36.000 | 3.000 | 4 | **12.030** |
| 16.000 | 16.000 | 15.500 | 92.000 | 32.000 | 42.000 | 0.500 | 4 | **16.005** |
| 16.000 | 16.000 | 15.500 | 92.000 | 32.000 | 42.000 | 1.000 | 4 | **16.010** |
| 16.000 | 16.000 | 15.500 | 92.000 | 32.000 | 42.000 | 1.500 | 4 | **16.015** |
| 16.000 | 16.000 | 15.500 | 92.000 | 32.000 | 42.000 | 2.000 | 4 | **16.020** |
| 16.000 | 16.000 | 15.500 | 92.000 | 32.000 | 42.000 | 2.500 | 4 | **16.025** |
| 16.000 | 16.000 | 15.500 | 92.000 | 32.000 | 42.000 | 3.000 | 4 | **16.030** |
| 16.000 | 16.000 | 15.500 | 92.000 | 32.000 | 42.000 | 4.000 | 4 | **16.040** |
| 20.000 | 20.000 | 19.500 | 104.000 | 38.000 | 52.000 | 0.500 | 4 | **20.005** |
| 20.000 | 20.000 | 19.500 | 104.000 | 38.000 | 52.000 | 1.000 | 4 | **20.010** |
| 20.000 | 20.000 | 19.500 | 104.000 | 38.000 | 52.000 | 1.500 | 4 | **20.015** |
| 20.000 | 20.000 | 19.500 | 104.000 | 38.000 | 52.000 | 2.000 | 4 | **20.020** |
| 20.000 | 20.000 | 19.500 | 104.000 | 38.000 | 52.000 | 2.500 | 4 | **20.025** |
| 20.000 | 20.000 | 19.500 | 104.000 | 38.000 | 52.000 | 3.000 | 4 | **20.030** |
| 20.000 | 20.000 | 19.500 | 104.000 | 38.000 | 52.000 | 4.000 | 4 | **20.040** |

| ISO | Hardness | $v_c$ | $f_z$ (mm/z) / Ø | | | | | | | $v_c$ | $f_z$ (mm/z) / Ø | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 3 | 6 | 8 | 10 | 12 | 16 | 20 | | 3 | 6 | 8 | 10 | 12 | 16 | 20 |
| | | | $a_p$ = 1,0xD | | | | | $a_e$ = 1,0xD | | | $a_p$ = 1,0xD | | | | $a_e$ max = 0,75xD | | |
| **P** | ≤ 850 N/mm² | **180** | 0,016 | 0,031 | 0,042 | 0,060 | 0,07 | 0,10 | 0,12 | **210** | 0,018 | 0,036 | 0,048 | 0,069 | 0,08 | 0,11 | 0,14 |
| | ≥ 850 N/mm² | **135** | 0,014 | 0,027 | 0,036 | 0,050 | 0,06 | 0,08 | 0,10 | **160** | 0,016 | 0,031 | 0,041 | 0,058 | 0,07 | 0,09 | 0,12 |
| **M** | ≤ 750 N/mm² | **120** | 0,014 | 0,027 | 0,036 | 0,050 | 0,06 | 0,08 | 0,10 | **140** | 0,016 | 0,031 | 0,041 | 0,058 | 0,07 | 0,09 | 0,12 |
| | ≥ 750 N/mm² | **60** | 0,011 | 0,021 | 0,028 | 0,040 | 0,05 | 0,06 | 0,08 | **80** | 0,013 | 0,025 | 0,034 | 0,048 | 0,06 | 0,08 | 0,10 |
| **S** | Ni-based | **30** | 0,008 | 0,017 | 0,022 | 0,032 | 0,04 | 0,05 | 0,06 | **40** | 0,010 | 0,020 | 0,027 | 0,038 | 0,05 | 0,06 | 0,08 |
| | Ti-based | **60** | 0,012 | 0,024 | 0,032 | 0,045 | 0,05 | 0,07 | 0,09 | **80** | 0,014 | 0,029 | 0,038 | 0,054 | 0,06 | 0,09 | 0,11 |
| **N** | ≤ 5 % Si | **500** | 0,020 | 0,039 | 0,052 | 0,080 | 0,10 | 0,13 | 0,16 | **600** | 0,022 | 0,045 | 0,060 | 0,092 | 0,11 | 0,15 | 0,18 |
| | ≥ 5 % Si | **230** | 0,017 | 0,033 | 0,044 | 0,060 | 0,07 | 0,10 | 0,12 | **300** | 0,019 | 0,038 | 0,051 | 0,069 | 0,08 | 0,11 | 0,14 |

# SuperF-UT end mills

## SuperF-UT end mills VA-X²

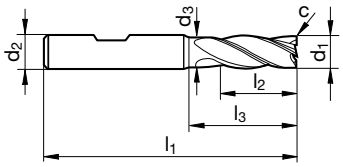
**Catalogue no. 64553**

HPC | HSC | SuperF-UT VA-X² | DIN 6527 L | VHM | TiAlZrN | HB | 36° 38° | 7°

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ○ | ● | | ○ | ● | |

Application recommendations page 204-217

- extremely long tool life thanks to highly hard TiAlZrN coating
- for the machining of stainless and acid-resistant steels as well as nickel-based alloys
- micro-corner protection
- neck clearance
- centre cutting
- the unequal helix achieves smooth, chatter-free operation




| d1 h10 mm | d2 h6 mm | d3 mm | l1 mm | l2 mm | l3 mm | c mm x 45° | Z | Code no. |
|---|---|---|---|---|---|---|---|---|
| 3.000 | 6.000 | 2.800 | 57.000 | 8.000 | 15.000 | 0.100 | 4 | **3.000** |
| 3.500 | 6.000 | 3.300 | 57.000 | 10.000 | 15.000 | 0.100 | 4 | **3.500** |
| 4.000 | 6.000 | 3.800 | 57.000 | 11.000 | 18.000 | 0.150 | 4 | **4.000** |
| 4.500 | 6.000 | 4.300 | 57.000 | 11.000 | 18.000 | 0.150 | 4 | **4.500** |
| 5.000 | 6.000 | 4.800 | 57.000 | 13.000 | 18.000 | 0.150 | 4 | **5.000** |
| 5.500 | 6.000 | 5.300 | 57.000 | 13.000 | 19.400 | 0.200 | 4 | **5.500** |
| 6.000 | 6.000 | 5.700 | 57.000 | 13.000 | 20.000 | 0.200 | 4 | **6.000** |
| 6.500 | 8.000 | 6.200 | 63.000 | 16.000 | 24.400 | 0.250 | 4 | **6.500** |
| 7.000 | 8.000 | 6.700 | 63.000 | 16.000 | 24.900 | 0.250 | 4 | **7.000** |
| 7.500 | 8.000 | 7.200 | 63.000 | 19.000 | 25.300 | 0.250 | 4 | **7.500** |
| 8.000 | 8.000 | 7.700 | 63.000 | 19.000 | 26.000 | 0.250 | 4 | **8.000** |
| 8.500 | 10.000 | 8.200 | 72.000 | 19.000 | 29.400 | 0.300 | 4 | **8.500** |
| 9.000 | 10.000 | 8.700 | 72.000 | 19.000 | 29.900 | 0.300 | 4 | **9.000** |
| 9.500 | 10.000 | 9.200 | 72.000 | 22.000 | 30.300 | 0.300 | 4 | **9.500** |
| 10.000 | 10.000 | 9.500 | 72.000 | 22.000 | 30.000 | 0.300 | 4 | **10.000** |
| 11.000 | 12.000 | 10.500 | 83.000 | 26.000 | 34.700 | 0.350 | 4 | **11.000** |
| 12.000 | 12.000 | 11.500 | 83.000 | 26.000 | 36.000 | 0.350 | 4 | **12.000** |
| 14.000 | 14.000 | 13.500 | 83.000 | 26.000 | 36.000 | 0.400 | 4 | **14.000** |
| 16.000 | 16.000 | 15.500 | 92.000 | 32.000 | 42.000 | 0.500 | 4 | **16.000** |
| 18.000 | 18.000 | 17.500 | 92.000 | 32.000 | 42.000 | 0.600 | 4 | **18.000** |
| 20.000 | 20.000 | 19.500 | 104.000 | 38.000 | 52.000 | 0.600 | 4 | **20.000** |
| 25.000 | 25.000 | 24.000 | 121.000 | 45.000 | 63.000 | 0.750 | 4 | **25.000** |

| ISO | Hardness | $v_c$ | $f_z$ (mm/z) / Ø | | | | | | | $v_c$ | $f_z$ (mm/z) / Ø | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 3 | 6 | 8 | 10 | 12 | 16 | 20 | | 3 | 6 | 8 | 10 | 12 | 16 | 20 |
| | | | $a_p$ = l2 | | HPC | HSC | | $a_e$ max = 0,10xD | | | $a_p$ = l2 | | | | | $a_e$ max = 0,02xD | |
| **P** | ≤ 850 N/mm² | **340** | 0,036 | 0,072 | 0,096 | 0,138 | 0,17 | 0,22 | 0,28 | **360** | 0,017 | 0,034 | 0,046 | 0,066 | 0,08 | 0,11 | 0,13 |
| | ≥ 850 N/mm² | **250** | 0,031 | 0,062 | 0,083 | 0,115 | 0,14 | 0,18 | 0,23 | **270** | 0,015 | 0,030 | 0,040 | 0,055 | 0,07 | 0,09 | 0,11 |
| **M** | ≤ 750 N/mm² | **220** | 0,031 | 0,062 | 0,083 | 0,115 | 0,14 | 0,18 | 0,23 | **240** | 0,015 | 0,030 | 0,040 | 0,055 | 0,07 | 0,09 | 0,11 |
| | ≥ 750 N/mm² | **110** | 0,024 | 0,048 | 0,064 | 0,092 | 0,11 | 0,15 | 0,18 | **120** | 0,011 | 0,021 | 0,028 | 0,040 | 0,05 | 0,06 | 0,08 |
| **S** | Ni-based | **60** | 0,019 | 0,039 | 0,052 | 0,074 | 0,09 | 0,12 | 0,15 | **60** | 0,008 | 0,017 | 0,022 | 0,032 | 0,04 | 0,05 | 0,06 |
| | Ti-based | **110** | 0,028 | 0,055 | 0,074 | 0,104 | 0,12 | 0,17 | 0,21 | **120** | 0,013 | 0,026 | 0,035 | 0,050 | 0,06 | 0,08 | 0,10 |
| **N** | ≤ 7 % Si | **900** | 0,045 | 0,090 | 0,120 | 0,184 | 0,22 | 0,29 | 0,37 | **1000** | 0,021 | 0,043 | 0,057 | 0,088 | 0,11 | 0,14 | 0,18 |
| | ≥ 7 % Si | **430** | 0,038 | 0,076 | 0,101 | 0,138 | 0,17 | 0,22 | 0,28 | **460** | 0,018 | 0,036 | 0,048 | 0,066 | 0,08 | 0,11 | 0,13 |

## SuperF-UT end mills

## SuperF-UT end mills VA-r

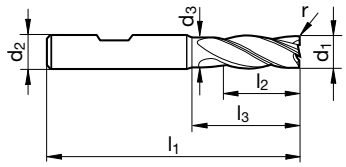
**Catalogue no. 54542**

HPC | HSC | SuperF-UT VA-r | DIN 6527 L | VHM | TiAlSiN | HB | 38° 40° | 12° | R±0,05

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ○ | ● | | ○ | ● | |

Application recommendations page 204-217

- acid resist./stainless steels
- optimised for milling strategies, e.g. HPC and HSC
- with defined corner radii
- neck clearance
- centre cutting
- the unequal helix achieves smooth, chatter-free operation



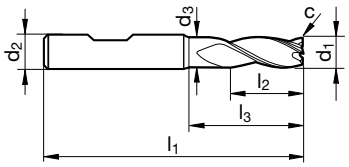

| d1 h10 mm | d2 h6 mm | d3 mm | l1 mm | l2 mm | l3 mm | r | Z | Code no. |
|---|---|---|---|---|---|---|---|---|
| 3.000 | 6.000 | 2.800 | 57.000 | 8.000 | 15.000 | 0.200 | 4 | **3.002** |
| 3.000 | 6.000 | 2.800 | 57.000 | 8.000 | 15.000 | 0.500 | 4 | **3.005** |
| 4.000 | 6.000 | 3.800 | 57.000 | 11.000 | 18.000 | 0.200 | 4 | **4.002** |
| 4.000 | 6.000 | 3.800 | 57.000 | 11.000 | 18.000 | 0.500 | 4 | **4.005** |
| 4.000 | 6.000 | 3.800 | 57.000 | 11.000 | 18.000 | 1.000 | 4 | **4.010** |
| 5.000 | 6.000 | 4.800 | 57.000 | 13.000 | 18.000 | 0.200 | 4 | **5.002** |
| 5.000 | 6.000 | 4.800 | 57.000 | 13.000 | 18.000 | 0.500 | 4 | **5.005** |
| 5.000 | 6.000 | 4.800 | 57.000 | 13.000 | 18.000 | 1.000 | 4 | **5.010** |
| 6.000 | 6.000 | 5.700 | 57.000 | 13.000 | 20.000 | 0.200 | 4 | **6.002** |
| 6.000 | 6.000 | 5.700 | 57.000 | 13.000 | 20.000 | 0.500 | 4 | **6.005** |
| 6.000 | 6.000 | 5.700 | 57.000 | 13.000 | 20.000 | 1.000 | 4 | **6.010** |
| 6.000 | 6.000 | 5.700 | 57.000 | 13.000 | 20.000 | 1.500 | 4 | **6.015** |
| 8.000 | 8.000 | 7.700 | 63.000 | 19.000 | 26.000 | 0.300 | 4 | **8.003** |
| 8.000 | 8.000 | 7.700 | 63.000 | 19.000 | 26.000 | 0.500 | 4 | **8.005** |
| 8.000 | 8.000 | 7.700 | 63.000 | 19.000 | 26.000 | 1.000 | 4 | **8.010** |
| 8.000 | 8.000 | 7.700 | 63.000 | 19.000 | 26.000 | 1.500 | 4 | **8.015** |
| 8.000 | 8.000 | 7.700 | 63.000 | 19.000 | 26.000 | 2.000 | 4 | **8.020** |
| 10.000 | 10.000 | 9.500 | 72.000 | 22.000 | 30.000 | 0.300 | 4 | **10.003** |
| 10.000 | 10.000 | 9.500 | 72.000 | 22.000 | 30.000 | 0.500 | 4 | **10.005** |
| 10.000 | 10.000 | 9.500 | 72.000 | 22.000 | 30.000 | 1.000 | 4 | **10.010** |
| 10.000 | 10.000 | 9.500 | 72.000 | 22.000 | 30.000 | 1.500 | 4 | **10.015** |
| 10.000 | 10.000 | 9.500 | 72.000 | 22.000 | 30.000 | 2.000 | 4 | **10.020** |
| 10.000 | 10.000 | 9.500 | 72.000 | 22.000 | 30.000 | 2.500 | 4 | **10.025** |
| 12.000 | 12.000 | 11.500 | 83.000 | 26.000 | 36.000 | 0.300 | 4 | **12.003** |
| 12.000 | 12.000 | 11.500 | 83.000 | 26.000 | 36.000 | 0.500 | 4 | **12.005** |
| 12.000 | 12.000 | 11.500 | 83.000 | 26.000 | 36.000 | 1.000 | 4 | **12.010** |
| 12.000 | 12.000 | 11.500 | 83.000 | 26.000 | 36.000 | 1.500 | 4 | **12.015** |
| 12.000 | 12.000 | 11.500 | 83.000 | 26.000 | 36.000 | 2.000 | 4 | **12.020** |
| 12.000 | 12.000 | 11.500 | 83.000 | 26.000 | 36.000 | 2.500 | 4 | **12.025** |
| 12.000 | 12.000 | 11.500 | 83.000 | 26.000 | 36.000 | 3.000 | 4 | **12.030** |
| 16.000 | 16.000 | 15.500 | 92.000 | 32.000 | 42.000 | 0.500 | 4 | **16.005** |
| 16.000 | 16.000 | 15.500 | 92.000 | 32.000 | 42.000 | 1.000 | 4 | **16.010** |
| 16.000 | 16.000 | 15.500 | 92.000 | 32.000 | 42.000 | 1.500 | 4 | **16.015** |
| 16.000 | 16.000 | 15.500 | 92.000 | 32.000 | 42.000 | 2.000 | 4 | **16.020** |
| 16.000 | 16.000 | 15.500 | 92.000 | 32.000 | 42.000 | 2.500 | 4 | **16.025** |
| 16.000 | 16.000 | 15.500 | 92.000 | 32.000 | 42.000 | 3.000 | 4 | **16.030** |
| 16.000 | 16.000 | 15.500 | 92.000 | 32.000 | 42.000 | 4.000 | 4 | **16.040** |
| 20.000 | 20.000 | 19.500 | 104.000 | 38.000 | 52.000 | 0.500 | 4 | **20.005** |
| 20.000 | 20.000 | 19.500 | 104.000 | 38.000 | 52.000 | 1.000 | 4 | **20.010** |
| 20.000 | 20.000 | 19.500 | 104.000 | 38.000 | 52.000 | 1.500 | 4 | **20.015** |
| 20.000 | 20.000 | 19.500 | 104.000 | 38.000 | 52.000 | 2.000 | 4 | **20.020** |
| 20.000 | 20.000 | 19.500 | 104.000 | 38.000 | 52.000 | 2.500 | 4 | **20.025** |
| 20.000 | 20.000 | 19.500 | 104.000 | 38.000 | 52.000 | 3.000 | 4 | **20.030** |
| 20.000 | 20.000 | 19.500 | 104.000 | 38.000 | 52.000 | 4.000 | 4 | **20.040** |

| ISO | Hardness | $v_c$ | $f_z$ (mm/z) / Ø | | | | | | | $v_c$ | $f_z$ (mm/z) / Ø | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 3 | 6 | 8 | 10 | 12 | 16 | 20 | | 3 | 6 | 8 | 10 | 12 | 16 | 20 |
| | | | $a_p$ = 1,0xD | | | | | $a_e$ = 1,0xD | | | $a_p$ = 1,0xD | | | | | $a_e$ max = 0,75xD | |
| **P** | ≤ 850 N/mm² | **180** | 0,016 | 0,031 | 0,042 | 0,060 | 0,07 | 0,10 | 0,12 | **210** | 0,018 | 0,036 | 0,048 | 0,069 | 0,08 | 0,11 | 0,14 |
| | ≥ 850 N/mm² | **135** | 0,014 | 0,027 | 0,036 | 0,050 | 0,06 | 0,08 | 0,10 | **160** | 0,016 | 0,031 | 0,041 | 0,058 | 0,07 | 0,09 | 0,12 |
| **M** | ≤ 750 N/mm² | **120** | 0,014 | 0,027 | 0,036 | 0,050 | 0,06 | 0,08 | 0,10 | **140** | 0,016 | 0,031 | 0,041 | 0,058 | 0,07 | 0,09 | 0,12 |
| | ≥ 750 N/mm² | **60** | 0,011 | 0,021 | 0,028 | 0,040 | 0,05 | 0,06 | 0,08 | **80** | 0,013 | 0,025 | 0,034 | 0,048 | 0,06 | 0,08 | 0,10 |
| **S** | Ni-based | **30** | 0,008 | 0,017 | 0,022 | 0,032 | 0,04 | 0,05 | 0,06 | **40** | 0,010 | 0,020 | 0,027 | 0,038 | 0,05 | 0,06 | 0,08 |
| | Ti-based | **60** | 0,012 | 0,024 | 0,032 | 0,045 | 0,05 | 0,07 | 0,09 | **80** | 0,014 | 0,029 | 0,038 | 0,054 | 0,06 | 0,09 | 0,11 |
| **N** | ≤ 5 % Si | **500** | 0,020 | 0,039 | 0,052 | 0,080 | 0,10 | 0,13 | 0,16 | **600** | 0,022 | 0,045 | 0,060 | 0,092 | 0,11 | 0,15 | 0,18 |
| | ≥ 5 % Si | **230** | 0,017 | 0,033 | 0,044 | 0,060 | 0,07 | 0,10 | 0,12 | **300** | 0,019 | 0,038 | 0,051 | 0,069 | 0,08 | 0,11 | 0,14 |

# SuperF-UT end mills

## SuperF-UT end mills Al-L

**Catalogue no. 74556**




HPC | HSC | SuperF-UT Al-L | WN | VHM | bright | HB | 39° 40° 41° | 10°

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| | | | ● | | |

Application recommendations page 204-217

- nano polished cutting edges
- particularly stable thanks to re-inforced core
- neck clearance
- centre cutting
- 3-fluted with increased flute space
- aluminium and aluminium-alloys as well as other long-chipping non-ferrous metals
- the unequal helix achieves smooth, chatter-free operation
- 3xD cutting edge length
- mirror finish for optimal chip evacuation
- optimised micro geometry

| d1 e8<br>mm | d2 h6<br>mm | d3<br>mm | l1<br>mm | l2<br>mm | l3<br>mm | c<br>mm x 45° | Z | **Code no.** |
|---|---|---|---|---|---|---|---|---|
| 5.000 | 6.000 | 4.800 | 57.000 | 15.000 | 19.400 | 0.050 | 3 | **5.000** |
| 6.000 | 6.000 | 5.700 | 65.000 | 18.000 | 28.000 | 0.060 | 3 | **6.000** |
| 8.000 | 8.000 | 7.700 | 75.000 | 24.000 | 38.000 | 0.080 | 3 | **8.000** |
| 10.000 | 10.000 | 9.500 | 80.000 | 30.000 | 38.000 | 0.100 | 3 | **10.000** |
| 12.000 | 12.000 | 11.500 | 93.000 | 36.000 | 46.000 | 0.120 | 3 | **12.000** |
| 16.000 | 16.000 | 15.500 | 108.000 | 48.000 | 58.000 | 0.160 | 3 | **16.000** |
| 20.000 | 20.000 | 19.500 | 126.000 | 60.000 | 74.000 | 0.200 | 3 | **20.000** |

| ISO | Hardness | $v_c$ | $f_z$ (mm/z) / Ø | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | 3 | 6 | 8 | 10 | 12 | 16 | 20 |
| | | | $a_p$ = l2 | | HPC | HSC | | $a_e$ max =0,10xD | |
| **N** | ≤ 5 % Si | **900** | 0,045 | 0,090 | 0,120 | 0,184 | 0,221 | 0,294 | 0,368 |
| | ≥ 5 % Si | **400** | 0,038 | 0,076 | 0,101 | 0,138 | 0,166 | 0,221 | 0,276 |
| **NF** | ≤ 850 N/mm² | **470** | 0,038 | 0,076 | 0,101 | 0,138 | 0,166 | 0,221 | 0,276 |

| $v_c$ | $f_z$ (mm/z) / Ø | | | | | | |
|---|---|---|---|---|---|---|---|
| | 3 | 6 | 8 | 10 | 12 | 16 | 20 |
| | $a_p$ = l2 | | | | $a_e$ max = 0,02xD | | |
| **1000** | 0,021 | 0,043 | 0,057 | 0,088 | 0,106 | 0,141 | 0,176 |
| **460** | 0,018 | 0,036 | 0,048 | 0,066 | 0,079 | 0,106 | 0,132 |
| **500** | 0,018 | 0,030 | 0,036 | 0,048 | 0,066 | 0,079 | 0,106 |

Our Carbo-coating is available as an option to improve chip flow and tool life

# SuperF-UT end mills

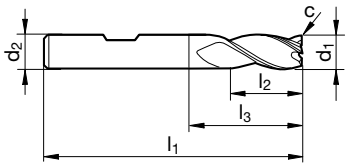
## SuperF-UT end mills Al-XL

**Catalogue no. 74558**

HPC | HSC | SuperF-UT Al-XL | WN | VHM | bright | HB | 39° 40° 41° | 10°

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| | | | ● | | |

Application recommendations page 204-217




- nano polished cutting edges
- particularly stable thanks to re-inforced core
- centre cutting
- 3-fluted with increased flute space
- aluminium and aluminium-alloys as well as other long-chipping non-ferrous metals
- the unequal helix achieves smooth, chatter-free operation
- 5xD cutting edge length
- mirror finish for optimal chip evacuation
- optimised micro geometry
- without neck clearance

| d1 e8<br>mm | d2 h6<br>mm | l1<br>mm | l2<br>mm | l3<br>mm | c<br>mm x 45° | Z | **Code no.** |
|---|---|---|---|---|---|---|---|
| 6.000 | 6.000 | 75.000 | 30.000 | 39.000 | 0.060 | 3 | **6.000** |
| 8.000 | 8.000 | 86.000 | 40.000 | 50.000 | 0.080 | 3 | **8.000** |
| 10.000 | 10.000 | 100.000 | 50.000 | 60.000 | 0.100 | 3 | **10.000** |
| 12.000 | 12.000 | 120.000 | 60.000 | 75.000 | 0.120 | 3 | **12.000** |
| 16.000 | 16.000 | 150.000 | 80.000 | 102.000 | 0.160 | 3 | **16.000** |
| 20.000 | 20.000 | 175.000 | 100.000 | 125.000 | 0.200 | 3 | **20.000** |

| ISO | Hardness | $v_c$ | $f_z$ (mm/z) / Ø | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | 3 | 6 | 8 | 10 | 12 | 16 | 20 |
| | | | $a_p$ = l2 | | HPC | HSC | | $a_e$ max = 0,10xD | |
| **N** | ≤ 5 % Si | **400** | 0,016 | 0,031 | 0,042 | 0,064 | 0,08 | 0,10 | 0,13 |
| | ≥ 5 % Si | **200** | 0,013 | 0,027 | 0,035 | 0,048 | 0,06 | 0,08 | 0,10 |
| **NF** | ≤ 850 N/mm² | **190** | 0,013 | 0,027 | 0,035 | 0,048 | 0,06 | 0,08 | 0,10 |

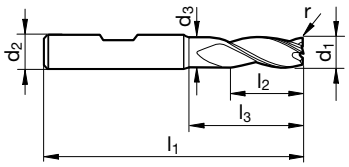
| $v_c$ | $f_z$ (mm/z) / Ø | | | | | | |
|---|---|---|---|---|---|---|---|
| | 3 | 6 | 8 | 10 | 12 | 16 | 20 |
| | $a_p$ = l2 | | | | $a_e$ max = 0,02xD | | |
| **450** | 0,010 | 0,020 | 0,026 | 0,040 | 0,048 | 0,064 | 0,080 |
| **210** | 0,008 | 0,017 | 0,022 | 0,030 | 0,036 | 0,048 | 0,060 |
| **220** | 0,008 | 0,017 | 0,022 | 0,030 | 0,036 | 0,048 | 0,060 |

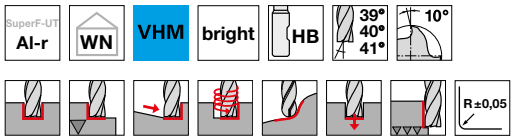
Our Carbo-coating is available as an option to improve chip flow and tool life

# SuperF-UT end mills

## SuperF-UT end mills Al-r

**Catalogue no. 74562**




| P | M | K | N | S | H |
|---|---|---|---|---|---|
| | | | ● | | |

Application recommendations page 204-217

- nano polished cutting edges
- neck clearance
- centre cutting
- 3-fluted with increased flute space
- aluminium and aluminium-alloys as well as other long-chipping non-ferrous metals
- the unequal helix achieves smooth, chatter-free operation
- with defined corner radii
- mirror finish for optimal chip evacuation
- optimised micro geometry

| d1 e8 mm | d2 h6 mm | d3 mm | l1 mm | l2 mm | l3 mm | r | Z | Code no. |
|---|---|---|---|---|---|---|---|---|
| 6.000 | 6.000 | 5.700 | 57.000 | 13.000 | 20.000 | 0.500 | 3 | **6.005** |
| 6.000 | 6.000 | 5.700 | 57.000 | 13.000 | 20.000 | 1.000 | 3 | **6.010** |
| 8.000 | 8.000 | 7.700 | 63.000 | 19.000 | 26.000 | 0.500 | 3 | **8.005** |
| 8.000 | 8.000 | 7.700 | 63.000 | 19.000 | 26.000 | 1.000 | 3 | **8.010** |
| 10.000 | 10.000 | 9.500 | 72.000 | 22.000 | 30.000 | 0.500 | 3 | **10.005** |
| 10.000 | 10.000 | 9.500 | 72.000 | 22.000 | 30.000 | 1.000 | 3 | **10.010** |
| 10.000 | 10.000 | 9.500 | 72.000 | 22.000 | 30.000 | 1.500 | 3 | **10.015** |
| 12.000 | 12.000 | 11.500 | 83.000 | 26.000 | 36.000 | 0.500 | 3 | **12.005** |
| 12.000 | 12.000 | 11.500 | 83.000 | 26.000 | 36.000 | 1.000 | 3 | **12.010** |
| 12.000 | 12.000 | 11.500 | 83.000 | 26.000 | 36.000 | 1.500 | 3 | **12.015** |
| 12.000 | 12.000 | 11.500 | 83.000 | 26.000 | 36.000 | 2.000 | 3 | **12.020** |
| 12.000 | 12.000 | 11.500 | 83.000 | 26.000 | 36.000 | 2.500 | 3 | **12.025** |
| 12.000 | 12.000 | 11.500 | 83.000 | 26.000 | 36.000 | 3.000 | 3 | **12.030** |
| 12.000 | 12.000 | 11.500 | 83.000 | 26.000 | 36.000 | 4.000 | 3 | **12.040** |
| 16.000 | 16.000 | 15.500 | 92.000 | 32.000 | 42.000 | 1.000 | 3 | **16.010** |
| 16.000 | 16.000 | 15.500 | 92.000 | 32.000 | 42.000 | 2.000 | 3 | **16.020** |
| 16.000 | 16.000 | 15.500 | 92.000 | 32.000 | 42.000 | 2.500 | 3 | **16.025** |
| 16.000 | 16.000 | 15.500 | 92.000 | 32.000 | 42.000 | 3.000 | 3 | **16.030** |
| 16.000 | 16.000 | 15.500 | 92.000 | 32.000 | 42.000 | 4.000 | 3 | **16.040** |
| 20.000 | 20.000 | 19.500 | 104.000 | 38.000 | 52.000 | 1.000 | 3 | **20.010** |
| 20.000 | 20.000 | 19.500 | 104.000 | 38.000 | 52.000 | 2.000 | 3 | **20.020** |
| 20.000 | 20.000 | 19.500 | 104.000 | 38.000 | 52.000 | 2.500 | 3 | **20.025** |
| 20.000 | 20.000 | 19.500 | 104.000 | 38.000 | 52.000 | 3.000 | 3 | **20.030** |
| 20.000 | 20.000 | 19.500 | 104.000 | 38.000 | 52.000 | 4.000 | 3 | **20.040** |
| 25.000 | 25.000 | 24.000 | 121.000 | 45.000 | 63.000 | 2.000 | 3 | **25.020** |
| 25.000 | 25.000 | 24.000 | 121.000 | 45.000 | 63.000 | 3.000 | 3 | **25.030** |
| 25.000 | 25.000 | 24.000 | 121.000 | 45.000 | 63.000 | 4.000 | 3 | **25.040** |

| ISO | Hardness | $v_c$ | $f_z$ (mm/z) / Ø | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | 3 | 6 | 8 | 10 | 12 | 16 | 20 |
| | | | $a_p$ = 1,0xD | | | | | $a_e$ = 1,0xD | |
| **N** | ≤ 5 % Si | **500** | 0,020 | 0,039 | 0,052 | 0,080 | 0,10 | 0,13 | 0,16 |
| | ≥ 5 % Si | **230** | 0,017 | 0,033 | 0,044 | 0,060 | 0,07 | 0,10 | 0,12 |
| **NF** | ≤ 850 N/mm² | **250** | 0,017 | 0,033 | 0,044 | 0,060 | 0,07 | 0,10 | 0,12 |

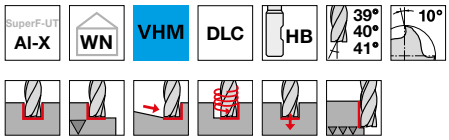
| $v_c$ | $f_z$ (mm/z) / Ø | | | | | | |
|---|---|---|---|---|---|---|---|
| | 3 | 6 | 8 | 10 | 12 | 16 | 20 |
| | $a_p$ = l2 | | | | $a_e$ max = 0,33xD | | |
| **750** | 0,025 | 0,051 | 0,068 | 0,104 | 0,12 | 0,17 | 0,21 |
| **345** | 0,021 | 0,043 | 0,057 | 0,078 | 0,09 | 0,12 | 0,16 |
| **375** | 0,021 | 0,043 | 0,057 | 0,078 | 0,09 | 0,12 | 0,16 |

Our Carbo-coating is available as an option to improve chip flow and tool life

# SuperF-UT end mills

## SuperF-UT end mills Al-X

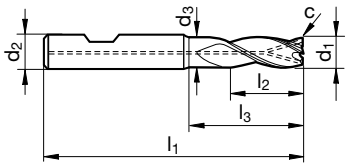
**Catalogue no. 54592**




| P | M | K | N | S | H |
|---|---|---|---|---|---|
| | | | ● | | |

Application recommendations page 204-217

- with internal cooling: Radial and axial exits
- nano polished cutting edges
- neck clearance
- centre cutting
- 3-fluted with increased flute space
- aluminium and aluminium-alloys as well as other long-chipping non-ferrous metals
- the unequal helix achieves smooth, chatter-free operation
- extremely long tool life thanks to highly hard DLC coating




| d1 e8<br>mm | d2 h6<br>mm | d3<br>mm | l1<br>mm | l2<br>mm | l3<br>mm | c<br>mm x 45° | Z | **Code no.** |
|---|---|---|---|---|---|---|---|---|
| 5.000 | 6.000 | 4.800 | 57.000 | 13.000 | 18.000 | 0.050 | 3 | **5.000** |
| 6.000 | 6.000 | 5.700 | 57.000 | 13.000 | 20.000 | 0.060 | 3 | **6.000** |
| 8.000 | 8.000 | 7.700 | 63.000 | 19.000 | 26.000 | 0.080 | 3 | **8.000** |
| 10.000 | 10.000 | 9.500 | 72.000 | 22.000 | 30.000 | 0.100 | 3 | **10.000** |
| 12.000 | 12.000 | 11.500 | 83.000 | 26.000 | 36.000 | 0.120 | 3 | **12.000** |
| 16.000 | 16.000 | 15.500 | 92.000 | 32.000 | 42.000 | 0.160 | 3 | **16.000** |
| 20.000 | 20.000 | 19.500 | 104.000 | 38.000 | 52.000 | 0.200 | 3 | **20.000** |

| ISO | Hardness | $v_c$ | $f_z$ (mm/z) / Ø | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | 3 | 6 | 8 | 10 | 12 | 16 | 20 |
| | | | $a_p$ = 1,0xD | | | | | $a_e$ = 1,0xD | |
| **N** | ≤ 5 % Si | **500** | 0,020 | 0,039 | 0,052 | 0,080 | 0,10 | 0,13 | 0,16 |
| | ≥ 5 % Si | **230** | 0,017 | 0,033 | 0,044 | 0,060 | 0,07 | 0,10 | 0,12 |
| **NF** | ≤ 850 N/mm² | **250** | 0,017 | 0,033 | 0,044 | 0,060 | 0,07 | 0,10 | 0,12 |

| $v_c$ | $f_z$ (mm/z) / Ø | | | | | | |
|---|---|---|---|---|---|---|---|
| | 3 | 6 | 8 | 10 | 12 | 16 | 20 |
| | $a_p$ = l2 | | | | $a_e$ max = 0,33xD | | |
| **750** | 0,025 | 0,051 | 0,068 | 0,104 | 0,12 | 0,17 | 0,21 |
| **345** | 0,021 | 0,043 | 0,057 | 0,078 | 0,09 | 0,12 | 0,16 |
| **375** | 0,021 | 0,043 | 0,057 | 0,078 | 0,09 | 0,12 | 0,16 |

# SuperF-UT end mills

## SuperF-UT end mill Z, sets

**Catalogue no. 78882**

TC | HPC | HSC | SuperF-UT Z | WN | VHM | AlTiN+ | HB | 48° | 9°

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ● | ● | | | ● | |

Application recommendations page 204-217

- particularly stable thanks to re-inforced core
- for universal application
- for materials up to 1400 N/mm²
- micro-corner protection
- centre cutting
- unequal flute spacing
- HPC machining of tough, low- and high-alloyed steels and difficult to machine special materials
- consisting of catalogue no. 54577

| Code no. | d1<br>mm | Pieces/set |
|---|---|---|
| **1.000** | **6.0-16.0** | 5 |
| **2.000** | **6.0-12.0** | 4 |

| ISO | Hardness | $v_c$ | $f_z$ (mm/z) / Ø | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | 3 | 6 | 8 | 10 | 12 | 16 | 20 |
| | | | $a_p$ = l2 | | HPC | HSC | | $a_e$ max = 0,10xD | |
| P | ≤ 850 N/mm² | **340** | 0,036 | 0,072 | 0,096 | 0,138 | 0,17 | 0,22 | 0,28 |
| | ≥ 850 N/mm² | **250** | 0,031 | 0,062 | 0,083 | 0,115 | 0,14 | 0,18 | 0,23 |
| M | ≤ 750 N/mm² | **220** | 0,031 | 0,062 | 0,083 | 0,115 | 0,14 | 0,18 | 0,23 |
| | ≥ 750 N/mm² | **110** | 0,024 | 0,048 | 0,064 | 0,092 | 0,11 | 0,15 | 0,18 |
| S | Ni-based | **60** | 0,019 | 0,039 | 0,052 | 0,074 | 0,09 | 0,12 | 0,15 |
| | Ti-based | **110** | 0,028 | 0,055 | 0,074 | 0,104 | 0,12 | 0,17 | 0,21 |

| $v_c$ | $f_z$ (mm/z) / Ø | | | | | | |
|---|---|---|---|---|---|---|---|
| | 3 | 6 | 8 | 10 | 12 | 16 | 20 |
| | $a_p$ = l2 | | | | $a_e$ max = 0,02xD | | |
| **360** | 0,017 | 0,034 | 0,046 | 0,066 | 0,08 | 0,11 | 0,13 |
| **270** | 0,015 | 0,030 | 0,040 | 0,055 | 0,07 | 0,09 | 0,11 |
| **240** | 0,015 | 0,030 | 0,040 | 0,055 | 0,07 | 0,09 | 0,11 |
| **120** | 0,011 | 0,021 | 0,028 | 0,040 | 0,05 | 0,06 | 0,08 |
| **60** | 0,008 | 0,017 | 0,022 | 0,032 | 0,04 | 0,05 | 0,06 |
| **120** | 0,013 | 0,026 | 0,035 | 0,050 | 0,06 | 0,08 | 0,10 |

# SuperF-UT end mills

## SuperF-UT end mill N², sets

**Catalogue no. 78883**

HPC | HSC | SuperF-UT N² | DIN 6527 L | VHM | TiAlZrN | HB | 35° 38° | 4°

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ● | ○ | ● | ○ | ○ | ○ |

Application recommendations page 204-217

- wide material spectrum = for universal application
- extremely long tool life thanks to highly hard TiAlZrN coating
- up to 1600 N/mm²
- micro-corner protection
- neck clearance
- centre cutting
- the unequal helix achieves smooth, chatter-free operation
- consisting of catalogue no. 64552

| Code no. | d1 mm | Pieces/set |
|---|---|---|
| **1.000** | **6.0-16.0** | 5 |

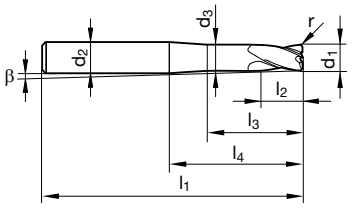
| ISO | Hardness | $v_c$ | $f_z$ (mm/z) / Ø | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | 3 | 6 | 8 | 10 | 12 | 16 | 20 |
| | | | $a_p$ = 1,0xD | | | | $a_e$ = 1,0xD | | |
| **P** | ≤ 850 N/mm² | **180** | 0,016 | 0,031 | 0,042 | 0,060 | 0,07 | 0,10 | 0,12 |
| | ≥ 850 N/mm² | **135** | 0,014 | 0,027 | 0,036 | 0,050 | 0,06 | 0,08 | 0,10 |
| **K** | ≤ 240 HB | **160** | 0,017 | 0,033 | 0,044 | 0,065 | 0,08 | 0,10 | 0,13 |
| | ≥ 240 HB | **140** | 0,015 | 0,030 | 0,040 | 0,055 | 0,07 | 0,09 | 0,11 |

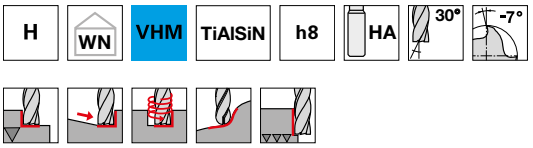
| $v_c$ | $f_z$ (mm/z) / Ø | | | | | | |
|---|---|---|---|---|---|---|---|
| | 3 | 6 | 8 | 10 | 12 | 16 | 20 |
| | $a_p$ = l2 | | HPC | HSC | | $a_e$ max = 0,2xD | |
| **305** | 0,025 | 0,050 | 0,067 | 0,096 | 0,12 | 0,15 | 0,19 |
| **230** | 0,022 | 0,043 | 0,058 | 0,080 | 0,10 | 0,13 | 0,16 |
| **270** | 0,026 | 0,053 | 0,070 | 0,104 | 0,12 | 0,17 | 0,21 |
| **240** | 0,024 | 0,048 | 0,064 | 0,088 | 0,11 | 0,14 | 0,18 |

## Solid carbide end mills

### Torus end mills

**Catalogue no. 54304**




| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ○ | | ● | | | ● |

Application recommendations page 204-217

- short version
- centre cutting
- for the moulding-industry
- long tool life thanks to extremely hard coating
- up to 63 HRC

| d1 h8 mm | d2 h6 mm | d3 mm | l1 mm | l2 mm | l3 mm | l4 mm | r mm | β ° | Z | Code no. |
|---|---|---|---|---|---|---|---|---|---|---|
| **1.000** | 4.000 | 0.950 | 50.000 | 2.000 | 6.000 | 20.000 | 0.200 | 4.000 | 2 | 1.002 |
| **2.000** | 6.000 | 1.900 | 57.000 | 3.000 | 8.000 | 21.000 | 0.200 | 5.500 | 2 | 2.002 |
| **2.000** | 6.000 | 1.900 | 57.000 | 3.000 | 8.000 | 21.000 | 0.500 | 5.600 | 2 | 2.005 |
| **3.000** | 6.000 | 2.800 | 57.000 | 3.500 | 14.000 | 21.000 | 0.500 | 4.200 | 4 | 3.000 |
| **3.000** | 6.000 | 2.800 | 57.000 | 3.500 | 14.000 | 21.000 | 0.300 | 4.200 | 4 | 3.003 |
| **4.000** | 6.000 | 3.800 | 57.000 | 4.000 | 16.000 | 21.000 | 0.500 | 2.800 | 4 | 4.000 |
| **4.000** | 6.000 | 3.800 | 57.000 | 4.000 | 16.000 | 21.000 | 0.300 | 2.800 | 4 | 4.003 |
| **5.000** | 6.000 | 4.800 | 57.000 | 5.000 | 18.000 | 21.000 | 0.500 | 1.400 | 4 | 5.000 |
| **5.000** | 6.000 | 4.800 | 57.000 | 5.000 | 18.000 | 21.000 | 0.300 | 1.400 | 4 | 5.003 |
| **6.000** | 6.000 | 5.700 | 57.000 | 6.000 | 20.000 | 21.000 | 1.000 | | 4 | 6.000 |
| **6.000** | 6.000 | 5.700 | 57.000 | 6.000 | 20.000 | 21.000 | 0.300 | | 4 | 6.003 |
| **6.000** | 6.000 | 5.700 | 57.000 | 6.000 | 20.000 | 21.000 | 0.500 | | 4 | 6.005 |
| **6.000** | 6.000 | 5.700 | 57.000 | 6.000 | 20.000 | 21.000 | 1.500 | | 4 | 6.015 |
| **8.000** | 8.000 | 7.700 | 63.000 | 8.000 | 26.000 | 27.000 | 1.000 | | 4 | 8.000 |
| **8.000** | 8.000 | 7.700 | 63.000 | 8.000 | 26.000 | 27.000 | 0.500 | | 4 | 8.005 |
| **8.000** | 8.000 | 7.700 | 63.000 | 8.000 | 26.000 | 27.000 | 2.000 | | 4 | 8.020 |
| **10.000** | 10.000 | 9.500 | 72.000 | 10.000 | 30.000 | 32.000 | 1.500 | | 4 | 10.000 |
| **10.000** | 10.000 | 9.500 | 72.000 | 10.000 | 30.000 | 32.000 | 0.500 | | 4 | 10.005 |
| **10.000** | 10.000 | 9.500 | 72.000 | 10.000 | 30.000 | 32.000 | 1.000 | | 4 | 10.010 |
| **12.000** | 12.000 | 11.500 | 83.000 | 12.000 | 36.000 | 38.000 | 1.500 | | 4 | 12.000 |
| **12.000** | 12.000 | 11.500 | 83.000 | 12.000 | 36.000 | 38.000 | 0.500 | | 4 | 12.005 |
| **12.000** | 12.000 | 11.500 | 83.000 | 12.000 | 36.000 | 38.000 | 1.000 | | 4 | 12.010 |
| **12.000** | 12.000 | 11.500 | 83.000 | 12.000 | 36.000 | 38.000 | 2.000 | | 4 | 12.020 |
| **16.000** | 16.000 | 15.500 | 92.000 | 16.000 | 42.000 | 44.000 | 2.000 | | 4 | 16.000 |
| **16.000** | 16.000 | 15.500 | 92.000 | 16.000 | 42.000 | 44.000 | 3.000 | | 4 | 16.030 |

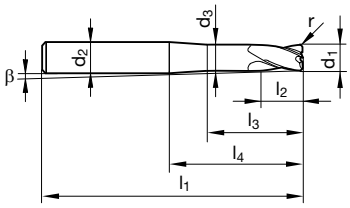
| ISO | Hardness | $v_c$ | $f_z$ (mm/z) / Ø | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | 2 | 3 | 4 | 6 | 8 | 10 | 12 |
| | | | $a_p$ = 0,1xD | | | | | $a_e$ = 0,1xD | |
| **P** | ≤ 850 N/mm² | **200** | 0,024 | 0,036 | 0,048 | 0,072 | 0,096 | 0,120 | 0,144 |
| | ≥ 850 N/mm² | **120** | 0,024 | 0,036 | 0,048 | 0,072 | 0,096 | 0,120 | 0,144 |
| **H** | ≤ 55 HRC | **180** | 0,026 | 0,039 | 0,052 | 0,078 | 0,104 | 0,130 | 0,156 |
| | 55-63 HRC | **90** | 0,020 | 0,030 | 0,040 | 0,060 | 0,080 | 0,100 | 0,120 |
| **K** | ≥ 240 HB | **220** | 0,030 | 0,045 | 0,060 | 0,090 | 0,120 | 0,150 | 0,180 |

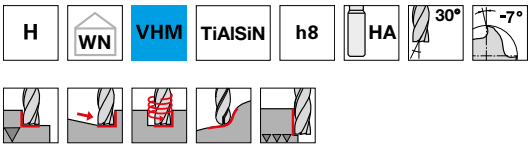
| $v_c$ | $f_z$ (mm/z) / Ø | | | | | | |
|---|---|---|---|---|---|---|---|
| | 2 | 3 | 4 | 6 | 8 | 10 | 12 |
| | $a_p$ = 0,01xD | | | | $a_e$ max = 0,01xD | | |
| **300** | 0,017 | 0,025 | 0,034 | 0,050 | 0,067 | 0,084 | 0,101 |
| **200** | 0,017 | 0,025 | 0,034 | 0,050 | 0,067 | 0,084 | 0,101 |
| **270** | 0,018 | 0,027 | 0,036 | 0,055 | 0,073 | 0,091 | 0,109 |
| **160** | 0,013 | 0,020 | 0,026 | 0,039 | 0,052 | 0,065 | 0,078 |
| **360** | 0,018 | 0,027 | 0,036 | 0,054 | 0,072 | 0,090 | 0,108 |

## Solid carbide end mills

### Torus end mills

**Catalogue no. 54305**




| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ○ | | ● | | | ● |

Application recommendations page 204-217

- long version
- centre cutting
- with extra long reach for the moulding-industry
- long tool life thanks to extremely hard coating
- up to 63 HRC



| d1 h8 mm | d2 h6 mm | d3 mm | l1 mm | l2 mm | l3 mm | l4 mm | r mm | β ° | Z | Code no. |
|---|---|---|---|---|---|---|---|---|---|---|
| **1.000** | 4.000 | 0.950 | 50.000 | 2.000 | 12.000 | 20.000 | 0.200 | 4.400 | 2 | 1.002 |
| **2.000** | 6.000 | 1.900 | 75.000 | 3.000 | 18.000 | 35.000 | 0.500 | 3.400 | 2 | 2.005 |
| **3.000** | 6.000 | 2.800 | 75.000 | 5.000 | 25.000 | 39.000 | 0.300 | 2.300 | 4 | 3.003 |
| **3.000** | 6.000 | 2.800 | 75.000 | 5.000 | 25.000 | 39.000 | 0.500 | 2.300 | 4 | 3.005 |
| **4.000** | 6.000 | 3.800 | 75.000 | 6.000 | 32.000 | 39.000 | 0.300 | 1.500 | 4 | 4.003 |
| **4.000** | 6.000 | 3.800 | 75.000 | 6.000 | 32.000 | 39.000 | 0.500 | 1.500 | 4 | 4.005 |
| **5.000** | 6.000 | 4.800 | 75.000 | 8.000 | 38.000 | 39.000 | 0.500 | 0.800 | 4 | 5.005 |
| **6.000** | 6.000 | 5.700 | 75.000 | 9.000 | 38.000 | 39.000 | 1.000 | | 4 | 6.000 |
| **6.000** | 6.000 | 5.700 | 75.000 | 9.000 | 38.000 | 39.000 | 0.500 | | 4 | 6.005 |
| **8.000** | 8.000 | 7.700 | 100.000 | 12.000 | 59.000 | 64.000 | 1.000 | | 4 | 8.000 |
| **8.000** | 8.000 | 7.700 | 100.000 | 12.000 | 59.000 | 64.000 | 0.500 | | 4 | 8.005 |
| **10.000** | 10.000 | 9.500 | 100.000 | 15.000 | 58.000 | 60.000 | 1.500 | | 4 | 10.000 |
| **10.000** | 10.000 | 9.500 | 100.000 | 15.000 | 58.000 | 60.000 | 0.500 | | 4 | 10.005 |
| **10.000** | 10.000 | 9.500 | 100.000 | 15.000 | 58.000 | 60.000 | 1.000 | | 4 | 10.010 |
| **10.000** | 10.000 | 9.500 | 100.000 | 15.000 | 58.000 | 60.000 | 2.000 | | 4 | 10.020 |
| **12.000** | 12.000 | 11.500 | 150.000 | 18.000 | 98.000 | 105.000 | 1.500 | | 4 | 12.000 |
| **12.000** | 12.000 | 11.500 | 150.000 | 18.000 | 98.000 | 105.000 | 0.500 | | 4 | 12.005 |
| **12.000** | 12.000 | 11.500 | 150.000 | 18.000 | 98.000 | 105.000 | 1.000 | | 4 | 12.010 |
| **12.000** | 12.000 | 11.500 | 150.000 | 18.000 | 98.000 | 105.000 | 2.000 | | 4 | 12.020 |
| **16.000** | 16.000 | 15.500 | 150.000 | 24.000 | 98.000 | 102.000 | 2.000 | | 4 | 16.000 |

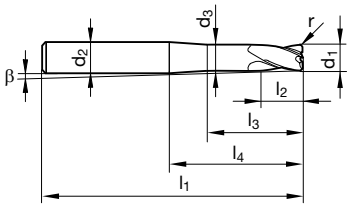
| ISO | Hardness | $v_c$ | $f_z$ (mm/z) / Ø | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | 2 | 3 | 4 | 6 | 8 | 10 | 12 |
| | | | $a_p$ = 0,1xD | | | | | $a_e$ = 0,1xD | |
| **P** | ≤ 850 N/mm² | **100** | 0,012 | 0,018 | 0,024 | 0,036 | 0,048 | 0,060 | 0,072 |
| | ≥ 850 N/mm² | **60** | 0,012 | 0,018 | 0,024 | 0,036 | 0,048 | 0,060 | 0,072 |
| **H** | ≤ 55 HRC | **90** | 0,013 | 0,020 | 0,026 | 0,039 | 0,052 | 0,065 | 0,078 |
| | 55-63 HRC | **50** | 0,010 | 0,015 | 0,020 | 0,030 | 0,040 | 0,050 | 0,060 |
| **K** | ≥ 240 HB | **220** | 0,030 | 0,045 | 0,060 | 0,090 | 0,120 | 0,150 | 0,180 |

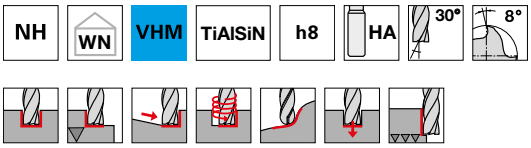
| $v_c$ | $f_z$ (mm/z) / Ø | | | | | | |
|---|---|---|---|---|---|---|---|
| | 2 | 3 | 4 | 6 | 8 | 10 | 12 |
| | $a_p$ = 0,01xD | | | | | $a_e$ max = 0,01xD | |
| **150** | 0,008 | 0,013 | 0,017 | 0,025 | 0,034 | 0,042 | 0,050 |
| **100** | 0,008 | 0,013 | 0,017 | 0,025 | 0,034 | 0,042 | 0,050 |
| **135** | 0,009 | 0,014 | 0,018 | 0,027 | 0,036 | 0,046 | 0,055 |
| **80** | 0,007 | 0,010 | 0,013 | 0,020 | 0,026 | 0,033 | 0,039 |
| **360** | 0,018 | 0,027 | 0,036 | 0,054 | 0,072 | 0,090 | 0,108 |

## Solid carbide end mills

### Torus end mills

**Catalogue no. 54302**




| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ● | ● | ● | ○ | ● | ○ |

Application recommendations page 204-217

- for roughing, finishing and fine finishing under HSC conditions in die and mold making
- centre cutting
- suitable for hardened materials up to 40-54 HRC
- long tool life thanks to extremely hard coating

| d1 h8 mm | d2 h6 mm | d3 mm | l1 mm | l2 mm | l3 mm | l4 mm | r mm | β ° | Z | Code no. |
|---|---|---|---|---|---|---|---|---|---|---|
| **0.500** | 4.000 | 0.480 | 50.000 | 1.000 | 3.000 | 22.000 | 0.100 | 4.600 | 2 | 0.501 |
| **1.000** | 4.000 | 0.950 | 50.000 | 2.000 | 6.000 | 22.000 | 0.200 | 4.000 | 2 | 1.002 |
| **2.000** | 6.000 | 1.900 | 57.000 | 3.000 | 8.000 | 21.000 | 0.500 | 5.600 | 2 | 2.000 |
| **2.000** | 6.000 | 1.900 | 57.000 | 3.000 | 8.000 | 21.000 | 0.200 | 5.500 | 2 | 2.002 |
| **3.000** | 6.000 | 2.800 | 57.000 | 3.500 | 14.000 | 21.000 | 0.500 | 4.200 | 2 | 3.000 |
| **4.000** | 6.000 | 3.800 | 57.000 | 4.000 | 16.000 | 21.000 | 1.000 | 2.900 | 2 | 4.000 |
| **4.000** | 6.000 | 3.800 | 57.000 | 4.000 | 16.000 | 21.000 | 0.300 | 2.800 | 2 | 4.003 |
| **4.000** | 6.000 | 3.800 | 57.000 | 4.000 | 16.000 | 21.000 | 0.500 | 2.800 | 2 | 4.005 |
| **5.000** | 6.000 | 4.800 | 57.000 | 5.000 | 18.000 | 21.000 | 0.500 | 1.400 | 2 | 5.005 |
| **5.000** | 6.000 | 4.800 | 57.000 | 5.000 | 18.000 | 21.000 | 1.000 | 1.500 | 2 | 5.010 |
| **6.000** | 6.000 | 5.700 | 57.000 | 6.000 | 20.000 | 21.000 | 2.000 | | 2 | 6.000 |
| **6.000** | 6.000 | 5.700 | 57.000 | 6.000 | 20.000 | 21.000 | 0.500 | | 2 | 6.005 |
| **6.000** | 6.000 | 5.700 | 57.000 | 6.000 | 20.000 | 21.000 | 1.000 | | 2 | 6.010 |
| **6.000** | 6.000 | 5.700 | 57.000 | 6.000 | 20.000 | 21.000 | 1.500 | | 2 | 6.015 |
| **8.000** | 8.000 | 7.700 | 63.000 | 8.000 | 26.000 | 27.000 | 2.000 | | 2 | 8.000 |
| **8.000** | 8.000 | 7.700 | 63.000 | 8.000 | 26.000 | 27.000 | 0.500 | | 2 | 8.005 |
| **8.000** | 8.000 | 7.700 | 63.000 | 8.000 | 26.000 | 27.000 | 1.000 | | 2 | 8.010 |
| **10.000** | 10.000 | 9.500 | 72.000 | 10.000 | 30.000 | 32.000 | 3.000 | | 2 | 10.000 |
| **10.000** | 10.000 | 9.500 | 72.000 | 10.000 | 30.000 | 32.000 | 0.500 | | 2 | 10.005 |
| **10.000** | 10.000 | 9.500 | 72.000 | 10.000 | 30.000 | 32.000 | 1.500 | | 2 | 10.015 |
| **12.000** | 12.000 | 11.500 | 83.000 | 12.000 | 36.000 | 38.000 | 4.000 | | 2 | 12.000 |
| **12.000** | 12.000 | 11.500 | 83.000 | 12.000 | 36.000 | 38.000 | 2.000 | | 2 | 12.020 |

| ISO | Hardness | $v_c$ | $f_z$ (mm/z) / Ø | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | 2 | 3 | 4 | 6 | 8 | 10 | 12 |
| | | | $a_p$ = 0,1xD | | | | | $a_e$ = 0,1xD | |
| **P** | ≤850 N/mm² | **240** | 0,030 | 0,045 | 0,060 | 0,090 | 0,120 | 0,150 | 0,180 |
| | ≥850 N/mm² | **200** | 0,024 | 0,036 | 0,048 | 0,072 | 0,096 | 0,120 | 0,144 |
| **H** | ≤55 HRC | **120** | 0,024 | 0,036 | 0,048 | 0,072 | 0,096 | 0,120 | 0,144 |
| **M** | ≤750 N/mm² | **160** | 0,026 | 0,039 | 0,052 | 0,078 | 0,104 | 0,130 | 0,156 |
| | ≥750 N/mm² | **80** | 0,020 | 0,030 | 0,040 | 0,060 | 0,080 | 0,100 | 0,120 |
| **S** | Ni-based | **45** | 0,020 | 0,030 | 0,040 | 0,060 | 0,080 | 0,100 | 0,120 |
| | Ti-based | **100** | 0,024 | 0,036 | 0,048 | 0,072 | 0,096 | 0,120 | 0,144 |
| **K** | ≤240 HB | **220** | 0,030 | 0,045 | 0,060 | 0,090 | 0,120 | 0,150 | 0,180 |
| | ≥240 HB | **180** | 0,026 | 0,039 | 0,052 | 0,078 | 0,104 | 0,130 | 0,156 |
| **N** | ≥7 % Si | **300** | 0,030 | 0,045 | 0,060 | 0,090 | 0,120 | 0,150 | 0,180 |

| $v_c$ | $f_z$ (mm/z) / Ø | | | | | | |
|---|---|---|---|---|---|---|---|
| | 2 | 3 | 4 | 6 | 8 | 10 | 12 |
| | $a_p$ = 0,01xD | | | | | $a_e$ max = 0,01xD | |
| **360** | 0,021 | 0,032 | 0,042 | 0,063 | 0,084 | 0,105 | 0,126 |
| **300** | 0,017 | 0,025 | 0,034 | 0,050 | 0,067 | 0,084 | 0,101 |
| **200** | 0,017 | 0,025 | 0,034 | 0,050 | 0,067 | 0,084 | 0,101 |
| **240** | 0,018 | 0,027 | 0,036 | 0,055 | 0,073 | 0,091 | 0,109 |
| **130** | 0,013 | 0,020 | 0,026 | 0,039 | 0,052 | 0,065 | 0,078 |
| **80** | 0,013 | 0,020 | 0,026 | 0,039 | 0,052 | 0,065 | 0,078 |
| **150** | 0,017 | 0,025 | 0,034 | 0,050 | 0,067 | 0,084 | 0,101 |
| **330** | 0,021 | 0,032 | 0,042 | 0,063 | 0,084 | 0,105 | 0,126 |
| **270** | 0,018 | 0,027 | 0,036 | 0,055 | 0,073 | 0,091 | 0,109 |
| **500** | 0,021 | 0,032 | 0,042 | 0,063 | 0,084 | 0,105 | 0,126 |

# Deburring and chamfering tools

## Deburring end mills 90°

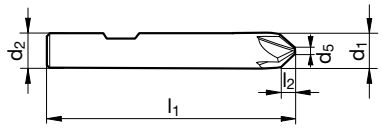
**Catalogue no. 53399**

Super AF-90 | WN | VHM | TiAlZrN | 90° | js9 | HB | 0°

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ● | ● | ● | ● | ● | ○ |

Application recommendations page 204-217

- deburring- and chamfering-mill to machine workpiece edges with a 90° angle
- highest feed rates and improved surface finish thanks to z = 6
- also available as kit 322 044 176
- HA shank on request




| d1 js9 mm | d2 h6 mm | d5 mm | l1 mm | l2 mm | Z | Code no. |
|---|---|---|---|---|---|---|
| **6.000** | 6.000 | 1.500 | 57.000 | 2.300 | 6 | **6.000** |
| **8.000** | 8.000 | 2.000 | 63.000 | 3.000 | 6 | **8.000** |
| **10.000** | 10.000 | 3.000 | 72.000 | 3.500 | 6 | **10.000** |
| **12.000** | 12.000 | 3.000 | 83.000 | 4.500 | 6 | **12.000** |
| **16.000** | 16.000 | 4.000 | 92.000 | 6.000 | 6 | **16.000** |
| **20.000** | 20.000 | 6.000 | 92.000 | 6.900 | 6 | **20.000** |

| ISO | Hardness | $v_c$ | $f_z$ (mm/z) / Ø 3 | 6 | 8 | 10 | 12 | 16 | 20 |
|---|---|---|---|---|---|---|---|---|---|
| | | | Chamfering | | | | $a_p/a_e$ max = 0,25xD | | |
| **P** | ≤ 850 N/mm² | **192** | 0,018 | 0,036 | 0,048 | 0,06 | 0,08 | 0,10 | 0,13 |
| | ≥ 850 N/mm² | **140** | 0,016 | 0,032 | 0,042 | 0,06 | 0,07 | 0,09 | 0,12 |
| **M** | ≤ 750 N/mm² | **120** | 0,013 | 0,025 | 0,034 | 0,05 | 0,05 | 0,07 | 0,09 |
| | ≥ 750 N/mm² | **80** | 0,009 | 0,019 | 0,025 | 0,04 | 0,04 | 0,06 | 0,07 |
| **K** | ≤ 240 HB | **170** | 0,017 | 0,033 | 0,044 | 0,06 | 0,07 | 0,09 | 0,12 |
| **N** | ≥ 7 % Si | **250** | 0,023 | 0,047 | 0,062 | 0,08 | 0,10 | 0,13 | 0,17 |

| $v_c$ | $f_z$ (mm/z) / Ø 3 | 6 | 8 | 10 | 12 | 16 | 20 |
|---|---|---|---|---|---|---|---|
| | De-burring | | | | $a_p/a_e$ max = 0,05xD | | |
| **250** | 0,030 | 0,060 | 0,080 | 0,11 | 0,13 | 0,17 | 0,21 |
| **180** | 0,026 | 0,053 | 0,070 | 0,10 | 0,12 | 0,16 | 0,20 |
| **160** | 0,021 | 0,042 | 0,056 | 0,08 | 0,09 | 0,12 | 0,15 |
| **100** | 0,016 | 0,032 | 0,042 | 0,06 | 0,07 | 0,10 | 0,12 |
| **230** | 0,028 | 0,056 | 0,074 | 0,10 | 0,12 | 0,16 | 0,20 |
| **330** | 0,039 | 0,078 | 0,104 | 0,14 | 0,17 | 0,22 | 0,28 |

## Carbide reamers

## Solid carbide high-performance reamers

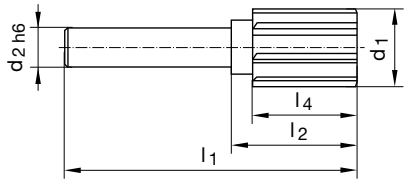
**Catalogue no. 72874**

SuperR-HS-KS | WN | VHM | AlTiN nano | H7 | R | HA | 0°

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ● | ● | ○ | | ● | ● |

Application recommendations page 218

- for highest cutting rates and exceptional hole quality
- with axial coolant duct, for reaming blind holes
- high reaming depth variance through use of the shrink extension (Cat. No. 78719)
- clamping in hydraulic expansion or shrink fit chucks possible




| **d1** mm | d2 h6 mm | l1 mm | l2 mm | l4 mm | Z | **Code no.** |
|---|---|---|---|---|---|---|
| **14.000** | 6.000 | 66.000 | 30.000 | 25.000 | 8 | **14.000** |
| **15.000** | 6.000 | 66.000 | 30.000 | 25.000 | 8 | **15.000** |
| **16.000** | 8.000 | 66.000 | 30.000 | 25.000 | 8 | **16.000** |
| **18.000** | 8.000 | 66.000 | 30.000 | 25.000 | 8 | **18.000** |
| **20.000** | 10.000 | 70.000 | 30.000 | 25.000 | 8 | **20.000** |
| **22.000** | 10.000 | 70.000 | 30.000 | 25.000 | 8 | **22.000** |
| **24.000** | 12.000 | 75.000 | 30.000 | 25.000 | 8 | **24.000** |
| **25.000** | 12.000 | 75.000 | 30.000 | 25.000 | 8 | **25.000** |
| **26.000** | 12.000 | 75.000 | 30.000 | 25.000 | 8 | **26.000** |
| **28.000** | 12.000 | 75.000 | 30.000 | 25.000 | 8 | **28.000** |
| **30.000** | 16.000 | 78.000 | 30.000 | 25.000 | 8 | **30.000** |
| **32.000** | 16.000 | 78.000 | 30.000 | 25.000 | 8 | **32.000** |
| **34.000** | 20.000 | 80.000 | 30.000 | 25.000 | 8 | **34.000** |
| **36.000** | 20.000 | 80.000 | 30.000 | 25.000 | 8 | **36.000** |
| **38.000** | 20.000 | 80.000 | 30.000 | 25.000 | 8 | **38.000** |
| **40.000** | 20.000 | 80.000 | 30.000 | 25.000 | 8 | **40.000** |
| **42.000** | 20.000 | 80.000 | 30.000 | 25.000 | 8 | **42.000** |

# Carbide reamers

## Solid carbide high-performance reamers

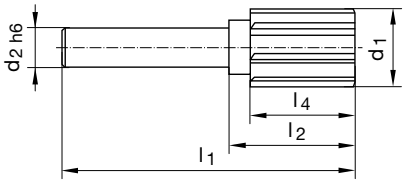
**Catalogue no. 72875**

SuperR-HS-KD | WN | VHM | AlTiN nano | H7 | R | HA | 0°

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ● | ● | ○ | | ● | ● |

Application recommendations page 218

- for highest cutting rates and exceptional hole quality
- with radial coolant supply and spiral point for optimal chip evacuation in feed direction when machining through holes
- high reaming depth variance through use of the shrink extension (Cat. No. 78719)
- clamping in hydraulic expansion or shrink fit chucks possible




| **d1** mm | d2 h6 mm | l1 mm | l2 mm | l4 mm | Z | **Code no.** |
|---|---|---|---|---|---|---|
| **14.000** | 6.000 | 66.000 | 30.000 | 25.000 | 8 | **14.000** |
| **15.000** | 6.000 | 66.000 | 30.000 | 25.000 | 8 | **15.000** |
| **16.000** | 8.000 | 66.000 | 30.000 | 25.000 | 8 | **16.000** |
| **18.000** | 8.000 | 66.000 | 30.000 | 25.000 | 8 | **18.000** |
| **20.000** | 10.000 | 70.000 | 30.000 | 25.000 | 8 | **20.000** |
| **22.000** | 10.000 | 70.000 | 30.000 | 25.000 | 8 | **22.000** |
| **24.000** | 12.000 | 75.000 | 30.000 | 25.000 | 8 | **24.000** |
| **25.000** | 12.000 | 75.000 | 30.000 | 25.000 | 8 | **25.000** |
| **26.000** | 12.000 | 75.000 | 30.000 | 25.000 | 8 | **26.000** |
| **28.000** | 12.000 | 75.000 | 30.000 | 25.000 | 8 | **28.000** |
| **30.000** | 16.000 | 78.000 | 30.000 | 25.000 | 8 | **30.000** |
| **32.000** | 16.000 | 78.000 | 30.000 | 25.000 | 8 | **32.000** |
| **34.000** | 20.000 | 80.000 | 30.000 | 25.000 | 8 | **34.000** |
| **36.000** | 20.000 | 80.000 | 30.000 | 25.000 | 8 | **36.000** |
| **38.000** | 20.000 | 80.000 | 30.000 | 25.000 | 8 | **38.000** |
| **40.000** | 20.000 | 80.000 | 30.000 | 25.000 | 8 | **40.000** |
| **42.000** | 20.000 | 80.000 | 30.000 | 25.000 | 8 | **42.000** |

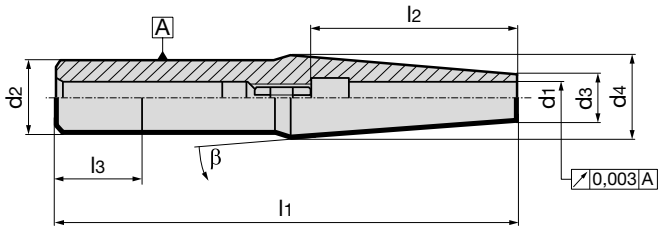
## Shrink fit chucks

## Shrink fit extensions

**Catalogue no. 78719**

WN | bright

- for clamping in hydraulic chucks or shrink fit chucks
- suitable for internal cooling
- for carbide tool shanks in tolerance h6 (from d1 14 mm also HSS possible)
- special designs on request

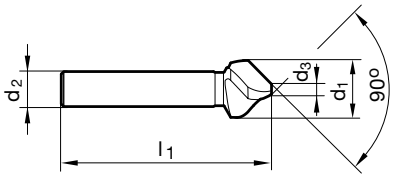



| d1 h6<br>mm | d2 h6<br>mm | d3<br>mm | d4<br>mm | l1<br>mm | l2<br>± mm | l3<br>mm | β<br>° | Code no. |
|---|---|---|---|---|---|---|---|---|
| 3.00 | 20.00 | 10.00 | 20.00 | 160.00 | 30.00 | 50.00 | 4 | **3.120** |
| 3.00 | 20.00 | 10.00 | 20.00 | 200.00 | 30.00 | 50.00 | 4 | **3.220** |
| 4.00 | 20.00 | 10.00 | 20.00 | 160.00 | 35.00 | 50.00 | 4 | **4.120** |
| 4.00 | 20.00 | 10.00 | 20.00 | 200.00 | 35.00 | 50.00 | 4 | **4.220** |
| 5.00 | 20.00 | 10.00 | 20.00 | 160.00 | 40.00 | 50.00 | 4 | **5.120** |
| 5.00 | 20.00 | 10.00 | 20.00 | 200.00 | 40.00 | 50.00 | 4 | **5.220** |
| 6.00 | 12.00 | 10.00 | 12.00 | 125.00 | 38.00 | 45.00 | 3 | **6.012** |
| 6.00 | 20.00 | 14.00 | 20.00 | 160.00 | 36.00 | 50.00 | 4 | **6.120** |
| 6.00 | 20.00 | 14.00 | 20.00 | 200.00 | 36.00 | 50.00 | 4 | **6.220** |
| 6.00 | 12.00 | 10.00 | 12.20 | 200.00 | 38.00 | 45.00 | 3 | **6.312** |
| 8.00 | 14.00 | 12.00 | 14.00 | 125.00 | 38.00 | 45.00 | 3 | **8.014** |
| 8.00 | 20.00 | 14.00 | 20.00 | 160.00 | 36.00 | 50.00 | 4 | **8.120** |
| 8.00 | 20.00 | 14.00 | 20.00 | 200.00 | 36.00 | 50.00 | 4 | **8.220** |
| 8.00 | 14.00 | 12.00 | 14.20 | 200.00 | 38.00 | 45.00 | 3 | **8.314** |
| 10.00 | 16.00 | 14.00 | 16.00 | 160.00 | 42.00 | 48.00 | 3 | **10.116** |
| 10.00 | 25.00 | 20.00 | 25.00 | 160.00 | 41.00 | 56.00 | 4 | **10.125** |
| 10.00 | 25.00 | 20.00 | 25.00 | 200.00 | 41.00 | 56.00 | 4 | **10.225** |
| 10.00 | 16.00 | 14.00 | 16.20 | 250.00 | 42.00 | 48.00 | 3 | **10.316** |
| 12.00 | 20.00 | 16.00 | 20.00 | 160.00 | 47.00 | 50.00 | 3 | **12.120** |
| 12.00 | 25.00 | 20.00 | 25.00 | 160.00 | 46.00 | 56.00 | 4 | **12.125** |
| 12.00 | 25.00 | 20.00 | 25.00 | 200.00 | 46.00 | 56.00 | 4 | **12.225** |
| 12.00 | 20.00 | 16.00 | 20.20 | 250.00 | 47.00 | 50.00 | 3 | **12.320** |
| 14.00 | 25.00 | 20.00 | 29.00 | 160.00 | 46.00 | 56.00 | 4 | **14.125** |
| 14.00 | 32.00 | 20.00 | 32.00 | 200.00 | 46.00 | 60.00 | 4 | **14.232** |
| 16.00 | 25.00 | 22.00 | 33.00 | 160.00 | 49.00 | 56.00 | 4 | **16.125** |
| 16.00 | 25.00 | 22.00 | 25.00 | 160.00 | 50.00 | 56.00 | 3 | **16.225** |
| 16.00 | 32.00 | 24.00 | 32.00 | 200.00 | 49.00 | 60.00 | 4 | **16.232** |
| 16.00 | 25.00 | 22.00 | 25.20 | 250.00 | 50.00 | 56.00 | 3 | **16.325** |
| 18.00 | 32.00 | 27.00 | 32.00 | 160.00 | 49.00 | 60.00 | 4 | **18.132** |
| 18.00 | 32.00 | 27.00 | 32.00 | 200.00 | 49.00 | 60.00 | 4 | **18.232** |
| 20.00 | 32.00 | 27.00 | 32.00 | 160.00 | 51.00 | 60.00 | 4 | **20.132** |
| 20.00 | 32.00 | 27.00 | 32.00 | 200.00 | 51.00 | 60.00 | 4 | **20.232** |
| 20.00 | 32.00 | 27.00 | 32.00 | 160.00 | 52.00 | 60.00 | 3 | **20.332** |
| 20.00 | 32.00 | 27.00 | 32.20 | 250.00 | 52.00 | 60.00 | 3 | **20.432** |

## Countersinks HSS-Co

### 90° Countersinks, spiral-fluted

**Catalogue no. 52348**




V-NX | DIN 335 | C | HSS-Co | Al-TiN | 90° | R | Cyl

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ● | ● | ● | ○ | ○ | |

Application recommendations page 220

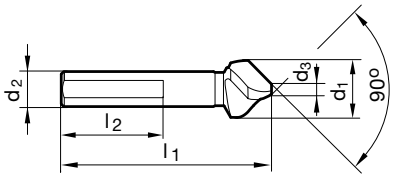
- 3 different convex cutting edges
- low-vibration cutting processes
- for round and chatter-free countersinking
- considerably lower feed force required
- for universal application

| d1 mm | d2 mm | d3 mm | l1 mm | Z | Code no. |
|---|---|---|---|---|---|
| **6.300** | 5.000 | 1.500 | 45.000 | 3 | **6.300** |
| **8.000** | 6.000 | 2.000 | 50.000 | 3 | **8.000** |
| **8.300** | 6.000 | 2.000 | 50.000 | 3 | **8.300** |
| **10.000** | 6.000 | 2.500 | 50.000 | 3 | **10.000** |
| **10.400** | 6.000 | 2.500 | 50.000 | 3 | **10.400** |
| **11.500** | 8.000 | 2.800 | 56.000 | 3 | **11.500** |
| **12.400** | 8.000 | 2.800 | 56.000 | 3 | **12.400** |
| **15.000** | 10.000 | 3.200 | 60.000 | 3 | **15.000** |
| **16.500** | 10.000 | 3.200 | 60.000 | 3 | **16.500** |
| **19.000** | 10.000 | 3.500 | 63.000 | 3 | **19.000** |
| **20.500** | 10.000 | 3.500 | 63.000 | 3 | **20.500** |
| **23.000** | 10.000 | 3.800 | 67.000 | 3 | **23.000** |
| **25.000** | 10.000 | 3.800 | 67.000 | 3 | **25.000** |
| **31.000** | 12.000 | 4.200 | 71.000 | 3 | **31.000** |
| **40.000** | 12.000 | 10.000 | 75.000 | 3 | **40.000** |

## Countersinks HSS-Co

### 90° Countersinks, spiral-fluted

**Catalogue no. 52350**




V-NX | DIN 335 | C | HSS-Co | Al-TiN | 90° | R | 3

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ● | ● | ● | ○ | ○ | |

Application recommendations page 220

- 3-flats on shank prevent slipping in the chuck
- 3 different convex cutting edges
- perfect for hand drills
- low-vibration cutting processes
- for round and chatter-free countersinking
- considerably lower feed force required
- for universal application

| **d1** mm | d2 mm | d3 mm | l1 mm | l2 mm | Z | **Code no.** |
|---|---|---|---|---|---|---|
| **6.300** | 5.000 | 1.500 | 45.000 | 30.000 | 3 | **6.300** |
| **8.000** | 6.000 | 2.000 | 50.000 | 30.000 | 3 | **8.000** |
| **8.300** | 6.000 | 2.000 | 50.000 | 30.000 | 3 | **8.300** |
| **10.000** | 6.000 | 2.500 | 50.000 | 30.000 | 3 | **10.000** |
| **10.400** | 6.000 | 2.500 | 50.000 | 30.000 | 3 | **10.400** |
| **11.500** | 8.000 | 2.800 | 56.000 | 30.000 | 3 | **11.500** |
| **12.400** | 8.000 | 2.800 | 56.000 | 30.000 | 3 | **12.400** |
| **15.000** | 10.000 | 3.200 | 60.000 | 30.000 | 3 | **15.000** |
| **16.500** | 10.000 | 3.200 | 60.000 | 30.000 | 3 | **16.500** |
| **19.000** | 10.000 | 3.500 | 63.000 | 30.000 | 3 | **19.000** |
| **20.500** | 10.000 | 3.500 | 63.000 | 30.000 | 3 | **20.500** |
| **23.000** | 10.000 | 3.800 | 67.000 | 30.000 | 3 | **23.000** |
| **25.000** | 10.000 | 3.800 | 67.000 | 30.000 | 3 | **25.000** |
| **31.000** | 12.000 | 4.200 | 71.000 | 30.000 | 3 | **31.000** |
| **40.000** | 12.000 | 10.000 | 75.000 | 30.000 | 3 | **40.000** |

## 90° Countersink sets, spiral-fluted

V-NX | DIN 335 | C | HSS-Co | Al-TiN | 90° | R | Cyl

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ● | ● | ● | ○ | ○ | |

Application recommendations page 220

- consisting of catalogue no. 52348
- 3 different convex cutting edges
- low-vibration cutting processes
- for round and chatter-free countersinking
- considerably lower feed force required
- for universal application

**Catalogue no. 52398**

| Code no. | Ø-range mm | Pieces/set |
|---|---|---|
| **1.000** | **6.3/8.3/10.4/12.4/16.5/20.5** | 6 |

## Countersinks HSS-Co

### 90° Countersink sets, spiral-fluted

V-NX | DIN 335 | C | HSS-Co | Al-TiN | 90° | R | 3

| P | M | K | N | S | H |
|---|---|---|---|---|---|
| ● | ● | ● | ○ | ○ | |

Application recommendations page 220

- consisting of catalogue no. 52350
- 3-flats on shank prevent slipping in the chuck
- 3 different convex cutting edges
- perfect for hand drills
- low-vibration cutting processes
- for round and chatter-free countersinking
- considerably lower feed force required
- for universal application

**Catalogue no. 52399**

| Code no. | Ø-range mm | Pieces/set |
|---|---|---|
| **1.000** | **6.3/8.3/10.4/12.4/16.5/20.5** | 6 |

# APPLICATION RECOMMENDAT

TIONS

# SuperV drills

## Application recommendations

**Feed column**

| Drill-Ø mm | Code-letter A | B | C | D | E | F | G | H | I |
|---|---|---|---|---|---|---|---|---|---|
| **0,50** | 0,004 | 0,006 | 0,007 | 0,008 | 0,010 | 0,012 | 0,014 | 0,016 | 0,019 |
| **1,00** | 0,006 | 0,008 | 0,012 | 0,014 | 0,016 | 0,018 | 0,020 | 0,023 | 0,025 |
| **2,00** | 0,020 | 0,025 | 0,032 | 0,040 | 0,050 | 0,063 | 0,080 | 0,100 | 0,125 |
| **2,50** | 0,025 | 0,032 | 0,040 | 0,050 | 0,063 | 0,080 | 0,100 | 0,125 | 0,160 |
| **3,15** | 0,032 | 0,040 | 0,050 | 0,063 | 0,080 | 0,100 | 0,125 | 0,160 | 0,160 |
| **4,00** | 0,040 | 0,050 | 0,063 | 0,080 | 0,100 | 0,125 | 0,160 | 0,200 | 0,200 |
| **5,00** | 0,040 | 0,050 | 0,063 | 0,080 | 0,100 | 0,125 | 0,160 | 0,200 | 0,250 |
| **6,30** | 0,050 | 0,063 | 0,080 | 0,100 | 0,125 | 0,160 | 0,200 | 0,250 | 0,315 |
| **8,00** | 0,063 | 0,080 | 0,100 | 0,125 | 0,160 | 0,200 | 0,250 | 0,315 | 0,315 |
| **10,00** | 0,080 | 0,100 | 0,125 | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,400 |
| **12,50** | 0,080 | 0,100 | 0,125 | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 |
| **16,00** | 0,100 | 0,125 | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 | 0,630 |
| **20,00** | 0,125 | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 | 0,630 | 0,630 |
| **25,00** | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 | 0,630 | 0,800 | 0,800 |
| **31,50** | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 | 0,630 | 0,800 | 1,000 |
| **40,00** | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 | 0,630 | 0,800 | 1,000 | 1,250 |

Feed f (mm/rev)

Tools with feed column no. in bold are preferred choices for listed material group.

Meaning of code letters with type descriptions:

- **S** for high-tensile materials
- **U** for universal machining, carbon steels
- **VA** for stainless materials
- **X** for the machining of steel

**Lubricants:**

cutting oil, highly activated ■
soluble oil (emulsion) ■
without lubricant □
air only [!]

| Material group | Materials examples, **new designations** (old designation in brackets) Figures in bold = material no. to DIN EN | Tensile strength MPa (N/mm²) | Hardness | Coolant |
|---|---|---|---|---|
| General purpose steels | **1.0035** S185(St33),**1.0486** P275N(StE285),**1.0345** P235GH(H1),**1.0425** P265GH(H2) | ≤500 | | ■ |
| | **1.0050** E295 (St50-2), **1.0070** E360 (St70-2), **1.8937** P500NH (WStE500) | >500-850 | | ■ |
| Free-cutting steels | **1.0718** 11SMnPb30 (9SMnPb28), **1.0736** 11SMn37 (9SMn36) | ≤850 | | ■ |
| | **1.0727** 46S20 (45S20), **1.0728** (60S20), **1.0757** 46SPb20 (45SPb20) | 850-1000 | | ■ |
| Unalloyed tempering steels | **1.0402** C22, **1.1178** C30E (Ck30) | ≤ 700 | | ■ |
| | **1.0503** C45, **1.1191** C45E (Ck45) | 700-850 | | ■ |
| | **1.0601** C60, **1.1221** C60E (Ck60) | 850-1000 | | ■ |
| Alloyed tempering steels | **1.5131** 50MnSi4, **1.7003** 38Cr2, **1.7030** 28Cr4 | 850-≤1000 | | ■ |
| | **1.5710** 36NiCr6, **1.7035** 41Cr4, **1.7225** 42CrMo4 | 1000-1200 | | ■ |
| Unalloyed case hardened steels | **1.0301** (C10), **1.1121** C10E (Ck10) | ≤750 | | ■ |
| Alloyed case hardened steels | **1.7043** 38Cr4 | 850-≤1000 | | ■ ■ |
| | **1.5752** 15NiCr13 (15NiCr13), **1.7131** 16MnCr5, **1.7264** 20CrMo5 | 1000-1200 | | ■ ■ |
| Nitriding steels | **1.8504** 34CrAl6 | ≥850-≤1000 | | ■ |
| | **1.8519** 31CrMoV9, **1.8550** 34CrAlNi7 | >1000-1200 | | ■ ■ |
| Tool steels | **1.1750** C75W, **1.2067** 102Cr6, **1.2307** 29CrMoV9 | ≤850 | | ■ |
| | **1.2080** X210Cr12, **1.2083** X42Cr13, **1.2419** 105WCr6, **1.2767** X45NiCrMo4 | >850-1000 | | ■ ■ |
| High speed steels | **1.3243** S 6-5-2-5, **1.3343** S 6-5-2, **1.3344** S 6-5-3 | ≥650-1000 | | ■ |
| Spring steels | **1.5026** 55Si7, **1.7176** 55Cr3, **1.8159** 51CrV4 (51CrV4) | | ≤330 HB | ■ ■ |
| Hardened steels | – | | ≤40-48 HRC | ■ |
| | | | >48-60 HRC | ■ |
| Stainless steels, sulphured | **1.4005** X12CrS13, **1.4104** X14CrMoS17, **1.4105** X6CrMoS17, **1.4305** X8CrNiS18-9 | ≤850 | | ■ |
| austenitic | **1.4301** X5CrNi18-10 (V2A), **1.4541** X6CrNiTi18-10, **1.4571** X6CrNiMoTi 17-12-2 (V4A) | ≤850 | | ■ |
| martensitic | **1.4057** X20CrNi 17 2 (X17CrNi16-2), **1.4122** X39CrMo17-1, **1.4521** X2CrMoTi18-2 | ≤850 | | ■ |
| Cast iron | **0.6010** EN-GJL-100(GG10), **0.6020** EN-GJL-200(GG20) | 850-≤1000 | | ■ □ |
| | **0.6025** EN-GJL-250(GG25), **0.6035** EN-GJL-350(GG35) | 1000-1200 | | ■ □ |
| Spheroidal graphite iron and | **0.7050** EN-GJS-500-7(GGG50), **0.8035** EN-GJMW-350-4(GTW35) | | ≤240 HB | ■ |
| malleable cast iron | **0.7070** EN-GJS-700-2(GGG70), **0.8170** EN-GJMB-700-2(GTS70) | | <300 HB | ■ |
| Chilled cast iron | – | | ≤350 HB | ■ |
| New Cast iron GGV | **EN-GJV250** (GGV25), **EN-GJV350** (GGV35) | | | ■ □ |
| | **EN-GJV400** (GGV40), **EN-GJV500** (GGV50), SiMo6 | | | ■ □ |
| New Cast iron ADI | **EN-GJS-800-8** (ADI800), **EN-GJS-1000-5** (ADI1000) | 800-1000 | | ■ □ |
| | **EN-GJS-1200-2** (ADI1200), **EN-GJS-1400-1** (ADI1400) | 1200-1400 | | ■ □ |
| Special alloys | Nimonic, Inconel, Monel, Hastelloy | ≤1200 | | ■ |
| Ti and Ti-alloys | **3.7024** Ti99,5, **3.7114** TiAl5Sn2,5, **3.7124** TiCu2 | ≤850 | | ■ |
| | **3.7154** TiAl6Zr5, **3.7165** TiAl6V4, **3.7184** TiAl4Mo4Sn2,5, - TiAl8Mo1V1 | >850-1200 | | ■ |
| Aluminium and Al-alloys | **3.0255** Al99,5, **3.2315** AlMgSi1, **3.3515** AlMg1 | ≤400 | | ■ |
| Al wrought alloys | **3.0615** AlMgSiPb, **3.1325** AlCuMg1, **3.3245** AlMg3Si, **3.4365** AlZnMgCu1,5 | ≤450 | | ■ |
| Al cast alloys ≤ 10 % Si | **3.2131** G-AlSi5Cu1, **3.2153** G-AlSi7Cu3, **3.2573** G-AlSi9 | ≤600 | | ■ |
| > 10 % Si | **3.2581** G-AlSi12, **3.2583** G-AlSi12Cu, - G-AlSi12CuNiMg | ≤600 | | ■ |
| Magnesium alloys | **3.5200** MgMn2, **3.5812.05** G-MgAl8Zn1, **3.5612.05** G-MgAl6Zn1 | ≤450 | | [!] |
| Copper, low alloyed | **2.0070** SE-Cu, **2.1020** CuSn6, **2.1096** G-CuSn5ZnPb | ≤400 | | ■ ■ |
| Brass, short-chipping | **2.0380** CuZn39Pb2, **2.0401** CuZn39Pb3, **2.0410** CuZn43Pb2 | ≤600 | | ■ ■ |
| long-chipping | **2.0250** CuZn20, **2.0280** CuZn33, **2.0332** CuZn37Pb0,5 | ≤600 | | ■ ■ |
| Bronze, short-chipping | **2.1090** CuSn7ZnPb, **2.1170** CuPb5Sn5, **2.1176** CuPb10Sn | ≤600 | | ■ ■ |
| | **2.0790** CuNi18Zn19Pb | >600-850 | | ■ |
| Bronze, long-chipping | **2.0916** CuAl5, **2.0960** CuAl9Mn, **2.1050** CuSn10 | ≤850 | | ■ |
| | **2.0980** CuAl11Ni, **2.1247** CuBe2 | >850-1000 | | ■ |
| Duroplastics | Epoxidharz, Resopal, Pertinax, Moltopren | | – | □ |
| Thermoplastics | Plexiglas, Hostalen, Novodur, Makralon | | – | ■ □ |
| Kevlar | Kevlar | | – | □ |
| Glass/carbon-concentr. plastics | GFK/CFK | | – | □ |

## ≤3×D drilling depth

## ≤5×D drilling depth

| Catalog no. | 51673 | 51676 | 51670 | 51687 | 51681 | 51674 | 71791 |
|---|---|---|---|---|---|---|---|
| Tool material | Solid carb. | Solid carb. | Solid carb. | Solid carb. | Solid carb. | Solid carb. | Solid carb. |
| Carbide grade | K/P | K/P | K/P | K/P | K/P | K/P | K/P |
| Surface finish | TiAlN nano | TiAlN nano | TiAlN nano | TiAlN nano | TiAlN nano | TiAlN nano | blank |
| DIN/Form | 6537K | 6537K | 6537K | 6537L | 6537L | 6537L | 6537L |
| Type | U | U | VA | U | U | VA | Al |
| Coolant | without | with | with | without | with | with | with |
| Page | 16 | 20 | 22 | 20 | 32 | 34 | 30 |

| $v_c$ m/min | Feed no. | $v_c$ m/min | Feed no. | $v_c$ m/min | Feed no. | $v_c$ m/min | Feed no. | $v_c$ m/min | Feed no. | $v_c$ m/min | Feed no. | $v_c$ m/min | Feed no. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 130 | G | 145 | G | | | 130 | G | 145 | G | | | | |
| 110 | F | 120 | F | | | 110 | F | 120 | F | | | | |
| 145 | H | 170 | H | | | 145 | H | 170 | H | | | | |
| 110 | G | 145 | H | | | 110 | G | 145 | H | | | | |
| 120 | G | 130 | H | | | 120 | G | 130 | H | | | | |
| 110 | G | 125 | G | | | 110 | G | 125 | G | | | | |
| 105 | G | 120 | G | | | 105 | G | 120 | G | | | | |
| 105 | G | 120 | G | | | 105 | G | 120 | G | | | | |
| 100 | F | 105 | G | | | 100 | F | 105 | G | | | | |
| 130 | H | 145 | H | | | 130 | H | 145 | H | | | | |
| 120 | G | 120 | G | | | 120 | G | 120 | G | | | | |
| 85 | E | 85 | E | | | 85 | E | 85 | E | | | | |
| 100 | F | 110 | G | | | 100 | F | 105 | G | | | | |
| 90 | E | 105 | E | | | 90 | E | 100 | E | | | | |
| 65 | F | 80 | F | | | 65 | F | 70 | F | | | | |
| 55 | E | 65 | E | | | 55 | E | 55 | E | | | | |
| 55 | | 60 | D | | | 55 | | 60 | E | | | | |
| 45 | C | 60 | C | | | 45 | C | 60 | C | | | | |
| 40 | A | 55 | C | | | 35 | A | 55 | C | | | | |
| 20 | A | 35 | B | | | 20 | A | 35 | B | | | | |
| 40 | B | 60 | E | 80 | E | 45 | B | 60 | E | 80 | E | | |
| 15 | A | 55 | B | 60 | B-C | 15 | A | 55 | B | 60 | B-C | | |
| 35 | B | 45 | E | 80 | E | 35 | B | 50 | E | 80 | E | | |
| 210 | H | 210 | I | | | 210 | H | 195 | I | | | | |
| 155 | H | 160 | I | | | 155 | H | 160 | I | | | | |
| 155 | G | 140 | I | | | 145 | G | 140 | I | | | | |
| 125 | G | 130 | H | | | 125 | G | 130 | H | | | | |
| 35 | C | 40 | C | | | 35 | C | 40 | C | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| 25 | D | 35 | D | 30 | D | 25 | D | 35 | D | 30 | D | | |
| 15 | A | 45 | D | 45 | D | 15 | A | 45 | D | 45 | D | | |
| 15 | A | 40 | C | 40 | C | 15 | A | 40 | C | 40 | C | | |
| 260 | I | 310 | I | | | 260 | I | 310 | I | | | 350 | I |
| 260 | I | 310 | I | | | 260 | I | 310 | I | | | 350 | I |
| 220 | H | 260 | I | | | 235 | I | 260 | I | | | 320 | H |
| 180 | H | 220 | I | | | 170 | H | 220 | I | | | 280 | G |
| 260 | H | 280 | H | | | 260 | H | 280 | H | | | 320 | G |
| 105 | G | 125 | G | | | 105 | G | 125 | G | | | 190 | G |
| 270 | H | 325 | H | | | 270 | H | 325 | H | | | 160 | F |
| 180 | G | 220 | G | | | 180 | G | 220 | G | | | 160 | F |
| 105 | F | 125 | G | | | 105 | F | 125 | G | | | 160 | F |
| 85 | F | 105 | F | | | 85 | F | 105 | F | | | 160 | F |
| 80 | E | 90 | F | | | 80 | E | 90 | F | | | 150 | F |
| 60 | E | 80 | F | | | 60 | E | 80 | F | | | 150 | F |
| | | | | | | | | | | | | 100 | C |
| | | | | | | | | | | | | 100 | C |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | 100 | B |

# SuperV drills

## Application recommendations

**Feed column**

| Drill-Ø mm | Code-letter A | B | C | D | E | F | G | H | I |
|---|---|---|---|---|---|---|---|---|---|
| **0,50** | 0,004 | 0,006 | 0,007 | 0,008 | 0,010 | 0,012 | 0,014 | 0,016 | 0,019 |
| **1,00** | 0,006 | 0,008 | 0,012 | 0,014 | 0,016 | 0,018 | 0,020 | 0,023 | 0,025 |
| **2,00** | 0,020 | 0,025 | 0,032 | 0,040 | 0,050 | 0,063 | 0,080 | 0,100 | 0,125 |
| **2,50** | 0,025 | 0,032 | 0,040 | 0,050 | 0,063 | 0,080 | 0,100 | 0,125 | 0,160 |
| **3,15** | 0,032 | 0,040 | 0,050 | 0,063 | 0,080 | 0,100 | 0,125 | 0,160 | 0,160 |
| **4,00** | 0,040 | 0,050 | 0,063 | 0,080 | 0,100 | 0,125 | 0,160 | 0,200 | 0,200 |
| **5,00** | 0,040 | 0,050 | 0,063 | 0,080 | 0,100 | 0,125 | 0,160 | 0,200 | 0,250 |
| **6,30** | 0,050 | 0,063 | 0,080 | 0,100 | 0,125 | 0,160 | 0,200 | 0,250 | 0,315 |
| **8,00** | 0,063 | 0,080 | 0,100 | 0,125 | 0,160 | 0,200 | 0,250 | 0,315 | 0,315 |
| **10,00** | 0,080 | 0,100 | 0,125 | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,400 |
| **12,50** | 0,080 | 0,100 | 0,125 | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 |
| **16,00** | 0,100 | 0,125 | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 | 0,630 |
| **20,00** | 0,125 | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 | 0,630 | 0,630 |
| **25,00** | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 | 0,630 | 0,800 | 0,800 |
| **31,50** | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 | 0,630 | 0,800 | 1,000 |
| **40,00** | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 | 0,630 | 0,800 | 1,000 | 1,250 |

Feed f (mm/rev)

Tools with feed column no. in bold are preferred choices for listed material group.

Meaning of code letters with type descriptions:

- **S** for high-tensile materials
- **U** for universal machining, carbon steels
- **VA** for stainless materials
- **X** for the machining of steel

**Lubricants:**

cutting oil, highly activated ■
soluble oil (emulsion) ■
without lubricant □
air only [!]

| Material group | Materials examples, **new designations** (old designation in brackets)<br>Figures in bold = material no. to DIN EN | Tensile strength MPa (N/mm²) | Hardness | Coolant |
|---|---|---|---|---|
| General purpose steels | **1.0035** S185(St33),**1.0486** P275N(StE285),**1.0345** P235GH(H1),**1.0425** P265GH(H2) | ≤500 | | ■ |
| | **1.0050** E295 (St50-2), **1.0070** E360 (St70-2), **1.8937** P500NH (WStE500) | >500-850 | | ■ |
| Free-cutting steels | **1.0718** 11SMnPb30 (9SMnPb28), **1.0736** 11SMn37 (9SMn36) | ≤850 | | ■ |
| | **1.0727** 46S20 (45S20), **1.0728** (60S20), **1.0757** 46SPb20 (45SPb20) | 850-1000 | | ■ |
| Unalloyed tempering steels | **1.0402** C22, **1.1178** C30E (Ck30) | ≤ 700 | | ■ |
| | **1.0503** C45, **1.1191** C45E (Ck45) | 700-850 | | ■ |
| | **1.0601** C60, **1.1221** C60E (Ck60) | 850-1000 | | ■ |
| Alloyed tempering steels | **1.5131** 50MnSi4, **1.7003** 38Cr2, **1.7030** 28Cr4 | 850-≤1000 | | ■ |
| | **1.5710** 36NiCr6, **1.7035** 41Cr4, **1.7225** 42CrMo4 | 1000-1200 | | ■ |
| Unalloyed case hardened steels | **1.0301** (C10), **1.1121** C10E (Ck10) | ≤750 | | ■ |
| Alloyed case hardened steels | **1.7043** 38Cr4 | 850-≤1000 | | ■ ■ |
| | **1.5752** 15NiCr13 (15NiCr13), **1.7131** 16MnCr5, **1.7264** 20CrMo5 | 1000-1200 | | ■ ■ |
| Nitriding steels | **1.8504** 34CrAl6 | ≥850-≤1000 | | ■ |
| | **1.8519** 31CrMoV9, **1.8550** 34CrAlNi7 | >1000-1200 | | ■ ■ |
| Tool steels | **1.1750** C75W, **1.2067** 102Cr6, **1.2307** 29CrMoV9 | ≤850 | | ■ |
| | **1.2080** X210Cr12, **1.2083** X42Cr13, **1.2419** 105WCr6, **1.2767** X45NiCrMo4 | >850-1000 | | ■ ■ |
| High speed steels | **1.3243** S 6-5-2-5, **1.3343** S 6-5-2, **1.3344** S 6-5-3 | ≥650-1000 | | ■ |
| Spring steels | **1.5026** 55Si7, **1.7176** 55Cr3, **1.8159** 51CrV4 (51CrV4) | | ≤330 HB | ■ ■ |
| Hardened steels | – | | ≤40-48 HRC | ■ |
| | | | >48-60 HRC | ■ |
| Stainless steels, sulphured | **1.4005** X12CrS13, **1.4104** X14CrMoS17, **1.4105** X6CrMoS17, **1.4305** X8CrNiS18-9 | ≤850 | | ■ |
| austenitic | **1.4301** X5CrNi18-10 (V2A), **1.4541** X6CrNiTi18-10, **1.4571** X6CrNiMoTi 17-12-2 (V4A) | ≤850 | | ■ |
| martensitic | **1.4057** X20CrNi 17 2 (X17CrNi16-2), **1.4122** X39CrMo17-1, **1.4521** X2CrMoTi18-2 | ≤850 | | ■ |
| Cast iron | **0.6010** EN-GJL-100(GG10), **0.6020** EN-GJL-200(GG20) | 850-≤1000 | | ■ □ |
| | **0.6025** EN-GJL-250(GG25), **0.6035** EN-GJL-350(GG35) | 1000-1200 | | ■ □ |
| Spheroidal graphite iron and | **0.7050** EN-GJS-500-7(GGG50), **0.8035** EN-GJMW-350-4(GTW35) | | ≤240 HB | ■ |
| malleable cast iron | **0.7070** EN-GJS-700-2(GGG70), **0.8170** EN-GJMB-700-2(GTS70) | | <300 HB | ■ |
| Chilled cast iron | – | | ≤350 HB | ■ |
| New Cast iron GGV | **EN-GJV250** (GGV25), **EN-GJV350** (GGV35) | | | ■ □ |
| | **EN-GJV400** (GGV40), **EN-GJV500** (GGV50), SiMo6 | | | ■ □ |
| New Cast iron ADI | **EN-GJS-800-8** (ADI800), **EN-GJS-1000-5** (ADI1000) | 800-1000 | | ■ □ |
| | **EN-GJS-1200-2** (ADI1200), **EN-GJS-1400-1** (ADI1400) | 1200-1400 | | ■ □ |
| Special alloys | Nimonic, Inconel, Monel, Hastelloy | ≤1200 | | ■ |
| Ti and Ti-alloys | **3.7024** Ti99,5, **3.7114** TiAl5Sn2,5, **3.7124** TiCu2 | ≤850 | | ■ |
| | **3.7154** TiAl6Zr5, **3.7165** TiAl6V4, **3.7184** TiAl4Mo4Sn2,5, - TiAl8Mo1V1 | >850-1200 | | ■ |
| Aluminium and Al-alloys | **3.0255** Al99,5, **3.2315** AlMgSi1, **3.3515** AlMg1 | ≤400 | | ■ |
| Al wrought alloys | **3.0615** AlMgSiPb, **3.1325** AlCuMg1, **3.3245** AlMg3Si, **3.4365** AlZnMgCu1,5 | ≤450 | | ■ |
| Al cast alloys ≤ 10 % Si | **3.2131** G-AlSi5Cu1, **3.2153** G-AlSi7Cu3, **3.2573** G-AlSi9 | ≤600 | | ■ |
| > 10 % Si | **3.2581** G-AlSi12, **3.2583** G-AlSi12Cu, - G-AlSi12CuNiMg | ≤600 | | ■ |
| Magnesium alloys | **3.5200** MgMn2, **3.5812.05** G-MgAl8Zn1, **3.5612.05** G-MgAl6Zn1 | ≤450 | | [!] |
| Copper, low alloyed | **2.0070** SE-Cu, **2.1020** CuSn6, **2.1096** G-CuSn5ZnPb | ≤400 | | ■ ■ |
| Brass, short-chipping | **2.0380** CuZn39Pb2, **2.0401** CuZn39Pb3, **2.0410** CuZn43Pb2 | ≤600 | | ■ ■ |
| long-chipping | **2.0250** CuZn20, **2.0280** CuZn33, **2.0332** CuZn37Pb0,5 | ≤600 | | ■ ■ |
| Bronze, short-chipping | **2.1090** CuSn7ZnPb, **2.1170** CuPb5Sn5, **2.1176** CuPb10Sn | ≤600 | | ■ ■ |
| | **2.0790** CuNi18Zn19Pb | >600-850 | | ■ |
| Bronze, long-chipping | **2.0916** CuAl5, **2.0960** CuAl9Mn, **2.1050** CuSn10 | ≤850 | | ■ |
| | **2.0980** CuAl11Ni, **2.1247** CuBe2 | >850-1000 | | ■ |
| Duroplastics | Epoxidharz, Resopal, Pertinax, Moltopren | | – | □ |
| Thermoplastics | Plexiglas, Hostalen, Novodur, Makralon | | – | ■ □ |
| Kevlar | Kevlar | | – | □ |
| Glass/carbon-concentr. plastics | GFK/CFK | | – | □ |

## ≤3×D drilling depth

## ≤5×D

## ≤7×D

| | | | | | | |
|---|---|---|---|---|---|---|
| Catalog no. | 51750 | 51752 | 51753 | 51754 | 51755 | 51756 |
| Tool material | Solid carbide | Solid carbide | Solid carbide | Solid carbide | Solid carbide | Solid carbide |
| Carbide grade | K/P | K/P | K/P | K/P | K/P | K/P |
| Surface finish | TiAlSiN | TiAlSiN | TiAlSiN | TiAlSiN | TiAlSiN | TiAlSiN |
| DIN/Form | 6537K | 6537K | 6537K | 6537L | 6537L | Stock std. |
| Type | S | S | S | S | S | S |
| Coolant | without | with | with | with | with | with |
| Page | 18 | 26 | 28 | 38 | 40 | 44 |

| $v_c$ m/min | Feed no. | $v_c$ m/min | Feed no. | | $v_c$ m/min | Feed no. | | $v_c$ m/min | Feed no. |
|---|---|---|---|---|---|---|---|---|---|
| 130 | G | 145 | G | G | 145 | G | G | 145 | F |
| 110 | F | 120 | F | F | 120 | F | F | 120 | E |
| 145 | H | 170 | H | H | 170 | H | H | 170 | G |
| 110 | G | 145 | H | H | 145 | H | H | 145 | G |
| 120 | G | 130 | H | H | 130 | H | H | 130 | G |
| 110 | G | 125 | G | G | 125 | G | G | 125 | F |
| 105 | G | 120 | G | G | 120 | G | G | 120 | F |
| 105 | G | 120 | G | G | 120 | G | G | 120 | F |
| 100 | F | 105 | G | G | 105 | G | G | 105 | F |
| 130 | H | 145 | H | H | 145 | H | H | 145 | G |
| 120 | G | 120 | G | G | 120 | G | G | 120 | F |
| 85 | E | 85 | E | E | 85 | E | E | 85 | D |
| 100 | F | 110 | G | G | 110 | G | G | 110 | F |
| 90 | E | 105 | E | E | 105 | E | E | 105 | D |
| 65 | F | 80 | F | F | 80 | F | F | 80 | E |
| 55 | E | 65 | E | E | 65 | E | E | 65 | D |
| 55 | D | 60 | D | D | 60 | D | D | 60 | C |
| 45 | C | 60 | C | C | 60 | C | C | 60 | B |
| 40 | A | 55 | C | C | 55 | C | C | 55 | B |
| 20 | A | 35 | B | B | 35 | B | B | 35 | A |
| 25 | D | 35 | D | D | 35 | D | D | 35 | C |
| 15 | A | 45 | D | D | 45 | D | D | 45 | C |
| 15 | A | 40 | C | C | 40 | C | C | 40 | D |

# SuperV drills

# Application recommendations

## Feed column

| drill-Ø mm | Code-letter A | B | C | D | E | F | G | H | I |
|---|---|---|---|---|---|---|---|---|---|
| **0,50** | 0,004 | 0,006 | 0,007 | 0,008 | 0,010 | 0,012 | 0,014 | 0,016 | 0,019 |
| **1,00** | 0,006 | 0,008 | 0,012 | 0,014 | 0,016 | 0,018 | 0,020 | 0,023 | 0,025 |
| **2,00** | 0,020 | 0,025 | 0,032 | 0,040 | 0,050 | 0,063 | 0,080 | 0,100 | 0,125 |
| **2,50** | 0,025 | 0,032 | 0,040 | 0,050 | 0,063 | 0,080 | 0,100 | 0,125 | 0,160 |
| **3,15** | 0,032 | 0,040 | 0,050 | 0,063 | 0,080 | 0,100 | 0,125 | 0,160 | 0,160 |
| **4,00** | 0,040 | 0,050 | 0,063 | 0,080 | 0,100 | 0,125 | 0,160 | 0,200 | 0,200 |
| **5,00** | 0,040 | 0,050 | 0,063 | 0,080 | 0,100 | 0,125 | 0,160 | 0,200 | 0,250 |
| **6,30** | 0,050 | 0,063 | 0,080 | 0,100 | 0,125 | 0,160 | 0,200 | 0,250 | 0,315 |
| **8,00** | 0,063 | 0,080 | 0,100 | 0,125 | 0,160 | 0,200 | 0,250 | 0,315 | 0,315 |
| **10,00** | 0,080 | 0,100 | 0,125 | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,400 |
| **12,50** | 0,080 | 0,100 | 0,125 | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 |
| **16,00** | 0,100 | 0,125 | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 | 0,630 |
| **20,00** | 0,125 | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 | 0,630 | 0,630 |
| **25,00** | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 | 0,630 | 0,800 | 0,800 |
| **31,50** | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 | 0,630 | 0,800 | 1,000 |
| **40,00** | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 | 0,630 | 0,800 | 1,000 | 1,250 |

Feed f (mm/rev)

Tools with feed column no. in bold are preferred choices for listed material group.

Meaning of code letters with type descriptions:

- **S** for high-tensile materials
- **U** for universal machining, carbon steels
- **VA** for stainless materials
- **X** for the machining of steel

Application recommendations for SuperV-T-drills:
In order to achieve optimal machining results when producing deep holes, we recommend:

1. Production of a cylindrical pilot hole (tolerance F9) with a min. drilling depth of 1 x D with our SuperV drill type U or VA (140° point angle, tolerance m7). Or alternatively the Pilot Drill-Mill cat. no. 54700
2. Entry in the pilot hole: speed approx. 300 rev./min, feed rate approx. 500 mm/min.
3. Setting of coolant pressure and speed.
4. Continuous drilling to complete hole depth without withdrawing.
5. For through holes with plain - i.e. 90° - exit, reduce feed rate vf to 50 % approx. 1 mm prior to break-through.
6. For through holes with oblique exit, reduce the feed rate $v_f$ to 40% approx. 1 mm prior to break-through.
7. After reaching hole depth stop machine spindle and coolant supply, withdrawal with max. 5000 mm/min.

**Lubricants:**
cutting oil, highly activated ■
soluble oil (emulsion) ■
without lubricant □
air only [!]

| Material group | Materials examples, **new designations** (old designation in brackets) Figures in bold = material no. to DIN EN | Tensile strength MPa (N/mm²) | Hardness | Coolant |
|---|---|---|---|---|
| General purpose steels | **1.0035** S185(St33),**1.0486** P275N(StE285),**1.0345** P235GH(H1),**1.0425** P265GH(H2) | ≤500 | | ■ |
| | **1.0050** E295 (St50-2), **1.0070** E360 (St70-2), **1.8937** P500NH (WStE500) | >500-850 | | ■ |
| Free-cutting steels | **1.0718** 11SMnPb30 (9SMnPb28), **1.0736** 11SMn37 (9SMn36) | ≤850 | | ■ |
| | **1.0727** 46S20 (45S20), **1.0728** (60S20), **1.0757** 46SPb20 (45SPb20) | 850-1000 | | ■ |
| Unalloyed tempering steels | **1.0402** C22, **1.1178** C30E (Ck30) | ≤ 700 | | ■ |
| | **1.0503** C45, **1.1191** C45E (Ck45) | 700-850 | | ■ |
| | **1.0601** C60, **1.1221** C60E (Ck60) | 850-1000 | | ■ |
| Alloyed tempering steels | **1.5131** 50MnSi4, **1.7003** 38Cr2, **1.7030** 28Cr4 | 850-≤1000 | | ■ |
| | **1.5710** 36NiCr6, **1.7035** 41Cr4, **1.7225** 42CrMo4 | 1000-1200 | | ■ |
| Unalloyed case hardened steels | **1.0301** (C10), **1.1121** C10E (Ck10) | ≤750 | | ■ |
| Alloyed case hardened steels | **1.7043** 38Cr4 | 850-≤1000 | | ■ ■ |
| | **1.5752** 15NiCr13 (15NiCr13), **1.7131** 16MnCr5, **1.7264** 20CrMo5 | 1000-1200 | | ■ ■ |
| Nitriding steels | **1.8504** 34CrAl6 | ≥850-≤1000 | | ■ |
| | **1.8519** 31CrMoV9, **1.8550** 34CrAlNi7 | >1000-1200 | | ■ ■ |
| Tool steels | **1.1750** C75W, **1.2067** 102Cr6, **1.2307** 29CrMoV9 | ≤850 | | ■ |
| | **1.2080** X210Cr12, **1.2083** X42Cr13, **1.2419** 105WCr6, **1.2767** X45NiCrMo4 | >850-1000 | | ■ ■ |
| High speed steels | **1.3243** S 6-5-2-5, **1.3343** S 6-5-2, **1.3344** S 6-5-3 | ≥650-1000 | | ■ |
| Spring steels | **1.5026** 55Si7, **1.7176** 55Cr3, **1.8159** 51CrV4 (51CrV4) | | ≤330 HB | ■ ■ |
| Hardened steels | – | | ≤40-48 HRC | ■ |
| | | | >48-60 HRC | ■ |
| Stainless steels, sulphured | **1.4005** X12CrS13, **1.4104** X14CrMoS17, **1.4105** X6CrMoS17, **1.4305** X8CrNiS18-9 | ≤850 | | ■ |
| austenitic | **1.4301** X5CrNi18-10 (V2A), **1.4541** X6CrNiTi18-10, **1.4571** X6CrNiMoTi 17-12-2 (V4A) | ≤850 | | ■ |
| martensitic | **1.4057** X20CrNi 17 2 (X17CrNi16-2), **1.4122** X39CrMo17-1, **1.4521** X2CrMoTi18-2 | ≤850 | | ■ |
| Cast iron | **0.6010** EN-GJL-100(GG10), **0.6020** EN-GJL-200(GG20) | 850-≤1000 | | ■ □ |
| | **0.6025** EN-GJL-250(GG25), **0.6035** EN-GJL-350(GG35) | 1000-1200 | | ■ □ |
| Spheroidal graphite iron and | **0.7050** EN-GJS-500-7(GGG50), **0.8035** EN-GJMW-350-4(GTW35) | | ≤240 HB | ■ |
| malleable cast iron | **0.7070** EN-GJS-700-2(GGG70), **0.8170** EN-GJMB-700-2(GTS70) | | <300 HB | ■ |
| Chilled cast iron | – | | ≤350 HB | ■ |
| New Cast iron GGV | **EN-GJV250** (GGV25), **EN-GJV350** (GGV35) | | | ■ □ |
| | **EN-GJV400** (GGV40), **EN-GJV500** (GGV50), SiMo6 | | | ■ □ |
| New Cast iron ADI | **EN-GJS-800-8** (ADI800), **EN-GJS-1000-5** (ADI1000) | 800-1000 | | ■ □ |
| | **EN-GJS-1200-2** (ADI1200), **EN-GJS-1400-1** (ADI1400) | 1200-1400 | | ■ □ |
| Special alloys | Nimonic, Inconel, Monel, Hastelloy | ≤1200 | | ■ |
| Ti and Ti-alloys | **3.7024** Ti99,5, **3.7114** TiAl5Sn2,5, **3.7124** TiCu2 | ≤850 | | ■ |
| | **3.7154** TiAl6Zr5, **3.7165** TiAl6V4, **3.7184** TiAl4Mo4Sn2,5, - TiAl8Mo1V1 | >850-1200 | | ■ |
| Aluminium and Al-alloys | **3.0255** Al99,5, **3.2315** AlMgSi1, **3.3515** AlMg1 | ≤400 | | ■ |
| Al wrought alloys | **3.0615** AlMgSiPb, **3.1325** AlCuMg1, **3.3245** AlMg3Si, **3.4365** AlZnMgCu1,5 | ≤450 | | ■ |
| Al cast alloys ≤ 10 % Si | **3.2131** G-AlSi5Cu1, **3.2153** G-AlSi7Cu3, **3.2573** G-AlSi9 | ≤600 | | ■ |
| > 10 % Si | **3.2581** G-AlSi12, **3.2583** G-AlSi12Cu, - G-AlSi12CuNiMg | ≤600 | | ■ |
| Magnesium alloys | **3.5200** MgMn2, **3.5812.05** G-MgAl8Zn1, **3.5612.05** G-MgAl6Zn1 | ≤450 | | [!] |
| Copper, low alloyed | **2.0070** SE-Cu, **2.1020** CuSn6, **2.1096** G-CuSn5ZnPb | ≤400 | | ■ ■ |
| Brass, short-chipping | **2.0380** CuZn39Pb2, **2.0401** CuZn39Pb3, **2.0410** CuZn43Pb2 | ≤600 | | ■ ■ |
| long-chipping | **2.0250** CuZn20, **2.0280** CuZn33, **2.0332** CuZn37Pb0,5 | ≤600 | | ■ ■ |
| Bronze, short-chipping | **2.1090** CuSn7ZnPb, **2.1170** CuPb5Sn5, **2.1176** CuPb10Sn | ≤600 | | ■ ■ |
| | **2.0790** CuNi18Zn19Pb | >600-850 | | ■ |
| Bronze, long-chipping | **2.0916** CuAl5, **2.0960** CuAl9Mn, **2.1050** CuSn10 | ≤850 | | ■ |
| | **2.0980** CuAl11Ni, **2.1247** CuBe2 | >850-1000 | | ■ |
| Duroplastics | Epoxidharz, Resopal, Pertinax, Moltopren | | – | □ |
| Thermoplastics | Plexiglas, Hostalen, Novodur, Makralon | | – | ■ □ |
| Kevlar | Kevlar | | – | □ |
| Glass/carbon-concentr. plastics | GFK/CFK | | – | □ |

| | ≤5×D | ≤7×D | ≤15×D | ≤20×D | ≤25×D | ≤30×D | ≤40×D |
|---|---|---|---|---|---|---|---|
| Catalog no. | 51786 | 51791 | 51764 | 51765 | 51766 | 51767 | 51768 |
| Tool material | Solid carb. | Solid carb. | Solid carb. | Solid carb. | Solid carb. | Solid carb. | Solid carb. |
| Carbide grade | K/P | K/P | K/P | K/P | K/P | K/P | K/P |
| Surface finish | TiAlN nano | TiAlN nano | AlTiN | AlTiN | AlTiN | AlTiN | AlTiN |
| DIN | 6537L | Stock std. | Stock std. | Stock std. | Stock std. | Stock std. | Stock std. |
| Type | X | X | T | T | T | T | T |
| Coolant | with | with | with | with | with | with | with |
| Page | 36 | 42 | 45 | 46 | 47 | 48 | 49 |

| $v_c$ m/min | Feed no. | $v_c$ m/min | Feed no. | $v_c$ m/min | Feed no. | $v_c$ m/min | Feed no. | $v_c$ m/min | Feed no. | $v_c$ m/min | Feed no. | $v_c$ m/min | Feed no. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 200 | H | 180 | H | 110 | H | 110 | H | 100 | H | 80 | G | 80 | G |
| 200 | G | 180 | G | 110 | H | 110 | H | 100 | H | 80 | G | 80 | G |
| 200 | H | 180 | H | 120 | H | 120 | H | 120 | H | 100 | H | 100 | H |
| 200 | H | 180 | H | 120 | H | 120 | H | 100 | H | 100 | H | 100 | H |
| 180 | H | 160 | H | 110 | F | 110 | F | 110 | F | 110 | F | 110 | F |
| 160 | H | 140 | H | 110 | H | 110 | H | 100 | H | 80 | G | 80 | G |
| 130 | H | 120 | H | 100 | G | 100 | G | 100 | G | 80 | G | 80 | G |
| 120 | H | 110 | H | 110 | G | 110 | G | 100 | G | 80 | G | 80 | F-G |
| 120 | G | 110 | G | 110 | F | 110 | F | 100 | F | 80 | F | 80 | F |
| 180 | H | 160 | H | 110 | H | 110 | H | 100 | H | 80 | G | 80 | G |
| 120 | H | 110 | H | 110 | G | 110 | G | 100 | G | 80 | F | 80 | F |
| 110 | G | 100 | G | 110 | F | 110 | F | 100 | F | 80 | F | 80 | F |
| 110 | G | 100 | G | 100 | E | 100 | E | 80 | E | 80 | E | 80 | E |
| 100 | E | 90 | E | 80 | E | 80 | E | 60 | E | 60 | E | 60 | E |
| 90 | G | 80 | G | 100 | F-G | 100 | F | 90 | F | 80 | F | 80 | F-G |
| 65 | F | 60 | F | 80 | E | 80 | E | 70 | D | 70 | D | 70 | D |
| 60 | E | 55 | E | 50 | E | 50 | E | 50 | D | 50 | D | 50 | D |
| 60 | E | 55 | E | 50 | E | 50 | E | 50 | D | 50 | D | 50 | D |
| 55 | C | 45 | C | 50 | D | 50 | D | 50 | D | 50 | D | 50 | D |
| 80 | E | 70 | E | 100 | E | 100 | E | 100 | E | 80 | E | 80 | E |
| | | | | 70 | B-C | 60 | C | 60 | C | 60 | C | 70 | B-C |
| 60 | E | 50 | E | 100 | E | 100 | E | 100 | E | 80 | E | 80 | E |
| 180 | I | 165 | I | 140 | H | 140 | H | 130 | H | 120 | H | 120 | H |
| 160 | I | 145 | I | 100 | H | 100 | H | 90 | H | 80 | H | 80 | H |
| 140 | I | 130 | I | 140 | H | 140 | H | 130 | H | 120 | H | 120 | H |
| 140 | H | 130 | H | 100 | H | 100 | H | 90 | H | 80 | H | 80 | H |
| 140 | H | 130 | H | 100 | F | 100 | F | 90 | F | 80 | F | 80 | F |
| 140 | H | 130 | H | 100 | F | 100 | F | 90 | F | 80 | F | 80 | F |
| 80 | G | 70 | G | 90 | H | 90 | H | 80 | H | 70 | H | 70 | H |
| 80 | G | 70 | G | | | | | | | | | | |
| 30 | D | 25 | D | 30 | B | 30 | B | 30 | B | 30 | B | 30 | B |
| 40 | D | 35 | D | | | | | | | | | | |
| 35 | C | 30 | C | | | | | | | | | | |
| | | | | 120 | A | 120 | A | 120 | A | 120 | A | 120 | A |
| | | | | 120 | H | 120 | H | 110 | H | 100 | H | 100 | H |

# Twist Drills

## Application recommendations

**Feed column**

| Drill-Ø mm | Code-letter A | B | C | D | E | F | G | H | I |
|---|---|---|---|---|---|---|---|---|---|
| **0,50** | 0,004 | 0,006 | 0,007 | 0,008 | 0,010 | 0,012 | 0,014 | 0,016 | 0,019 |
| **1,00** | 0,006 | 0,008 | 0,012 | 0,014 | 0,016 | 0,018 | 0,020 | 0,023 | 0,025 |
| **2,00** | 0,020 | 0,025 | 0,032 | 0,040 | 0,050 | 0,063 | 0,080 | 0,100 | 0,125 |
| **2,50** | 0,025 | 0,032 | 0,040 | 0,050 | 0,063 | 0,080 | 0,100 | 0,125 | 0,160 |
| **3,15** | 0,032 | 0,040 | 0,050 | 0,063 | 0,080 | 0,100 | 0,125 | 0,160 | 0,160 |
| **4,00** | 0,040 | 0,050 | 0,063 | 0,080 | 0,100 | 0,125 | 0,160 | 0,200 | 0,200 |
| **5,00** | 0,040 | 0,050 | 0,063 | 0,080 | 0,100 | 0,125 | 0,160 | 0,200 | 0,250 |
| **6,30** | 0,050 | 0,063 | 0,080 | 0,100 | 0,125 | 0,160 | 0,200 | 0,250 | 0,315 |
| **8,00** | 0,063 | 0,080 | 0,100 | 0,125 | 0,160 | 0,200 | 0,250 | 0,315 | 0,315 |
| **10,00** | 0,080 | 0,100 | 0,125 | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,400 |
| **12,50** | 0,080 | 0,100 | 0,125 | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 |
| **16,00** | 0,100 | 0,125 | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 | 0,630 |
| **20,00** | 0,125 | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 | 0,630 | 0,630 |
| **25,00** | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 | 0,630 | 0,800 | 0,800 |
| **31,50** | 0,160 | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 | 0,630 | 0,800 | 1,000 |
| **40,00** | 0,200 | 0,250 | 0,315 | 0,400 | 0,500 | 0,630 | 0,800 | 1,000 | 1,250 |

Feed f (mm/rev)

Tools with feed column no. in bold are preferred choices for listed material group.

**Lubricants:**
cutting oil, highly activated ■
soluble oil (emulsion) ■
without lubricant □
air only [!]

| Material group | Materials examples, **new designations** (old designation in brackets) Figures in bold = material no. to DIN EN | Tensile strength MPa (N/mm²) | Hardness | Coolant |
|---|---|---|---|---|
| General purpose steels | **1.0035** S185(St33),**1.0486** P275N(StE285),**1.0345** P235GH(H1),**1.0425** P265GH(H2) | ≤500 | | ■ |
| | **1.0050** E295 (St50-2), **1.0070** E360 (St70-2), **1.8937** P500NH (WStE500) | >500-850 | | ■ |
| Free-cutting steels | **1.0718** 11SMnPb30 (9SMnPb28), **1.0736** 11SMn37 (9SMn36) | ≤850 | | ■ |
| | **1.0727** 46S20 (45S20), **1.0728** (60S20), **1.0757** 46SPb20 (45SPb20) | 850-1000 | | ■ |
| Unalloyed tempering steels | **1.0402** C22, **1.1178** C30E (Ck30) | ≤ 700 | | ■ |
| | **1.0503** C45, **1.1191** C45E (Ck45) | 700-850 | | ■ |
| | **1.0601** C60, **1.1221** C60E (Ck60) | 850-1000 | | ■ |
| Alloyed tempering steels | **1.5131** 50MnSi4, **1.7003** 38Cr2, **1.7030** 28Cr4 | 850-≤1000 | | ■ |
| | **1.5710** 36NiCr6, **1.7035** 41Cr4, **1.7225** 42CrMo4 | 1000-1200 | | ■ |
| Unalloyed case hardened steels | **1.0301** (C10), **1.1121** C10E (Ck10) | ≤750 | | ■ |
| Alloyed case hardened steels | **1.7043** 38Cr4 | 850-≤1000 | | ■ ■ |
| | **1.5752** 15NiCr13 (15NiCr13), **1.7131** 16MnCr5, **1.7264** 20CrMo5 | 1000-1200 | | ■ ■ |
| Nitriding steels | **1.8504** 34CrAl6 | ≥850-≤1000 | | ■ |
| | **1.8519** 31CrMoV9, **1.8550** 34CrAlNi7 | >1000-1200 | | ■ ■ |
| Tool steels | **1.1750** C75W, **1.2067** 102Cr6, **1.2307** 29CrMoV9 | ≤850 | | ■ |
| | **1.2080** X210Cr12, **1.2083** X42Cr13, **1.2419** 105WCr6, **1.2767** X45NiCrMo4 | >850-1000 | | ■ ■ |
| High speed steels | **1.3243** S 6-5-2-5, **1.3343** S 6-5-2, **1.3344** S 6-5-3 | ≥650-1000 | | ■ |
| Spring steels | **1.5026** 55Si7, **1.7176** 55Cr3, **1.8159** 51CrV4 (51CrV4) | | ≤330 HB | ■ ■ |
| Hardened steels | – | | ≤40-48 HRC | ■ |
| | | | >48-60 HRC | ■ |
| Stainless steels, sulphured | **1.4005** X12CrS13, **1.4104** X14CrMoS17, **1.4105** X6CrMoS17, **1.4305** X8CrNiS18-9 | ≤850 | | ■ |
| austenitic | **1.4301** X5CrNi18-10 (V2A), **1.4541** X6CrNiTi18-10, **1.4571** X6CrNiMoTi 17-12-2 (V4A) | ≤850 | | ■ |
| martensitic | **1.4057** X20CrNi 17 2 (X17CrNi16-2), **1.4122** X39CrMo17-1, **1.4521** X2CrMoTi18-2 | ≤850 | | ■ |
| Cast iron | **0.6010** EN-GJL-100(GG10), **0.6020** EN-GJL-200(GG20) | 850-≤1000 | | ■ □ |
| | **0.6025** EN-GJL-250(GG25), **0.6035** EN-GJL-350(GG35) | 1000-1200 | | ■ □ |
| Spheroidal graphite iron and | **0.7050** EN-GJS-500-7(GGG50), **0.8035** EN-GJMW-350-4(GTW35) | | ≤240 HB | ■ |
| malleable cast iron | **0.7070** EN-GJS-700-2(GGG70), **0.8170** EN-GJMB-700-2(GTS70) | | <300 HB | ■ |
| Chilled cast iron | – | | ≤350 HB | ■ |
| New Cast iron GGV | **EN-GJV250** (GGV25), **EN-GJV350** (GGV35) | | | ■ □ |
| | **EN-GJV400** (GGV40), **EN-GJV500** (GGV50), SiMo6 | | | ■ □ |
| New Cast iron ADI | **EN-GJS-800-8** (ADI800), **EN-GJS-1000-5** (ADI1000) | 800-1000 | | ■ □ |
| | **EN-GJS-1200-2** (ADI1200), **EN-GJS-1400-1** (ADI1400) | 1200-1400 | | ■ □ |
| Special alloys | Nimonic, Inconel, Monel, Hastelloy | ≤1200 | | ■ |
| Ti and Ti-alloys | **3.7024** Ti99,5, **3.7114** TiAl5Sn2,5, **3.7124** TiCu2 | ≤850 | | ■ |
| | **3.7154** TiAl6Zr5, **3.7165** TiAl6V4, **3.7184** TiAl4Mo4Sn2,5, - TiAl8Mo1V1 | >850-1200 | | ■ |
| Aluminium and Al-alloys | **3.0255** Al99,5, **3.2315** AlMgSi1, **3.3515** AlMg1 | ≤400 | | ■ |
| Al wrought alloys | **3.0615** AlMgSiPb, **3.1325** AlCuMg1, **3.3245** AlMg3Si, **3.4365** AlZnMgCu1,5 | ≤450 | | ■ |
| Al cast alloys ≤ 10 % Si | **3.2131** G-AlSi5Cu1, **3.2153** G-AlSi7Cu3, **3.2573** G-AlSi9 | ≤600 | | ■ |
| > 10 % Si | **3.2581** G-AlSi12, **3.2583** G-AlSi12Cu, - G-AlSi12CuNiMg | ≤600 | | ■ |
| Magnesium alloys | **3.5200** MgMn2, **3.5812.05** G-MgAl8Zn1, **3.5612.05** G-MgAl6Zn1 | ≤450 | | [!] |
| Copper, low alloyed | **2.0070** SE-Cu, **2.1020** CuSn6, **2.1096** G-CuSn5ZnPb | ≤400 | | ■ ■ |
| Brass, short-chipping | **2.0380** CuZn39Pb2, **2.0401** CuZn39Pb3, **2.0410** CuZn43Pb2 | ≤600 | | ■ ■ |
| long-chipping | **2.0250** CuZn20, **2.0280** CuZn33, **2.0332** CuZn37Pb0,5 | ≤600 | | ■ ■ |
| Bronze, short-chipping | **2.1090** CuSn7ZnPb, **2.1170** CuPb5Sn5, **2.1176** CuPb10Sn | ≤600 | | ■ ■ |
| | **2.0790** CuNi18Zn19Pb | >600-850 | | ■ |
| Bronze, long-chipping | **2.0916** CuAl5, **2.0960** CuAl9Mn, **2.1050** CuSn10 | ≤850 | | ■ |
| | **2.0980** CuAl11Ni, **2.1247** CuBe2 | >850-1000 | | ■ |
| Duroplastics | Epoxidharz, Resopal, Pertinax, Moltopren | | – | □ |
| Thermoplastics | Plexiglas, Hostalen, Novodur, Makralon | | – | ■ □ |
| Kevlar | Kevlar | | – | □ |
| Glass/carbon-concentr. plastics | GFK/CFK | | – | □ |

| | ≤5×D | ≤3×D | ~3×D | ~5×D | ~5×D |
|---|---|---|---|---|---|
| Catalog no. | **51290** | **51146** | **61131** | **61232** | **71018** |
| Tool material | **Solid carbide** | **Solid carbide** | **HSS-Co** | **HSS-Co** | **M42** |
| Carbide grade | K/P | K/P | | | |
| Surface finish | TiAlN nano | TiAlN nano | AlTiZrN | AlTiZrN | Bronze-VAP |
| DIN | **Stock std.** | **6537K** | **1897** | **338** | **338** |
| Type | N | H | V18 | V18 | V16 |
| Coolant | **without** | **without** | **without** | **without** | **without** |
| Page | 50 | 51 | 56 | 58 | 60 |

| $v_c$ m/min | Feed no. | $v_c$ m/min | Feed no. | $v_c$ m/min | Feed no. | $v_c$ m/min | Feed no. | $v_c$ m/min | Feed no. |
|---|---|---|---|---|---|---|---|---|---|
| 100 | E | | | 38 | F | 38 | F | 35 | **F** |
| 90 | E | | | 33 | E | 33 | E | 30 | E |
| 100 | **F** | | | 44 | F | 44 | F | 40 | **F** |
| 90 | **D** | | | 42 | E | 42 | E | 40 | E |
| 100 | E | | | 44 | E | 44 | E | 40 | **E** |
| 90 | E | | | 44 | E | 44 | E | 40 | E |
| 80 | E | | | | | | | 35 | D |
| 80 | E | | | | | | | 20 | D |
| | | 80 | F | | | | | 16 | C |
| 100 | F | | | 40 | F | 40 | F | 36 | **F** |
| 80 | E | | | | | | | 20 | C |
| | | 65 | D | | | | | 15 | C |
| 65 | E | | | | | | | 16 | **D** |
| | | 80 | D | | | | | 12 | **C** |
| 65 | C | | | | | | | 15 | **C** |
| | | | | | | | | 12 | **C** |
| | | | | | | | | 15 | **C** |
| 30 | C | | | | | | | 8 | **B** |
| 20 | B | 40 | **B** | | | | | 4 | **A** |
| | | 30 | **A** | | | | | | |
| 30 | **B** | | | 20 | **D** | 20 | **D** | 18 | **C** |
| 20 | **A** | | | 15 | **C** | 15 | **C** | 14 | **C** |
| 30 | **B** | | | 18 | **C** | 18 | **C** | 16 | **C** |
| 115 | **E** | 90 | H | 30 | F | 30 | F | 35 | **F** |
| 100 | **E** | 80 | H | 30 | F | 30 | F | 30 | F |
| 90 | E | 80 | H | | | | | 30 | **F** |
| 80 | **E** | 70 | G | | | | | 28 | F |
| | | 30 | B | | | | | 10 | **C** |
| | | | | | | | | | |
| | | | | | | | | | |
| 20 | C | | | H | A | H | A | 8 | A |
| 15 | **A** | | | 12 | **B** | 12 | **B** | 10 | B |
| 15 | **A** | | | H | **B** | H | **B** | 6 | B |
| 260 | **H** | | | 90 | G | 90 | G | 90 | **G** |
| 260 | **H** | | | 90 | G | 90 | G | 90 | G |
| 195 | **G** | | | 80 | G | 80 | G | 80 | **G** |
| 155 | **G** | | | 70 | F | 70 | F | 70 | **F** |
| 235 | **F** | | | 70 | F | 70 | F | 70 | **F** |
| 100 | **F** | | | 70 | E | 70 | E | 70 | **E** |
| 235 | F | | | 60 | E | 60 | E | 60 | **E** |
| 235 | F | | | 40 | E | 40 | E | 40 | **E** |
| 155 | F | | | 35 | D | 35 | D | 35 | **D** |
| 155 | F | | | 33 | D | 33 | D | 33 | **D** |
| 90 | E | | | 20 | **D** | 20 | **D** | 20 | **D** |
| 65 | D | | | 15 | **D** | 15 | **D** | 15 | **D** |
| 50 | E | | | | | | | 20 | **D** |
| 65 | D | | | 30 | D | 30 | D | 30 | **E** |
| | | | | | | | | | |
| 100 | D | | | | | | | | |

# Gun drills

## Application recommendations

**Feed column no.**

| Drill Ø mm | Code-Letter K | L | M | N | O | P | Q | R |
|---|---|---|---|---|---|---|---|---|
| **1,50** | 0,002 | 0,004 | 0,006 | 0,008 | 0,012 | 0,020 | 0,032 | 0,045 |
| **2,00** | 0,003 | 0,005 | 0,007 | 0,010 | 0,016 | 0,028 | 0,046 | 0,055 |
| **2,50** | 0,004 | 0,006 | 0,008 | 0,012 | 0,018 | 0,030 | 0,054 | 0,070 |
| **4,00** | 0,005 | 0,007 | 0,010 | 0,016 | 0,025 | 0,043 | 0,065 | 0,085 |
| **6,00** | 0,007 | 0,009 | 0,013 | 0,024 | 0,035 | 0,061 | 0,085 | 0,120 |
| **8,00** | 0,010 | 0,014 | 0,022 | 0,032 | 0,045 | 0,068 | 0,100 | 0,150 |
| **10,00** | 0,012 | 0,016 | 0,028 | 0,040 | 0,055 | 0,075 | 0,120 | 0,160 |
| **14,00** | 0,020 | 0,025 | 0,035 | 0,050 | 0,065 | 0,085 | 0,130 | 0,180 |
| **18,00** | 0,025 | 0,030 | 0,040 | 0,055 | 0,070 | 0,095 | 0,145 | 0,200 |
| **20,00** | 0,026 | 0,035 | 0,045 | 0,060 | 0,080 | 0,110 | 0,180 | 0,250 |
| **24,00** | 0,027 | 0,036 | 0,047 | 0,065 | 0,085 | 0,130 | 0,185 | 0,300 |
| **28,00** | 0,028 | 0,038 | 0,049 | 0,068 | 0,090 | 0,140 | 0,195 | 0,350 |
| **30,00** | 0,030 | 0,040 | 0,050 | 0,070 | 0,100 | 0,150 | 0,200 | 0,400 |
| **35,00** | 0,035 | 0,045 | 0,055 | 0,075 | 0,120 | 0,180 | 0,250 | 0,450 |
| **40,00** | 0,040 | 0,050 | 0,060 | 0,080 | 0,150 | 0,200 | 0,300 | 0,500 |

Feed f (mm/rev)

All gun drills must have support for the pilot hole.
Gun drills must never operate at full speed without guidance inside the machine.
Please consider the additional information!

**Lubricants:**

cutting oil, highly activated, surface active lubricant with effective additives which chemically react and result in a special adhesive and abrasion reducing lubricant film. ■
soluble oil (emulsion) ■
without lubricant □
air only [!]

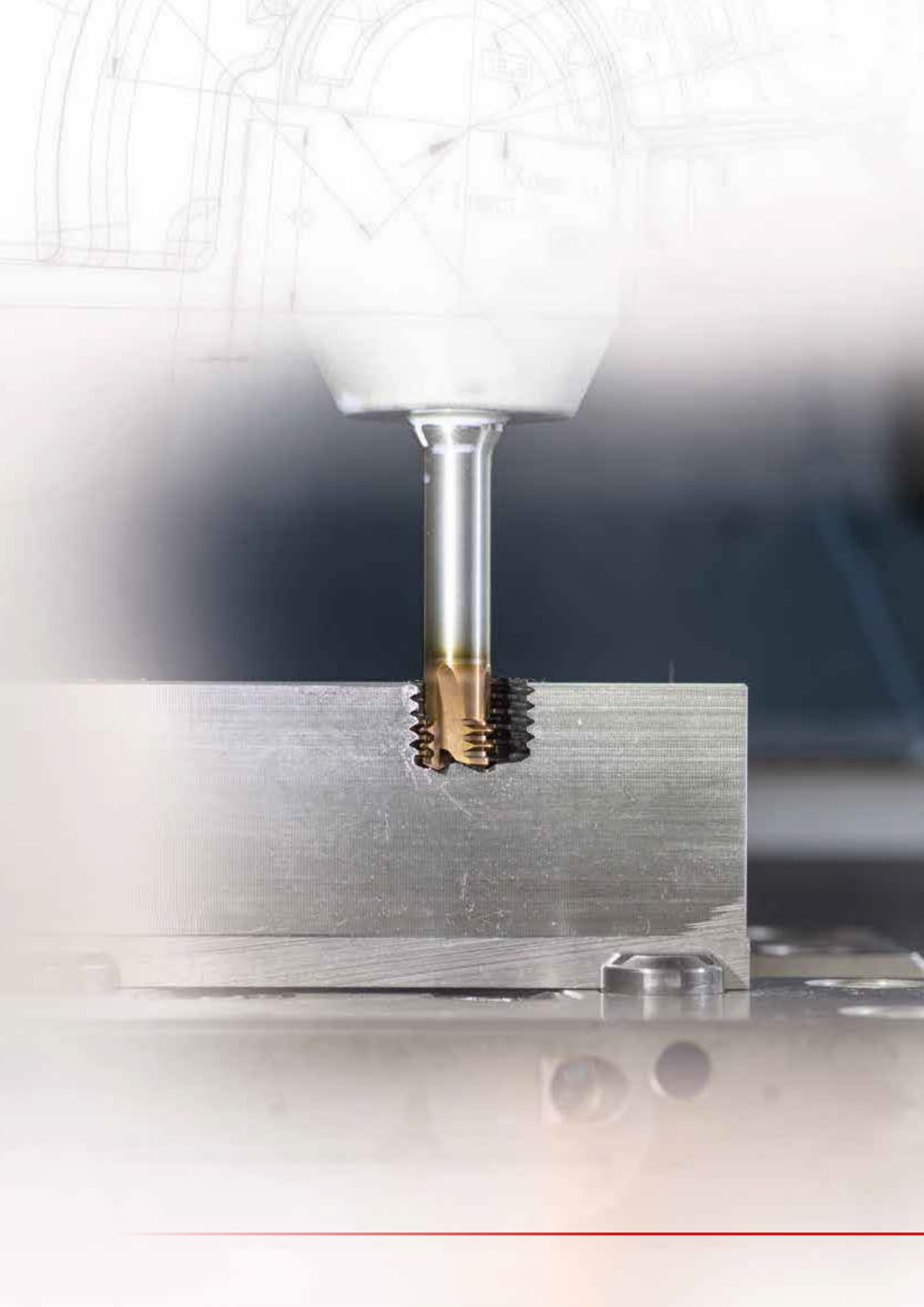
| Material group | Materials examples, **new designations** (old designation in brackets) Figures in bold = material no. to DIN EN | Tensile strength MPa (N/mm²) | Hardness | Coolant |
|---|---|---|---|---|
| General purpose steels | **1.0035** S185(St33),**1.0486** P275N(StE285),**1.0345** P235GH(H1),**1.0425** P265GH(H2) | ≤500 | | ■ |
| | **1.0050** E295 (St50-2), **1.0070** E360 (St70-2), **1.8937** P500NH (WStE500) | >500-850 | | ■ |
| Free-cutting steels | **1.0718** 11SMnPb30 (9SMnPb28), **1.0736** 11SMn37 (9SMn36) | ≤850 | | ■ |
| | **1.0727** 46S20 (45S20), **1.0728** (60S20), **1.0757** 46SPb20 (45SPb20) | 850-1000 | | ■ |
| Unalloyed tempering steels | **1.0402** C22, **1.1178** C30E (Ck30) | ≤ 700 | | ■ |
| | **1.0503** C45, **1.1191** C45E (Ck45) | 700-850 | | ■ |
| | **1.0601** C60, **1.1221** C60E (Ck60) | 850-1000 | | ■ |
| Alloyed tempering steels | **1.5131** 50MnSi4, **1.7003** 38Cr2, **1.7030** 28Cr4 | 850-≤1000 | | ■ |
| | **1.5710** 36NiCr6, **1.7035** 41Cr4, **1.7225** 42CrMo4 | 1000-1200 | | ■ |
| Unalloyed case hardened steels | **1.0301** (C10), **1.1121** C10E (Ck10) | ≤750 | | ■ |
| Alloyed case hardened steels | **1.7043** 38Cr4 | 850-≤1000 | | ■ ■ |
| | **1.5752** 15NiCr13 (15NiCr13), **1.7131** 16MnCr5, **1.7264** 20CrMo5 | 1000-1200 | | ■ ■ |
| Nitriding steels | **1.8504** 34CrAl6 | ≥850-≤1000 | | ■ |
| | **1.8519** 31CrMoV9, **1.8550** 34CrAlNi7 | >1000-1200 | | ■ ■ |
| Tool steels | **1.1750** C75W, **1.2067** 102Cr6, **1.2307** 29CrMoV9 | ≤850 | | ■ |
| | **1.2080** X210Cr12, **1.2083** X42Cr13, **1.2419** 105WCr6, **1.2767** X45NiCrMo4 | >850-1000 | | ■ ■ |
| High speed steels | **1.3243** S 6-5-2-5, **1.3343** S 6-5-2, **1.3344** S 6-5-3 | ≥650-1000 | | ■ |
| Spring steels | **1.5026** 55Si7, **1.7176** 55Cr3, **1.8159** 51CrV4 (51CrV4) | | ≤330 HB | ■ ■ |
| Hardened steels | – | | ≤40-48 HRC | ■ |
| | | | >48-60 HRC | ■ |
| Stainless steels, sulphured | **1.4005** X12CrS13, **1.4104** X14CrMoS17, **1.4105** X6CrMoS17, **1.4305** X8CrNiS18-9 | ≤850 | | ■ |
| austenitic | **1.4301** X5CrNi18-10 (V2A), **1.4541** X6CrNiTi18-10, **1.4571** X6CrNiMoTi 17-12-2 (V4A) | ≤850 | | ■ |
| martensitic | **1.4057** X20CrNi 17 2 (X17CrNi16-2), **1.4122** X39CrMo17-1, **1.4521** X2CrMoTi18-2 | ≤850 | | ■ |
| Cast iron | **0.6010** EN-GJL-100(GG10), **0.6020** EN-GJL-200(GG20) | 850-≤1000 | | ■ □ |
| | **0.6025** EN-GJL-250(GG25), **0.6035** EN-GJL-350(GG35) | 1000-1200 | | ■ □ |
| Spheroidal graphite iron and | **0.7050** EN-GJS-500-7(GGG50), **0.8035** EN-GJMW-350-4(GTW35) | | ≤240 HB | ■ |
| malleable cast iron | **0.7070** EN-GJS-700-2(GGG70), **0.8170** EN-GJMB-700-2(GTS70) | | <300 HB | ■ |
| Chilled cast iron | – | | ≤350 HB | ■ |
| New cast iron GGV | **EN-GJV250** (GGV25), **EN-GJV350** (GGV35) | | | ■ □ |
| | **EN-GJV400** (GGV40), **EN-GJV500** (GGV50), SiMo6 | | | ■ □ |
| New cast iron ADI | **EN-GJS-800-8** (ADI800), **EN-GJS-1000-5** (ADI1000) | 800-1000 | | ■ □ |
| | **EN-GJS-1200-2** (ADI1200), **EN-GJS-1400-1** (ADI1400) | 1200-1400 | | ■ □ |
| Special alloys | Nimonic, Inconel, Monel, Hastelloy | ≤1200 | | ■ |
| Ti and Ti-alloys | **3.7024** Ti99,5, **3.7114** TiAl5Sn2,5, **3.7124** TiCu2 | ≤850 | | ■ |
| | **3.7154** TiAl6Zr5, **3.7165** TiAl6V4, **3.7184** TiAl4Mo4Sn2,5, - TiAl8Mo1V1 | >850-1200 | | ■ |
| Aluminium and Al-alloys | **3.0255** Al99,5, **3.2315** AlMgSi1, **3.3515** AlMg1 | ≤400 | | ■ |
| Al wrought alloys | **3.0615** AlMgSiPb, **3.1325** AlCuMg1, **3.3245** AlMg3Si, **3.4365** AlZnMgCu1,5 | ≤450 | | ■ |
| Al cast alloys ≤ 10 % Si | **3.2131** G-AlSi5Cu1, **3.2153** G-AlSi7Cu3, **3.2573** G-AlSi9 | ≤600 | | ■ |
| > 10 % Si | **3.2581** G-AlSi12, **3.2583** G-AlSi12Cu, - G-AlSi12CuNiMg | ≤600 | | ■ |
| Magnesium alloys | **3.5200** MgMn2, **3.5812.05** G-MgAl8Zn1, **3.5612.05** G-MgAl6Zn1 | ≤450 | | [!] |
| Copper, low alloyed | **2.0070** SE-Cu, **2.1020** CuSn6, **2.1096** G-CuSn5ZnPb | ≤400 | | ■ ■ |
| Brass, short-chipping | **2.0380** CuZn39Pb2, **2.0401** CuZn39Pb3, **2.0410** CuZn43Pb2 | ≤600 | | ■ ■ |
| long-chipping | **2.0250** CuZn20, **2.0280** CuZn33, **2.0332** CuZn37Pb0,5 | ≤600 | | ■ ■ |
| Bronze, short-chipping | **2.1090** CuSn7ZnPb, **2.1170** CuPb5Sn5, **2.1176** CuPb10Sn | ≤600 | | ■ ■ |
| | **2.0790** CuNi18Zn19Pb | >600-850 | | ■ |
| Bronze, long-chipping | **2.0916** CuAl5, **2.0960** CuAl9Mn, **2.1050** CuSn10 | ≤850 | | ■ |
| | **2.0980** CuAl11Ni, **2.1247** CuBe2 | >850-1000 | | ■ |
| Duroplastics | Epoxidharz, Resopal, Pertinax, Moltopren | | – | □ |
| Thermoplastics | Plexiglass, Hostalen, Novodur, Makralon | | – | ■ □ |
| Kevlar | Kevlar | | – | □ |
| Glass/carbon-concentr. plastics | GFK/CFK | | – | □ |

| | |
|---|---|
| Catalog no. | **65030**<br>**65031**<br>**65032**<br>**65033** |
| Tool material | **Carbide** |
| Surface finish | TiN |
| Type | **SuperT-NXL** |
| Page | 52/53/54/55 |

| $v_c$ m/min | Feed no. |
|---|---|
| 100 | N |
| 85 | N |
| 90 | N |
| 80 | N |
| 90 | M |
| 80 | M |
| 75 | M |
| 75 | M |
| 65 | M |
| 80 | N |
| 75 | M |
| 65 | M |
| 75 | M |
| 65 | M |
| 75 | L |
| 65 | L |
| 55 | K |
| 65 | L |
| 30 | L |
| 25 | K |
| 55 | M |
| 45 | M |
| 35 | M |
| 85 | O |
| 80 | O |
| 80 | N |
| 70 | N |
| 55 | M |
| | |
| | |
| 35 | K |
| 35 | K |
| 30 | K |
| 150 | P |
| 120 | O |
| 150 | P |
| 130 | P |
| 110 | P |
| 75 | N |
| 120 | Q |
| 90 | Q |
| 95 | P |
| 75 | P |
| 70 | P |
| 60 | P |
| 75 | N |
| 70 | N |
| 60 | M |
| 50 | M |

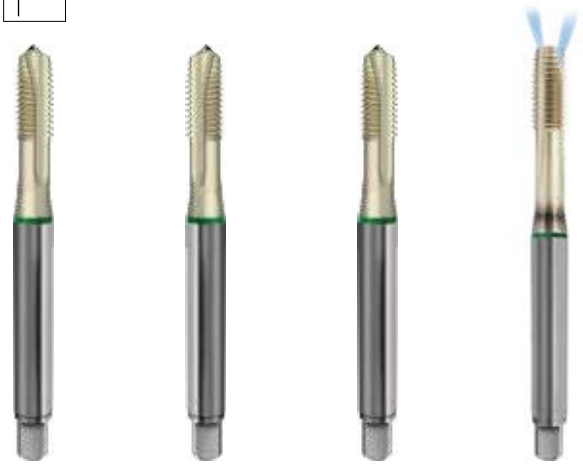
SuperT

- single-fluted gun drills for highest precision
- drilling depths up to 80xD with only one tool
- manufactured from 0.9 mm nominal diameter
- with and without chip breaker
- for universal application



# Application recommendations for taps

PREMIUM



| Hole type | | | | |
|---|---|---|---|---|
| **Tool material** | HSS-E | HSS-E | HSS-E-PM | HSS-E-PM |
| **Cutting direction** | right | left | right | right |
| **Type** | ProduktivN-X | ProduktivN-X | ProduktivN-X | ProduktivN-X |
| **Form** | B | B | B | B |
| **Cooling** | external | external | external | radial |
| **Surface finish** | AlTiZrN | AlTiZrN | AlTiZrN | AlTiZrN |

| Thread type | Dimensions to DIN 2184-1 | Tolerance zone | Catalogue no./Ø-range/Page | | | |
|---|---|---|---|---|---|---|
| **M** | DIN 371/DIN 376 | 6HX | 53733<br>M2 - M42<br>Page 68 | 53734<br>M2 - M30<br>Page 69 | 53735<br>M3 - M20<br>Page 70 | 53736<br>M5 - M30<br>Page 71 |
| | | 6H+0,1 | 53737<br>M2 - M30<br>Page 72 | | | |
| | | 6GX | 53738<br>M2 - M30<br>Page 73 | | | |
| | Company std.<br>extra length | 6HX | 53739<br>M3 - M20<br>Page 74 | | | |
| **MF** | DIN 374 | 6HX | 53778<br>M3x0,35 - M24x2<br>Page 93 | | 53789<br>M8x1 - M24x1.5<br>Page 94 | 53790<br>M8x1 - M24x1.5<br>Page 95 |
| | | 6GX | 53779<br>M6x0.75 - M24x1.5<br>Page 96 | | | |
| **UNC** | DIN 2184-1 | 2BX | 53782<br>No.2-56 - 1-8<br>Page 103 | | | |
| **UNF** | DIN 2184-1 | 2BX | 53784<br>No.2-64 - 1-12<br>Page 105 | | | |

ECONOMY

## ECONOMY CLASS

the most economic machining of internal threads

BUSINESS

## BUSINESS CLASS

economic machining of internal threads

PREMIUM

## PREMIUM CLASS

the optimal machining of internal threads

# Application recommendations for taps

| | Material group | Tensile strength | Example materials | Material no. | Recommended cutting speed $v_c$ m/min | | | |
|---|---|---|---|---|---|---|---|---|
| P | Structural and free cutting steels, heat-treatable steels unalloyed | ≤800 N/mm² | S235JR<br>C15<br>11SMnPb30 | 1.0037<br>1.0401<br>1.0718 | **20** | **20** | **25** | **25** |
| P | Free-cutting steels, unalloyed case hardened steels, nitriding steels | 800 - 1000 N/mm² | S355J2<br>C60<br>31CrMo12 | 1.0577<br>1.0601<br>1.8515 | **15** | **15** | **20** | **20** |
| P | Alloyed heat-treatable steels, tool steels, high speed steels | 800 - 1200 N/mm² | 42CrMo4<br>36CrNiMo4<br>X36CrMo17<br>HS 6-5-2 | 1.7225<br>1.6511<br>1.2316<br>1.3343 | **10** | **10** | **15** | **15** |
| M | Stainless steels, sulphured, austenitic | ≤1000 N/mm² | X5CrNi18-10<br>X6CrNiTi18-10<br>X8CrNiS18-9 | 1.4301<br>1.4571<br>1.4305 | **12** | **12** | **15** | **15** |
| M | Stainless- and acidresistant steels, martensitic | ≤1000 N/mm² | X17CrNi16-2<br>X90CrMoV18<br>X2CrTi12 | 1.4057<br>1.4112<br>1.4512 | **10** | **10** | **12** | **12** |
| M | Duplex and Super Duplex | ≤1300 N/mm² | X2CrNiMoN22-5-3<br>X2CrNiMoN25-7-4<br>X2CrNiMoCuWN25-7-4 | 1.4462<br>1.4410<br>1.4501 | 6 | 6 | 8 | 8 |
| K | Cast iron | 300 HB | EN-GJL-150<br>EN-GJL-250<br>EN-GJL-300 | 0.6015<br>0.6025<br>0.6030 | 20 | 20 | 25 | 25 |
| K | Spheroidal graphite iron and malleable cast iron | 350 HB | EN-GJS-400-15<br>EN-GJS-600-3<br>EN-GJS-700-2 | 0.7040<br>0.7060<br>0.7070 | 20 | 20 | 25 | 25 |
| K | ADI<br>GGV | 1000 N/mm²<br>350 HB | EN-GJS1000-5<br>EN-GJV250<br>EN-GJV400 | | 10 | 10 | 15 | 15 |
| N | Aluminium, Aluminium wrought alloys | ≤450 N/mm² | Al99,5H<br>AlMgSi1<br>AlZn4,5Mg | 3.0250<br>32315<br>3.4335 | 10 | 10 | 12 | 12 |
| N | Aluminium cast alloys | ≤600 N/mm² | GD-AlSi5Cu1Mg<br>GD-AlSi8Cu3<br>G-AlSi9Mg<br>G-AlSi12 | 3.2134<br>3.2162<br>3.2373<br>3.2581 | 20 | 20 | 25 | 25 |
| N | Magnesium alloys | ≤500 N/mm² | GDMgAl8Zn1 | 3.5812.08 | | | | |
| N | Copper and copper alloys | long-chipping | CuZn20<br>CuZn37Pb0,5 | 2.0250<br>2.0332 | 20 | 20 | 25 | 25 |
| N | Copper and copper alloys | short-chipping | CuZn39Pb2<br>CuZn43Pb2 | 2.0380<br>2.0410 | 20 | 20 | 25 | 25 |
| N | Copper special alloys | ≤1400 N/mm² | Ampco | | 10 | 10 | 15 | 15 |
| N | Plastics [Thermoplastics, duroplastics] | long-chipping<br>short-chipping | PMMA, POM,PVC<br>Pertinax | | | | | |
| S | Titanium and Titanium alloys | ≤ 1200 N/mm² | Titan<br>TiAl5Sn2<br>TiAl6V4 | 3.702<5<br>3.7115<br>3.7165 | 3 | 3 | 5 | 5 |
| S | Nickel, cobalt, iron alloys | ≤ 1400 N/mm² | Hastelloy C4<br>Inconel 718<br>Nimonic 105 | 2.4610<br>2.4668<br>2.4634 | 2 | 2 | 3 | 3 |
| H | High tensile steels, hardened steels | 45 - 55 HRC | | | | | | |
| H | | 55 - 62 HRC | | | | | | |

# Application recommendations for taps

PREMIUM

| Hole type | | | | | |
|---|---|---|---|---|---|
| **Tool material** | HSS-E | HSS-E | HSS-E-PM | HSS-E-PM | HSS-E |
| **Cutting direction** | right | left | right | right | right |
| **Type** | IntensivN-X | IntensivN-X | IntensivN-X | IntensivN-X | IntensivN-X |
| **Form** | C | C | C | C | E |
| **Cooling** | external | external | external | axial | external |
| **Surface finish** | TiAlN-H | TiAlN-H | TiAlN-H | TiAlN-H | TiAlN-H |

| Thread type | Dimensions to DIN 2184-1 | Tolerance zone | Catalogue no./Ø-range/Page | | | | |
|---|---|---|---|---|---|---|---|
| **M** | DIN 371/DIN 376 | 6HX | 53746<br>M2 - M42<br>Page 75 | 53747<br>M2 - M30<br>Page 76 | 53748<br>M3 - M20<br>Page 77 | 53749<br>M5 - M30<br>Page 78 | 53760<br>M2 - M30<br>Page 79 |
| | | 6H+0,1 | 53750<br>M2 - M30<br>Page 80 | | | | |
| | | 6GX | 53751<br>M2 - M30<br>Page 81 | | | | |
| | Company std.<br>extra length | 6HX | 53752<br>M3 - M20<br>Page 82 | | | | |
| **MF** | DIN 374 | 6HX | 53780<br>M3x0,35 -<br>M24x2<br>Page 97 | | 53791<br>M8x1 -<br>M24x1.5<br>Page 98 | 53792<br>M8x1 -<br>M24x1.5<br>Page 99 | 53770<br>M6x0.75 -<br>M24x1.5<br>Page 100 |
| | | 6GX | 53781<br>M6x0.75 -<br>M24x1.5<br>Page 101 | | | | |
| **UNC** | DIN 2184-1 | 2BX | 53783<br>No.2-56 - 1-8<br>Page 104 | | | | |
| **UNF** | DIN 2184-1 | 2BX | 53785<br>No.2-64 - 1-12<br>Page 106 | | | | |
| **G** | DIN 5156 | DIN ISO 228 | | | | | 53775<br>G1/16 - G1<br>Page 107 |

# Application recommendations for taps

| | Material group | Tensile strength | Example materials | Material no. | Recommended cutting speed $v_c$ m/min | | | | |
|---|---|---|---|---|---|---|---|---|---|
| P | Structural and free cutting steels, heat-treatable steels unalloyed | ≤800 N/mm² | S235JR<br>C15<br>11SMnPb30 | 1.0037<br>1.0401<br>1.0718 | **20** | **20** | **25** | **25** | **20** |
| P | Free-cutting steels, unalloyed case hardened steels, nitriding steels | 800 - 1000 N/mm² | S355J2<br>C60<br>31CrMo12 | 1.0577<br>1.0601<br>1.8515 | **15** | **15** | **20** | **20** | **15** |
| P | Alloyed heat-treatable steels, tool steels, high speed steels | 800 - 1200 N/mm² | 42CrMo4<br>36CrNiMo4<br>X36CrMo17<br>HS 6-5-2 | 1.7225<br>1.6511<br>1.2316<br>1.3343 | **10** | **10** | **12** | **12** | **10** |
| M | Stainless steels, sulphured, austenitic | ≤1000 N/mm² | X5CrNi18-10<br>X6CrNiTi18-10<br>X8CrNiS18-9 | 1.4301<br>1.4571<br>1.4305 | **12** | **12** | **15** | **15** | **12** |
| M | Stainless- and acidresistant steels, martensitic | ≤1000 N/mm² | X17CrNi16-2<br>X90CrMoV18<br>X2CrTi12 | 1.4057<br>1.4112<br>1.4512 | **10** | **10** | **12** | **12** | **10** |
| M | Duplex and Super Duplex | ≤1300 N/mm² | X2CrNiMoN22-5-3<br>X2CrNiMoN25-7-4<br>X2CrNiMoCuWN25-7-4 | 1.4462<br>1.4410<br>1.4501 | 6 | 6 | 8 | 8 | 6 |
| K | Cast iron | 300 HB | EN-GJL-150<br>EN-GJL-250<br>EN-GJL-300 | 0.6015<br>0.6025<br>0.6030 | 20 | 20 | 25 | 25 | 20 |
| K | Spheroidal graphite iron and malleable cast iron | 350 HB | EN-GJS-400-15<br>EN-GJS-600-3<br>EN-GJS-700-2 | 0.7040<br>0.7060<br>0.7070 | 20 | 20 | 25 | 25 | 20 |
| K | ADI<br>GGV | 1000 N/mm²<br>350 HB | EN-GJS1000-5<br>EN-GJV250<br>EN-GJV400 | | 10 | 10 | 15 | 15 | 10 |
| N | Aluminium, Aluminium wrought alloys | ≤450 N/mm² | Al99,5H<br>AlMgSi1<br>AlZn4,5Mg | 3.0250<br>32315<br>3.4335 | 10 | 10 | 12 | 12 | 10 |
| N | Aluminium cast alloys | ≤600 N/mm² | GD-AlSi5Cu1Mg<br>GD-AlSi8Cu3<br>G-AlSi9Mg<br>G-AlSi12 | 3.2134<br>3.2162<br>3.2373<br>3.2581 | 20 | 20 | 25 | 25 | 20 |
| N | Magnesium alloys | ≤500 N/mm² | GDMgAl8Zn1 | 3.5812.08 | | | | | |
| N | Copper and copper alloys | long-chipping | CuZn20<br>CuZn37Pb0,5 | 2.0250<br>2.0332 | 20 | 20 | 25 | 25 | 20 |
| N | Copper and copper alloys | short-chipping | CuZn39Pb2<br>CuZn43Pb2 | 2.0380<br>2.0410 | 20 | 20 | 25 | 25 | 20 |
| N | Copper special alloys | ≤1400 N/mm² | Ampco | | 10 | 10 | 15 | 15 | 10 |
| N | Plastics [Thermoplastics, duroplastics] | long-chipping<br>short-chipping | PMMA, POM,PVC<br>Pertinax | | | | | | |
| S | Titanium and Titanium alloys | ≤ 1200 N/mm² | Titan<br>TiAl5Sn2<br>TiAl6V4 | 3.702<5<br>3.7115<br>3.7165 | 3 | 3 | 5 | 5 | 3 |
| S | Nickel, cobalt, iron alloys | ≤ 1400 N/mm² | Hastelloy C4<br>Inconel 718<br>Nimonic 105 | 2.4610<br>2.4668<br>2.4634 | 2 | 2 | 3 | 3 | 2 |
| H | High tensile steels, hardened steels | 45 - 55 HRC | | | | | | | |
| H | | 55 - 62 HRC | | | | | | | |

# Application recommendations for taps

| Hole type | | | | | |
|---|---|---|---|---|---|
| **Tool material** | HSS-E | HSS-E-PM | HSS-E | HSS-E | HSS-E-PM |
| **Type** | Produktiv H | Produktiv H | Intensiv H | Intensiv H | Intensiv H |
| **Form** | B | B | C | C | C |
| **Surface finish** | TiCN | TiCN | nitrided | TiCN | TiAlN |

| Thread type | Dimensions to DIN 2184-1 | Tolerance zone | Catalogue no./Ø-range/Page | | | | |
|---|---|---|---|---|---|---|---|
| **M** | DIN 371 | ISO 2 6H | 53642 M2 - M10 Page 86 | 53640 M3 - M10 Page 87 | 73661 M3 - M10 Page 88 | 53661 M2 - M10 Page 90 | 53664 M3 - M10 Page 91 |
| | DIN 376 | ISO 2 6H | 53642 M12 - M20 Page 86 | 53640 M12 - M16 Page 87 | 73664 M12 - M20 Page 89 | 53661 M12 - M20 Page 90 | 53664 M12 - M20 Page 91 |
| **MF** | DIN 374 | ISO 2 6H | | | 73647 M8x0.75 - M24x1.5 Page 102 | | |

| | Material group | Tensile strength | Example materials | Material no. | Recommended cutting speed $v_c$ m/min | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **P** | Structural and free cutting steels, heat-treatable steels unalloyed | ≤800 N/mm² | S235JR | 1.0037 | | | | | |
| | | | C15 | 1.0401 | | | | | |
| | | | 11SMnPb30 | 1.0718 | | | | | |
| | Free-cutting steels, unalloyed case hardened steels, nitriding steels | 800 - 1000 N/mm² | S355J2 | 1.0577 | 6 | 10 | | | |
| | | | C60 | 1.0601 | | | | | |
| | | | 31CrMo12 | 1.8515 | | | | | |
| | Alloyed heat-treatable steels, tool steels, high speed steels | 800 - 1200 N/mm² | 42CrMo4 | 1.7225 | **12** | **15** | **10** | **12** | **6** |
| | | | 36CrNiMo4 | 1.6511 | | | | | |
| | | | X36CrMo17 | 1.2316 | | | | | |
| | | | HS 6-5-2 | 1.3343 | | | | | |

# Application recommendations for taps

| | | | |
|---|---|---|---|
| **Hole type** | | | max. 1.5 x D |
| **Tool material** | HSS-E | HSS-E | HSS-E-PM |
| **Type** | Produktiv N | H | H |
| **Form** | B | C | D |
| **Surface finish** | TiN | TiCN | TiCN |

| Thread type | Dimensions to DIN 2184-1 | Tolerance zone | Catalogue no./Ø-range/Page | | |
|---|---|---|---|---|---|
| M | DIN 371 | ISO 2 6H | 63033 M3 - M10 Page 83 | | |
| | | 6HX | | | 53676 M3 - M16 Page 92 |
| | DIN 376 | ISO 2 6H | 63033 M12 - M20 Page 83 | | |
| | | 6HX | | 53646 M16 - M39 Page 84 | |
| | ~ DIN 376 | 6HX | | 53647 (Company std., extra length) M16 - M39 Page 85 | |

| | Material group | Tensile strength | Example materials | Material no. | Recommended cutting speed $v_c$ m/min | | |
|---|---|---|---|---|---|---|---|
| P | Structural and free cutting steels, heat-treatable steels unalloyed | ≤800 N/mm² | S235JR<br>C15<br>11SMnPb30 | 1.0037<br>1.0401<br>1.0718 | **15** | | |
| P | Free-cutting steels, unalloyed case hardened steels, nitriding steels | 800 - 1000 N/mm² | S355J2<br>C60<br>31CrMo12 | 1.0577<br>1.0601<br>1.8515 | **12** | **15** | |
| P | Alloyed heat-treatable steels, tool steels, high speed steels | 800 - 1200 N/mm² | 42CrMo4<br>36CrNiMo4<br>X36CrMo17<br>HS 6-5-2 | 1.7225<br>1.6511<br>1.2316<br>1.3343 | 8 | **12** | |
| K | Cast iron | 300 HB | EN-GJL-150<br>EN-GJL-250<br>EN-GJL-300 | 0.6015<br>0.6025<br>0.6030 | | **25** | |
| K | Spheroidal graphite iron and malleable cast iron | 350 HB | EN-GJS-400-15<br>EN-GJS-600-3<br>EN-GJS-700-2 | 0.7040<br>0.7060<br>0.7070 | | **20** | |
| K | ADI GGV | 1000 N/mm²<br>350 HB | EN-GJS1000-5<br>EN-GJV250<br>EN-GJV400 | | | **15** | |
| H | High tensile steels, hardened steels | 45-55 HRC | Hardox 500 | | | | **3** |
| | | 55-62 HRC | | | | | |

# Application recommendations for fluteless taps

PREMIUM

| | | | |
|---|---|---|---|
| **Hole type** | | | |
| **Tool material** | HSS-E-PM | HSS-E-PM | HSS-E-PM |
| **Type** | Durativ N-X | Durativ N-X | Durativ N-X |
| **Form** | C with oil grooves | C with oil grooves | E |
| **Surface finish** | TiCN | TiCN | TiCN |
| **Cooling** | external | radial | axial* |

| Thread type | Dimensions to DIN 2184-1 | Tolerance zone | Catalogue no./Ø-range/Page | | |
|---|---|---|---|---|---|
| **M** | ~ DIN 371 | 4/6HX | 53630<br>M1-M20<br>Page 108 | 53610<br>M5-M20<br>Page 114 | 53618<br>M2*-M10<br>Page 115 |
| | | 6GX | 53631<br>M2-M10<br>Page 109 | | |
| | ~ DIN 376 | 6HX | 53630<br>M12-M20<br>Page 108 | | 53618<br>M12-M20<br>Page 115 |
| | | 6GX | 53631<br>M12-M20<br>Page 109 | | |
| **MF** | ~ DIN 374 | 6HX | 53632<br>M3x0,35-M24x2<br>Page 110 | 53612<br>M8x1-M20x1.5<br>Page 116 | 53619<br>M8x1-M20x1.5<br>Page 117 |
| **UNC** | ~ DIN 371<br>~ DIN 376 | 2BX | 53633<br>No.4-40 - 3/4-10<br>Page 111 | | |
| **UNF** | ~ DIN 374 | 2BX | 53634<br>No.4-48 - 3/4-16<br>Page 112 | | |
| **G** | DIN 5156 | X | 53635<br>G1/8 - G1/2<br>Page 113 | | |

All tools from M2 with oil grooves.

* from M5 with IC

# Application recommendations for fluteless taps

| | | Material group | Tensile strength | Example materials | Material no. | Recommended cutting speed $v_c$ m/min | | |
|---|---|---|---|---|---|---|---|---|
| P | P1 | Structural and free cutting steels, heat-treatable steels unalloyed | ≤800 N/mm² | S235JR<br>C15<br>11SMnPb30 | 1.0037<br>1.0401<br>1.0718 | 25 | 25 | 25 |
| | P2 | Free-cutting steels, unalloyed case hardened steels, nitriding steels | 800 - 1000 N/mm² | S355J2<br>C60<br>31CrMo12 | 1.0577<br>1.0601<br>1.8515 | 25 | 25 | 25 |
| | P3 | Alloyed heat-treatable steels, tool steels, high speed steels | 800 - 1200 N/mm² | 42CrMo4<br>36CrNiMo4<br>X36CrMo17<br>HS 6-5-2 | 1.7225<br>1.6511<br>1.2316<br>1.3343 | 15 | 15 | 15 |
| M | M1 | Stainless steels, sulphured, austenitic | ≤1000 N/mm² | X5CrNi18-10<br>X6CrNiTi18-10<br>X8CrNiS18-9 | 1.4301<br>1.4571<br>1.4305 | 15 | 15 | 15 |
| | M2 | Stainless- and acidresistant steels, martensitic | ≤1000 N/mm² | X17CrNi16-2<br>X90CrMoV18<br>X2CrTi12 | 1.4057<br>1.4112<br>1.4512 | 10 | 10 | 10 |
| | M3 | Duplex and Super Duplex | ≤1300 N/mm² | X2CrNiMoN22-5-3<br>X2CrNiMoN25-7-4<br>X2CrNiMoCuWN25-7-4 | 1.4462<br>1.4410<br>1.4501 | 6 | 6 | 6 |
| K | K1 | Cast iron | 300 HB | EN-GJL-150<br>EN-GJL-250<br>EN-GJL-300 | 0.6015<br>0.6025<br>0.6030 | | | |
| | K2 | Spheroidal graphite iron and malleable cast iron | 350 HB | EN-GJS-400-15<br>EN-GJS-600-3<br>EN-GJS-700-2 | 0.7040<br>0.7060<br>0.7070 | 30 | 30 | 30 |
| | K3 | ADI<br>GGV | 1000 N/mm²<br>350 HB | EN-GJS1000-5<br>EN-GJV250<br>EN-GJV400 | | 25 | 25 | 25 |
| N | N1 | Aluminium, Aluminium wrought alloys | ≤450 N/mm² | Al99,5H<br>AlMgSi1<br>AlZn4,5Mg | 3.0250<br>3.2315<br>3.4335 | 15 | 15 | 15 |
| | N2 | Aluminium cast alloys | ≤600 N/mm² | GD-AlSi5Cu1Mg<br>GD-AlSi8Cu3<br>G-AlSi9Mg<br>G-AlSi12 | 3.2134<br>3.2162<br>3.2373<br>3.2581 | 30 | 30 | 30 |
| | N3 | Magnesium alloys | ≤500 N/mm² | GDMgAl8Zn1 | 3.5812.08 | | | |
| | N4 | Copper and copper alloys | long-chipping | CuZn20<br>CuZn37Pb0,5 | 2.0250<br>2.0332 | 30 | 30 | 30 |
| | | | short-chipping | CuZn39Pb2<br>CuZn43Pb2 | 2.0380<br>2.0410 | | | |
| | N5 | Copper special alloys | ≤1400 N/mm² | Ampco | | | | |
| | N6 | Plastics [Thermoplastics, duroplastics] | long-chipping<br>short-chipping | PMMA, POM, PVC<br>Pertinax | | | | |
| S | S1 | Titanium and Titanium alloys | ≤1200 N/mm² | Titan<br>TiAl5Sn2<br>TiAl6V4 | 3.7025<br>3.7115<br>3.7165 | 8 | 8 | 8 |
| | S2 | Nickel, cobalt, iron alloys | ≤1400 N/mm² | Hastelloy C4<br>Inconel 718<br>Nimonic 105 | 2.4610<br>2.4668<br>2.4634 | 8 | 8 | 8 |
| H | H1 | High tensile steels, hardened steels | 45 - 55 HRC | | | | | |
| | H2 | | 55 - 62 HRC | | | | | |

# Application recommendation

## Thread milling cutters und Micro thread milling cutters

| ISO | | Material group | Hardness | Example materials | Material no. | Cutting speed $v_c$ (m/min) |
|---|---|---|---|---|---|---|
| P | P1 | Structural and free cutting steels, heat-treatable steels unalloyed | < 800 N/mm² | S235JR<br>C15<br>11SMnPb30 | 1.0037<br>1.0401<br>1.0718 | 90 |
| | P2 | Free-cutting steels, unalloyed case hardened steels, nitriding steels | 800-1000 N/mm² | S355J2<br>C60<br>31CrMo12 | 1.0577<br>1.0601<br>1.8515 | 80 |
| | P3 | Alloyed heat-treatable steels, tool steels, high speed steels | 800-1200 N/mm² | 42CrMo4<br>36CrNiMo4<br>X36CrMo17<br>HS 6-5-2 | 1.7225<br>1.6511<br>1.2316<br>1.3343 | 70 |
| M | M1 | Stainless steels, sulphured, austenitic | < 1000 N/mm² | X5CrNi18-10<br>X6CrNiTi18-10<br>X8CrNiS18-9 | 1.4301<br>1.4571<br>1.4305 | 55 |
| | M2 | Stainless- and acidresistant steels, martensitic | < 1000 N/mm² | X17CrNi16-2<br>X90CrMoV18<br>X2CrTi12 | 1.4057<br>1.4112<br>1.4512 | 50 |
| | M3 | Duplex and Super Duplex | < 1300 N/mm² | X2CrNiMoN22-5-3<br>X2CrNiMoN25-7-4<br>X2CrNiMoCuWn25-7-4 | 1.4462<br>1.441<br>1.4501 | 45 |
| K | K1 | Cast iron | 300 HB | EN-GJL-150<br>EN-GJL-250<br>EN-GJL-300 | 0.6015<br>0.6025<br>0.603 | 120 |
| | K2 | Spheroidal graphite iron and malleable cast iron | 350 HB | EN-GJS-400-15<br>EN-GJS-600-3<br>EN-GJS-700-2 | 0.704<br>0.706<br>0.707 | 100 |
| | K3 | ADI, GGV | 1000 N/mm²<br>350 HB | EN-GJS1000-5<br>EN-GJV250<br>EN-GJV400 | | 80 |
| N | N1 | Aluminium and wrought alloys | < 450 N/mm² | Al99,5H<br>AlMgSi1<br>AlZn4,5Mg | 3.025<br>3.2315<br>3.4335 | 250 |
| | N2 | Al cast alloys | < 600 N/mm² | GD-AlSi5Cu1Mg<br>GD-AlSi8Cu3<br>G-AlSi9Mg<br>G-AlSi12 | 3.2134<br>3.2162<br>3.2373<br>3.2581 | 230 |
| | N3 | Magnesium alloys | < 500 N/mm² | GDMgAl8Zn1 | 3.5812.08 | 180 |
| | N4 | Copper and copper alloys | long-chipping<br>short-chipping | CuZn20<br>CuZn37Pb0,5<br>CuZn39Pb2<br>CuZn43Pb2 | 2.025<br>2.0332<br>2.038<br>2.041 | 130 |
| | N5 | Copper special alloys | < 1400 N/mm² | Ampco | | 160 |
| | N6 | Plastics [Thermoplastics, Duroplastics] | long-chipping<br>short-chipping | PMMA, POM,PVC<br>Pertinax | | 300 |
| S | S1 | Ti and Ti alloys | < 1200 N/mm² | Titan<br>TiAl5Sn2<br>TiAl6V4 | 3.7025<br>3.7115<br>3.7165 | 40 |
| | S2 | Nickel, cobalt and iron alloys | < 1400 N/mm² | Hastelloy C4<br>Inconel 718<br>Nimonic | 2.461<br>2.4668<br>2.4634 | 30 |
| H | H1<br>H2 | High tensile steels, hardened steels | 45-55 HRC<br>55-62 HRC | Hardox<br>PM30 | | 45<br>40 |

**Please note:**
The cutting values specified in the respective columns are guide values, they have to be adapted according to application conditions (material, lubrication, tool clamping, machine etc.)
**Depending on the machining task the optimal cutting values can differ from those in the table by up to ±30 %!**

| Milling part diameter [ $d_1$ ] / feed per tooth [ $f_z$ ] [ conventional milling ] | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ø1 | Ø2 | Ø3 | Ø4 | Ø5 | Ø6 | Ø7 | Ø8 | Ø9 | Ø10 | Ø12 | Ø14 | Ø16 | Ø18 | Ø20 |
| mm | mm | mm | mm | mm | mm | mm | mm | mm | mm | mm | mm | mm | mm | mm |
| 0.01 | 0.02 | 0.02 | 0.025 | 0.03 | 0.035 | 0.045 | 0.05 | 0.055 | 0.06 | 0.06 | 0.065 | 0.065 | 0.07 | 0.08 |
| 0.01 | 0.02 | 0.02 | 0.025 | 0.03 | 0.035 | 0.045 | 0.05 | 0.055 | 0.06 | 0.06 | 0.065 | 0.065 | 0.07 | 0.08 |
| 0.01 | 0.02 | 0.02 | 0.025 | 0.03 | 0.035 | 0.045 | 0.05 | 0.055 | 0.06 | 0.06 | 0.065 | 0.065 | 0.07 | 0.08 |
| 0.01 | 0.02 | 0.025 | 0.03 | 0.03 | 0.03 | 0.035 | 0.04 | 0.05 | 0.055 | 0.06 | 0.065 | 0.065 | 0.07 | 0.075 |
| 0.01 | 0.02 | 0.025 | 0.03 | 0.03 | 0.03 | 0.035 | 0.04 | 0.05 | 0.055 | 0.06 | 0.065 | 0.065 | 0.07 | 0.075 |
| 0.01 | 0.02 | 0.025 | 0.03 | 0.03 | 0.03 | 0.035 | 0.04 | 0.05 | 0.055 | 0.06 | 0.065 | 0.065 | 0.07 | 0.075 |
| 0.01 | 0.02 | 0.025 | 0.03 | 0.035 | 0.04 | 0.045 | 0.05 | 0.06 | 0.065 | 0.07 | 0.08 | 0.09 | 0.1 | 0.12 |
| 0.01 | 0.02 | 0.025 | 0.03 | 0.035 | 0.04 | 0.045 | 0.05 | 0.06 | 0.065 | 0.07 | 0.08 | 0.09 | 0.1 | 0.12 |
| 0.01 | 0.02 | 0.025 | 0.03 | 0.035 | 0.04 | 0.045 | 0.05 | 0.06 | 0.065 | 0.07 | 0.08 | 0.09 | 0.1 | 0.12 |
| 0.02 | 0.03 | 0.035 | 0.04 | 0.045 | 0.05 | 0.055 | 0.06 | 0.065 | 0.07 | 0.08 | 0.085 | 0.09 | 0.1 | 0.12 |
| 0.02 | 0.03 | 0.035 | 0.04 | 0.045 | 0.05 | 0.055 | 0.06 | 0.065 | 0.07 | 0.08 | 0.085 | 0.09 | 0.1 | 0.12 |
| 0.02 | 0.03 | 0.035 | 0.04 | 0.045 | 0.05 | 0.055 | 0.06 | 0.065 | 0.07 | 0.08 | 0.085 | 0.09 | 0.1 | 0.12 |
| 0.01 | 0.02 | 0.025 | 0.03 | 0.035 | 0.04 | 0.045 | 0.05 | 0.055 | 0.06 | 0.065 | 0.07 | 0.075 | 0.08 | 0.09 |
| 0.01 | 0.02 | 0.025 | 0.03 | 0.035 | 0.04 | 0.045 | 0.05 | 0.055 | 0.06 | 0.06 | 0.065 | 0.07 | 0.075 | 0.08 |
| 0.02 | 0.03 | 0.04 | 0.045 | 0.05 | 0.055 | 0.06 | 0.07 | 0.08 | 0.09 | 0.09 | 0.1 | 0.12 | 0.13 | 0.15 |
| 0.01 | 0.01 | 0.015 | 0.02 | 0.025 | 0.03 | 0.035 | 0.04 | 0.04 | 0.045 | 0.05 | 0.055 | 0.06 | 0.065 | 0.07 |
| 0.01 | 0.01 | 0.015 | 0.02 | 0.025 | 0.03 | 0.035 | 0.04 | 0.04 | 0.045 | 0.05 | 0.055 | 0.06 | 0.065 | 0.07 |
| x 0.01 | 0.01 | 0.015 | 0.02 | 0.025 | 0.03 | 0.03 | 0.035 | 0.04 | 0.045 | 0.05 | 0.055 | 0.06 | 0.065 | 0.07 |
| x 0.01 | 0.01 | 0.015 | 0.02 | 0.025 | 0.03 | 0.03 | 0.035 | 0.04 | 0.045 | 0.05 | 0.055 | 0.06 | 0.065 | 0.07 |

| TM | TMU | TM SP | TM SP H |
|---|---|---|---|
| 53830<br>53831<br>53860 | 53832<br>73830 | 53840<br>53841 | 53850 |
| | | | |
| ●● | ●● | ●● | ○ |
| ●● | ●● | ●● | ○ |
| ● | ●● | ●● | ● |
| ● | ●● | ●● | ○ |
| ● | ●● | ●● | ○ |
| ● | ●● | ●● | ○ |
| ●● | ●● | ●● | ○ |
| ●● | ●● | ●● | ○ |
| ●● | ●● | ●● | ● |
| ●● | ●● | ●● | ○ |
| ●● | ●● | ●● | ○ |
| ●● | ●● | ●● | ○ |
| ●● | ●● | ●● | ○ |
| ●● | ●● | ●● | ○ |
| ●● | ●● | ●● | ○ |
| ●● | ●● | ●● | ●● |
| ● | ● | ●● | ●● |
| ○ | ○ | ○ | ●● |

**General recommendation:**

1.) From 2.5xD [thread depth] thread Ø should be programmed in 2 passes. [2/3-1/3 in the conventional milling]

2.) Generally in VA and in hard machining from > HRC40 it is recommended that the thread Ø is programmed in 2 passes. [2/3-1/3 in the conventional milling]

●● optimally suited

● suited

○ not suitable

Application recommendations

# Application recommendation

## MTM-NX 2.5xD (Please note, M4 counter clockwise)

| ISO | | Material group | Hardness | Example materials | Material no. | Cutting speed $v_c$ (m/min) |
|---|---|---|---|---|---|---|
| P | P1 | Structural and free cutting steels, heat-treatable steels unalloyed | < 800 N/mm² | S235JR<br>C15<br>11SMnPb30 | 1.0037<br>1.0401<br>1.0718 | 100 |
| | P2 | Free-cutting steels, unalloyed case hardened steels, nitriding steels | 800-1000 N/mm² | S355J2<br>C60<br>31CrMo12 | 1.0577<br>1.0601<br>1.8515 | 90 |
| | P3 | Alloyed heat-treatable steels, tool steels, high speed steels | 800-1200 N/mm² | 42CrMo4<br>36CrNiMo4<br>X36CrMo17<br>HS 6-5-2 | 1.7225<br>1.6511<br>1.2316<br>1.3343 | 80 |
| M | M1 | Stainless steels, sulphured, austenitic | < 1000 N/mm² | X5CrNi18-10<br>X6CrNiTi18-10<br>X8CrNiS18-9 | 1.4301<br>1.4571<br>1.4305 | 65 |
| | M2 | Stainless- and acidresistant steels, martensitic | < 1000 N/mm² | X17CrNi16-2<br>X90CrMoV18<br>X2CrTi12 | 1.4057<br>1.4112<br>1.4512 | 60 |
| | M3 | Duplex and Super Duplex | < 1300 N/mm² | X2CrNiMoN22-5-3<br>X2CrNiMoN25-7-4<br>X2CrNiMoCuWn25-7-4 | 1.4462<br>1.441<br>1.4501 | 55 |
| K | K1 | Cast iron | 300 HB | EN-GJL-150<br>EN-GJL-250<br>EN-GJL-300 | 0.6015<br>0.6025<br>0.603 | 140 |
| | K2 | Spheroidal graphite iron and malleable cast iron | 350 HB | EN-GJS-400-15<br>EN-GJS-600-3<br>EN-GJS-700-2 | 0.704<br>0.706<br>0.707 | 120 |
| | K3 | ADI, GGV | 1000 N/mm²<br>350 HB | EN-GJS1000-5<br>EN-GJV250<br>EN-GJV400 | | 100 |
| N | N1 | Aluminium and wrought alloys | < 450 N/mm² | Al99,5H<br>AlMgSi1<br>AlZn4,5Mg | 3.025<br>3.2315<br>3.4335 | 280 |
| | N2 | Al cast alloys | < 600 N/mm² | GD-AlSi5Cu1Mg<br>GD-AlSi8Cu3<br>G-AlSi9Mg<br>G-AlSi12 | 3.2134<br>3.2162<br>3.2373<br>3.2581 | 250 |
| | N3 | Magnesium alloys | < 500 N/mm² | GDMgAl8Zn1 | 3.5812.08 | 200 |
| | N4 | Copper and copper alloys | long-chipping<br>short-chipping | CuZn20<br>CuZn37Pb0,5<br>CuZn39Pb2<br>CuZn43Pb2 | 2.025<br>2.0332<br>2.038<br>2.041 | 140 |
| | N5 | Copper special alloys | < 1400 N/mm² | Ampco | | 130 |
| | N6 | Plastics [Thermoplastics, Duroplastics] | long-chipping<br>short-chipping | PMMA, POM,PVC<br>Pertinax | | 300 |
| S | S1 | Ti and Ti alloys | < 1200 N/mm² | Titan<br>TiAl5Sn2<br>TiAl6V4 | 3.7025<br>3.7115<br>3.7165 | 55 |
| | S2 | Nickel, cobalt and iron alloys | < 1400 N/mm² | Hastelloy C4<br>Inconel 718<br>Nimonic | 2.461<br>2.4668<br>2.4634 | 40 |
| H | H1<br>H2 | High tensile steels, hardened steels | 45-55 HRC<br>55-66 HRC | Hardox<br>PM30 | | 50<br>x |

**Please note:**
The cutting values specified in the respective columns are guide values, they have to be adapted according to application conditions (material, lubrication, tool clamping, machine etc.)
**Depending on the machining task the optimal cutting values can differ from those in the table by up to ±30 %!**

| MTM-NX<br>53892 | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Milling part diameter [d1] / feed per tooth [$f_z$] [climb milling] | | | | | | | | | | | | |
| **Ø1** | **Ø2** | **Ø3** | **Ø4** | **Ø5** | **Ø6** | **Ø7** | **Ø8** | **Ø9** | **Ø10** | **Ø12** | **Ø14** | **Ø16** | |
| mm | mm | mm | mm | mm | mm | mm | mm | mm | mm | mm | mm | mm | |
| 0.01 | 0.02 | 0.02 | 0.025 | 0.03 | 0.03 | 0.035 | 0.035 | 0.04 | 0.045 | 0.05 | 0.055 | 0.06 | ●● |
| 0.01 | 0.02 | 0.02 | 0.025 | 0.03 | 0.03 | 0.035 | 0.035 | 0.04 | 0.045 | 0.05 | 0.055 | 0.06 | ●● |
| 0.01 | 0.02 | 0.02 | 0.025 | 0.03 | 0.03 | 0.035 | 0.035 | 0.04 | 0.045 | 0.05 | 0.055 | 0.06 | ●● |
| 0.008 | 0.015 | 0.02 | 0.025 | 0.03 | 0.03 | 0.03 | 0.035 | 0.04 | 0.04 | 0.045 | 0.05 | 0.055 | ●● |
| 0.008 | 0.015 | 0.02 | 0.025 | 0.03 | 0.03 | 0.03 | 0.035 | 0.04 | 0.04 | 0.045 | 0.05 | 0.055 | ●● |
| 0.008 | 0.015 | 0.02 | 0.025 | 0.03 | 0.03 | 0.03 | 0.035 | 0.04 | 0.04 | 0.045 | 0.05 | 0.055 | ●● |
| 0.01 | 0.02 | 0.02 | 0.025 | 0.03 | 0.03 | 0.035 | 0.035 | 0.04 | 0.045 | 0.05 | 0.055 | 0.06 | ●● |
| 0.01 | 0.02 | 0.02 | 0.025 | 0.03 | 0.03 | 0.035 | 0.035 | 0.04 | 0.045 | 0.05 | 0.055 | 0.06 | ●● |
| 0.01 | 0.02 | 0.02 | 0.025 | 0.03 | 0.03 | 0.035 | 0.035 | 0.04 | 0.045 | 0.05 | 0.055 | 0.06 | ●● |
| 0.01 | 0.02 | 0.025 | 0.03 | 0.035 | 0.04 | 0.045 | 0.05 | 0.055 | 0.06 | 0.065 | 0.07 | 0.075 | ●● |
| 0.01 | 0.02 | 0.025 | 0.03 | 0.035 | 0.04 | 0.045 | 0.05 | 0.055 | 0.06 | 0.065 | 0.07 | 0.075 | ●● |
| 0.01 | 0.02 | 0.025 | 0.03 | 0.035 | 0.04 | 0.045 | 0.05 | 0.055 | 0.06 | 0.065 | 0.07 | 0.075 | ●● |
| 0.01 | 0.02 | 0.025 | 0.03 | 0.035 | 0.04 | 0.045 | 0.05 | 0.055 | 0.06 | 0.065 | 0.07 | 0.075 | ●● |
| 0.01 | 0.02 | 0.025 | 0.03 | 0.035 | 0.04 | 0.045 | 0.05 | 0.055 | 0.06 | 0.065 | 0.07 | 0.075 | ●● |
| 0.01 | 0.02 | 0.025 | 0.03 | 0.035 | 0.04 | 0.045 | 0.05 | 0.055 | 0.06 | 0.065 | 0.07 | 0.075 | ●● |
| 0.005 | 0.007 | 0.012 | 0.015 | 0.02 | 0.025 | 0.03 | 0.035 | 0.035 | 0.04 | 0.045 | 0.045 | 0.05 | ●● |
| 0.005 | 0.007 | 0.012 | 0.015 | 0.02 | 0.025 | 0.03 | 0.035 | 0.035 | 0.04 | 0.045 | 0.045 | 0.05 | ●● |
| 0.005<br>x | 0.008<br>x | 0.01<br>x | 0.012<br>x | 0.015<br>x | 0.02<br>x | 0.025<br>x | 0.025<br>x | 0.03<br>x | 0.03<br>x | 0.035<br>x | 0.04<br>x | 0.045<br>x | ●●<br>○ |

●● optimally suited
● suited
○ not suitable

# Application recommendation

## TMC-NX 2xD IC

| ISO | | Material group | Hardness | Example materials | Material no. | Cutting speed $v_c$ (m/min) |
|---|---|---|---|---|---|---|
| P | P1 | Structural and free cutting steels, heat-treatable steels unalloyed | < 800 N/mm² | S235JR<br>C15<br>11SMnPb30 | 1.0037<br>1.0401<br>1.0718 | 100 |
| | P2 | Free-cutting steels, unalloyed case hardened steels, nitriding steels | 800-1000 N/mm² | S355J2<br>C60<br>31CrMo12 | 1.0577<br>1.0601<br>1.8515 | 90 |
| | P3 | Alloyed heat-treatable steels, tool steels, high speed steels | 800-1200 N/mm² | 42CrMo4<br>36CrNiMo4<br>X36CrMo17<br>HS 6-5-2 | 1.7225<br>1.6511<br>1.2316<br>1.3343 | 80 |
| M | M1 | Stainless steels, sulphured, austenitic | < 1000 N/mm² | X5CrNi18-10<br>X6CrNiTi18-10<br>X8CrNiS18-9 | 1.4301<br>1.4571<br>1.4305 | 60 |
| | M2 | Stainless- and acidresistant steels, martensitic | < 1000 N/mm² | X17CrNi16-2<br>X90CrMoV18<br>X2CrTi12 | 1.4057<br>1.4112<br>1.4512 | 55 |
| | M3 | Duplex and Super Duplex | < 1300 N/mm² | X2CrNiMoN22-5-3<br>X2CrNiMoN25-7-4<br>X2CrNiMoCuWn25-7-4 | 1.4462<br>1.441<br>1.4501 | 50 |
| K | K1 | Cast iron | 300 HB | EN-GJL-150<br>EN-GJL-250<br>EN-GJL-300 | 0.6015<br>0.6025<br>0.603 | 120 |
| | K2 | Spheroidal graphite iron and malleable cast iron | 350 HB | EN-GJS-400-15<br>EN-GJS-600-3<br>EN-GJS-700-2 | 0.704<br>0.706<br>0.707 | 100 |
| | K3 | ADI, GGV | 1000 N/mm²<br>350 HB | EN-GJS1000-5<br>EN-GJV250<br>EN-GJV400 | | 90 |
| N | N1 | Aluminium and wrought alloys | < 450 N/mm² | Al99,5H<br>AlMgSi1<br>AlZn4,5Mg | 3.025<br>3.2315<br>3.4335 | x |
| | N2 | Al cast alloys | < 600 N/mm² | GD-AlSi5Cu1Mg<br>GD-AlSi8Cu3<br>G-AlSi9Mg<br>G-AlSi12 | 3.2134<br>3.2162<br>3.2373<br>3.2581 | x |
| | N3 | Magnesium alloys | < 500 N/mm² | GDMgAl8Zn1 | 3.5812.08 | x |
| | N4 | Copper and copper alloys | long-chipping<br>short-chipping | CuZn20<br>CuZn37Pb0,5<br>CuZn39Pb2<br>CuZn43Pb2 | 2.025<br>2.0332<br>2.038<br>2.041 | 90 |
| | N5 | Copper special alloys | < 1400 N/mm² | Ampco | | 70 |
| | N6 | Plastics [Thermoplastics, Duroplastics] | long-chipping<br>short-chipping | PMMA, POM,PVC<br>Pertinax | | x |
| S | S1 | Ti and Ti alloys | < 1200 N/mm² | Titan<br>TiAl5Sn2<br>TiAl6V4 | 3.7025<br>3.7115<br>3.7165 | 55 |
| | S2 | Nickel, cobalt and iron alloys | < 1400 N/mm² | Hastelloy C4<br>Inconel 718<br>Nimonic | 2.461<br>2.4668<br>2.4634 | 45 |
| H | H1<br>H2 | High tensile steels, hardened steels | 45-55 HRC<br>55-66 HRC | Hardox<br>PM30 | | x<br>x |

**Please note:**
The cutting values specified in the respective columns are guide values, they have to be adapted according to application conditions (material, lubrication, tool clamping, machine etc.)
**Depending on the machining task the optimal cutting values can differ from those in the table by up to ±30 %!**

| TMC-NX 53890 | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | |
| Milling part diameter [d1] / feed per tooth [$f_z$] [conventional milling] | | | | | | | | | | | |
| **Ø2** mm | **Ø3** mm | **Ø4** mm | **Ø5** mm | **Ø6** mm | **Ø7** mm | **Ø8** mm | **Ø9** mm | **Ø10** mm | **Ø12** mm | **Ø14** mm | |
| 0.01 | 0.015 | 0.02 | 0.02 | 0.025 | 0.025 | 0.025 | 0.03 | 0.03 | 0.035 | 0.04 | ●● |
| 0.01 | 0.015 | 0.02 | 0.02 | 0.025 | 0.025 | 0.025 | 0.03 | 0.03 | 0.035 | 0.04 | ●● |
| 0.01 | 0.015 | 0.02 | 0.02 | 0.025 | 0.025 | 0.025 | 0.03 | 0.03 | 0.035 | 0.04 | ●● |
| 0.005 | 0.01 | 0.015 | 0.015 | 0.02 | 0.02 | 0.02 | 0.025 | 0.025 | 0.03 | 0.03 | ●● |
| 0.005 | 0.01 | 0.015 | 0.015 | 0.02 | 0.02 | 0.02 | 0.025 | 0.025 | 0.03 | 0.03 | ●● |
| 0.005 | 0.01 | 0.015 | 0.015 | 0.02 | 0.02 | 0.02 | 0.025 | 0.025 | 0.03 | 0.03 | ●● |
| 0.01 | 0.02 | 0.025 | 0.03 | 0.03 | 0.035 | 0.04 | 0.04 | 0.045 | 0.05 | 0.06 | ●● |
| 0.01 | 0.02 | 0.025 | 0.03 | 0.03 | 0.035 | 0.04 | 0.04 | 0.045 | 0.05 | 0.06 | ●● |
| 0.01 | 0.02 | 0.025 | 0.03 | 0.03 | 0.035 | 0.04 | 0.04 | 0.045 | 0.05 | 0.06 | ●● |
| x | x | x | x | x | x | x | x | x | x | x | ○ |
| x | x | x | x | x | x | x | x | x | x | x | ○ |
| x | x | x | x | x | x | x | x | x | x | x | ○ |
| 0.01 | 0.015 | 0.02 | 0.02 | 0.025 | 0.025 | 0.025 | 0.03 | 0.03 | 0.035 | 0.04 | ●● |
| 0.005 | 0.01 | 0.015 | 0.015 | 0.02 | 0.02 | 0.02 | 0.025 | 0.025 | 0.03 | 0.035 | ●● |
| x | x | x | x | x | x | x | x | x | x | x | ○ |
| 0.01 | 0.015 | 0.015 | 0.02 | 0.025 | 0.025 | 0.025 | 0.03 | 0.03 | 0.035 | 0.035 | ●● |
| 0.005 | 0.01 | 0.01 | 0.015 | 0.02 | 0.02 | 0.02 | 0.025 | 0.025 | 0.03 | 0.03 | ● |
| x<br>x | x<br>x | x<br>x | x<br>x | x<br>x | x<br>x | x<br>x | x<br>x | x<br>x | x<br>x | x<br>x | ○<br>○ |

●● optimally suited
● suited
○ not suitable

# Application recommendation

## TMD-NX 2.5xD (Please note, M4 counter clockwise)

| ISO | | Material group | Hardness | Example materials | Material no. | Cutting speed $v_c$ (m/min) |
|---|---|---|---|---|---|---|
| P | P1 | Structural and free cutting steels, heat-treatable steels unalloyed | < 800 N/mm² | S235JR<br>C15<br>11SMnPb30 | 1.0037<br>1.0401<br>1.0718 | 80 |
| | P2 | Free-cutting steels, unalloyed case hardened steels, nitriding steels | 800-1000 N/mm² | S355J2<br>C60<br>31CrMo12 | 1.0577<br>1.0601<br>1.8515 | 70 |
| | P3 | Alloyed heat-treatable steels, tool steels, high speed steels | 800-1200 N/mm² | 42CrMo4<br>36CrNiMo4<br>X36CrMo17<br>HS 6-5-2 | 1.7225<br>1.6511<br>1.2316<br>1.3343 | 70 |
| M | M1 | Stainless steels, sulphured, austenitic | < 1000 N/mm² | X5CrNi18-10<br>X6CrNiTi18-10<br>X8CrNiS18-9 | 1.4301<br>1.4571<br>1.4305 | 55 |
| | M2 | Stainless- and acidresistant steels, martensitic | < 1000 N/mm² | X17CrNi16-2<br>X90CrMoV18<br>X2CrTi12 | 1.4057<br>1.4112<br>1.4512 | 50 |
| | M3 | Duplex and Super Duplex | < 1300 N/mm² | X2CrNiMoN22-5-3<br>X2CrNiMoN25-7-4<br>X2CrNiMoCuWn25-7-4 | 1.4462<br>1.441<br>1.4501 | 50 |
| K | K1 | Cast iron | 300 HB | EN-GJL-150<br>EN-GJL-250<br>EN-GJL-300 | 0.6015<br>0.6025<br>0.603 | 80 |
| | K2 | Spheroidal graphite iron and malleable cast iron | 350 HB | EN-GJS-400-15<br>EN-GJS-600-3<br>EN-GJS-700-2 | 0.704<br>0.706<br>0.707 | 75 |
| | K3 | ADI, GGV | 1000 N/mm²<br>350 HB | EN-GJS1000-5<br>EN-GJV250<br>EN-GJV400 | | 65 |
| N | N1 | Aluminium and wrought alloys | < 450 N/mm² | Al99,5H<br>AlMgSi1<br>AlZn4,5Mg | 3.025<br>3.2315<br>3.4335 | x |
| | N2 | Al cast alloys | < 600 N/mm² | GD-AlSi5Cu1Mg<br>GD-AlSi8Cu3<br>G-AlSi9Mg<br>G-AlSi12 | 3.2134<br>3.2162<br>3.2373<br>3.2581 | 120 |
| | N3 | Magnesium alloys | < 500 N/mm² | GDMgAl8Zn1 | 3.5812.08 | x |
| | N4 | Copper and copper alloys | long-chipping<br>short-chipping | CuZn20<br>CuZn37Pb0,5<br>CuZn39Pb2<br>CuZn43Pb2 | 2.025<br>2.0332<br>2.038<br>2.041 | 80 |
| | N5 | Copper special alloys | < 1400 N/mm² | Ampco | | 65 |
| | N6 | Plastics [Thermoplastics, Duroplastics] | long-chipping<br>short-chipping | PMMA, POM,PVC<br>Pertinax | | x |
| S | S1 | Ti and Ti alloys | < 1200 N/mm² | Titan<br>TiAl5Sn2<br>TiAl6V4 | 3.7025<br>3.7115<br>3.7165 | 45 |
| | S2 | Nickel, cobalt and iron alloys | < 1400 N/mm² | Hastelloy C4<br>Inconel 718<br>Nimonic | 2.461<br>2.4668<br>2.4634 | 45 |
| H | H1<br>H2 | High tensile steels, hardened steels | 45-55 HRC<br>55-66 HRC | Hardox<br>PM30 | | 40<br>30 |

**Please note:**
The cutting values specified in the respective columns are guide values, they have to be adapted according to application conditions (material, lubrication, tool clamping, machine etc.)
**Depending on the machining task the optimal cutting values can differ from those in the table by up to ±30 %!**

| TMD-NX<br>53948<br>53949<br>53950 |
|---|

| Milling part diameter [d1] / feed per tooth [$f_z$] | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Ø1-1,8** | | **Ø1,81-2,4** | **Ø2,41-2,7** | **Ø2,71-3,1** | **Ø3,11-3,8** | **Ø3,81-4,6** | **Ø4,61-6,2** | **Ø6,21-7,5** | **Ø7,51-9,0** | **Ø9,01-16** | |
| mm | mm | mm | mm | mm | mm | mm | mm | mm | mm | mm | |
| 0.008 | 0.008 | 0.012 | 0.014 | 0.018 | 0.026 | 0.028 | 0.030 | 0.035 | 0.040 | 0.048 | ●● |
| 0.008 | 0.008 | 0.012 | 0.014 | 0.018 | 0.026 | 0.028 | 0.030 | 0.035 | 0.040 | 0.048 | ●● |
| 0.007 | 0.007 | 0.010 | 0.011 | 0.012 | 0.016 | 0.020 | 0.025 | 0.030 | 0.036 | 0.044 | ●● |
| 0.007 | 0.007 | 0.010 | 0.011 | 0.012 | 0.016 | 0.020 | 0.025 | 0.030 | 0.036 | 0.044 | ●● |
| 0.007 | 0.007 | 0.010 | 0.011 | 0.012 | 0.016 | 0.020 | 0.025 | 0.030 | 0.036 | 0.044 | ●● |
| 0.005 | 0.005 | 0.007 | 0.008 | 0.010 | 0.014 | 0.016 | 0.018 | 0.020 | 0.026 | 0.033 | ●● |
| 0.008 | 0.008 | 0.012 | 0.014 | 0.016 | 0.020 | 0.024 | 0.030 | 0.036 | 0.040 | 0.048 | ●● |
| 0.008 | 0.008 | 0.012 | 0.014 | 0.016 | 0.020 | 0.024 | 0.030 | 0.036 | 0.040 | 0.048 | ●● |
| 0.007 | 0.007 | 0.011 | 0.013 | 0.015 | 0.018 | 0.022 | 0.028 | 0.033 | 0.038 | 0.046 | ●● |
| x | x | x | x | x | x | x | x | x | x | x | ● |
| 0.007 | 0.007 | 0.011 | 0.013 | 0.015 | 0.018 | 0.022 | 0.028 | 0.033 | 0.038 | 0.046 | ● |
| x | x | x | x | x | x | x | x | x | x | x | ● |
| 0.008 | 0.008 | 0.012 | 0.014 | 0.016 | 0.020 | 0.024 | 0.030 | 0.036 | 0.040 | 0.048 | ●● |
| 0.007 | 0.007 | 0.010 | 0.011 | 0.012 | 0.016 | 0.020 | 0.025 | 0.030 | 0.036 | 0.048 | ●● |
| x | x | x | x | x | x | x | x | x | x | x | ○ |
| 0.007 | 0.007 | 0.010 | 0.011 | 0.012 | 0.016 | 0.020 | 0.025 | 0.030 | 0.036 | 0.044 | ●● |
| 0.007 | 0.007 | 0.010 | 0.011 | 0.012 | 0.016 | 0.020 | 0.025 | 0.030 | 0.036 | 0.044 | ●● |
| 0.007<br>0.005 | 0.007<br>0.005 | 0.010<br>0.008 | 0.011<br>0.009 | 0.012<br>0.010 | 0.016<br>0.014 | 0.020<br>0.018 | 0.025<br>0.022 | 0.030<br>0.028 | 0.036<br>0.033 | 0.044<br>0.042 | ●●<br>●● |

●● optimally suited
● suited
○ not suitable

# Tapping hole size diameter

## Thread cutting tools

### Std. ISO metric threads DIN 13

| nom.-Ø | Pitch P mm | Tapping hole size Ø DIN 336 mm | Core diameter of int. thread 6H* min. mm | Core diameter of int. thread 6H* max. mm |
|---|---|---|---|---|
| M 1 | 0.25 | **0.75** | 0.729 | 0.785 |
| M 1.1 | 0.25 | **0.85** | 0.829 | 0.885 |
| M 1.2 | 0.25 | **0.95** | 0.929 | 0.985 |
| M 1.4 | 0.30 | **1.10** | 1.075 | 1.142 |
| M 1.6 | 0.35 | **1.25** | 1.221 | 1.321 |
| M 1.8 | 0.35 | **1.45** | 1.421 | 1.521 |
| M 2 | 0.40 | **1.60** | 1.567 | 1.679 |
| M 2.2 | 0.45 | **1.75** | 1.713 | 1.838 |
| M 2.5 | 0.45 | **2.05** | 2.013 | 2.138 |
| M 3 | 0.50 | **2.50** | 2.459 | 2.599 |
| M 3.5 | 0.60 | **2.90** | 2.850 | 3.010 |
| M 4 | 0.70 | **3.30** | 3.242 | 3.422 |
| M 4.5 | 0.75 | **3.70** | 3.688 | 3.878 |
| M 5 | 0.80 | **4.20** | 4.134 | 4.334 |
| M 6 | 1.00 | **5.00** | 4.917 | 5.153 |
| M 7 | 1.00 | **6.00** | 5.917 | 6.153 |
| M 8 | 1.25 | **6.80** | 6.647 | 6.912 |
| M 9 | 1.25 | **7.80** | 7.647 | 7.912 |
| M 10 | 1.50 | **8.50** | 8.376 | 8.676 |
| M 11 | 1.50 | **9.50** | 9.376 | 9.676 |
| M 12 | 1.75 | **10.20** | 10.106 | 10.441 |
| M 14 | 2.00 | **12.00** | 11.835 | 12.210 |
| M 16 | 2.00 | **14.00** | 13.835 | 14.210 |
| M 18 | 2.50 | **15.50** | 15.294 | 15.744 |
| M 20 | 2.50 | **17.50** | 17.294 | 17.744 |
| M 22 | 2.50 | **19.50** | 19.294 | 19.744 |
| M 24 | 3.00 | **21.00** | 20.752 | 21.252 |
| M 27 | 3.00 | **24.00** | 23.752 | 24.252 |
| M 30 | 3.50 | **26.50** | 26.211 | 26.771 |
| M 33 | 3.50 | **29.50** | 29.211 | 29.771 |
| M 36 | 4.00 | **32.00** | 31.670 | 32.270 |
| M 39 | 4.00 | **35.00** | 34.670 | 35.270 |
| M 42 | 4.50 | **37.50** | 37.129 | 37.799 |
| M 45 | 4.50 | **40.50** | 40.129 | 40.799 |
| M 48 | 5.00 | **43.00** | 42.587 | 43.297 |
| M 52 | 5.00 | **47.00** | 46.587 | 47.297 |
| M 56 | 5.50 | **50.50** | 50.046 | 50.796 |

* M 1.1 to M 1.4 core diameter of int. thread 5H

### Std. ISO metric fine threads DIN 13

| nom.-Ø x Pitch P mm | Tapping hole size Ø DIN 336 mm | Core diameter of int. thread 6H* min. mm | Core diameter of int. thread 6H* max. mm |
|---|---|---|---|
| M 2.5 x 0.35 | **2.15** | 2.121 | 2.221 |
| M 3.0 x 0.35 | **2.65** | 2.621 | 2.721 |
| M 3.5 x 0.35 | **3.15** | 3.121 | 3.221 |
| M 4.0 x 0.50 | **3.50** | 3.459 | 3.599 |
| M 4.5 x 0.50 | **4.00** | 3.959 | 4.099 |
| M 5.0 x 0.50 | **4.50** | 4.459 | 4.599 |
| M 5.5 x 0.50 | **5.00** | 4.959 | 5.099 |
| M 6.0 x 0.75 | **5.20** | 5.188 | 5.378 |
| M 7.0 x 0.75 | **6.20** | 6.188 | 6.378 |
| M 8.0 x 0.50 | **7.50** | 7.459 | 7.599 |
| M 8.0 x 0.75 | **7.20** | 7.188 | 7.378 |
| M 8.0 x 1.00 | **7.00** | 6.917 | 7.153 |
| M 9.0 x 0.75 | **8.20** | 8.188 | 8.378 |
| M 9.0 x 1.00 | **8.00** | 7.917 | 8.153 |
| M 10 x 0.75 | **9.20** | 9.188 | 9.378 |
| M 10 x 1.00 | **9.00** | 8.917 | 9.153 |
| M 10 x 1.25 | **8.80** | 8.647 | 8.912 |
| M 11 x 0.75 | **10.20** | 10.188 | 10.378 |
| M 11 x 1.00 | **10.00** | 9.917 | 10.153 |
| M 12 x 1.00 | **11.00** | 10.917 | 11.153 |
| M 12 x 1.25 | **10.80** | 10.647 | 10.912 |
| M 12 x 1.50 | **10.50** | 10.376 | 10.676 |
| M 14 x 1.00 | **13.00** | 12.917 | 13.153 |
| M 14 x 1.25 | **12.80** | 12.647 | 12.912 |
| M 14 x 1.50 | **12.50** | 12.376 | 12.676 |
| M 15 x 1.00 | **14.00** | 13.917 | 14.153 |
| M 15 x 1.50 | **13.50** | 13.376 | 13.676 |
| M 16 x 1.00 | **15.00** | 14.917 | 15.153 |
| M 16 x 1.25 | **14.80** | 14.647 | 14.912 |
| M 16 x 1.50 | **14.50** | 14.376 | 14.676 |
| M 17 x 1.00 | **16.00** | 15.917 | 16.153 |
| M 17 x 1.50 | **15.50** | 15.376 | 15.676 |
| M 18 x 1.00 | **17.00** | 16.917 | 17.153 |
| M 18 x 1.50 | **16.50** | 16.376 | 16.676 |
| M 20 x 1.00 | **19.00** | 18.917 | 19.153 |
| M 20 x 1.50 | **18.50** | 18.376 | 18.676 |
| M 20 x 2.00 | **18.00** | 17.835 | 18.210 |
| M 22 x 1.00 | **21.00** | 20.917 | 21.153 |
| M 22 x 1.50 | **20.50** | 20.376 | 20.676 |
| M 22 x 2.00 | **20.00** | 19.835 | 20.210 |
| M 24 x 1.00 | **23.00** | 22.917 | 23.153 |
| M 24 x 1.50 | **22.50** | 22.376 | 22.676 |
| M 24 x 2.00 | **22.00** | 21.835 | 22.210 |
| M 25 x 1.00 | **24.00** | 23.917 | 24.153 |
| M 25 x 1.50 | **23.50** | 23.376 | 23.676 |
| M 25 x 2.00 | **23.00** | 22.835 | 23.210 |
| M 27 x 1.00 | **26.00** | 25.917 | 26.153 |
| M 27 x 1.50 | **25.50** | 25.376 | 25.676 |
| M 27 x 2.00 | **25.00** | 24.835 | 25.210 |
| M 28 x 1.00 | **27.00** | 26.917 | 27.153 |
| M 28 x 1.50 | **26.50** | 26.376 | 26.676 |
| M 28 x 2.00 | **26.00** | 25.835 | 26.210 |
| M 30 x 1.00 | **29.00** | 28.917 | 29.153 |
| M 30 x 1.50 | **28.50** | 28.376 | 28.676 |
| M 30 x 2.00 | **28.00** | 27.835 | 28.210 |
| M 30 x 3.00 | **27.00** | 26.752 | 27.252 |
| M 32 x 1.50 | **30.50** | 30.376 | 30.676 |
| M 32 x 2.00 | **30.00** | 29.835 | 30.210 |
| M 33 x 1.50 | **31.50** | 31.376 | 31.676 |
| M 33 x 2.00 | **31.00** | 30.835 | 31.210 |
| M 33 x 3.00 | **30.00** | 29.752 | 30.252 |
| M 35 x 1.50 | **33.50** | 33.376 | 33.676 |
| M 36 x 1.50 | **34.50** | 34.376 | 34.676 |

### UNC threads ASME B1.1

| nom.-Ø Threads per inch | Tapping hole size Ø DIN 336 mm | Core diameter of int. thread 2B min. mm | Core diameter of int. thread 2B max. mm |
|---|---|---|---|
| No 1 - 64 | **1.55** | 1.425 | 1.580 |
| No 2 - 56 | **1.85** | 1.694 | 1.872 |
| No 3 - 48 | **2.10** | 1.941 | 2.146 |
| No 4 - 40 | **2.35** | 2.157 | 2.385 |
| No 5 - 40 | **2.65** | 2.487 | 2.698 |
| No 6 - 32 | **2.85** | 2.642 | 2.896 |
| No 8 - 32 | **3.50** | 3.302 | 3.531 |
| No 10 - 24 | **3.90** | 3.683 | 3.937 |
| No 12 - 24 | **4.50** | 4.343 | 4.597 |
| 1/4 - 20 | **5.10** | 4.978 | 5.258 |
| 5/16 - 18 | **6.60** | 6.401 | 6.731 |
| 3/8 - 16 | **8.00** | 7.798 | 8.153 |
| 7/16 - 14 | **9.40** | 9.144 | 9.550 |
| 1/2 - 13 | **10.80** | 10.592 | 11.024 |
| 9/16 - 12 | **12.20** | 11.989 | 12.446 |
| 5/8 - 11 | **13.50** | 13.386 | 13.868 |
| 3/4 - 10 | **16.50** | 16.307 | 16.840 |
| 7/8 - 9 | **19.50** | 19.177 | 19.761 |
| 1 - 8 | **22.25** | 21.971 | 22.606 |
| 1 1/8 - 7 | **25.00** | 24.638 | 25.349 |
| 1 1/4 - 7 | **28.00** | 27.813 | 28.524 |
| 1 3/8 - 6 | **30.75** | 30.353 | 31.115 |
| 1 1/2 - 6 | **34.00** | 33.528 | 34.290 |
| 1 3/4 - 5 | **39.50** | 38.938 | 39.802 |
| 2 - 4.5 | **45.00** | 44.679 | 45.593 |

**The corresponding twist drills can be found in our general catalogue or our webshop www.stock.de.**

### MJ threads DIN ISO 5855

| nom.-Ø x Pitch P mm | Tapping hole size Ø mm | Core diameter of int. thread 5H* min. mm | Core diameter of int. thread 5H* max. mm |
|---|---|---|---|
| MJ 3 x 0.50 | **2.60** | 2.513 | 2.653 |
| MJ 4 x 0.70 | **3.40** | 3.318 | 3.498 |
| MJ 5 x 0.80 | **4.30** | 4.221 | 4.421 |
| MJ 6 x 0.50 | **5.55** | 5.513 | 5.625 |
| MJ 6 x 0.75 | **5.35** | 5.269 | 5.419 |
| MJ 6 x 1.00 | **5.10** | 5.026 | 5.216 |
| MJ 8 x 0.50 | **7.55** | 7.513 | 7.625 |
| MJ 8 x 0.75 | **7.35** | 7.269 | 7.419 |
| MJ 8 x 1.00 | **7.10** | 7.026 | 7.216 |
| MJ 8 x 1.25 | **6.90** | 6.782 | 6.994 |
| MJ 10 x 1.00 | **9.10** | 9.026 | 9.216 |
| MJ 10 x 1.25 | **8.90** | 8.782 | 8.994 |
| MJ 10 x 1.50 | **8.60** | 8.539 | 8.775 |
| MJ 12 x 1.75 | **10.40** | 10.295 | 10.560 |
| MJ 16 x 2.00 | **14.20** | 14.051 | 14.351 |

* MJ 3 x 0.50 to MJ 5 x 0.80 core diameter of int. thread 6H

### UNJC threads ISO 3161

| nom.-Ø Threads per inch | Tapping hole size Ø mm | Core diameter of int. thread 3B min. mm | Core diameter of int. thread 3B max. mm |
|---|---|---|---|
| No 6 - 32 | **2.85** | 2.733 | 2.939 |
| No 8 - 32 | **3.55** | 3.393 | 3.599 |
| No 10 - 24 | **4.00** | 3.795 | 4.064 |
| No 12 - 24 | **4.60** | 4.455 | 4.704 |
| 1/4 - 20 | **5.30** | 5.113 | 5.387 |
| 5/16 - 18 | **6.75** | 6.563 | 6.833 |
| 3/8 - 16 | **8.20** | 7.978 | 8.255 |
| 7/16 - 14 | **9.60** | 9.346 | 9.639 |
| 1/2 - 13 | **11.00** | 10.798 | 11.095 |
| 9/16 - 12 | **12.40** | 12.228 | 12.482 |
| 5/8 - 11 | **13.80** | 13.627 | 13.904 |

### UNJF threads ISO 3161

| nom.-Ø Threads per inch | Tapping hole size Ø mm | Core diameter of int. thread 3B min. mm | Core diameter of int. thread 3B max. mm |
|---|---|---|---|
| No 6 - 40 | **3.00** | 2.888 | 3.053 |
| No 8 - 36 | **3.60** | 3.480 | 3.663 |
| No 10 - 32 | **4.20** | 4.054 | 4.255 |
| No 12 - 28 | **4.75** | 4.602 | 4.816 |
| 1/4 - 28 | **5.60** | 5.466 | 5.662 |
| 5/16 - 24 | **7.00** | 6.906 | 7.109 |
| 3/8 - 24 | **8.60** | 8.494 | 8.679 |
| 7/16 - 20 | **10.00** | 9.876 | 10.084 |
| 1/2 - 20 | **11.60** | 11.463 | 11.661 |
| 9/16 - 18 | **13.00** | 12.913 | 13.122 |
| 5/8 - 18 | **14.60** | 14.501 | 14.702 |

## UNF threads ASME B1.1

| nom.-Ø | Threads per inch | Tapping hole size Ø DIN 336 mm | Core diameter of int. thread 2B min. mm | Core diameter of int. thread 2B max. mm |
|---|---|---|---|---|
| No 1 | 72 | **1.55** | 1.473 | 1.610 |
| No 2 | 64 | **1.85** | 1.755 | 1.910 |
| No 3 | 56 | **2.15** | 2.024 | 2.197 |
| No 4 | 48 | **2.40** | 2.271 | 2.459 |
| No 5 | 44 | **2.70** | 2.550 | 2.741 |
| No 6 | 40 | **2.95** | 2.819 | 3.023 |
| No 8 | 36 | **3.50** | 3.404 | 3.607 |
| No 10 | 32 | **4.10** | 3.962 | 4.166 |
| No 12 | 28 | **4.60** | 4.496 | 4.724 |
| 1/4 | 28 | **5.50** | 5.359 | 5.588 |
| 5/16 | 24 | **6.90** | 6.782 | 7.036 |
| 3/8 | 24 | **8.50** | 8.382 | 8.636 |
| 7/16 | 20 | **9.90** | 9.728 | 10.033 |
| 1/2 | 20 | **11.50** | 11.328 | 11.608 |
| 9/16 | 18 | **12.90** | 12.751 | 13.081 |
| 5/8 | 18 | **14.50** | 14.351 | 14.681 |
| 3/4 | 16 | **17.50** | 17.323 | 17.678 |
| 7/8 | 14 | **20.40** | 20.269 | 20.650 |
| 1 | 12 | **23.25** | 23.114 | 23.571 |
| 1 1/8 | 12 | **26.50** | 26.289 | 26.746 |
| 1 1/4 | 12 | **29.50** | 29.464 | 29.921 |
| 1 3/8 | 12 | **32.75** | 32.639 | 33.096 |
| 1 1/2 | 12 | **36.00** | 35.814 | 36.271 |

## BSW (Whitworth) threads BS84

| nom.-Ø inch | Threads per inch | Tapping hole size Ø mm | Core diameter of int. thread min. mm | Core diameter of int. thread max. mm |
|---|---|---|---|---|
| W 1/16 | 60 | **1.20** | 1.045 | 1.230 |
| W 3/32 | 48 | **1.80** | 1.704 | 1.912 |
| W 1/8 | 40 | **2.50** | 2.362 | 2.591 |
| W 5/32 | 32 | **3.20** | 2.952 | 3.214 |
| W 3/16 | 24 | **3.60** | 3.407 | 3.745 |
| W 7/32 | 24 | **4.50** | 4.201 | 4.539 |
| W 1/4 | 20 | **5.10** | 4.724 | 5.156 |
| W 5/16 | 18 | **6.50** | 6.130 | 6.590 |
| W 3/8 | 16 | **7.90** | 7.492 | 7.987 |
| W 7/16 | 14 | **9.20** | 8.789 | 9.330 |
| W 1/2 | 12 | **10.50** | 9.989 | 10.591 |
| W 9/16 | 12 | **12.00** | 11.577 | 12.179 |
| W 5/8 | 11 | **13.50** | 12.918 | 13.558 |
| W 3/4 | 10 | **16.25** | 15.797 | 16.483 |
| W 7/8 | 9 | **19.25** | 18.611 | 19.353 |
| W 1 | 8 | **22.00** | 21.334 | 22.147 |
| W 1 1/8 | 7 | **24.50** | 23.928 | 24.832 |
| W 1 1/4 | 7 | **27.75** | 27.103 | 28.007 |
| W 1 3/8 | 6 | **30.50** | 29.504 | 30.528 |
| W 1 1/2 | 6 | **33.50** | 32.679 | 33.703 |
| W 1 5/8 | 5 | **35.50** | 34.769 | 35.963 |
| W 1 3/4 | 5 | **39.00** | 37.944 | 39.138 |
| W 2 | 4.5 | **44.50** | 43.571 | 44.877 |

## (Whitworth) BSP threads (acc. to DIN-ISO 228-1)

| nom.-Ø inch | Threads per inch | Tapping hole size Ø DIN 336 mm | Core diameter of int. thread min. mm | Core diameter of int. thread max. mm |
|---|---|---|---|---|
| G 1/16 | 28 | **6.80** | 6.561 | 6.843 |
| G 1/8 | 28 | **8.80** | 8.566 | 8.848 |
| G 1/4 | 19 | **11.80** | 11.445 | 11.890 |
| G 3/8 | 19 | **15.25** | 14.950 | 15.395 |
| G 1/2 | 14 | **19.00** | 18.631 | 19.172 |
| G 5/8 | 14 | **21.00** | 20.587 | 21.128 |
| G 3/4 | 14 | **24.50** | 24.117 | 24.658 |
| G 7/8 | 14 | **28.25** | 27.877 | 28.418 |
| G 1 | 11 | **30.75** | 30.291 | 30.931 |
| G 1 1/8 | 11 | **35.50** | 34.939 | 35.579 |
| G 1 1/4 | 11 | **39.50** | 38.952 | 39.592 |
| G 1 1/2 | 11 | **45.25** | 44.845 | 45.485 |
| G 1 3/4 | 11 | **51.00** | 50.788 | 51.428 |
| G 2 | 11 | **57.00** | 56.656 | 57.296 |

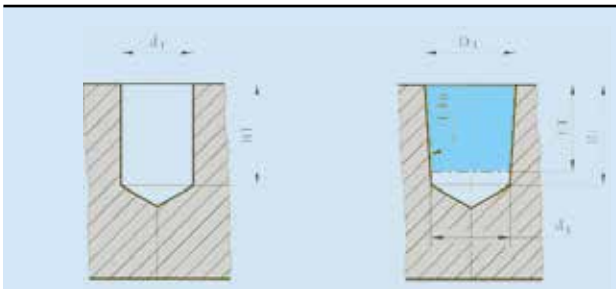
## PG threads acc. to DIN 40430

| nom.-Ø | Threads per inch | Tapping hole size Ø mm | Core diameter of int. thread min. mm | Core diameter of int. thread max. mm |
|---|---|---|---|---|
| Pg 7 | 20 | **11.40** | 11.280 | 11.430 |
| Pg 9 | 18 | **14.00** | 13.860 | 14.010 |
| Pg 11 | 18 | **17.30** | 17.260 | 17.410 |
| Pg 13.5 | 18 | **19.00** | 19.060 | 19.210 |
| Pg 16 | 18 | **21.30** | 21.160 | 21.310 |
| Pg 21 | 16 | **26.90** | 26.780 | 27.030 |
| Pg 29 | 16 | **35.50** | 35.480 | 35.730 |
| Pg 36 | 16 | **45.50** | 45.480 | 45.730 |
| Pg 42 | 16 | **52.50** | 52.480 | 52.730 |
| Pg 48 | 16 | **57.80** | 57.780 | 58.030 |

## NPT ANSI B 2.1 American tapered pipe thread 1:16

Version A (to avoid if possible)

Version B



| nom.-Ø | Threads per inch | Tapp. hole Ø cyl. (A) $d_1$ | Core diameter conical (B) $D_1$ | Cutting depth ET mm | Drill depth BT (min) mm |
|---|---|---|---|---|---|
| 1/16 | 27 | **6.15** | 6.39 | 9.29 | 10.7 |
| 1/8 | 27 | **8.40** | 8.74 | 9.32 | 10.8 |
| 1/4 | 18 | **11.10** | 11.36 | 13.52 | 15.6 |
| 3/8 | 18 | **14.30** | 14.80 | 13.83 | 16.0 |
| 1/2 | 14 | **17.90** | 18.32 | 18.07 | 20.8 |
| 3/4 | 14 | **23.30** | 23.67 | 18.55 | 21.3 |
| 1 | 11.5 | **29.00** | 29.69 | 22.29 | 25.6 |
| 1 1/4 | 11.5 | **37.70** | 38.45 | 22.80 | 26.1 |
| 1 1/2 | 11.5 | **43.70** | 44.52 | 22.80 | 26.1 |
| 2 | 11.5 | **55.60** | 56.56 | 23.20 | 26.5 |
| 2 1/2 | 8 | **66.30** | 67.62 | 31.75 | 36.3 |
| 3 | 8 | **82.30** | 83.52 | 33.74 | 38.5 |

## EG threads Metr./Metr. fine (EG M 14 x 1,25) for wire thread inserts DIN 8140

| nom.-Ø | x Pitch P mm | Tapping hole size Ø mm | Core diameter of int. thread min. mm | Core diameter of int. thread max. mm |
|---|---|---|---|---|
| EG M 4 | 0.70 | **4.20** | 4.152 | 4.292 |
| EG M 5 | 0.80 | **5.25** | 5.174 | 5.334 |
| EG M 6 | 1.00 | **6.30** | 6.217 | 6.407 |
| EG M 8 | 1.25 | **8.40** | 8.271 | 8.483 |
| EG M10 | 1.50 | **10.50** | 10.324 | 10.560 |
| EG M12 | 1.75 | **12.50** | 12.379 | 12.644 |
| EG M14 x | 1.25 | **14.40** | 14.271 | 14.483 |
| EG M16 | 2.00 | **16.50** | 16.433 | 16.733 |

## EG UNC (UNC-STI) threads for wire thread inserts ASME B18.29.1

| nom.-Ø | Threads per inch | Tapping hole size Ø mm | Core diameter of int. thread min. mm | Core diameter of int. thread max. mm |
|---|---|---|---|---|
| EG No 6 | 32 | **3.80** | 3.678 | 3.879 |
| EG No 8 | 32 | **4.40** | 4.338 | 4.524 |
| EG No 10 | 24 | **5.20** | 5.055 | 5.283 |
| EG No 12 | 24 | **5.80** | 5.715 | 5.944 |
| EG 1/4 | 20 | **6.70** | 6.624 | 6.868 |
| EG 5/16 | 18 | **8.40** | 8.242 | 8.489 |
| EG 3/8 | 16 | **10.00** | 9.868 | 10.127 |
| EG 7/16 | 14 | **11.60** | 11.506 | 11.783 |
| EG 1/2 | 13 | **13.30** | 13.122 | 13.393 |
| EG 9/16 | 12 | **14.90** | 14.747 | 15.032 |
| EG 5/8 | 11 | **16.50** | 16.375 | 16.673 |

## EG UNF (UNF-STI) threads for wire thread inserts ASME B18.29.1

| nom.-Ø | Threads per inch | Tapping hole size Ø mm | Core diameter of int. thread min. mm | Core diameter of int. thread max. mm |
|---|---|---|---|---|
| EG No 6 | 40 | **3.70** | 3.644 | 3.818 |
| EG No 8 | 36 | **4.40** | 4.321 | 4.498 |
| EG No 10 | 32 | **5.10** | 4.999 | 5.184 |
| EG No 12 | 28 | **5.70** | 5.682 | 5.809 |
| EG 1/4 | 28 | **6.60** | 6.546 | 6.721 |
| EG 5/16 | 24 | **8.25** | 8.166 | 8.352 |
| EG 3/8 | 24 | **9.80** | 9.754 | 9.931 |
| EG 7/16 | 20 | **11.50** | 11.389 | 11.585 |
| EG 1/2 | 20 | **13.10** | 12.974 | 13.172 |
| EG 9/16 | 18 | **14.70** | 14.592 | 14.798 |
| EG 5/8 | 18 | **16.25** | 16.180 | 16.386 |

# Recommended hole size diameter

## Cold forming taps

### Std. ISO metric threads DIN 13

| nom.-Ø mm | Pitch P | Tapp. hole size Ø mm | Tapping hole size Ø min. mm | Tapping hole size Ø max. mm | Core-Ø of int. thread 7H* min. mm | Core-Ø of int. thread 7H* max. mm |
|---|---|---|---|---|---|---|
| M1 | 0.25 | **0.90** | 0.89 | 0.92 | 0.729 | 0.819 |
| M1.2 | 0.25 | **1.10** | 1.09 | 1.12 | 0.929 | 1.019 |
| M1.4 | 0.30 | **1.28** | 1.27 | 1.30 | 1.075 | 1.181 |
| M1.6 | 0.35 | **1.46** | 1.45 | 1.48 | 1.221 | 1.346 |
| M1.7 | 0.35 | **1.56** | 1.55 | 1.58 | 1.321 | 1.446 |
| M1.8 | 0.35 | **1.66** | 1.65 | 1.68 | 1.421 | 1.546 |
| M 2 | 0.40 | **1.85** | 1.84 | 1.88 | 1.567 | 1.679 |
| M 2.2 | 0.45 | **2.00** | 2.01 | 2.05 | 1.713 | 1.838 |
| M 2.5 | 0.45 | **2.30** | 2.28 | 2.32 | 2.013 | 2.138 |
| M 3 | 0.50 | **2.80** | 2.78 | 2.85 | 2.459 | 2.639 |
| M 3.5 | 0.60 | **3.25** | 3.23 | 3.30 | 2.850 | 3.050 |
| M 4 | 0.70 | **3.70** | 3.68 | 3.76 | 3.242 | 3.466 |
| M 4.5 | 0.75 | **4.20** | | | | |
| M 5 | 0.80 | **4.65** | 4.62 | 4.71 | 4.134 | 4.384 |
| M 6 | 1.00 | **5.55** | 5.52 | 5.62 | 4.917 | 5.217 |
| M 7 | 1.00 | **6.55** | 6.52 | 6.62 | 5.917 | 6.217 |
| M 8 | 1.25 | **7.40** | 7.36 | 7.47 | 6.647 | 6.982 |
| M 9 | 1.25 | **8.40** | 8.36 | 8.47 | 7.647 | 7.982 |
| M 10 | 1.50 | **9.30** | 9.26 | 9.38 | 8.376 | 8.751 |
| M 11 | 1.50 | **10.30** | 10.26 | 10.38 | 9.376 | 9.751 |
| M 12 | 1.75 | **11.20** | 11.15 | 11.29 | 10.106 | 10.531 |
| M 14 | 2.00 | **13.10** | 13.05 | 13.20 | 11.835 | 12.310 |
| M 16 | 2.00 | **15.10** | 15.05 | 15.20 | 13.835 | 14.310 |
| M 18 | 2.50 | **16.90** | 16.83 | 17.02 | 15.294 | 15.854 |
| M 20 | 2.50 | **18.90** | 18.83 | 19.02 | 17.294 | 17.854 |
| M 22 | 2.50 | **20.90** | 20.83 | 21.02 | 19.294 | 19.854 |
| M 24 | 3.00 | **22.70** | 22.62 | 22.80 | 20.752 | 21.382 |
| M 27 | 3.00 | **25.70** | 25.62 | 25.80 | 23.752 | 24.382 |
| M 30 | 3.50 | **28.50** | 28.40 | 28.60 | 26.211 | 26.921 |
| M 33 | 3.50 | **31.50** | 31.40 | 31.60 | 29.211 | 29.921 |
| M 36 | 4.00 | **34.30** | 34.17 | 34.40 | 31.670 | 32.420 |
| M 39 | 4.00 | **37.30** | 37.17 | 37.40 | 34.670 | 35.420 |
| M 42 | 4.50 | **40.10** | 39.95 | 40.20 | 37.129 | 37.979 |

* M 2 to M 2.5 core-Ø of int. thread 6H

### Std. ISO metric fine threads DIN 13

| nom.-Ø mm | x Pitch P | Tapp. hole size Ø mm | Tapping hole size Ø min. mm | Tapping hole size Ø max. mm | Core-Ø of int. thread 7H* min. mm | Core-Ø of int. thread 7H* max. mm |
|---|---|---|---|---|---|---|
| M 2.5 | x 0.35 | **2.35** | 2.35 | 2.38 | 2.121 | 2.221 |
| M 3 | x 0.35 | **2.85** | 2.85 | 2.88 | 2.621 | 2.721 |
| M 4 | x 0.35 | **3.85** | 3.85 | 3.88 | 3.621 | 3.721 |
| M 4 | x 0.50 | **3.80** | 3.78 | 3.83 | 3.459 | 3.639 |
| M 5 | x 0.50 | **4.80** | 4.78 | 4.83 | 4.459 | 4.639 |
| M 5.5 | x 0.50 | **5.30** | 5.28 | 5.33 | 4.959 | 5.139 |
| M 6 | x 0.75 | **5.65** | 5.62 | 5.70 | 5.188 | 5.424 |
| M 7 | x 0.75 | **6.65** | 6.62 | 6.70 | 6.188 | 6.424 |
| M 8 | x 0.75 | **7.65** | 7.62 | 7.70 | 7.188 | 7.424 |
| M 8 | x 1.00 | **7.55** | 7.52 | 7.62 | 6.917 | 7.217 |
| M 9 | x 0.75 | **8.65** | 8.62 | 8.70 | 8.188 | 8.424 |
| M 9 | x 1.00 | **8.55** | 8.52 | 8.62 | 7.917 | 8.217 |
| M 10 | x 0.75 | **9.65** | 9.62 | 9.70 | 9.188 | 9.424 |
| M 10 | x 1.00 | **9.55** | 9.52 | 9.62 | 8.917 | 9.217 |
| M 10 | x 1.25 | **9.40** | 9.36 | 9.47 | 8.647 | 8.982 |
| M 11 | x 0.75 | **10.65** | 10.62 | 10.70 | 10.188 | 10.424 |
| M 11 | x 1.00 | **10.55** | 10.52 | 10.62 | 9.917 | 10.217 |
| M 12 | x 1.00 | **11.55** | 11.52 | 11.62 | 10.917 | 11.217 |
| M 12 | x 1.25 | **11.40** | 11.36 | 11.47 | 10.647 | 10.982 |
| M 12 | x 1.50 | **11.30** | 11.26 | 11.38 | 10.376 | 10.751 |
| M 14 | x 1.00 | **13.55** | 13.52 | 13.62 | 12.917 | 13.217 |
| M 14 | x 1.25 | **13.40** | 13.36 | 13.47 | 12.647 | 12.982 |
| M 14 | x 1.50 | **13.30** | 13.26 | 13.38 | 12.376 | 12.751 |
| M 15 | x 1.00 | **14.55** | 14.52 | 14.62 | 13.917 | 14.217 |
| M 15 | x 1.50 | **14.30** | 14.26 | 14.38 | 13.376 | 13.751 |
| M 16 | x 1.00 | **15.55** | 15.52 | 15.62 | 14.917 | 15.217 |
| M 16 | x 1.50 | **15.30** | 15.26 | 15.38 | 14.376 | 14.751 |

* M 2.5 x 0.35 to M 4 x 0.35 core-Ø of int. thread 6H

| nom.-Ø mm | x Pitch P | Tapp. hole size Ø mm | Tapping hole size Ø min. mm | Tapping hole size Ø max. mm | Core-Ø of int. thread 7H* min. mm | Core-Ø of int. thread 7H* max. mm |
|---|---|---|---|---|---|---|
| M 17 | x 1.00 | **16.55** | 16.52 | 16.62 | 15.917 | 16.217 |
| M 17 | x 1.50 | **16.30** | 16.26 | 16.38 | 15.376 | 15.751 |
| M 18 | x 1.00 | **17.55** | 17.52 | 17.62 | 16.917 | 17.217 |
| M 18 | x 1.50 | **17.30** | 17.26 | 17.38 | 16.376 | 16.751 |
| M 18 | x 2.00 | **17.10** | 17.05 | 17.20 | 15.835 | 16.310 |
| M 20 | x 1.00 | **19.55** | 19.52 | 19.62 | 18.917 | 19.217 |
| M 20 | x 1.50 | **19.30** | 19.26 | 19.38 | 18.376 | 19.751 |
| M 24 | x 1.00 | **23.55** | 23.52 | 23.62 | 22.917 | 23.217 |
| M 24 | x 1.50 | **23.30** | 23.26 | 23.38 | 22.376 | 22.751 |
| M 24 | x 2.00 | **23.10** | 23.05 | 23.20 | 21.835 | 22.310 |
| M 27 | x 1.50 | **26.30** | 26.26 | 26.38 | 25.376 | 25.751 |
| M 30 | x 1.50 | **29.30** | 29.26 | 29.38 | 28.376 | 28.751 |
| M 33 | x 1.50 | **32.30** | 32.26 | 32.38 | 31.376 | 31.751 |
| M 36 | x 1.50 | **35.30** | 35.26 | 35.38 | 34.376 | 34.751 |
| M 39 | x 1.50 | **38.30** | 38.26 | 38.38 | 37.376 | 37.751 |
| M 42 | x 1.50 | **41.30** | 41.26 | 41.38 | 42.376 | 42.751 |

**Tapping hole size diameter tolerance zone for thread forming (to DIN 13, section 50)**
Due to the tensile strength it is not necessary to adhere to the tapping hole size diameter tolerance class 6H; tolerance class 7H satisfies the requirement that the flank coverage of external and internal threads should not fall below 0.32 x P. In addition, formed threads generally possess a higher tensile strength in comparison to cut threads thanks to an uninterrupted grain flow and subsequent work hardening.

### UNC threads ASME B1.1

| nom.-Ø | Threads per inch | Tapp. hole size Ø mm | Tapping hole size Ø min. mm | Tapping hole size Ø max. mm | Core-Ø of int. thread 2B min. mm | Core-Ø of int. thread 2B max. mm |
|---|---|---|---|---|---|---|
| No 1 | - 64 | **1.68** | 1.67 | 1.70 | 1.425 | 1.580 |
| No 2 | - 56 | **1.98** | 1.97 | 2.01 | 1.694 | 1.872 |
| No 3 | - 48 | **2.28** | 2.27 | 2.32 | 1.941 | 2.146 |
| No 4 | - 40 | **2.55** | 2.54 | 2.59 | 2.157 | 2.385 |
| No 5 | - 40 | **2.90** | 2.89 | 2.94 | 2.487 | 2.698 |
| No 6 | - 32 | **3.15** | 3.14 | 3.19 | 2.642 | 2.896 |
| No 8 | - 32 | **3.80** | 3.78 | 3.82 | 3.302 | 3.531 |
| No 10 | - 24 | **4.35** | 4.33 | 4.39 | 3.683 | 3.937 |
| No 12 | - 24 | **5.00** | 4.97 | 5.03 | 4.343 | 4.597 |
| 1/4 | - 20 | **5.75** | 5.72 | 5.80 | 4.978 | 5.258 |
| 5/16 | - 18 | **7.30** | 7.26 | 7.37 | 6.401 | 6.731 |
| 3/8 | - 16 | **8.80** | 8.77 | 8.88 | 7.798 | 8.153 |
| 7/16 | - 14 | **10.30** | 10.27 | 10.37 | 9.144 | 9.550 |
| 1/2 | - 13 | **11.80** | 11.77 | 11.88 | 10.592 | 11.024 |
| 9/16 | - 12 | **13.30** | 13.28 | 13.39 | 11.989 | 12.446 |
| 5/8 | - 11 | **14.80** | 14.78 | 14.90 | 13.386 | 13.868 |
| 3/4 | - 10 | **17.90** | 17.85 | 17.97 | 16.307 | 16.840 |
| 7/8 | - 9 | **21.00** | 20.95 | 21.10 | 19.177 | 19.761 |
| 1 | - 8 | **24.00** | 23.95 | 24.12 | 21.971 | 22.606 |

### UNF threads ASME B1.1

| nom.-Ø | Threads per inch | Tapp. hole size Ø mm | Tapping hole size Ø min. mm | Tapping hole size Ø max. mm | Core-Ø of int. thread 2B min. mm | Core-Ø of int. thread 2B max. mm |
|---|---|---|---|---|---|---|
| No 1 | - 72 | **1.70** | 1.69 | 1.72 | 1.473 | 1.610 |
| No 2 | - 64 | **2.00** | 1.99 | 2.03 | 1.755 | 1.910 |
| No 3 | - 56 | **2.30** | 2.29 | 2.34 | 2.024 | 2.197 |
| No 4 | - 48 | **2.60** | 2.59 | 2.63 | 2.271 | 2.459 |
| No 5 | - 44 | **2.90** | 2.89 | 2.93 | 2.550 | 2.741 |
| No 6 | - 40 | **3.20** | 3.19 | 3.24 | 2.819 | 3.023 |
| No 8 | - 36 | **3.85** | 3.83 | 3.88 | 3.404 | 3.607 |
| No 10 | - 32 | **4.45** | 3.43 | 4.49 | 3.962 | 4.166 |
| No 12 | - 28 | **5.10** | 5.07 | 5.13 | 4.496 | 4.724 |
| 1/4 | - 28 | **5.95** | 5.92 | 5.99 | 5.359 | 5.588 |
| 5/16 | - 24 | **7.45** | 7.42 | 7.50 | 6.782 | 7.036 |
| 3/8 | - 24 | **9.05** | 9.02 | 9.10 | 8.838 | 8.636 |
| 7/16 | - 20 | **10.55** | 10.48 | 10.58 | 9.728 | 10.033 |
| 1/2 | - 20 | **12.10** | 12.08 | 12.18 | 11.328 | 11.608 |
| 9/16 | - 18 | **13.65** | 13.61 | 13.72 | 12.751 | 13.081 |
| 5/8 | - 18 | **15.25** | 15.21 | 15.32 | 14.351 | 14.681 |
| 3/4 | - 16 | **18.35** | 15.30 | 18.41 | 17.323 | 17.678 |
| 7/8 | - 14 | **21.40** | 21.35 | 21.49 | 20.269 | 20.650 |
| 1 | - 12 | **24.45** | 24.40 | 24.54 | 23.114 | 23.571 |

### (Whitworth-) BSP threads DIN EN ISO 228-1

| nom.-Ø inch | Threads per inch | Tapp. hole size Ø mm | Tapping hole size Ø min. mm | Tapping hole size Ø max. mm | Core-Ø of int. thread min. mm | Core-Ø of int. thread max. mm |
|---|---|---|---|---|---|---|
| G 1/16 | 28 | **7.30** | 7.28 | 7.35 | 6.561 | 6.843 |
| G 1/8 | 28 | **9.30** | 9.28 | 9.35 | 8.566 | 8.848 |
| G 1/4 | 19 | **12.50** | 12.48 | 12.55 | 11.445 | 11.890 |
| G 3/8 | 19 | **16.00** | 15.98 | 16.05 | 14.950 | 15.395 |
| G 1/2 | 14 | **20.00** | 19.98 | 20.12 | 18.631 | 19.172 |
| G 5/8 | 14 | **22.00** | 21.98 | 22.12 | 20.587 | 21.128 |
| G 3/4 | 14 | **25.50** | 25.48 | 25.62 | 24.117 | 24.658 |
| G 7/8 | 14 | **29.25** | 29.23 | 29.37 | 27.877 | 28.418 |
| G 1 | 11 | **32.00** | 31.98 | 32.15 | 30.291 | 30.931 |
| G 1 1/4 | 11 | **40.75** | 40.70 | 40.85 | 38.952 | 39.592 |

# SuperF-UT stable conditions

Recommendation for smooth-edged milling tools.

| Correction factors | | |
|---|---|---|
| $a_p$ roughing > 1,5xD | $v_c$ -25 % | $f_z$ -25 % |
| medium length tools | $v_c$ -40 % | $f_z$ -40 % |
| extra length tools | $v_c$ -60 % | $f_z$ -55 % |

| Material | Hardness | Application | $a_e$ max. | $v_c$ | $f_z$ (mm/z) with nom. Ø | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 3 | 4 | 6 | 8 | 10 | 12 | 16 | 20 | 25 |
| **P Struct. + free-cutting steels, unalloyed heat-treat. + case hard. steels**<br>1.0035 S185, 1.0486 P275N, 1.0345 P235GH, 1.0050, 1.0070, 1.8937<br>1.0718 11SMnPb30, 1.0736 11SMn37<br>1.0402 C22, 1.1178 C30E, 1.0503 C45, 1.1191 C30E<br>1.0301 C10, 1.1121 C10E, 1.1750 C75W, 1.2076 102Cr6, 1.2307 29CrMoV9 | ≤850 N/mm² | Slot drilling | 1xD | 180 | 0.016 | 0.021 | 0.031 | 0.042 | 0.060 | 0.072 | 0.100 | 0.120 | 0.150 |
| | | Roughing | 0.75xD | 210 | 0.018 | 0.024 | 0.036 | 0.048 | 0.069 | 0.083 | 0.110 | 0.140 | 0.170 |
| | | Finishing | 0.02xD | 360 | 0.017 | 0.023 | 0.034 | 0.046 | 0.066 | 0.079 | 0.110 | 0.130 | 0.170 |
| **P Free-cutting steels, unalloyed case hardened steels, nitriding steels**<br>1.0727 46 S20, 1.0728 60 S20, 1.0757 46SPb20, 1.0601 C60, 1.1221 C60E<br>1.7043 38Cr4, 1.5752 15NiCr13, 1.7131 16MnCr5, 1.7264 20CrMo5<br>1.8504 34CrAl6, 1.8519 31CrMoV9, 1.8550 34CrAlNi7 | 850-1200 N/mm² | Slot drilling | 1xD | 160 | 0.014 | 0.019 | 0.029 | 0.038 | 0.055 | 0.066 | 0.090 | 0.110 | 0.140 |
| | | Roughing | 0.75xD | 190 | 0.017 | 0.022 | 0.033 | 0.044 | 0.063 | 0.076 | 0.100 | 0.130 | 0.160 |
| | | Finishing | 0.02xD | 320 | 0.016 | 0.021 | 0.032 | 0.042 | 0.061 | 0.073 | 0.100 | 0.120 | 0.150 |
| **P Alloyed heat-treatable, tool and high speed steels**<br>1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4, 1.5710 36NiCr6,<br>1.7035 41Cr4, 1.7225 42CrMo4, 1.2080 X210Cr12, 1.2083 X42Cr13,<br>1.2419 105WCr6, 1.2379 X155CrVMo12-1 1.3243 S 6-5-2-5, 1.3343 S 6-5-2,<br>1.3344 S 6-5-3, Spring steel = 1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4 | 850-1400 N/mm² | Slot drilling | 1xD | 135 | 0.014 | 0.018 | 0.027 | 0.036 | 0.050 | 0.060 | 0.080 | 0.100 | 0.130 |
| | | Roughing | 0.75xD | 160 | 0.016 | 0.021 | 0.031 | 0.041 | 0.058 | 0.069 | 0.090 | 0.120 | 0.140 |
| | | Finishing | 0.02xD | 270 | 0.015 | 0.020 | 0.030 | 0.040 | 0.055 | 0.066 | 0.090 | 0.110 | 0.140 |
| **H Hardened steel**<br>Tool steel, heat-treatable steel, spring steel,<br>high-speed steel, case hardened steel, etc.<br>e.g.: 1.2344 X40CrMoV5-1; 1.2767 X45NiCrMo4;<br>1.2379 X155CrVMo12-1; 1.2080 X210Cr12; 1.3343 S 6-5-2 | ≤55 HRC | Slot drilling | 1xD | 70 | 0.011 | 0.014 | 0.021 | 0.028 | 0.040 | 0.048 | 0.060 | 0.080 | 0.100 |
| | | Roughing | 0.33xD | 100 | 0.014 | 0.018 | 0.027 | 0.036 | 0.052 | 0.062 | 0.080 | 0.100 | 0.130 |
| | | Finishing | 0.01xD | 140 | 0.011 | 0.014 | 0.021 | 0.028 | 0.040 | 0.048 | 0.060 | 0.080 | 0.100 |
| | 55-63 HRC | Roughing | 0.03xD | 80 | 0.021 | 0.028 | 0.042 | 0.056 | 0.075 | 0.090 | 0.120 | 0.150 | 0.190 |
| | | Finishing | 0.005xD | 100 | 0.008 | 0.010 | 0.015 | 0.020 | 0.027 | 0.032 | 0.040 | 0.050 | 0.070 |
| **M Stainless steel**<br>1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X10CrNiS18-9<br>USA = 303, 410, 420F, 430, 430F | ≤750 N/mm² | Slot drilling | 1xD | 120 | 0.014 | 0.018 | 0.027 | 0.036 | 0.050 | 0.060 | 0.080 | 0.100 | 0.130 |
| | | Roughing | 0.75xD | 140 | 0.016 | 0.021 | 0.031 | 0.041 | 0.058 | 0.069 | 0.090 | 0.120 | 0.140 |
| | | Finishing | 0.02xD | 240 | 0.015 | 0.020 | 0.030 | 0.040 | 0.055 | 0.066 | 0.090 | 0.110 | 0.140 |
| **M Stainless steel**<br>1.4301X5CrNi18-10, 1.4303 X5CrNi18-12 1.4310 XCrNi18-8<br>USA = 304, 304L, 420 | 750-850 N/mm² | Slot drilling | 1xD | 80 | 0.012 | 0.016 | 0.024 | 0.032 | 0.045 | 0.054 | 0.070 | 0.090 | 0.110 |
| | | Roughing | 0.75xD | 100 | 0.014 | 0.018 | 0.028 | 0.037 | 0.052 | 0.062 | 0.080 | 0.100 | 0.130 |
| | | Finishing | 0.02xD | 160 | 0.013 | 0.018 | 0.026 | 0.035 | 0.050 | 0.059 | 0.080 | 0.100 | 0.120 |
| **M Stainless steel**<br>1.4438 X2CrNiMo18-15-4, 1.4404 X2CrNiMo17-12-2, 1.4571 X6CrNiTi18-10<br>USA = 310, 316, 316B, 316L, 317 | ≤850 N/mm² | Slot drilling | 1xD | 60 | 0.011 | 0.014 | 0.021 | 0.028 | 0.040 | 0.048 | 0.060 | 0.080 | 0.100 |
| | | Roughing | 0.60xD | 80 | 0.013 | 0.017 | 0.025 | 0.034 | 0.048 | 0.058 | 0.080 | 0.100 | 0.120 |
| | | Finishing | 0.01xD | 120 | 0.011 | 0.014 | 0.021 | 0.028 | 0.040 | 0.048 | 0.060 | 0.080 | 0.10 |
| **S Special alloys (nickel based "Ni")**<br>Nimonic, Inconel, Monel, Hastelloy | ≤1.300 N/mm² | Slot drilling | 1xD | 30 | 0.008 | 0.011 | 0.017 | 0.022 | 0.032 | 0.038 | 0.050 | 0.060 | 0.080 |
| | | Roughing | 0.60xD | 40 | 0.010 | 0.013 | 0.020 | 0.027 | 0.038 | 0.046 | 0.060 | 0.080 | 0.100 |
| | | Finishing | 0.01xD | 60 | 0.008 | 0.011 | 0.017 | 0.022 | 0.032 | 0.038 | 0.050 | 0.060 | 0.080 |
| **Ti Titanium alloys ("Ti")**<br>3.7024 Ti99,5, 3.7114 TiAl5Sn2,5, 3.7124 TiCu2<br>3.7154 TiAl6Zr5, 3.7164 TiAl6V4, 3.7184 TiAl4Mo4Sn2,5 | ≤1.300 N/mm² | Slot drilling | 1xD | 60 | 0.012 | 0.016 | 0.024 | 0.032 | 0.045 | 0.054 | 0.070 | 0.090 | 0.110 |
| | | Roughing | 0.60xD | 80 | 0.014 | 0.019 | 0.029 | 0.038 | 0.054 | 0.065 | 0.090 | 0.110 | 0.140 |
| | | Finishing | 0.02xD | 120 | 0.013 | 0.018 | 0.026 | 0.035 | 0.050 | 0.059 | 0.080 | 0.100 | 0.120 |
| **K Cast iron, grey cast iron, spheroidal graphite and malleable cast iron**<br>0.6010 EN-GL100 (GG10), 0.6020 EN-GJL-200 (GG20),<br>0.7050 EN-GJS-500-7 (GGG50), 0.8535 EN-GJMW-350-4 (GTW35) | ≤240 HB | Slot drilling | 1xD | 160 | 0.017 | 0.022 | 0.033 | 0.044 | 0.065 | 0.078 | 0.100 | 0.130 | 0.160 |
| | | Roughing | 0.75xD | 190 | 0.019 | 0.025 | 0.038 | 0.051 | 0.075 | 0.090 | 0.120 | 0.150 | 0.190 |
| | | Finishing | 0.02xD | 320 | 0.018 | 0.024 | 0.036 | 0.048 | 0.072 | 0.086 | 0.110 | 0.140 | 0.180 |
| **K Cast iron, grey cast iron, spheroidal graphite and malleable cast iron**<br>0.6025 EN-GL250 (GG25), 0.6035 EN-GJL-350 (GG35),<br>0.7070 EN-GJS-700-2 (GGG70), 0.8170 EN-GJMB-700-2 (GTS70) | ≥240 HB | Slot drilling | 1xD | 140 | 0.015 | 0.020 | 0.030 | 0.040 | 0.055 | 0.066 | 0.090 | 0.110 | 0.140 |
| | | Roughing | 0.75xD | 170 | 0.017 | 0.023 | 0.035 | 0.046 | 0.063 | 0.076 | 0.100 | 0.130 | 0.160 |
| | | Finishing | 0.02xD | 280 | 0.017 | 0.022 | 0.033 | 0.044 | 0.061 | 0.073 | 0.100 | 0.120 | 0.150 |
| **N Aluminium, Al-wrought alloys, Al-alloys**<br>3.0255 Al99,5, 3.2315 AlMgSi1, 3.3515 AlMg1<br>3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1,5 | up to 3 % Si | Slot drilling | 1xD | 500 | 0.020 | 0.026 | 0.039 | 0.052 | 0.080 | 0.096 | 0.130 | 0.160 | 0.200 |
| | | Roughing | 0.75xD | 600 | 0.022 | 0.030 | 0.045 | 0.060 | 0.092 | 0.110 | 0.150 | 0.180 | 0.230 |
| | | Finishing | 0.02xD | 1000 | 0.021 | 0.029 | 0.043 | 0.057 | 0.088 | 0.106 | 0.140 | 0.180 | 0.220 |
| **N Aluminium-cast alloys**<br>3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9<br>3.2581 G-AlSi12, 3.2583 G-AlSi12Cu,-G-AlSi12CuNiMg | ≥7 % Si | Slot drilling | 1xD | 230 | 0.017 | 0.022 | 0.033 | 0.044 | 0.060 | 0.072 | 0.100 | 0.120 | 0.150 |
| | | Roughing | 0.75xD | 300 | 0.019 | 0.025 | 0.038 | 0.051 | 0.069 | 0.083 | 0.110 | 0.140 | 0.170 |
| | | Finishing | 0.02xD | 460 | 0.018 | 0.024 | 0.036 | 0.048 | 0.066 | 0.079 | 0.110 | 0.130 | 0.170 |
| **N Magnesium-alloys**<br>MgMn2, G-MgAl8Zn1, G-MgAl6Zn3 | | Slot drilling | 1xD | 180 | 0.015 | 0.020 | 0.030 | 0.040 | 0.055 | 0.066 | 0.090 | 0.110 | 0.140 |
| | | Roughing | 0.75xD | 210 | 0.017 | 0.023 | 0.035 | 0.046 | 0.063 | 0.076 | 0.100 | 0.130 | 0.160 |
| | | Finishing | 0.02xD | 360 | 0.017 | 0.022 | 0.033 | 0.044 | 0.061 | 0.073 | 0.100 | 0.120 | 0.150 |
| **N Non-ferrous metals (copper, short- or long-chipping brass)**<br>2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5ZnPb, 2.0380 CuZn39Pb2,<br>2.0401 CuZn39Pb3, 2.0410 ... 2.0250 CuZn20, 2.0280 CuZn33,<br>2.0332 CuZn37Pb0,5, 2.1090 CuSn7ZnPb, 2.1170 CuPb5Sn5, 2.1176 ...<br>2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10 | ≤850 N/mm² | Slot drilling | 1xD | 250 | 0.017 | 0.022 | 0.033 | 0.044 | 0.060 | 0.072 | 0.100 | 0.120 | 0.150 |
| | | Roughing | 0.75xD | 290 | 0.019 | 0.025 | 0.038 | 0.051 | 0.069 | 0.083 | 0.110 | 0.140 | 0.170 |
| | | Finishing | 0.02xD | 500 | 0.018 | 0.024 | 0.036 | 0.048 | 0.066 | 0.079 | 0.110 | 0.130 | 0.170 |

# SuperF-UT unstable conditions

Recommendation for milling tools with flat nuckle-type teeth.

TC HPC HSC

| Correction factors | | |
|---|---|---|
| $a_p$ roughing > 1,5xD | $v_c$ -25 % | $f_z$ -25 % |
| medium length tools | $v_c$ -40 % | $f_z$ -40 % |
| extra length tools | $v_c$ -60 % | $f_z$ -55 % |

| Material | Hardness | Application | $a_e$ max. | $v_c$ | $f_z$ (mm/z) with nom. Ø | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 3 | 4 | 6 | 8 | 10 | 12 | 16 | 20 | 25 |
| **P Struct. + free-cutting steels, unalloyed heat-treat. + case hard. steels**<br>1.0035 S185, 1.0486 P275N, 1.0345 P235GH, 1.0050, 1.0070, 1.8937<br>1.0718 11SMnPb30, 1.0736 11SMn37<br>1.0402 C22, 1.1178 C30E, 1.0503 C45, 1.1191 C30E<br>1.0301 C10, 1.1121 C10E, 1.1750 C75W, 1.2076 102Cr6, 1.2307 29CrMoV9 | ≤850 N/mm² | Slot drilling | 1xD | 135 | 0.010 | 0.013 | 0.020 | 0.026 | 0.035 | 0.042 | 0.055 | 0.066 | 0.088 |
| | | Roughing | 0.75xD | 160 | 0.011 | 0.015 | 0.023 | 0.031 | 0.041 | 0.048 | 0.066 | 0.077 | 0.099 |
| **P Free-cutting steels, unalloyed case hardened steels, nitriding steels**<br>1.0727 46 S20, 1.0728 60 S20, 1.0757 46SPb20, 1.0601 C60, 1.1221 C60E<br>1.7043 38Cr4, 1.5752 15NiCr13, 1.7131 16MnCr5, 1.7264 20CrMo5<br>1.8504 34CrAl6, 1.8519 31CrMoV9, 1.8550 34CrAlNi7 | 850-1200 N/mm² | Slot drilling | 1xD | 120 | 0.010 | 0.013 | 0.020 | 0.026 | 0.035 | 0.042 | 0.055 | 0.066 | 0.088 |
| | | Roughing | 0.75xD | 140 | 0.011 | 0.015 | 0.023 | 0.031 | 0.041 | 0.048 | 0.066 | 0.077 | 0.099 |
| **P Alloyed heat-treatable, tool and high speed steels**<br>1.5131 50MnSi4, 1.7003 38Cr2, 1.7030 28Cr4, 1.5710 36NiCr6,<br>1.7035 41Cr4, 1.7225 42CrMo4, 1.2080 X210Cr12, 1.2083 X42Cr13,<br>1.2419 105WCr6, 1.2379 X155CrVMo12-1 1.3243 S 6-5-2-5, 1.3343 S 6-5-2,<br>1.3344 S 6-5-3, Spring steel = 1.5026 55Si7, 1.7176 55Cr3, 1.8159 51CrV4 | 850-1400 N/mm² | Slot drilling | 1xD | 100 | 0.009 | 0.012 | 0.019 | 0.024 | 0.033 | 0.040 | 0.055 | 0.066 | 0.088 |
| | | Roughing | 0.75xD | 120 | 0.011 | 0.014 | 0.021 | 0.029 | 0.039 | 0.045 | 0.066 | 0.077 | 0.099 |
| **H Hardened steel**<br>Tool steel, heat-treatable steel, spring steel, high-speed steel,<br>case hardened steel, etc. e.g.: 1.2344 X40CrMoV5-1; 1.2767 X45NiCrMo4;<br>1.2379 X155CrVMo12-1; 1.2080 X210Cr12; 1.3343 S 6-5-2 | ≤55 HRC | Slot drilling | 1xD | 55 | 0.007 | 0.009 | 0.013 | 0.018 | 0.024 | 0.029 | 0.044 | 0.044 | 0.066 |
| | | Roughing | 0.33xD | 80 | 0.009 | 0.011 | 0.018 | 0.023 | 0.032 | 0.037 | 0.055 | 0.066 | 0.077 |
| | 55-63 HRC | | | | | | | | | | | | |
| **M Stainless steel**<br>1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X10CrNiS18-9<br>USA = 303, 410, 420F, 430, 430F | ≤750 N/mm² | Slot drilling | 1xD | 90 | 0.009 | 0.012 | 0.019 | 0.024 | 0.033 | 0.040 | 0.055 | 0.066 | 0.088 |
| | | Roughing | 0.75xD | 100 | 0.011 | 0.014 | 0.021 | 0.029 | 0.039 | 0.045 | 0.066 | 0.077 | 0.099 |
| **M Stainless steel**<br>1.4301X5CrNi18-10, 1.4303 X5CrNi18-12 1.4310 XCrNi18-8<br>USA = 304, 304L, 420 | 750-850 N/mm² | Slot drilling | 1xD | 65 | 0.009 | 0.011 | 0.017 | 0.022 | 0.031 | 0.037 | 0.044 | 0.066 | 0.077 |
| | | Roughing | 0.75xD | 80 | 0.010 | 0.013 | 0.019 | 0.025 | 0.035 | 0.043 | 0.055 | 0.066 | 0.088 |
| **M Stainless steel**<br>1.4438 X2CrNiMo18-15-4, 1.4404 X2CrNiMo17-12-2, 1.4571 X6CrNiTi18-10<br>USA = 310, 316, 316B, 316L, 317 | ≤850 N/mm² | Slot drilling | 1xD | 55 | 0.008 | 0.010 | 0.014 | 0.020 | 0.028 | 0.033 | 0.044 | 0.055 | 0.066 |
| | | Roughing | 0.60xD | 70 | 0.009 | 0.012 | 0.018 | 0.023 | 0.033 | 0.040 | 0.055 | 0.066 | 0.088 |
| **S Special alloys (nickel based "Ni")**<br>Nimonic, Inconel, Monel, Hastelloy | ≤1.300 N/mm² | Slot drilling | 1xD | 25 | 0.007 | 0.009 | 0.013 | 0.018 | 0.024 | 0.029 | 0.044 | 0.044 | 0.066 |
| | | Roughing | 0.60xD | 40 | 0.008 | 0.011 | 0.015 | 0.021 | 0.029 | 0.035 | 0.044 | 0.055 | 0.077 |
| **Ti Titanium alloys ("Ti")**<br>3.7024 Ti99,5, 3.7114 TiAl5Sn2,5, 3.7124 TiCu2<br>3.7154 TiAl6Zr5, 3.7164 TiAl6V4, 3.7184 TiAl4Mo4Sn2,5 | ≤1.300 N/mm² | Slot drilling | 1xD | 50 | 0.008 | 0.010 | 0.014 | 0.020 | 0.028 | 0.033 | 0.044 | 0.055 | 0.066 |
| | | Roughing | 0.60xD | 70 | 0.009 | 0.012 | 0.018 | 0.023 | 0.033 | 0.040 | 0.055 | 0.066 | 0.088 |
| **K Cast iron, grey cast iron, spheroidal graphite and malleable cast iron**<br>0.6010 EN-GL100 (GG10), 0.6020 EN-GJL-200 (GG20),<br>0.7050 EN-GJS-500-7 (GGG50), 0.8535 EN-GJMW-350-4 (GTW35) | ≤240 HB | Slot drilling | 1xD | 120 | 0.010 | 0.013 | 0.020 | 0.026 | 0.035 | 0.042 | 0.055 | 0.066 | 0.088 |
| | | Roughing | 0.75xD | 140 | 0.011 | 0.015 | 0.023 | 0.031 | 0.041 | 0.048 | 0.066 | 0.077 | 0.099 |
| **K Cast iron, grey cast iron, spheroidal graphite and malleable cast iron**<br>0.6025 EN-GL250 (GG25), 0.6035 EN-GJL-350 (GG35),<br>0.7070 EN-GJS-700-2 (GGG70), 0.8170 EN-GJMB-700-2 (GTS70) | ≥240 HB | Slot drilling | 1xD | 105 | 0.009 | 0.012 | 0.019 | 0.024 | 0.033 | 0.040 | 0.055 | 0.066 | 0.088 |
| | | Roughing | 0.75xD | 130 | 0.011 | 0.014 | 0.021 | 0.029 | 0.039 | 0.045 | 0.066 | 0.077 | 0.099 |
| **N Aluminium, Al-wrought alloys, Al-alloys**<br>3.0255 Al99,5, 3.2315 AlMgSi1, 3.3515 AlMg1<br>3.0615 AlMgSiPb, 3.1325 AlCuMg1, 3.3245 AlMg3Si, 3.4365 AlZnMgCu1,5 | ≤7 % Si | Slot drilling | 1xD | 375 | 0.012 | 0.015 | 0.023 | 0.031 | 0.041 | 0.048 | 0.066 | 0.077 | 0.099 |
| | | Roughing | 0.75xD | 440 | 0.013 | 0.018 | 0.026 | 0.035 | 0.047 | 0.056 | 0.077 | 0.099 | 0.121 |
| **N Aluminium-cast alloys**<br>3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9<br>3.2581 G-AlSi12, 3.2583 G-AlSi12Cu,-G-AlSi12CuNiMg | ≥7 % Si | Slot drilling | 1xD | 180 | 0.011 | 0.014 | 0.021 | 0.029 | 0.039 | 0.046 | 0.066 | 0.077 | 0.099 |
| | | Roughing | 0.75xD | 210 | 0.012 | 0.017 | 0.024 | 0.032 | 0.044 | 0.053 | 0.066 | 0.088 | 0.110 |
| **N Magnesium-alloys**<br>MgMn2, G-MgAl8Zn1, G-MgAl6Zn3 | | Slot drilling | 1xD | 140 | 0.011 | 0.014 | 0.021 | 0.029 | 0.039 | 0.046 | 0.066 | 0.077 | 0.099 |
| | | Roughing | 0.75xD | 170 | 0.012 | 0.017 | 0.024 | 0.032 | 0.044 | 0.053 | 0.066 | 0.088 | 0.110 |
| **N Non-ferrous metals (copper, short- or long-chipping brass)**<br>2.0070 SE-Cu, 2.1020 CuSn6, 2.1096 G-CuSn5ZnPb, 2.0380 CuZn39Pb2,<br>2.0401 CuZn39Pb3, 2.0410 ... 2.0250 CuZn20, 2.0280 CuZn33,<br>2.0332 CuZn37Pb0,5, 2.1090 CuSn7ZnPb, 2.1170 CuPb5Sn5, 2.1176 ...<br>2.0916 CuAl5, 2.0960 CuAl9Mn, 2.1050 CuSn10 | ≤850 N/mm² | Slot drilling | 1xD | 200 | 0.011 | 0.014 | 0.021 | 0.029 | 0.039 | 0.046 | 0.066 | 0.077 | 0.099 |
| | | Roughing | 0.75xD | 230 | 0.012 | 0.017 | 0.024 | 0.032 | 0.044 | 0.053 | 0.066 | 0.088 | 0.110 |

# SuperF-UT Z

TC HPC HSC

**Slot drilling**

| Material | Machinability | $a_p$ max. | $a_e$ max. | max. pressure angle | $v_c$ | $f_z$ with nom. Ø 3 | 4 | 5 | 6 | 8 | 10 | 12 | 16 | 20 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P1/P2 | light/medial | 0.80xD | 1.00xD | 180° | 160 | 0.014 | 0.018 | 0.023 | 0.027 | 0.044 | 0.055 | 0.066 | 0.088 | 0.110 |
| P3 | difficult | 0.80xD | 1.00xD | 180° | 125 | 0.014 | 0.018 | 0.023 | 0.027 | 0.040 | 0.050 | 0.060 | 0.080 | 0.100 |
| M1 | light/medial | 0.80xD | 1.00xD | 180° | 85 | 0.011 | 0.014 | 0.018 | 0.021 | 0.028 | 0.035 | 0.042 | 0.056 | 0.070 |
| M2 | difficult | 0.80xD | 1.00xD | 180° | 55 | 0.011 | 0.014 | 0.018 | 0.021 | 0.028 | 0.035 | 0.042 | 0.056 | 0.070 |
| S | medial/difficult | 0.80xD | 1.00xD | 180° | 45 | 0.011 | 0.014 | 0.018 | 0.021 | 0.028 | 0.035 | 0.042 | 0.056 | 0.070 |
| | very difficult | 0.80xD | 1.00xD | 180° | 30 | 0.009 | 0.012 | 0.015 | 0.018 | 0.024 | 0.030 | 0.036 | 0.048 | 0.060 |

**HPC Roughing**

| Material | Machinability | $a_p$ max. | $a_e$ max. | max. pressure angle | $v_c$ | $f_z$ with nom. Ø 3 | 4 | 5 | 6 | 8 | 10 | 12 | 16 | 20 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P1/P2 | light/medial | L2 | 0.20xD | 53° | 270 | 0.022 | 0.029 | 0.036 | 0.043 | 0.070 | 0.088 | 0.106 | 0.141 | 0.176 |
| P3 | difficult | L2 | 0.20xD | 53° | 210 | 0.022 | 0.029 | 0.036 | 0.043 | 0.064 | 0.080 | 0.096 | 0.128 | 0.160 |
| M1 | light/medial | L2 | 0.15xD | 46° | 150 | 0.020 | 0.027 | 0.033 | 0.040 | 0.053 | 0.067 | 0.080 | 0.106 | 0.133 |
| M2 | difficult | L2 | 0.10xD | 37° | 100 | 0.024 | 0.032 | 0.040 | 0.048 | 0.064 | 0.081 | 0.097 | 0.129 | 0.161 |
| S | medial/difficult | L2 | 0.08xD | 31° | 90 | 0.026 | 0.035 | 0.044 | 0.053 | 0.070 | 0.088 | 0.105 | 0.140 | 0.175 |
| | very difficult | L2 | 0.08xD | 31° | 60 | 0.023 | 0.030 | 0.038 | 0.045 | 0.060 | 0.075 | 0.090 | 0.120 | 0.150 |

**HSC Roughing**

| Material | Machinability | $a_p$ max. | $a_e$ max. | max. pressure angle | $v_c$ | $f_z$ with nom. Ø 3 | 4 | 5 | 6 | 8 | 10 | 12 | 16 | 20 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P1/P2 | light/medial | L2 | 0.15xD | 46° | 290 | 0.026 | 0.034 | 0.043 | 0.051 | 0.084 | 0.105 | 0.125 | 0.167 | 0.209 |
| P3 | difficult | L2 | 0.15xD | 46° | 230 | 0.026 | 0.034 | 0.043 | 0.051 | 0.076 | 0.095 | 0.114 | 0.152 | 0.190 |
| M1 | light/medial | L2 | 0.10xD | 37° | 170 | 0.024 | 0.032 | 0.040 | 0.048 | 0.064 | 0.081 | 0.097 | 0.129 | 0.161 |
| M2 | difficult | L2 | 0.08xD | 31° | 110 | 0.026 | 0.035 | 0.044 | 0.053 | 0.070 | 0.088 | 0.105 | 0.140 | 0.175 |
| S | medial/difficult | L2 | 0.05xD | 26° | 100 | 0.026 | 0.035 | 0.044 | 0.053 | 0.070 | 0.088 | 0.105 | 0.140 | 0.175 |
| | very difficult | L2 | 0.05xD | 26° | 70 | 0.023 | 0.030 | 0.038 | 0.045 | 0.060 | 0.075 | 0.090 | 0.120 | 0.150 |

**Finishing**

| Material | Machinability | $a_p$ max. | $a_e$ max. | max. pressure angle | $v_c$ | $f_z$ with nom. Ø 3 | 4 | 5 | 6 | 8 | 10 | 12 | 16 | 20 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P1/P2 | light/medial | L2 | 0.02xD | 18° | 320 | 0.019 | 0.025 | 0.032 | 0.038 | 0.062 | 0.077 | 0.092 | 0.123 | 0.154 |
| P3 | difficult | L2 | 0.02xD | 18° | 250 | 0.019 | 0.025 | 0.032 | 0.038 | 0.056 | 0.070 | 0.084 | 0.112 | 0.140 |
| M1 | light/medial | L2 | 0.02xD | 18° | 170 | 0.015 | 0.020 | 0.025 | 0.029 | 0.039 | 0.049 | 0.059 | 0.078 | 0.098 |
| M2 | difficult | L2 | 0.01xD | 11° | 120 | 0.019 | 0.025 | 0.032 | 0.038 | 0.050 | 0.063 | 0.076 | 0.101 | 0.126 |
| S | medial/difficult | L2 | 0.01xD | 11° | 100 | 0.019 | 0.025 | 0.032 | 0.038 | 0.050 | 0.063 | 0.076 | 0.101 | 0.126 |
| | very difficult | L2 | 0.01xD | 11° | 70 | 0.016 | 0.022 | 0.027 | 0.032 | 0.043 | 0.054 | 0.065 | 0.086 | 0.108 |

| | | |
|---|---|---|
| P1 | **P** Struct. + free-cutting steels, unalloyed heat-treat. + case hard. steels | 1.0345 P235GH, 1.0050, 1.0503 C45, 1.2076 102Cr6 |
| P2 | **P** Free-cutting steels, unalloyed case hardened steels, nitriding steels | 1.1221 C60E, 1.7043 38Cr4, 1.7131 16MnCr5, 1.8550 34CrAlNi7 |
| P3 | **P** Alloyed heat-treatable, tool and high speed steels | 1.7003 38Cr2, 1.5710 36NiCr6, 1.7225 42CrMo4, 1.2419 105WCr6 |
| M1 | **M** Stainless steel (easy to machine/sulphured) | 1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X10CrNiS18-9 |
| M2 | **M** Stainless steel (moderately difficult to machine) | 1.4301X5CrNi18-10, 1.4571 X6CrNiTi18-10, 1.4404 X2CrNiMo17-12-2 |
| Ti | **T** Titanium alloys | 3.7114 TiAl5Sn2,5, 3.7124 TiCu2, 3.7154 TiAl6Zr5, 3.7164 TiAl6V4 |

## SUPERF-UT Z
## SUPERF-UT ZS

- HIGH-PERFORMANCE ROUGHING INCLUDING LARGE CUTTING DEPTHS
- HIGH RUNNING SMOOTHNESS AND METAL REMOVAL RATE
- HPC-MILLING IN TOUGH, LOW- AND HIGHALLOYED STEELS AND DIFFCULT-TO-MACHINE SPECIAL MATERIALS

# SuperF-UT ZS

TC HPC HSC

**HPC Roughing**

| Material | Machinability | $a_p$ max. | $a_e$ max. | max. pressure angle | $v_c$ | $f_z$ with nom. Ø | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 3 | 4 | 5 | 6 | 8 | 10 | 12 | 16 | 20 |
| P1/P2 | light/medial | L2 | 0.15xD | 46° | 280 | 0.026 | 0.034 | 0.043 | 0.051 | 0.084 | 0.105 | 0.125 | 0.167 | 0.209 |
| P3 | difficult | L2 | 0.15xD | 46° | 220 | 0.026 | 0.034 | 0.043 | 0.051 | 0.076 | 0.095 | 0.114 | 0.152 | 0.190 |
| M1 | light/medial | L2 | 0.10xD | 37° | 160 | 0.024 | 0.032 | 0.040 | 0.048 | 0.064 | 0.081 | 0.097 | 0.129 | 0.161 |
| M2 | difficult | L2 | 0.10xD | 37° | 100 | 0.024 | 0.032 | 0.040 | 0.048 | 0.064 | 0.081 | 0.097 | 0.129 | 0.161 |
| S | medial/difficult | L2 | 0.08xD | 31° | 90 | 0.026 | 0.035 | 0.044 | 0.053 | 0.070 | 0.088 | 0.105 | 0.140 | 0.175 |
| | very difficult | L2 | 0.08xD | 31° | 60 | 0.023 | 0.030 | 0.038 | 0.045 | 0.060 | 0.075 | 0.090 | 0.120 | 0.150 |

**HSC Roughing**

| Material | Machinability | $a_p$ max. | $a_e$ max. | max. pressure angle | $v_c$ | $f_z$ with nom. Ø | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 3 | 4 | 5 | 6 | 8 | 10 | 12 | 16 | 20 |
| P1/P2 | light/medial | L2 | 0.10xD | 37° | 310 | 0.031 | 0.041 | 0.052 | 0.062 | 0.101 | 0.127 | 0.152 | 0.202 | 0.253 |
| P3 | difficult | L2 | 0.10xD | 37° | 240 | 0.031 | 0.041 | 0.052 | 0.062 | 0.092 | 0.115 | 0.138 | 0.184 | 0.230 |
| M1 | light/medial | L2 | 0.08xD | 31° | 170 | 0.026 | 0.035 | 0.044 | 0.053 | 0.070 | 0.088 | 0.105 | 0.140 | 0.175 |
| M2 | difficult | L2 | 0.08xD | 31° | 110 | 0.026 | 0.035 | 0.044 | 0.053 | 0.070 | 0.088 | 0.105 | 0.140 | 0.175 |
| S | medial/difficult | L2 | 0.05xD | 26° | 100 | 0.026 | 0.035 | 0.044 | 0.053 | 0.070 | 0.088 | 0.105 | 0.140 | 0.175 |
| | very difficult | L2 | 0.05xD | 26° | 70 | 0.023 | 0.030 | 0.038 | 0.045 | 0.060 | 0.075 | 0.090 | 0.120 | 0.150 |

**Finishing**

| Material | Machinability | $a_p$ max. | $a_e$ max. | max. pressure angle | $v_c$ | $f_z$ with nom. Ø | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 3 | 4 | 5 | 6 | 8 | 10 | 12 | 16 | 20 |
| P1/P2 | light/medial | L2 | 0.01xD | 11° | 340 | 0.024 | 0.032 | 0.041 | 0.049 | 0.079 | 0.099 | 0.119 | 0.158 | 0.198 |
| P3 | difficult | L2 | 0.01xD | 11° | 270 | 0.024 | 0.032 | 0.041 | 0.049 | 0.072 | 0.090 | 0.108 | 0.144 | 0.180 |
| M1 | light/medial | L2 | 0.01xD | 11° | 180 | 0.019 | 0.025 | 0.032 | 0.038 | 0.050 | 0.063 | 0.076 | 0.101 | 0.126 |
| M2 | difficult | L2 | 0.01xD | 11° | 120 | 0.019 | 0.025 | 0.032 | 0.038 | 0.050 | 0.063 | 0.076 | 0.101 | 0.126 |
| S | medial/difficult | L2 | 0.01xD | 11° | 100 | 0.019 | 0.025 | 0.032 | 0.038 | 0.050 | 0.063 | 0.076 | 0.101 | 0.126 |
| | very difficult | L2 | 0.01xD | 11° | 70 | 0.016 | 0.022 | 0.027 | 0.032 | 0.043 | 0.054 | 0.065 | 0.086 | 0.108 |

| | | |
|---|---|---|
| P1 | **P** Struct. + free-cutting steels, unalloyed heat-treat. + case hard. steels | 1.0345 P235GH, 1.0050, 1.0503 C45, 1.2076 102Cr6 |
| P2 | **P** Free-cutting steels, unalloyed case hardened steels, nitriding steels | 1.1221 C60E, 1.7043 38Cr4, 1.7131 16MnCr5, 1.8550 34CrAlNi7 |
| P3 | **P** Alloyed heat-treatable, tool and high speed steels | 1.7003 38Cr2, 1.5710 36NiCr6, 1.7225 42CrMo4, 1.2419 105WCr6 |
| M1 | **M** Stainless steel (easy to machine/sulphured) | 1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X10CrNiS18-9 |
| M2 | **M** Stainless steel (moderately difficult to machine) | 1.4301X5CrNi18-10, 1.4571 X6CrNiTi18-10, 1.4404 X2CrNiMo17-12-2 |
| Ti | **T** Titanium alloys | 3.7114 TiAl5Sn2,5, 3.7124 TiCu2, 3.7154 TiAl6Zr5, 3.7164 TiAl6V4 |

## SUPERF-UT ZS-R
## SUPERF-UT ZS-7

- HIGHEST METAL REMOVAL RATE FOR TROCHOIDAL MILLING APPLICATIONS (TC)
- 5 OR 7 CUTTING EDGES WITH LOW HELIX ANGLE FOR REDUCED CONTACT POINTS
- HIGH FEED RATES AT LIMITED CUTTING SPEEDS FOR OUTSTANDING METAL REMOVAL RATES

# SuperF-UT NX Micro

## Catalogue no. 54594

### Open Slots and helix

| | Material/ISO material | $a_e$ max. | $a_p$ max. | $v_c$ | $f_z$ / Ø | | | $v_c$ | $f_z$ / Ø | | $v_c$ | $f_z$ / Ø | | | $v_c$ | $f_z$ / Ø | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 0.8 | 1.0 | 1.2 | | 1.5 | 1.8 | | 2.0 | 2.2 | 2.5 | | 2.8 | 3.0 |
| P | Unalloyed steel | 1.00xD | 1.00xD | 140 | 0.0072 | 0.0090 | 0.0108 | 168 | 0.0135 | 0.0162 | 182 | 0.0180 | 0.0198 | 0.0225 | 196 | 0.0252 | 0.0270 |
| P | Low-alloyed steel | 1.00xD | 1.00xD | 140 | 0.0064 | 0.0080 | 0.0096 | 168 | 0.0120 | 0.0144 | 182 | 0.0160 | 0.0176 | 0.0200 | 196 | 0.0224 | 0.0240 |
| P | High-alloyed steel and tool steel | 1.00xD | 0.75xD | 140 | 0.0048 | 0.0060 | 0.0072 | 168 | 0.0090 | 0.0108 | 182 | 0.0120 | 0.0132 | 0.0150 | 196 | 0.0168 | 0.0180 |
| M | Stainless steel, ferritic, martensitic | 1.00xD | 1.00xD | 140 | 0.0064 | 0.0080 | 0.0096 | 168 | 0.0120 | 0.0144 | 182 | 0.0160 | 0.0176 | 0.0200 | 196 | 0.0224 | 0.0240 |
| M | Stainless steel, austenitic | 1.00xD | 1.00xD | 120 | 0.0056 | 0.0070 | 0.0084 | 144 | 0.0105 | 0.0126 | 156 | 0.0140 | 0.0154 | 0.0175 | 168 | 0.0196 | 0.0210 |
| M | Duplex steel, high strength stainless steels | 1.00xD | 0.75xD | 90 | 0.0049 | 0.0061 | 0.0073 | 108 | 0.0092 | 0.0110 | 117 | 0.0122 | 0.0135 | 0.0153 | 126 | 0.0171 | 0.0184 |
| K | Grey cast iron | 1.00xD | 1.00xD | 120 | 0.0056 | 0.0070 | 0.0084 | 144 | 0.0105 | 0.0126 | 156 | 0.0140 | 0.0154 | 0.0175 | 168 | 0.0196 | 0.0210 |
| K | Cast iron with spheroidal graphite iron | | | | | | | | | | | | | | | | |
| K | Malleable cast iron | 1.00xD | 1.00xD | 100 | 0.0050 | 0.0062 | 0.0075 | 120 | 0.0093 | 0.0112 | 130 | 0.0124 | 0.0137 | 0.0156 | 140 | 0.0174 | 0.0187 |
| K | GJV & ADI | | | | | | | | | | | | | | | | |
| N | Aluminium-wrought alloys | 1.00xD | 1.00xD | 170 | 0.0096 | 0.0120 | 0.0144 | 204 | 0.0180 | 0.0216 | 221 | 0.0240 | 0.0264 | 0.0300 | 238 | 0.0336 | 0.0360 |
| N | Aluminium-cast alloys | | | | | | | | | | | | | | | | |
| N | Copper and copper alloys | 1.00xD | 1.00xD | 125 | 0.0088 | 0.0110 | 0.0133 | 150 | 0.0166 | 0.0199 | 162.5 | 0.0221 | 0.0243 | 0.0276 | 175 | 0.0309 | 0.0331 |
| S | Heat-resistant alloys, Fe-based | 1.00xD | 0.50xD | 100 | 0.0036 | 0.0045 | 0.0054 | 120 | 0.0068 | 0.0081 | 130 | 0.0090 | 0.0099 | 0.0113 | 140 | 0.0126 | 0.0135 |
| S | Heat-resistant alloys, Ni-based, CO-based | 1.00xD | 0.50xD | 60 | 0.0029 | 0.0037 | 0.0044 | 72 | 0.0055 | 0.0066 | 78 | 0.0073 | 0.0080 | 0.0091 | 84 | 0.0102 | 0.0110 |
| S | Titanium alloys & pure titanium | 1.00xD | 0.75xD | 100 | 0.0060 | 0.0075 | 0.0090 | 120 | 0.0113 | 0.0135 | 130 | 0.0150 | 0.0165 | 0.0188 | 140 | 0.0210 | 0.0225 |
| H | Hardened steel, hardened and tempered, < 55 HRC | 1.00xD | 0.25xD | 35 | 0.0032 | 0.0040 | 0.0048 | 42 | 0.0060 | 0.0072 | 46 | 0.0080 | 0.0088 | 0.0100 | 49 | 0.0112 | 0.0120 |

### Ramping and closed Slots

| | Material/ISO material | $a_e$ max. | $a_p$ max. | $v_c$ | $f_z$ / Ø | | | $v_c$ | $f_z$ / Ø | | $v_c$ | $f_z$ / Ø | | | $v_c$ | $f_z$ / Ø | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 0.8 | 1.0 | 1.2 | | 1.5 | 1.8 | | 2.0 | 2.2 | 2.5 | | 2.8 | 3.0 |
| P | Unalloyed steel | 1.00xD | 1.00xD | 100 | 0.0043 | 0.0054 | 0.0065 | 120 | 0.0081 | 0.0097 | 130 | 0.0108 | 0.0119 | 0.0135 | 140 | 0.0151 | 0.0162 |
| P | Low-alloyed steel | 1.00xD | 1.00xD | 100 | 0.0038 | 0.0048 | 0.0058 | 120 | 0.0072 | 0.0086 | 130 | 0.0096 | 0.0106 | 0.0120 | 140 | 0.0134 | 0.0144 |
| P | High-alloyed steel and tool steel | 1.00xD | 0.75xD | 100 | 0.0029 | 0.0036 | 0.0043 | 120 | 0.0054 | 0.0065 | 130 | 0.0072 | 0.0079 | 0.0090 | 140 | 0.0101 | 0.0108 |
| M | Stainless steel, ferritic, martensitic | 1.00xD | 1.00xD | 100 | 0.0038 | 0.0048 | 0.0058 | 120 | 0.0072 | 0.0086 | 130 | 0.0096 | 0.0106 | 0.0120 | 140 | 0.0134 | 0.0144 |
| M | Stainless steel, austenitic | 1.00xD | 1.00xD | 90 | 0.0034 | 0.0042 | 0.0050 | 108 | 0.0063 | 0.0076 | 117 | 0.0084 | 0.0092 | 0.0105 | 126 | 0.0118 | 0.0126 |
| M | Duplex steel, high strength stainless steels | 1.00xD | 0.75xD | 65 | 0.0029 | 0.0037 | 0.0044 | 78 | 0.0055 | 0.0066 | 85 | 0.0073 | 0.0081 | 0.0092 | 91 | 0.0103 | 0.0110 |
| K | Grey cast iron | 1.00xD | 1.00xD | 90 | 0.0034 | 0.0042 | 0.0050 | 108 | 0.0063 | 0.0076 | 117 | 0.0084 | 0.0092 | 0.0105 | 126 | 0.0118 | 0.0126 |
| K | Cast iron with spheroidal graphite iron | | | | | | | | | | | | | | | | |
| K | Malleable cast iron | 1.00xD | 1.00xD | 75 | 0.0030 | 0.0037 | 0.0045 | 90 | 0.0056 | 0.0067 | 98 | 0.0075 | 0.0082 | 0.0093 | 105 | 0.0105 | 0.0112 |
| K | GJV & ADI | | | | | | | | | | | | | | | | |
| N | Aluminium-wrought alloys | 1.00xD | 1.00xD | 120 | 0.0058 | 0.0072 | 0.0086 | 144 | 0.0108 | 0.0130 | 156 | 0.0144 | 0.0158 | 0.0180 | 168 | 0.0202 | 0.0216 |
| N | Aluminium-cast alloys | | | | | | | | | | | | | | | | |
| N | Copper and copper alloys | 1.00xD | 1.00xD | 90 | 0.0053 | 0.0066 | 0.0080 | 108 | 0.0099 | 0.0119 | 117 | 0.0133 | 0.0146 | 0.0166 | 126 | 0.0186 | 0.0199 |
| S | Heat-resistant alloys, Fe-based | 1.00xD | 0.50xD | 75 | 0.0022 | 0.0027 | 0.0032 | 90 | 0.0041 | 0.0049 | 98 | 0.0054 | 0.0059 | 0.0068 | 105 | 0.0076 | 0.0081 |
| S | Heat-resistant alloys, Ni-based, CO-based | 1.00xD | 0.50xD | 45 | 0.0018 | 0.0022 | 0.0026 | 54 | 0.0033 | 0.0039 | 59 | 0.0044 | 0.0048 | 0.0055 | 63 | 0.0061 | 0.0066 |
| S | Titanium alloys & pure titanium | 1.00xD | 0.75xD | 70 | 0.0036 | 0.0045 | 0.0054 | 84 | 0.0068 | 0.0081 | 91 | 0.0090 | 0.0099 | 0.0113 | 98 | 0.0126 | 0.0135 |
| H | Hardened steel, hardened and tempered, < 55 HRC | 1.00xD | 0.25xD | 25 | 0.0019 | 0.0024 | 0.0029 | 30 | 0.0036 | 0.0043 | 33 | 0.0048 | 0.0053 | 0.0060 | 35 | 0.0067 | 0.0072 |

### Roughing

| | Material/ISO material | $a_e$ max. | $a_p$ max. | $v_c$ | $f_z$ / Ø | | | $v_c$ | $f_z$ / Ø | | $v_c$ | $f_z$ / Ø | | | $v_c$ | $f_z$ / Ø | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 0.8 | 1.0 | 1.2 | | 1.5 | 1.8 | | 2.0 | 2.2 | 2.5 | | 2.8 | 3.0 |
| P | Unalloyed steel | 0.25xD | 2.00xD | 170 | 0.0113 | 0.0142 | 0.0170 | 204 | 0.0213 | 0.0255 | 221 | 0.0284 | 0.0312 | 0.0354 | 238 | 0.0397 | 0.0425 |
| P | Low-alloyed steel | 0.25xD | 2.00xD | 170 | 0.0101 | 0.0126 | 0.0151 | 204 | 0.0189 | 0.0227 | 221 | 0.0252 | 0.0277 | 0.0315 | 238 | 0.0353 | 0.0378 |
| P | High-alloyed steel and tool steel | 0.20xD | 2.00xD | 170 | 0.0076 | 0.0095 | 0.0113 | 204 | 0.0142 | 0.0170 | 221 | 0.0189 | 0.0208 | 0.0236 | 238 | 0.0265 | 0.0284 |
| M | Stainless steel, ferritic, martensitic | 0.25xD | 2.00xD | 170 | 0.0101 | 0.0126 | 0.0151 | 204 | 0.0189 | 0.0227 | 221 | 0.0252 | 0.0277 | 0.0315 | 238 | 0.0353 | 0.0378 |
| M | Stainless steel, austenitic | 0.20xD | 2.00xD | 145 | 0.0088 | 0.0110 | 0.0132 | 174 | 0.0165 | 0.0198 | 189 | 0.0221 | 0.0243 | 0.0276 | 203 | 0.0309 | 0.0331 |
| M | Duplex steel, high strength stainless steels | 0.20xD | 2.00xD | 105 | 0.0077 | 0.0096 | 0.0116 | 126 | 0.0145 | 0.0174 | 137 | 0.0193 | 0.0212 | 0.0241 | 147 | 0.0270 | 0.0289 |
| K | Grey cast iron | 0.25xD | 2.00xD | 145 | 0.0088 | 0.0110 | 0.0132 | 174 | 0.0165 | 0.0198 | 189 | 0.0221 | 0.0243 | 0.0276 | 203 | 0.0309 | 0.0331 |
| K | Cast iron with spheroidal graphite iron | | | | | | | | | | | | | | | | |
| K | Malleable cast iron | 0.25xD | 2.00xD | 120 | 0.0078 | 0.0098 | 0.0118 | 144 | 0.0147 | 0.0176 | 156 | 0.0196 | 0.0216 | 0.0245 | 168 | 0.0274 | 0.0294 |
| K | GJV & ADI | | | | | | | | | | | | | | | | |
| N | Aluminium-wrought alloys | 0.25xD | 2.00xD | 200 | 0.0151 | 0.0189 | 0.0227 | 240 | 0.0284 | 0.0340 | 260 | 0.0378 | 0.0416 | 0.0473 | 280 | 0.0529 | 0.0567 |
| N | Aluminium-cast alloys | | | | | | | | | | | | | | | | |
| N | Copper and copper alloys | 0.25xD | 2.00xD | 150 | 0.0139 | 0.0174 | 0.0209 | 180 | 0.0261 | 0.0313 | 195 | 0.0348 | 0.0383 | 0.0435 | 210 | 0.0487 | 0.0522 |
| S | Heat-resistant alloys, Fe-based | 0.15xD | 2.00xD | 120 | 0.0057 | 0.0071 | 0.0085 | 144 | 0.0106 | 0.0128 | 156 | 0.0142 | 0.0156 | 0.0177 | 168 | 0.0198 | 0.0213 |
| S | Heat-resistant alloys, Ni-based, CO-based | 0.15xD | 2.00xD | 70 | 0.0046 | 0.0058 | 0.0069 | 84 | 0.0086 | 0.0104 | 91 | 0.0115 | 0.0127 | 0.0144 | 98 | 0.0161 | 0.0173 |
| S | Titanium alloys & pure titanium | 0.20xD | 2.00xD | 115 | 0.0095 | 0.0118 | 0.0142 | 138 | 0.0177 | 0.0213 | 150 | 0.0236 | 0.0260 | 0.0295 | 161 | 0.0331 | 0.0354 |
| H | Hardened steel, hardened and tempered, < 55 HRC | 0.05xD | 2.00xD | 45 | 0.0050 | 0.0063 | 0.0076 | 54 | 0.0095 | 0.0113 | 59 | 0.0126 | 0.0139 | 0.0158 | 63 | 0.0176 | 0.0189 |

## Finishing

| | Material/ISO material | $a_e$ max. | $a_p$ max. | $v_c$ | $f_z$ / Ø | | | $v_c$ | $f_z$ / Ø | | $v_c$ | $f_z$ / Ø | | | $v_c$ | $f_z$ / Ø | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 0.8 | 1.0 | 1.2 | | 1.5 | 1.8 | | 2.0 | 2.2 | 2.5 | | 2.8 | 3.0 |
| P | Unalloyed steel | 0.03xD | 2.00xD | **180** | 0.0086 | 0.0108 | 0.0130 | **216** | 0.0162 | 0.0194 | **234** | 0.0216 | 0.0238 | 0.0270 | **252** | 0.0302 | 0.0324 |
| P | Low-alloyed steel | 0.03xD | 2.00xD | **180** | 0.0077 | 0.0096 | 0.0115 | **216** | 0.0144 | 0.0173 | **234** | 0.0192 | 0.0211 | 0.0240 | **252** | 0.0269 | 0.0288 |
| P | High-alloyed steel and tool steel | 0.03xD | 2.00xD | **180** | 0.0058 | 0.0072 | 0.0086 | **216** | 0.0108 | 0.0130 | **234** | 0.0144 | 0.0158 | 0.0180 | **252** | 0.0202 | 0.0216 |
| M | Stainless steel, ferritic, martensitic | 0.03xD | 2.00xD | **180** | 0.0077 | 0.0096 | 0.0115 | **216** | 0.0144 | 0.0173 | **234** | 0.0192 | 0.0211 | 0.0240 | **252** | 0.0269 | 0.0288 |
| M | Stainless steel, austenitic | 0.03xD | 2.00xD | **155** | 0.0067 | 0.0084 | 0.0101 | **186** | 0.0126 | 0.0151 | **202** | 0.0168 | 0.0185 | 0.0210 | **217** | 0.0235 | 0.0252 |
| M | Duplex steel, high strength stainless steels | 0.03xD | 2.00xD | **115** | 0.0059 | 0.0073 | 0.0088 | **138** | 0.0110 | 0.0132 | **150** | 0.0147 | 0.0162 | 0.0184 | **161** | 0.0206 | 0.0220 |
| K | Grey cast iron | 0.03xD | 2.00xD | **155** | 0.0067 | 0.0084 | 0.0101 | **186** | 0.0126 | 0.0151 | **202** | 0.0168 | 0.0185 | 0.0210 | **217** | 0.0235 | 0.0252 |
| K | Cast iron with spheroidal graphite iron | | | | | | | | | | | | | | | | |
| K | Malleable cast iron | 0.03xD | 2.00xD | **130** | 0.0060 | 0.0075 | 0.0090 | **156** | 0.0112 | 0.0134 | **169** | 0.0149 | 0.0164 | 0.0187 | **182** | 0.0209 | 0.0224 |
| K | GJV & ADI | | | | | | | | | | | | | | | | |
| N | Aluminium-wrought alloys | 0.03xD | 2.00xD | **220** | 0.0115 | 0.0144 | 0.0173 | **264** | 0.0216 | 0.0259 | **286** | 0.0288 | 0.0317 | 0.0360 | **308** | 0.0403 | 0.0432 |
| N | Aluminium-cast alloys | | | | | | | | | | | | | | | | |
| N | Copper and copper alloys | 0.03xD | 2.00xD | **160** | 0.0106 | 0.0133 | 0.0159 | **192** | 0.0199 | 0.0239 | **208** | 0.0265 | 0.0292 | 0.0331 | **224** | 0.0371 | 0.0398 |
| S | Heat-resistant alloys, Fe-based | 0.03xD | 2.00xD | **130** | 0.0043 | 0.0054 | 0.0065 | **156** | 0.0081 | 0.0097 | **169** | 0.0108 | 0.0119 | 0.0135 | **182** | 0.0151 | 0.0162 |
| S | Heat-resistant alloys, Ni-based, CO-based | 0.03xD | 2.00xD | **75** | 0.0035 | 0.0044 | 0.0053 | **90** | 0.0066 | 0.0079 | **98** | 0.0088 | 0.0096 | 0.0110 | **105** | 0.0123 | 0.0132 |
| S | Titanium alloys & pure titanium | 0.03xD | 2.00xD | **120** | 0.0072 | 0.0090 | 0.0108 | **144** | 0.0135 | 0.0162 | **156** | 0.0180 | 0.0198 | 0.0225 | **168** | 0.0252 | 0.0270 |
| H | Hardened steel, hardened and tempered, < 55 HRC | 0.02xD | 2.00xD | **45** | 0.0038 | 0.0048 | 0.0058 | **54** | 0.0072 | 0.0086 | **59** | 0.0096 | 0.0106 | 0.0120 | **63** | 0.0134 | 0.0144 |

## Drilling

| | Material/ISO material | $a_p$ max. | $v_c$ | $f_z$ / Ø | | | $v_c$ | $f_z$ / Ø | | $v_c$ | $f_z$ / Ø | | | $v_c$ | $f_z$ / Ø | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 0.8 | 1.0 | 1.2 | | 1.5 | 1.8 | | 2.0 | 2.2 | 2.5 | | 2.8 | 3.0 |
| P | Unalloyed steel | 1.00xD | **100** | 0.0014 | 0.0018 | 0.0022 | **120** | 0.0027 | 0.0032 | **130** | 0.0036 | 0.0040 | 0.0045 | **140** | 0.0050 | 0.0054 |
| P | Low-alloyed steel | 1.00xD | **100** | 0.0013 | 0.0016 | 0.0019 | **120** | 0.0024 | 0.0029 | **130** | 0.0032 | 0.0035 | 0.0040 | **140** | 0.0045 | 0.0048 |
| P | High-alloyed steel and tool steel | 0.50xD | **90** | 0.0010 | 0.0012 | 0.0014 | **108** | 0.0018 | 0.0022 | **117** | 0.0024 | 0.0026 | 0.0030 | **126** | 0.0034 | 0.0036 |
| M | Stainless steel, ferritic, martensitic | 0.75xD | **90** | 0.0012 | 0.0015 | 0.0018 | **108** | 0.0023 | 0.0027 | **117** | 0.0030 | 0.0033 | 0.0038 | **126** | 0.0042 | 0.0045 |
| M | Stainless steel, austenitic | 0.50xD | **85** | 0.0011 | 0.0014 | 0.0017 | **102** | 0.0021 | 0.0025 | **111** | 0.0028 | 0.0031 | 0.0035 | **119** | 0.0039 | 0.0042 |
| M | Duplex steel, high strength stainless steels | 0.25xD | **65** | 0.0010 | 0.0012 | 0.0014 | **78** | 0.0018 | 0.0022 | **85** | 0.0024 | 0.0026 | 0.0030 | **91** | 0.0034 | 0.0036 |
| K | Grey cast iron | 1.00xD | **90** | 0.0011 | 0.0014 | 0.0017 | **108** | 0.0021 | 0.0025 | **117** | 0.0028 | 0.0031 | 0.0035 | **126** | 0.0039 | 0.0042 |
| K | Cast iron with spheroidal graphite iron | | | | | | | | | | | | | | | |
| K | Malleable cast iron | 1.00xD | **75** | 0.0010 | 0.0012 | 0.0014 | **90** | 0.0018 | 0.0022 | **98** | 0.0024 | 0.0026 | 0.0030 | **105** | 0.0034 | 0.0036 |
| K | GJV & ADI | | | | | | | | | | | | | | | |
| N | Aluminium-wrought alloys | 0.50xD | **125** | 0.0019 | 0.0024 | 0.0029 | **150** | 0.0036 | 0.0043 | **163** | 0.0048 | 0.0053 | 0.0060 | **175** | 0.0067 | 0.0072 |
| N | Aluminium-cast alloys | | | | | | | | | | | | | | | |
| N | Copper and copper alloys | 0.50xD | **90** | 0.0018 | 0.0022 | 0.0026 | **108** | 0.0033 | 0.0040 | **117** | 0.0044 | 0.0048 | 0.0055 | **126** | 0.0062 | 0.0066 |
| S | Heat-resistant alloys, Fe-based | 0.25xD | **75** | 0.0007 | 0.0009 | 0.0011 | **90** | 0.0014 | 0.0016 | **98** | 0.0018 | 0.0020 | 0.0023 | **105** | 0.0025 | 0.0027 |
| S | Heat-resistant alloys, Ni-based, CO-based | 0.25xD | **45** | 0.0006 | 0.0008 | 0.0009 | **54** | 0.0011 | 0.0014 | **59** | 0.0015 | 0.0017 | 0.0019 | **63** | 0.0021 | 0.0023 |
| S | Titanium alloys & pure titanium | 0.25xD | **70** | 0.0012 | 0.0015 | 0.0018 | **84** | 0.0023 | 0.0027 | **91** | 0.0030 | 0.0033 | 0.0038 | **98** | 0.0042 | 0.0045 |

# SuperF-UT NX Micro

## Catalogue no. 54595

### Open Slots and helix

| | Material/ISO material | $a_e$ max. | $a_p$ max. | $v_c$ | $f_z$ / Ø 1.0 | $f_z$ / Ø 1.2 | $v_c$ | $f_z$ / Ø 1.5 | $v_c$ | $f_z$ / Ø 2.0 | $f_z$ / Ø 2.5 | $v_c$ | $f_z$ / Ø 2.8 | $f_z$ / Ø 3.0 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | Unalloyed steel | 1.00xD | 0.50xD | 112 | 0.0081 | 0.0097 | 134 | 0.0122 | 146 | 0.0162 | 0.0203 | 157 | 0.0227 | 0.0243 |
| P | Low-alloyed steel | 1.00xD | 0.50xD | 112 | 0.0072 | 0.0086 | 134 | 0.0108 | 146 | 0.0144 | 0.0180 | 157 | 0.0202 | 0.0216 |
| P | High-alloyed steel and tool steel | 1.00xD | 0.25xD | 112 | 0.0054 | 0.0065 | 134 | 0.0081 | 146 | 0.0108 | 0.0135 | 157 | 0.0151 | 0.0162 |
| M | Stainless steel, ferritic, martensitic | 1.00xD | 0.25xD | 112 | 0.0072 | 0.0086 | 134 | 0.0108 | 146 | 0.0144 | 0.0180 | 157 | 0.0202 | 0.0216 |
| M | Stainless steel, austenitic | 1.00xD | 0.25xD | 96 | 0.0063 | 0.0076 | 115 | 0.0095 | 125 | 0.0126 | 0.0158 | 134 | 0.0176 | 0.0189 |
| M | Duplex steel, high strength stainless steels | 1.00xD | 0.25xD | 71 | 0.0055 | 0.0066 | 85 | 0.0083 | 92 | 0.0110 | 0.0138 | 99 | 0.0154 | 0.0165 |
| K | Grey cast iron | 1.00xD | 0.50xD | 96 | 0.0063 | 0.0076 | 115 | 0.0095 | 125 | 0.0126 | 0.0158 | 134 | 0.0176 | 0.0189 |
| K | Cast iron with spheroidal graphite iron | | | | | | | | | | | | | |
| K | Malleable cast iron | 1.00xD | 0.50xD | 80 | 0.0056 | 0.0067 | 96 | 0.0084 | 104 | 0.0112 | 0.0140 | 112 | 0.0157 | 0.0168 |
| K | GJV & ADI | | | | | | | | | | | | | |
| N | Aluminium-wrought alloys | 1.00xD | 0.50xD | 136 | 0.0108 | 0.0130 | 163 | 0.0162 | 177 | 0.0216 | 0.0270 | 190 | 0.0302 | 0.0324 |
| N | Aluminium-cast alloys | | | | | | | | | | | | | |
| N | Copper and copper alloys | 1.00xD | 0.50xD | 100 | 0.0099 | 0.0119 | 120 | 0.0149 | 130 | 0.0199 | 0.0249 | 140 | 0.0278 | 0.0298 |
| S | Heat-resistant alloys, Fe-based | 1.00xD | 0.25xD | 80 | 0.0041 | 0.0049 | 96 | 0.0061 | 104 | 0.0081 | 0.0101 | 112 | 0.0113 | 0.0122 |
| S | Heat-resistant alloys, Ni-based, CO-based | 1.00xD | 0.25xD | 46 | 0.0033 | 0.0039 | 55 | 0.0049 | 60 | 0.0066 | 0.0082 | 64 | 0.0092 | 0.0099 |
| S | Titanium alloys & pure titanium | 1.00xD | 0.25xD | 72 | 0.0068 | 0.0081 | 86 | 0.0101 | 94 | 0.0135 | 0.0169 | 101 | 0.0189 | 0.0203 |
| H | Hardened steel, hardened and tempered, < 55 HRC | 1.00xD | 0.10xD | 26 | 0.0036 | 0.0043 | 31 | 0.0054 | 34 | 0.0072 | 0.0090 | 36 | 0.0101 | 0.0108 |

### Ramping and closed Slots

| | Material/ISO material | $a_e$ max. | $a_p$ max. | $v_c$ | $f_z$ / Ø 1.0 | $f_z$ / Ø 1.2 | $v_c$ | $f_z$ / Ø 1.5 | $v_c$ | $f_z$ / Ø 2.0 | $f_z$ / Ø 2.5 | $v_c$ | $f_z$ / Ø 2.8 | $f_z$ / Ø 3.0 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | Unalloyed steel | 1.00xD | 0.50xD | 78 | 0.0049 | 0.0058 | 94 | 0.0073 | 102 | 0.0097 | 0.0122 | 110 | 0.0136 | 0.0146 |
| P | Low-alloyed steel | 1.00xD | 0.50xD | 78 | 0.0043 | 0.0052 | 94 | 0.0065 | 102 | 0.0086 | 0.0108 | 110 | 0.0121 | 0.0130 |
| P | High-alloyed steel and tool steel | 1.00xD | 0.25xD | 78 | 0.0032 | 0.0039 | 94 | 0.0049 | 102 | 0.0065 | 0.0081 | 110 | 0.0091 | 0.0097 |
| M | Stainless steel, ferritic, martensitic | 1.00xD | 0.25xD | 78 | 0.0043 | 0.0052 | 94 | 0.0065 | 102 | 0.0086 | 0.0108 | 110 | 0.0121 | 0.0130 |
| M | Stainless steel, austenitic | 1.00xD | 0.25xD | 67 | 0.0038 | 0.0045 | 81 | 0.0057 | 87 | 0.0076 | 0.0095 | 94 | 0.0106 | 0.0113 |
| M | Duplex steel, high strength stainless steels | 1.00xD | 0.25xD | 50 | 0.0033 | 0.0040 | 60 | 0.0050 | 65 | 0.0066 | 0.0083 | 70 | 0.0093 | 0.0099 |
| K | Grey cast iron | 1.00xD | 0.50xD | 67 | 0.0038 | 0.0045 | 81 | 0.0057 | 87 | 0.0076 | 0.0095 | 94 | 0.0106 | 0.0113 |
| K | Cast iron with spheroidal graphite iron | | | | | | | | | | | | | |
| K | Malleable cast iron | 1.00xD | 0.50xD | 56 | 0.0034 | 0.0040 | 67 | 0.0050 | 73 | 0.0067 | 0.0084 | 78 | 0.0094 | 0.0101 |
| K | GJV & ADI | | | | | | | | | | | | | |
| N | Aluminium-wrought alloys | 1.00xD | 0.50xD | 95 | 0.0065 | 0.0078 | 114 | 0.0097 | 124 | 0.0130 | 0.0162 | 133 | 0.0181 | 0.0194 |
| N | Aluminium-cast alloys | | | | | | | | | | | | | |
| N | Copper and copper alloys | 1.00xD | 0.50xD | 70 | 0.0060 | 0.0072 | 84 | 0.0089 | 91 | 0.0119 | 0.0149 | 98 | 0.0167 | 0.0179 |
| S | Heat-resistant alloys, Fe-based | 1.00xD | 0.25xD | 56 | 0.0024 | 0.0029 | 67 | 0.0036 | 73 | 0.0049 | 0.0061 | 78 | 0.0068 | 0.0073 |
| S | Heat-resistant alloys, Ni-based, CO-based | 1.00xD | 0.25xD | 32 | 0.0020 | 0.0024 | 39 | 0.0030 | 42 | 0.0039 | 0.0049 | 45 | 0.0055 | 0.0059 |
| S | Titanium alloys & pure titanium | 1.00xD | 0.25xD | 50 | 0.0041 | 0.0049 | 60 | 0.0061 | 66 | 0.0081 | 0.0101 | 71 | 0.0113 | 0.0122 |
| H | Hardened steel, hardened and tempered, < 55 HRC | 1.00xD | 0.10xD | 18 | 0.0022 | 0.0026 | 22 | 0.0032 | 24 | 0.0043 | 0.0054 | 25 | 0.0060 | 0.0065 |

### Roughing

| | Material/ISO material | $a_e$ max. | $a_p$ max. | $v_c$ | $f_z$ / Ø 1.0 | $f_z$ / Ø 1.2 | $v_c$ | $f_z$ / Ø 1.5 | $v_c$ | $f_z$ / Ø 2.0 | $f_z$ / Ø 2.5 | $v_c$ | $f_z$ / Ø 2.8 | $f_z$ / Ø 3.0 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | Unalloyed steel | 0.10xD | 5.00xD | 134 | 0.0128 | 0.0153 | 161 | 0.0191 | 174 | 0.0255 | 0.0319 | 188 | 0.0357 | 0.0383 |
| P | Low-alloyed steel | 0.10xD | 5.00xD | 134 | 0.0113 | 0.0136 | 161 | 0.0170 | 174 | 0.0227 | 0.0284 | 188 | 0.0318 | 0.0340 |
| P | High-alloyed steel and tool steel | 0.08xD | 5.00xD | 134 | 0.0085 | 0.0102 | 161 | 0.0128 | 174 | 0.0170 | 0.0213 | 188 | 0.0238 | 0.0255 |
| M | Stainless steel, ferritic, martensitic | 0.10xD | 5.00xD | 134 | 0.0113 | 0.0136 | 161 | 0.0170 | 174 | 0.0227 | 0.0284 | 188 | 0.0318 | 0.0340 |
| M | Stainless steel, austenitic | 0.08xD | 5.00xD | 115 | 0.0099 | 0.0119 | 138 | 0.0149 | 150 | 0.0198 | 0.0248 | 161 | 0.0278 | 0.0298 |
| M | Duplex steel, high strength stainless steels | 0.05xD | 5.00xD | 86 | 0.0087 | 0.0104 | 103 | 0.0130 | 112 | 0.0174 | 0.0217 | 120 | 0.0243 | 0.0260 |
| K | Grey cast iron | 0.10xD | 5.00xD | 115 | 0.0099 | 0.0119 | 138 | 0.0149 | 150 | 0.0198 | 0.0248 | 161 | 0.0278 | 0.0298 |
| K | Cast iron with spheroidal graphite iron | | | | | | | | | | | | | |
| K | Malleable cast iron | 0.10xD | 5.00xD | 96 | 0.0088 | 0.0106 | 115 | 0.0132 | 125 | 0.0176 | 0.0220 | 134 | 0.0247 | 0.0265 |
| K | GJV & ADI | | | | | | | | | | | | | |
| N | Aluminium-wrought alloys | 0.15xD | 5.00xD | 163 | 0.0170 | 0.0204 | 196 | 0.0255 | 212 | 0.0340 | 0.0425 | 228 | 0.0476 | 0.0510 |
| N | Aluminium-cast alloys | | | | | | | | | | | | | |
| N | Copper and copper alloys | 0.12xD | 5.00xD | 120 | 0.0157 | 0.0188 | 144 | 0.0235 | 156 | 0.0313 | 0.0392 | 168 | 0.0438 | 0.0470 |
| S | Heat-resistant alloys, Fe-based | 0.08xD | 5.00xD | 96 | 0.0064 | 0.0077 | 115 | 0.0096 | 125 | 0.0128 | 0.0159 | 134 | 0.0179 | 0.0191 |
| S | Heat-resistant alloys, Ni-based, CO-based | 0.05xD | 5.00xD | 55 | 0.0052 | 0.0062 | 66 | 0.0078 | 72 | 0.0104 | 0.0130 | 77 | 0.0145 | 0.0155 |
| S | Titanium alloys & pure titanium | 0.08xD | 5.00xD | 86 | 0.0106 | 0.0128 | 103 | 0.0159 | 112 | 0.0213 | 0.0266 | 120 | 0.0298 | 0.0319 |
| H | Hardened steel, hardened and tempered, < 55 HRC | 0.03xD | 5.00xD | 31 | 0.0057 | 0.0068 | 37 | 0.0085 | 40 | 0.0113 | 0.0142 | 43 | 0.0159 | 0.0170 |

**Finishing**

| | Material/ISO material | $a_e$ max. | $a_p$ max. | $v_c$ | $f_z$ / Ø 1.0 | $f_z$ / Ø 1.2 | $v_c$ | $f_z$ / Ø 1.5 | $v_c$ | $f_z$ / Ø 2.0 | $f_z$ / Ø 2.5 | $v_c$ | $f_z$ / Ø 2.8 | $f_z$ / Ø 3.0 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | Unalloyed steel | 0.02xD | 5.00xD | **146** | 0.0097 | 0.0117 | **175** | 0.0146 | **190** | 0.0194 | 0.0243 | **204** | 0.0272 | 0.0292 |
| P | Low-alloyed steel | 0.02xD | 5.00xD | **146** | 0.0086 | 0.0104 | **175** | 0.0130 | **190** | 0.0173 | 0.0216 | **204** | 0.0242 | 0.0259 |
| P | High-alloyed steel and tool steel | 0.02xD | 5.00xD | **146** | 0.0065 | 0.0078 | **175** | 0.0097 | **190** | 0.0130 | 0.0162 | **204** | 0.0181 | 0.0194 |
| M | Stainless steel. ferritic. martensitic | 0.02xD | 5.00xD | **146** | 0.0086 | 0.0104 | **175** | 0.0130 | **190** | 0.0173 | 0.0216 | **204** | 0.0242 | 0.0259 |
| M | Stainless steel. austenitic | 0.02xD | 5.00xD | **125** | 0.0076 | 0.0091 | **150** | 0.0113 | **163** | 0.0151 | 0.0189 | **175** | 0.0212 | 0.0227 |
| M | Duplex steel. high strength stainless steels | 0.02xD | 5.00xD | **93** | 0.0066 | 0.0079 | **112** | 0.0099 | **121** | 0.0132 | 0.0165 | **130** | 0.0185 | 0.0198 |
| K | Grey cast iron | 0.02xD | 5.00xD | **125** | 0.0076 | 0.0091 | **150** | 0.0113 | **163** | 0.0151 | 0.0189 | **175** | 0.0212 | 0.0227 |
| K | Cast iron with spheroidal graphite iron | | | | | | | | | | | | | |
| K | Malleable cast iron | 0.02xD | 5.00xD | **104** | 0.0067 | 0.0081 | **125** | 0.0101 | **135** | 0.0134 | 0.0168 | **146** | 0.0188 | 0.0202 |
| K | GJV & ADI | | | | | | | | | | | | | |
| N | Aluminium-wrought alloys | 0.02xD | 5.00xD | **177** | 0.0130 | 0.0156 | **212** | 0.0194 | **230** | 0.0259 | 0.0324 | **248** | 0.0363 | 0.0389 |
| N | Aluminium-cast alloys | | | | | | | | | | | | | |
| N | Copper and copper alloys | 0.02xD | 5.00xD | **130** | 0.0119 | 0.0143 | **156** | 0.0179 | **169** | 0.0239 | 0.0298 | **182** | 0.0334 | 0.0358 |
| S | Heat-resistant alloys. Fe-based | 0.02xD | 5.00xD | **104** | 0.0049 | 0.0058 | **125** | 0.0073 | **135** | 0.0097 | 0.0122 | **146** | 0.0136 | 0.0146 |
| S | Heat-resistant alloys. Ni-based. CO-based | 0.02xD | 5.00xD | **60** | 0.0039 | 0.0047 | **72** | 0.0059 | **78** | 0.0079 | 0.0099 | **84** | 0.0111 | 0.0118 |
| S | Titanium alloys & pure titanium | 0.02xD | 5.00xD | **94** | 0.0081 | 0.0097 | **113** | 0.0122 | **122** | 0.0162 | 0.0203 | **132** | 0.0227 | 0.0243 |
| H | Hardened steel. hardened and tempered. < 55 HRC | 0.01xD | 5.00xD | **34** | 0.0043 | 0.0052 | **41** | 0.0065 | **44** | 0.0086 | 0.0108 | **48** | 0.0121 | 0.0130 |

**Drilling**

| | Material/ISO material | $a_e$ max. | $v_c$ | $f_z$ / Ø 1.0 | $f_z$ / Ø 1.2 | $v_c$ | $f_z$ / Ø 1.5 | $v_c$ | $f_z$ / Ø 2.0 | $f_z$ / Ø 2.5 | $v_c$ | $f_z$ / Ø 2.8 | $f_z$ / Ø 3.0 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| P | Unalloyed steel | 0.50xD | **84** | 0.0097 | 0.0117 | **175** | 0.0146 | **190** | 0.0194 | 0.0243 | **204** | 0.0272 | 0.0292 |
| P | Low-alloyed steel | 0.50xD | **84** | 0.0013 | 0.0015 | **101** | 0.0019 | **109** | 0.0026 | 0.0032 | **118** | 0.0036 | 0.0038 |
| P | High-alloyed steel and tool steel | 0.25xD | **84** | 0.0010 | 0.0012 | **101** | 0.0014 | **109** | 0.0019 | 0.0024 | **118** | 0.0027 | 0.0029 |
| M | Stainless steel, ferritic, martensitic | 0.25xD | **84** | 0.0013 | 0.0015 | **101** | 0.0019 | **109** | 0.0026 | 0.0032 | **118** | 0.0036 | 0.0038 |
| M | Stainless steel, austenitic | 0.25xD | **72** | 0.0011 | 0.0013 | **86** | 0.0017 | **94** | 0.0022 | 0.0028 | **101** | 0.0031 | 0.0034 |
| M | Duplex steel, high strength stainless steels | 0.25xD | **54** | 0.0010 | 0.0012 | **65** | 0.0015 | **70** | 0.0020 | 0.0024 | **76** | 0.0027 | 0.0029 |
| K | Grey cast iron | 0.50xD | **72** | 0.0011 | 0.0013 | **86** | 0.0017 | **94** | 0.0022 | 0.0028 | **101** | 0.0031 | 0.0034 |
| K | Cast iron with spheroidal graphite iron | | | | | | | | | | | | |
| K | Malleable cast iron | 0.50xD | **60** | 0.0010 | 0.0012 | **72** | 0.0015 | **78** | 0.0020 | 0.0025 | **84** | 0.0028 | 0.0030 |
| K | GJV & ADI | | | | | | | | | | | | |
| N | Aluminium-wrought alloys | 0.50xD | **102** | 0.0019 | 0.0023 | **122** | 0.0029 | **133** | 0.0038 | 0.0048 | **143** | 0.0054 | 0.0058 |
| N | Aluminium-cast alloys | | | | | | | | | | | | |
| N | Copper and copper alloys | 0.50xD | **75** | 0.0018 | 0.0021 | **90** | 0.0027 | **97.5** | 0.0035 | 0.0044 | **105** | 0.0049 | 0.0053 |
| S | Heat-resistant alloys, Fe-based | 0.25xD | **60** | 0.0007 | 0.0009 | **72** | 0.0011 | **78** | 0.0014 | 0.0018 | **84** | 0.0020 | 0.0022 |
| S | Heat-resistant alloys, Ni-based, CO-based | 0.25xD | **34** | 0.0006 | 0.0007 | **41** | 0.0009 | **44** | 0.0012 | 0.0015 | **48** | 0.0016 | 0.0018 |
| S | Titanium alloys & pure titanium | 0.25xD | **54** | 0.0012 | 0.0014 | **65** | 0.0018 | **70** | 0.0024 | 0.0030 | **76** | 0.0034 | 0.0036 |

# SuperF-UT NX

TC HPC HSC

## Slot drilling

| Material | Hardness | $a_p$ max. | $a_e$ max. | $v_c$ | $f_z$ with nom. Ø | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 4 | 5 | 6 | 8 | 10 | 12 | 16 | 20 |
| P1 | ≤850 N/mm² | 1xD | 1xD | 270 | 0.017 | 0.021 | 0.025 | 0.034 | 0.050 | 0.060 | 0.080 | 0.100 |
| P2 | 850-1200 N/mm² | 1xD | 1xD | 230 | 0.017 | 0.021 | 0.025 | 0.034 | 0.050 | 0.060 | 0.080 | 0.100 |
| P3 | 850-1400 N/mm² | 1xD | 1xD | 180 | 0.014 | 0.018 | 0.021 | 0.028 | 0.045 | 0.054 | 0.072 | 0.090 |
| M1 | ≤750 N/mm² | 1xD | 1xD | 120 | 0.014 | 0.018 | 0.021 | 0.028 | 0.045 | 0.054 | 0.072 | 0.090 |
| M2 | 750-950 N/mm² | 1xD | 1xD | 80 | 0.013 | 0.016 | 0.019 | 0.026 | 0.040 | 0.048 | 0.064 | 0.080 |
| Ti | ≤1300 N/mm² | 1xD | 1xD | 150 | 0.017 | 0.021 | 0.025 | 0.034 | 0.050 | 0.060 | 0.080 | 0.100 |
| K2 | ≥240 HB | 1xD | 1xD | 500 | 0.022 | 0.028 | 0.033 | 0.044 | 0.065 | 0.078 | 0.104 | 0.130 |
| N1 | ≤7 % Si | 1xD | 1xD | 340 | 0.018 | 0.023 | 0.027 | 0.036 | 0.055 | 0.066 | 0.088 | 0.110 |
| N2 | ≥7 % Si | 1xD | 1xD | 60 | 0.013 | 0.016 | 0.019 | 0.026 | 0.040 | 0.048 | 0.064 | 0.080 |

## HPC Roughing

| Material | Hardness | $a_p$ max. | $a_e$ max. | $v_c$ | $f_z$ with nom. Ø | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 4 | 5 | 6 | 8 | 10 | 12 | 16 | 20 |
| P1 | ≤850 N/mm² | 1.5xD | 0.40xD | 350 | 0.021 | 0.026 | 0.032 | 0.042 | 0.063 | 0.075 | 0.100 | 0.125 |
| P2 | 850-1200 N/mm² | 1.5xD | 0.40xD | 290 | 0.021 | 0.026 | 0.032 | 0.042 | 0.063 | 0.075 | 0.100 | 0.125 |
| P3 | 850-1400 N/mm² | 1.5xD | 0.33xD | 260 | 0.018 | 0.023 | 0.027 | 0.036 | 0.059 | 0.070 | 0.094 | 0.117 |
| M1 | ≤750 N/mm² | 1.5xD | 0.33xD | 160 | 0.018 | 0.023 | 0.027 | 0.036 | 0.059 | 0.070 | 0.094 | 0.117 |
| M2 | 750-950 N/mm² | 1.5xD | 0.25xD | 120 | 0.019 | 0.024 | 0.029 | 0.038 | 0.060 | 0.072 | 0.096 | 0.120 |
| Ti | ≤1300 N/mm² | 1.5xD | 0.40xD | 190 | 0.021 | 0.026 | 0.032 | 0.042 | 0.063 | 0.075 | 0.100 | 0.125 |
| K2 | ≥240 HB | 1.5xD | 0.40xD | 600 | 0.028 | 0.034 | 0.041 | 0.055 | 0.081 | 0.098 | 0.130 | 0.163 |
| N1 | ≤7 % Si | 1.5xD | 0.40xD | 440 | 0.023 | 0.028 | 0.034 | 0.045 | 0.069 | 0.083 | 0.110 | 0.138 |
| N2 | ≥7 % Si | 1.5xD | 0.33xD | 110 | 0.017 | 0.021 | 0.025 | 0.033 | 0.052 | 0.062 | 0.083 | 0.104 |

## HSC Finishing

| Material | Hardness | $a_p$ max. | $a_e$ max. | $v_c$ | $f_z$ with nom. Ø | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 4 | 5 | 6 | 8 | 10 | 12 | 16 | 20 |
| P1 | ≤850 N/mm² | 2xD | 0.02xD | 540 | 0.018 | 0.023 | 0.028 | 0.037 | 0.055 | 0.066 | 0.088 | 0.110 |
| P2 | 850-1200 N/mm² | 2xD | 0.02xD | 460 | 0.018 | 0.023 | 0.028 | 0.037 | 0.055 | 0.066 | 0.088 | 0.110 |
| P3 | 850-1400 N/mm² | 2xD | 0.02xD | 350 | 0.015 | 0.019 | 0.023 | 0.031 | 0.050 | 0.059 | 0.079 | 0.099 |
| M1 | ≤750 N/mm² | 2xD | 0.02xD | 220 | 0.015 | 0.019 | 0.023 | 0.031 | 0.050 | 0.059 | 0.079 | 0.099 |
| M2 | 750-950 N/mm² | 2xD | 0.02xD | 160 | 0.014 | 0.018 | 0.021 | 0.028 | 0.044 | 0.053 | 0.070 | 0.088 |
| Ti | ≤1300 N/mm² | 2xD | 0.02xD | 300 | 0.018 | 0.023 | 0.028 | 0.037 | 0.055 | 0.066 | 0.088 | 0.110 |
| K2 | ≥240 HB | 2xD | 0.02xD | 1000 | 0.024 | 0.030 | 0.036 | 0.048 | 0.072 | 0.086 | 0.114 | 0.143 |
| N1 | ≤7 % Si | 2xD | 0.02xD | 680 | 0.020 | 0.025 | 0.030 | 0.040 | 0.061 | 0.073 | 0.097 | 0.121 |
| N2 | ≥7 % Si | 2xD | 0.02xD | 130 | 0.014 | 0.018 | 0.021 | 0.028 | 0.044 | 0.053 | 0.070 | 0.088 |

## Ramping, Helix, Grooving

| Material | Hardness | Ramping depth ($a_p$) | Ramping max. angle | $v_c$ | $f_z$ with nom. Ø | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 4 | 5 | 6 | 8 | 10 | 12 | 16 | 20 |
| P1 | ≤850 N/mm² | 1xD | 45° | 270 | 0.015 | 0.019 | 0.023 | 0.030 | 0.045 | 0.054 | 0.072 | 0.090 |
| P2 | 850-1200 N/mm² | 1xD | 45° | 230 | 0.013 | 0.017 | 0.020 | 0.026 | 0.040 | 0.048 | 0.064 | 0.080 |
| P3 | 850-1400 N/mm² | 1xD | 30° | 180 | 0.011 | 0.014 | 0.017 | 0.022 | 0.030 | 0.036 | 0.048 | 0.060 |
| M1 | ≤750 N/mm² | 1xD | 10° | 120 | 0.009 | 0.012 | 0.014 | 0.018 | 0.030 | 0.036 | 0.048 | 0.060 |
| M2 | 750-950 N/mm² | 1xD | 5° | 80 | 0.007 | 0.009 | 0.011 | 0.014 | 0.025 | 0.030 | 0.040 | 0.050 |
| Ti | ≤1300 N/mm² | 1xD | 45° | 150 | 0.015 | 0.019 | 0.023 | 0.030 | 0.045 | 0.054 | 0.072 | 0.090 |
| K2 | ≥240 HB | 1xD | 30° | 500 | 0.013 | 0.017 | 0.020 | 0.026 | 0.040 | 0.048 | 0.064 | 0.080 |
| N1 | ≤7 % Si | 1xD | 45° | 340 | 0.015 | 0.019 | 0.023 | 0.030 | 0.045 | 0.054 | 0.072 | 0.090 |
| N2 | ≥7 % Si | 1xD | 10° | 60 | 0.007 | 0.009 | 0.011 | 0.014 | 0.025 | 0.030 | 0.040 | 0.050 |

## Drilling

| Material | Hardness | max. drilling depth without pecking | $v_c$ | $f_z$ with nom. Ø | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 4 | 5 | 6 | 8 | 10 | 12 | 16 | 20 |
| P1 | ≤850 N/mm² | 1.5xD | 270 | 0.014 | 0.018 | 0.021 | 0.028 | 0.040 | 0.048 | 0.064 | 0.080 |
| P2 | 850-1200 N/mm² | 1.5xD | 230 | 0.012 | 0.015 | 0.018 | 0.024 | 0.035 | 0.042 | 0.056 | 0.070 |
| P3 | 850-1400 N/mm² | 1.0xD | 180 | 0.008 | 0.010 | 0.012 | 0.016 | 0.025 | 0.030 | 0.040 | 0.050 |
| K2 | ≥240 HB | 1.5xD | 150 | 0.014 | 0.018 | 0.021 | 0.028 | 0.040 | 0.048 | 0.064 | 0.080 |
| N1 | ≤7 % Si | 1.0xD | 500 | 0.012 | 0.015 | 0.018 | 0.024 | 0.035 | 0.042 | 0.056 | 0.070 |
| N2 | ≥7 % Si | 1.0xD | 340 | 0.014 | 0.018 | 0.021 | 0.028 | 0.040 | 0.048 | 0.064 | 0.080 |

| | | |
|---|---|---|
| P1 | **P** Struct. + free-cutting steels, unalloyed heat-treat. + case hard. steels | 1.0345 P235GH, 1.0050, 1.0503 C45, 1.2076 102Cr6 |
| P2 | **P** Free-cutting steels, unalloyed case hardened steels, nitriding steels | 1.1221 C60E, 1.7043 38Cr4, 1.7131 16MnCr5, 1.8550 34CrAlNi7 |
| P3 | **P** Alloyed heat-treatable, tool and high speed steels | 1.7003 38Cr2, 1.5710 36NiCr6, 1.7225 42CrMo4, 1.2419 105WCr6 |
| M1 | **M** Stainless steel (easy to machine/sulphured) | 1.4104 X14CrMoS17, 1.4105 X6CrMoS17, 1.4305 X10CrNiS18-9 |
| M2 | **M** Stainless steel (moderately difficult to machine) | 1.4301X5CrNi18-10, 1.4571 X6CrNiTi18-10, 1.4404 X2CrNiMo17-12-2 |
| Ti | **T** Titanium alloys | 3.7114 TiAl5Sn2,5, 3.7124 TiCu2, 3.7154 TiAl6Zr5, 3.7164 TiAl6V4 |
| K2 | **K** Cast iron, grey cast iron, spheroidal graphite and malleable cast iron | 0.6025 EN-GL250 (GG25), 0.7070 EN-GJS-700-2 (GGG70) |
| N1 | **N** Aluminium, Al-wrought alloys, Al-alloys | 3.0255 Al99,5, 3.2315 AlMgSi1, 3.1325 AlCuMg1, 3.3245 AlMg3Si |
| N2 | **N** Aluminium-cast alloys | 3.2131 G-AlSi5Cu1, 3.2153 G-AlSi7Cu3, 3.2573 G-AlSi9 |

# Milling strategies

## Specific plunging – tools with special plunging geometry

**SuperF-UT NX**

- h10 cutting edge tolerance
- 36°/37°/38° helix
- reduced and nominal diameter
- good drilling characteristics
- very good milling characteristics

First choice: Milling and plunging

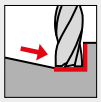
**Pilot milling cutter #54700**

- m8 cutting edge tolerance
- 30° helix
- a multitude of individual dimensions
- very good drilling characteristics
- sufficient milling characteristics

First choice: Drilling and pilot drilling

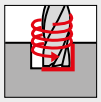
# Milling strategies

## Specific plunging – tools with special plunging geometry



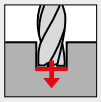
**Ramping**

- ramping angle = 15°-45° to max. $a_p$ 1xD
- $f_z$ **100 %**



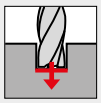
**Helix**

- feed = 0.10-0.30xD per revolution
- smallest diameter to be produced = 1.7xD
- $f_z$ **100 %**



**Grooving**

- alternative tool if problems through excessive radial forces come up
- $a_e$ 0.25xD - $a_p$ cutting edge length/clearance grind
- $f_z$ **100 %**



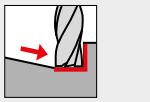
**Drilling/pilot drilling**

- max. depth feed 1xD then pecking
- $f_z$ **100 %**

Base $f_z$ = $f_z$ slotting

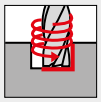
# Milling strategies

## General plunging with standard face geometries



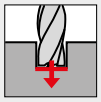
**Ramping**

- ramping angle = 2°-5° to max. $a_p$ 1xD
- even load increase
- $f_z$ **75 %**



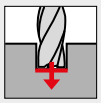
**Helix**

- feed = 0.05-0.15xD per revolution
- smallest diameter to be produced = 1.7xD
- $f_z$ **100 %**



**Grooving**

- alternative when problems through excess. radial forces occur
- $a_e$ 0.25xD - $a_p$ cutting edge length/clearance ground length
- $f_z$ **100 %**



**Drilling/pilot drilling**

- max. depth feed 0.5xD then pecking
- $f_z$ **50 %**

Base $f_z$ = $f_z$ slotting

# Chamfering milling cutters / front/back deburrer

Chamfering max. $a_p$ / $a_e$ 0,25xD

**Chamfering**

| Material | Hardness | $a_p$ max. | $a_e$ max. | $v_c$ | $f_z$ with nom. Ø | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 3 | 6 | 8 | 10 | 12 | 16 | 20 |
| P | ≤ 850 N/mm² | 0.25xD | 0.25xD | 192 | 0.018 | 0.036 | 0.048 | 0.060 | 0.080 | 0.100 | 0.130 |
| | ≥ 850 N/mm² | 0.25xD | 0.25xD | 140 | 0.016 | 0.032 | 0.042 | 0.060 | 0.070 | 0.090 | 0.120 |
| M | ≤ 750 N/mm² | 0.25xD | 0.25xD | 120 | 0.013 | 0.025 | 0.034 | 0.050 | 0.050 | 0.070 | 0.090 |
| | ≥ 750 N/mm² | 0.25xD | 0.25xD | 80 | 0.009 | 0.019 | 0.025 | 0.040 | 0.040 | 0.060 | 0.070 |
| K | ≤ 240 HB | 0.25xD | 0.25xD | 170 | 0.017 | 0.033 | 0.044 | 0.060 | 0.070 | 0.090 | 0.120 |
| | ≥ 240 HB | 0.25xD | 0.25xD | 150 | 0.014 | 0.028 | 0.037 | 0.050 | 0.060 | 0.080 | 0.100 |
| N | ≥ 7 % Si | 0.25xD | 0.25xD | 250 | 0.023 | 0.047 | 0.062 | 0.080 | 0.100 | 0.130 | 0.170 |
| H | ≤ 55 HRC | 0.25xD | 0.25xD | 50 | 0.010 | 0.020 | 0.026 | 0.040 | 0.050 | 0.060 | 0.070 |
| S | Ti-based | 0.25xD | 0.25xD | 50 | 0.010 | 0.020 | 0.027 | 0.036 | 0.043 | 0.060 | 0.070 |
| | Ni-based | 0.25xD | 0.25xD | 40 | 0.005 | 0.011 | 0.014 | 0.022 | 0.026 | 0.030 | 0.040 |

Deburring max. $a_p$ / $a_e$ 0,05xD

**Deburring**

| Material | Hardness | $a_p$ max. | $a_e$ max. | $v_c$ | $f_z$ with nom. Ø | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 3 | 6 | 8 | 10 | 12 | 16 | 20 |
| P | ≤ 850 N/mm² | 0.05xD | 0.05xD | 250 | 0.030 | 0.060 | 0.080 | 0.110 | 0.130 | 0.170 | 0.210 |
| | ≥ 850 N/mm² | 0.05xD | 0.05xD | 180 | 0.026 | 0.053 | 0.070 | 0.100 | 0.120 | 0.160 | 0.200 |
| M | ≤ 750 N/mm² | 0.05xD | 0.05xD | 160 | 0.021 | 0.042 | 0.056 | 0.080 | 0.090 | 0.120 | 0.150 |
| | ≥ 750 N/mm² | 0.05xD | 0.05xD | 100 | 0.016 | 0.032 | 0.042 | 0.060 | 0.070 | 0.100 | 0.120 |
| K | ≤ 240 HB | 0.05xD | 0.05xD | 230 | 0.028 | 0.056 | 0.074 | 0.100 | 0.120 | 0.160 | 0.200 |
| | ≥ 240 HB | 0.05xD | 0.05xD | 190 | 0.023 | 0.047 | 0.062 | 0.080 | 0.100 | 0.130 | 0.170 |
| N | ≥ 7 % Si | 0.05xD | 0.05xD | 330 | 0.039 | 0.078 | 0.104 | 0.140 | 0.170 | 0.220 | 0.280 |
| H | ≤ 55 HRC | 0.05xD | 0.05xD | 70 | 0.017 | 0.033 | 0.044 | 0.060 | 0.070 | 0.100 | 0.120 |
| S | Ti-based | 0.05xD | 0.05xD | 80 | 0.009 | 0.018 | 0.025 | 0.033 | 0.040 | 0.050 | 0.070 |
| | Ni-based | 0.05xD | 0.05xD | 50 | 0.004 | 0.008 | 0.011 | 0.017 | 0.021 | 0.029 | 0.039 |

Chamfering milling cutters with radial relief geometry for chamfering and deburring:

- especially smooth cutting operation
- regrindable
- universal application in most materials
- long tool life thanks to wear-resistant coating and ultra-tough carbide
- calculate cutting speed from effective diameter

# HPC and HSC milling strategies

**Guide values for increasing the cutting values with cutting edge lengths up to 3xD**

HPC HSC Roughing and TC HSC finishing

| Material | Application | radial feed in % of Ø | $v_c$ factor * | $f_z$ factor * | Angle of engagement |
|---|---|---|---|---|---|
| | **Nuten** | **100 %** | **1** | **1** | **180°** |
| N P K M S | HPC Roughing | 33 % | 1.5 | 1.3 | 70° |
| | HPC Roughing | 25 % | 1.6 | 1.5 | 60° |
| | HPC Roughing | 20 % | 1.7 | 1.6 | 53° |
| | HPC Roughing | 15 % | 1.8 | 1.9 | 46° |
| | HSC Roughing | 10 % | 1.9 | 2.3 | 37° |
| | HSC Roughing | 8 % | 2.0 | 2.5 | 31° |
| | HSC Roughing | 5 % | 2.1 | 2.5 | 26° |
| N P K M S | HSC Finishing | 3 % | 2.0 | 1.2 | 20° |
| | HSC Finishing | 2 % | 2.0 | 1.1 | 18° |
| | HSC Finishing | 1 % | 2.0 | 1.0 | 11° |
| | HSC Fine finishing | 0.5 % | 2.2 | 0.9 | 8° |

* The base values for the calculation with the $v_c$ and $f_z$ factors please refer to the table below:

**Base cutting values slotting – SuperF-UT tools – smooth cutting**

| Material | Hardness | Application | $v_c$ | $f_z$ with nom. Ø | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 3 | 4 | 5 | 6 | 8 | 10 | 12 | 16 | 20 | 25 |
| P1 | ≤850 N/mm² | Slotting | 180 | 0.015 | 0.020 | 0.025 | 0.030 | 0.040 | 0.060 | 0.072 | 0.096 | 0.120 | 0.150 |
| P2 | 850-1200 N/mm² | Slotting | 160 | 0.014 | 0.019 | 0.024 | 0.029 | 0.038 | 0.055 | 0.066 | 0.088 | 0.110 | 0.138 |
| P3 | 850-1400 N/mm² | Slotting | 135 | 0.014 | 0.018 | 0.023 | 0.027 | 0.036 | 0.050 | 0.060 | 0.080 | 0.100 | 0.125 |
| M1 | < 750 N/mm² | Slotting | 120 | 0.014 | 0.018 | 0.023 | 0.027 | 0.036 | 0.050 | 0.060 | 0.080 | 0.100 | 0.125 |
| M2 | 750-850 N/mm² | Slotting | 80 | 0.012 | 0.016 | 0.020 | 0.024 | 0.032 | 0.045 | 0.054 | 0.072 | 0.090 | 0.113 |
| M3 | >850 N/mm² | Slotting | 70 | 0.011 | 0.014 | 0.018 | 0.021 | 0.028 | 0.040 | 0.048 | 0.064 | 0.080 | 0.100 |
| S-Ni | ≤1300 N/mm² | Slotting | 30 | 0.008 | 0.011 | 0.014 | 0.017 | 0.022 | 0.032 | 0.038 | 0.051 | 0.064 | 0.080 |
| S-Ti | ≤1300 N/mm² | Slotting | 60 | 0.012 | 0.016 | 0.020 | 0.024 | 0.032 | 0.045 | 0.054 | 0.072 | 0.090 | 0.113 |
| K1 | ≤240 HB | Slotting | 160 | 0.017 | 0.022 | 0.028 | 0.033 | 0.044 | 0.065 | 0.078 | 0.104 | 0.130 | 0.163 |
| K2 | >240 HB | Slotting | 140 | 0.015 | 0.020 | 0.025 | 0.030 | 0.040 | 0.055 | 0.066 | 0.088 | 0.110 | 0.138 |
| Wr. al.alloy | ≤5 % Si | Slotting | 500 | 0.020 | 0.026 | 0.033 | 0.039 | 0.052 | 0.075 | 0.090 | 0.120 | 0.150 | 0.188 |
| Cast al. alloy | >5 % Si | Slotting | 230 | 0.017 | 0.022 | 0.028 | 0.033 | 0.044 | 0.060 | 0.072 | 0.096 | 0.120 | 0.150 |
| Non-fer.metals | ≤850 N/mm² | Slotting | 250 | 0.017 | 0.022 | 0.028 | 0.033 | 0.044 | 0.060 | 0.072 | 0.096 | 0.120 | 0.150 |

**Metal removal rate** $a_p$ (mm) x $a_e$ (mm) x $v_f$ (m/min) = Q (cm³/min)

| | |
|---|---|
| **Example** | HPC Roughing: 15 % $a_e$; 2xD $a_p$; C45 |
| **Tool** | SuperF-UT type N Ø 12 mm-4 flutes |
| **Feed** | radial feed $a_e$ 1.8 mm = 15 % of D |
| **Base value slotting** | $v_c$ slotting = 180 m/min, $f_z$ slotting = 0.072 mm |
| **Conversion** | $v_c$ factor = 1.8 → $v_c$: 180 m/min x 1.8 = $v_c$ 324 m/min<br>$f_z$ factor = 1.9 → $f_z$: 0.072 mm x 1.9 = $f_z$ 0.137 |
| **Increased values** | $v_c$: 324 m/min / $f_z$: 0.137 mm<br>n: 8594 rev./min / $v_f$: 4710 mm/min |
| **Metal removal rate** | Q = 203 cm³/min |

# SuperR-HS Reamers

## Application recommendations

**Feed column**

| Tool-Ø mm | Code-letter E | F | G | H | I | J |
|---|---|---|---|---|---|---|
| **3.15** | 0.080 | 0.100 | 0.125 | 0.300 | 0.500 | 0.800 |
| **4.00** | 0.100 | 0.125 | 0.160 | 0.300 | 0.500 | 1.000 |
| **5.00** | 0.100 | 0.125 | 0.160 | 0.400 | 0.600 | 1.000 |
| **6.30** | 0.125 | 0.160 | 0.200 | 0.400 | 0.700 | 1.200 |
| **8.00** | 0.160 | 0.200 | 0.250 | 0.600 | 1.000 | 1.800 |
| **10.00** | 0.200 | 0.250 | 0.315 | 0.600 | 1.200 | 1.800 |
| **12.50** | 0.200 | 0.250 | 0.315 | 0.800 | 1.200 | 2.000 |
| **16.00** | 0.250 | 0.315 | 0.400 | 0.800 | 1.400 | 2.200 |
| **20.00** | 0.315 | 0.400 | 0.500 | 0.800 | 1.400 | 2.200 |
| **25.00** | 0.400 | 0.500 | 0.630 | 1.000 | 1.600 | 2.500 |
| **31.50** | 0.400 | 0.500 | 0.630 | 1.000 | 2.000 | 3.000 |
| **40.00** | 0.500 | 0.630 | 0.800 | 1.200 | 2.000 | 3.000 |
| **50.00** | 0.630 | 0.800 | 1.000 | 1.400 | 2.200 | 3.200 |

Feed f (mm/rev)

Tools with feed column no. in bold are preferred choices for listed material group.

For an optimal cooling lubricant supply to SuperR-HS type D reamer cutting edges for through holes we recommend clamping in hydraulic or shrink fit chucks to the maximum clamping depth.

| **Diameter** | **Recommended undersize** |
|---|---|
| <6 mm | 0.1-0.2 mm |
| <10 mm | 0.2 mm |
| <16 mm | 0.2-0.3 mm |
| <25 mm | 0.3-0.4 mm |
| >25 mm | 0.4 mm |

**Lubricants:**

cutting oil, highly activated, surface active lubricant with effective additives which chemically react and result in a special adhesive and abrasion reducing lubricant film. ■

soluble oil (emulsion) ■

without lubricant □

air only ▣

| Material group | Materials examples, **new designations** (old designation in brackets) Figures in bold = material no. to DIN EN | Tensile strength MPa (N/mm²) | Hardness | Coolant |
|---|---|---|---|---|
| General purpose steels | **1.0035** S185(St33),**1.0486** P275N(StE285),**1.0345** P235GH(H1),**1.0425** P265GH(H2) | ≤500 | | ■ |
| | **1.0050** E295 (St50-2), **1.0070** E360 (St70-2), **1.8937** P500NH (WStE500) | >500-850 | | ■ |
| Free-cutting steels | **1.0718** 11SMnPb30 (9SMnPb28), **1.0736** 11SMn37 (9SMn36) | ≤850 | | ■ |
| | **1.0727** 46S20 (45S20), **1.0728** (60S20), **1.0757** 46SPb20 (45SPb20) | 850-1000 | | ■ |
| Unalloyed tempering steels | **1.0402** C22, **1.1178** C30E (Ck30) | ≤ 700 | | ■ |
| | **1.0503** C45, **1.1191** C45E (Ck45) | 700-850 | | ■ |
| | **1.0601** C60, **1.1221** C60E (Ck60) | 850-1000 | | ■ |
| Alloyed tempering steels | **1.5131** 50MnSi4, **1.7003** 38Cr2, **1.7030** 28Cr4 | 850-≤1000 | | ■ |
| | **1.5710** 36NiCr6, **1.7035** 41Cr4, **1.7225** 42CrMo4 | 1000-1200 | | ■ |
| Unalloyed case hardened steels | **1.0301** (C10), **1.1121** C10E (Ck10) | ≤750 | | ■ |
| Alloyed case hardened steels | **1.7043** 38Cr4 | 850-≤1000 | | ■ ■ |
| | **1.5752** 15NiCr13 (15NiCr13), **1.7131** 16MnCr5, **1.7264** 20CrMo5 | 1000-1200 | | ■ ■ |
| Nitriding steels | **1.8504** 34CrAl6 | ≥850-≤1000 | | ■ |
| | **1.8519** 31CrMoV9, **1.8550** 34CrAlNi7 | >1000-1200 | | ■ ■ |
| Tool steels | **1.1750** C75W, **1.2067** 102Cr6, **1.2307** 29CrMoV9 | ≤850 | | ■ |
| | **1.2080** X210Cr12, **1.2083** X42Cr13, **1.2419** 105WCr6, **1.2767** X45NiCrMo4 | >850-1000 | | ■ ■ |
| High speed steels | **1.3243** S 6-5-2-5, **1.3343** S 6-5-2, **1.3344** S 6-5-3 | ≥650-1000 | | ■ |
| Spring steels | **1.5026** 55Si7, **1.7176** 55Cr3, **1.8159** 51CrV4 (51CrV4) | | ≤330 HB | ■ ■ |
| Hardened steels | – | | ≤40-48 HRC | ■ |
| | | | >48-60 HRC | ■ |
| Stainless steels, sulphured | **1.4005** X12CrS13, **1.4104** X14CrMoS17, **1.4105** X6CrMoS17, **1.4305** X8CrNiS18-9 | ≤850 | | ■ |
| austenitic | **1.4301** X5CrNi18-10 (V2A), **1.4541** X6CrNiTi18-10, **1.4571** X6CrNiMoTi 17-12-2 (V4A) | ≤850 | | ■ |
| martensitic | **1.4057** X20CrNi 17 2 (X17CrNi16-2), **1.4122** X39CrMo17-1, **1.4521** X2CrMoTi18-2 | ≤850 | | ■ |
| Cast iron | **0.6010** EN-GJL-100(GG10), **0.6020** EN-GJL-200(GG20) | 850-≤1000 | | ■ □ |
| | **0.6025** EN-GJL-250(GG25), **0.6035** EN-GJL-350(GG35) | 1000-1200 | | ■ □ |
| Spheroidal graphite iron and | **0.7050** EN-GJS-500-7(GGG50), **0.8035** EN-GJMW-350-4(GTW35) | | ≤240 HB | ■ |
| malleable cast iron | **0.7070** EN-GJS-700-2(GGG70), **0.8170** EN-GJMB-700-2(GTS70) | | <300 HB | ■ |
| Chilled cast iron | – | | ≤350 HB | ■ |
| New Cast iron GGV | **EN-GJV250** (GGV25), **EN-GJV350** (GGV35) | | | ■ □ |
| | **EN-GJV400** (GGV40), **EN-GJV500** (GGV50), SiMo6 | | | ■ □ |
| New Cast iron ADI | **EN-GJS-800-8** (ADI800), **EN-GJS-1000-5** (ADI1000) | 800-1000 | | ■ □ |
| | **EN-GJS-1200-2** (ADI1200), **EN-GJS-1400-1** (ADI1400) | 1200-1400 | | ■ □ |
| Special alloys | Nimonic, Inconel, Monel, Hastelloy | ≤1200 | | ■ |
| Ti and Ti-alloys | **3.7024** Ti99,5, **3.7114** TiAl5Sn2,5, **3.7124** TiCu2 | ≤850 | | ■ |
| | **3.7154** TiAl6Zr5, **3.7165** TiAl6V4, **3.7184** TiAl4Mo4Sn2,5,-TiAl8Mo1V1 | >850-1200 | | ■ |
| Aluminium and Al-alloys | **3.0255** Al99,5, **3.2315** AlMgSi1, **3.3515** AlMg1 | ≤400 | | ■ |
| Al wrought alloys | **3.0615** AlMgSiPb, **3.1325** AlCuMg1, **3.3245** AlMg3Si, **3.4365** AlZnMgCu1,5 | ≤450 | | ■ |
| Al cast alloys ≤ 10 % Si | **3.2131** G-AlSi5Cu1, **3.2153** G-AlSi7Cu3, **3.2573** G-AlSi9 | ≤600 | | ■ |
| >10 % Si | **3.2581** G-AlSi12, **3.2583** G-AlSi12Cu,-G-AlSi12CuNiMg | ≤600 | | ■ |
| Magnesium alloys | **3.5200** MgMn2, **3.5812.05** G-MgAl8Zn1, **3.5612.05** G-MgAl6Zn1 | ≤450 | | ▣ |
| Copper, low alloyed | **2.0070** SE-Cu, **2.1020** CuSn6, **2.1096** G-CuSn5ZnPb | ≤400 | | ■ ■ |
| Brass, short-chipping | **2.0380** CuZn39Pb2, **2.0401** CuZn39Pb3, **2.0410** CuZn43Pb2 | ≤600 | | ■ ■ |
| long-chipping | **2.0250** CuZn20, **2.0280** CuZn33, **2.0332** CuZn37Pb0,5 | ≤600 | | ■ ■ |
| Bronze, short-chipping | **2.1090** CuSn7ZnPb, **2.1170** CuPb5Sn5, **2.1176** CuPb10Sn | ≤600 | | ■ ■ |
| | **2.0790** CuNi18Zn19Pb | >600-850 | | ■ |
| Bronze, long-chipping | **2.0916** CuAl5, **2.0960** CuAl9Mn, **2.1050** CuSn10 | ≤850 | | ■ |
| | **2.0980** CuAl11Ni, **2.1247** CuBe2 | >850-1000 | | ■ |
| Duroplastics | Epoxy resin, Resopal, Pertinax, Moltopren | | – | □ |
| Thermoplastics | Plexiglas, Hostalen, Novodur, Makralon | | – | ■ □ |
| Kevlar | Kevlar | | – | □ |
| Glass/carbon-concentr. plastics | GFK/CFK | | – | □ |

# Solid carbide head reamer SuperR-HS

- High-performance reamer ensures especially economical machining
- Flexible holder options thanks to HA shank
- Simple extension thanks to shrink fit extension or hydraulic chuck
- Available as universal design – also in special designs available at short notice (e.g. for cast aluminum machining)

| Catalogue no. | 72874 | 72875 |
|---|---|---|
| Tool material | solid carbide | |
| Surface finish | AlTiN nano | |
| DIN | Stock std. | Stock std. |
| Type | HS-KS | HS-KD |
| Page | 163 | 164 |

| $v_c$ m/min | Feed no. | |
|---|---|---|
| 185 | I-J | I-J |
| 185 | I-J | I-J |
| 185 | I-J | I-J |
| 185 | I-J | I-J |
| 185 | I-J | I-J |
| 185 | I-J | I-J |
| 185 | I-J | I-J |
| 185 | I-J | I-J |
| 185 | I-J | I-J |
| 185 | I-J | I-J |
| 185 | I-J | I-J |
| 185 | I-J | I-J |
| 185 | I-J | I-J |
| 185 | I-J | I-J |
| 185 | I-J | I-J |
| 185 | I-J | I-J |
| 90 | I-J | I-J |
| 45 | G-H | G-H |
| 50 | G-H | G-H |
| 45 | G-H | G-H |
| 90 | H-I | H-I |
| 60 | H-I | H-I |
| 90 | H-I | H-I |
| 100 | I-J | I-J |
| 100 | I-J | I-J |
| 185 | I-J | I-J |
| 90 | I-J | I-J |
| 40 | H-I | H-I |
| 80 | I-J | I-J |
| 80 | I-J | I-J |
| 80 | I-J | I-J |
| 80 | I-J | I-J |
| 50 | G-H | G-H |
| 60 | H-I | H-I |
| 60 | H-I | H-I |
| | | |
| | | |
| | | |
| 120 | I-J | I-J |
| | | |
| 175 | I-J | I-J |
| | | |
| 175 | I-J | I-J |
| 175 | I-J | I-J |
| | | |
| 140 | I-J | I-J |
| 140 | I-J | I-J |
| 80 | E | E |
| 80 | E | E |

**Version for through hole**
with radial coolant supply

**Version for blind hole**
with central coolant exit

# Countersink V-NX

## Application recommendations

**Feed column no.**

| Tool-Ø mm | Code letter E | F | G | H | I | J |
|---|---|---|---|---|---|---|
| **2.00** | 0.03 | 0.04 | 0.06 | 0.08 | 0.10 | 0.13 |
| **2.50** | 0.03 | 0.05 | 0.07 | 0.10 | 0.13 | 0.16 |
| **3.15** | 0.03 | 0.05 | 0.08 | 0.11 | 0.15 | 0.20 |
| **4.00** | 0.04 | 0.06 | 0.09 | 0.13 | 0.17 | 0.22 |
| **5.00** | 0.04 | 0.07 | 0.10 | 0.14 | 0.18 | 0.23 |
| **6.30** | 0.04 | 0.07 | 0.12 | 0.15 | 0.19 | 0.24 |
| **8.00** | 0.05 | 0.08 | 0.13 | 0.16 | 0.20 | 0.25 |
| **10.00** | 0.06 | 0.09 | 0.14 | 0.17 | 0.22 | 0.26 |
| **12.50** | 0.06 | 0.10 | 0.15 | 0.19 | 0.23 | 0.28 |
| **16.00** | 0.07 | 0.11 | 0.17 | 0.21 | 0.26 | 0.31 |
| **20.00** | 0.08 | 0.13 | 0.18 | 0.23 | 0.28 | 0.33 |
| **25.00** | 0.09 | 0.15 | 0.21 | 0.26 | 0.30 | 0.38 |
| **31.50** | 0.12 | 0.17 | 0.24 | 0.30 | 0.36 | 0.42 |
| **40.00** | 0.14 | 0.21 | 0.28 | 0.34 | 0.40 | 0.46 |

Feed f (mm/rpm)

Tools with feed column no. in bold are preferred choices for listed material group.

**Lubricants:**

cutting oil, highly activated, surface active lubricant with effective additives which chemically react and result in a special adhesive and abrasion reducing lubricant film. ■

soluble oil (emulsion) ■

without lubricant □

air only ⊡

| Material group | Materials examples, **new designations** (old designation in brackets)<br>Figures in bold = material no. to DIN EN | Tensile strength MPa (N/mm²) | Hardness | Coolant |
|---|---|---|---|---|
| General purpose steels | **1.0035** S185(St33),**1.0486** P275N(StE285),**1.0345** P235GH(H1),**1.0425** P265GH(H2) | ≤500 | | ■ |
| | **1.0050** E295 (St50-2), **1.0070** E360 (St70-2), **1.8937** P500NH (WStE500) | >500-850 | | ■ |
| Free-cutting steels | **1.0718** 11SMnPb30 (9SMnPb28), **1.0736** 11SMn37 (9SMn36) | ≤850 | | ■ |
| | **1.0727** 46S20 (45S20), **1.0728** (60S20), **1.0757** 46SPb20 (45SPb20) | 850-1000 | | ■ |
| Unalloyed tempering steels | **1.0402** C22, **1.1178** C30E (Ck30) | ≤ 700 | | ■ |
| | **1.0503** C45, **1.1191** C45E (Ck45) | 700-850 | | ■ |
| | **1.0601** C60, **1.1221** C60E (Ck60) | 850-1000 | | ■ |
| Alloyed tempering steels | **1.5131** 50MnSi4, **1.7003** 38Cr2, **1.7030** 28Cr4 | 850-≤1000 | | ■ |
| | **1.5710** 36NiCr6, **1.7035** 41Cr4, **1.7225** 42CrMo4 | 1000-1200 | | ■ |
| Unalloyed case hardened steels | **1.0301** (C10), **1.1121** C10E (Ck10) | ≤750 | | ■ |
| Alloyed case hardened steels | **1.7043** 38Cr4 | 850-≤1000 | | ■ ■ |
| | **1.5752** 15NiCr13 (15NiCr13), **1.7131** 16MnCr5, **1.7264** 20CrMo5 | 1000-1200 | | ■ ■ |
| Nitriding steels | **1.8504** 34CrAl6 | ≥850-≤1000 | | ■ |
| | **1.8519** 31CrMoV9, **1.8550** 34CrAlNi7 | >1000-1200 | | ■ ■ |
| Tool steels | **1.1750** C75W, **1.2067** 102Cr6, **1.2307** 29CrMoV9 | ≤850 | | ■ |
| | **1.2080** X210Cr12, **1.2083** X42Cr13, **1.2419** 105WCr6, **1.2767** X45NiCrMo4 | >850-1000 | | ■ ■ |
| High speed steels | **1.3243** S 6-5-2-5, **1.3343** S 6-5-2, **1.3344** S 6-5-3 | ≥650-1000 | | ■ |
| Spring steels | **1.5026** 55Si7, **1.7176** 55Cr3, **1.8159** 51CrV4 (51CrV4) | | ≤330 HB | ■ ■ |
| Hardened steels | – | | ≤40-48 HRC | ■ |
| | | | >48-60 HRC | ■ |
| Stainless steels, sulphured | **1.4005** X12CrS13, **1.4104** X14CrMoS17, **1.4105** X6CrMoS17, **1.4305** X8CrNiS18-9 | ≤850 | | ■ |
| austenitic | **1.4301** X5CrNi18-10 (V2A), **1.4541** X6CrNiTi18-10, **1.4571** X6CrNiMoTi 17-12-2 (V4A) | ≤850 | | ■ |
| martensitic | **1.4057** X20CrNi 17 2 (X17CrNi16-2), **1.4122** X39CrMo17-1, **1.4521** X2CrMoTi18-2 | ≤850 | | ■ |
| Cast iron | **0.6010** EN-GJL-100(GG10), **0.6020** EN-GJL-200(GG20) | 850-≤1000 | | ■ □ |
| | **0.6025** EN-GJL-250(GG25), **0.6035** EN-GJL-350(GG35) | 1000-1200 | | ■ □ |
| Spheroidal graphite iron and malleable cast iron | **0.7050** EN-GJS-500-7(GGG50), **0.8035** EN-GJMW-350-4(GTW35) | | ≤240 HB | ■ |
| | **0.7070** EN-GJS-700-2(GGG70), **0.8170** EN-GJMB-700-2(GTS70) | | <300 HB | ■ |
| Chilled cast iron | – | | ≤350 HB | ■ |
| New Cast iron GGV | **EN-GJV250** (GGV25), **EN-GJV350** (GGV35) | | | ■ □ |
| | **EN-GJV400** (GGV40), **EN-GJV500** (GGV50), SiMo6 | | | ■ □ |
| New Cast iron ADI | **EN-GJS-800-8** (ADI800), **EN-GJS-1000-5** (ADI1000) | 800-1000 | | ■ □ |
| | **EN-GJS-1200-2** (ADI1200), **EN-GJS-1400-1** (ADI1400) | 1200-1400 | | ■ □ |
| Special alloys | Nimonic, Inconel, Monel, Hastelloy | ≤1200 | | ■ |
| Ti and Ti-alloys | **3.7024** Ti99,5, **3.7114** TiAl5Sn2,5, **3.7124** TiCu2 | ≤850 | | ■ |
| | **3.7154** TiAl6Zr5, **3.7165** TiAl6V4, **3.7184** TiAl4Mo4Sn2,5, - TiAl8Mo1V1 | >850-1200 | | ■ |
| Aluminium and Al-alloys | **3.0255** Al99,5, **3.2315** AlMgSi1, **3.3515** AlMg1 | ≤400 | | ■ |
| Al wrought alloys | **3.0615** AlMgSiPb, **3.1325** AlCuMg1, **3.3245** AlMg3Si, **3.4365** AlZnMgCu1,5 | ≤450 | | ■ |
| Al cast alloys ⍰ 10 % Si | **3.2131** G-AlSi5Cu1, **3.2153** G-AlSi7Cu3, **3.2573** G-AlSi9 | ≤600 | | ■ |
| > 10 % Si | **3.2581** G-AlSi12, **3.2583** G-AlSi12Cu, - G-AlSi12CuNiMg | ≤600 | | ■ |
| Magnesium alloys | **3.5200** MgMn2, **3.5812.05** G-MgAl8Zn1, **3.5612.05** G-MgAl6Zn1 | ≤450 | | ⊡ |
| Copper, low alloyed | **2.0070** SE-Cu, **2.1020** CuSn6, **2.1096** G-CuSn5ZnPb | ≤400 | | ■ ■ |
| Brass, short-chipping | **2.0380** CuZn39Pb2, **2.0401** CuZn39Pb3, **2.0410** CuZn43Pb2 | ≤600 | | ■ ■ |
| long-chipping | **2.0250** CuZn20, **2.0280** CuZn33, **2.0332** CuZn37Pb0,5 | ≤600 | | ■ ■ |
| Bronze, short-chipping | **2.1090** CuSn7ZnPb, **2.1170** CuPb5Sn5, **2.1176** CuPb10Sn | ≤600 | | ■ ■ |
| | **2.0790** CuNi18Zn19Pb | >600-850 | | ■ |
| Bronze, long-chipping | **2.0916** CuAl5, **2.0960** CuAl9Mn, **2.1050** CuSn10 | ≤850 | | ■ |
| | **2.0980** CuAl11Ni, **2.1247** CuBe2 | >850-1000 | | ■ |
| Duroplastics | Epoxy resin, Resopal, Pertinax, Moltopren | | – | □ |
| Thermoplastics | Plexiglas, Hostalen, Novodur, Makralon | | – | ■ □ |
| Kevlar | Kevlar | | – | □ |
| Glass/carbon-concentr. plastics | GFK/CFK | | – | □ |

| Catalogue no. | 52348 | 52350 | 52398 | 52399 |
|---|---|---|---|---|
| Tool material | HSS-Co | HSS-Co | HSS-Co | HSS-Co |
| Surface finish | AlTiN | AlTiN | AlTiN | AlTiN |
| DIN | 335 | 335 | 335 | 335 |
| Countersink angle | 90° | 90° | 90° | 90° |
| Shank form | cylindrical | 3-surface | cylindrical | 3-surface |
| Page | 166 | 167 | 168 | 169 |

| $v_c$ m/min | Feed no. | $v_c$ m/min | Feed no. | $v_c$ m/min | Feed no. | $v_c$ m/min | Feed no. |
|---|---|---|---|---|---|---|---|
| 41 | G | 41 | G | 41 | G | 41 | G |
| 39 | F | 39 | F | 39 | F | 39 | F |
| 41 | G | 41 | G | 41 | G | 41 | G |
| 39 | F | 39 | F | 39 | F | 39 | F |
| 41 | G | 41 | G | 41 | G | 41 | G |
| 39 | G | 39 | G | 39 | G | 39 | G |
| 25 | F | 25 | F | 25 | F | 25 | F |
| 19 | G | 19 | G | 19 | G | 19 | G |
| 15 | F | 15 | F | 15 | F | 15 | F |
| 32 | G | 32 | G | 32 | G | 32 | G |
| 19 | G | 19 | G | 19 | G | 19 | G |
| 13 | F | 13 | F | 13 | F | 13 | F |
| 19 | F | 19 | F | 19 | F | 19 | F |
| 15 | E | 15 | E | 15 | E | 15 | E |
| 22 | F | 22 | F | 22 | F | 22 | F |
| 19 | E | 19 | E | 19 | E | 19 | E |
| 19 | E | 19 | E | 19 | E | 19 | E |
| 13 | E | 13 | E | 13 | E | 13 | E |
| | | | | | | | |
| 20 | F | 20 | F | 20 | F | 20 | F |
| 15 | E | 15 | E | 15 | E | 15 | E |
| 18 | E | 18 | E | 18 | E | 18 | E |
| 32 | G | 32 | G | 32 | G | 32 | G |
| 20 | G | 20 | G | 20 | G | 20 | G |
| 28 | G | 28 | G | 28 | G | 28 | G |
| 25 | G | 25 | G | 25 | G | 25 | G |
| 10 | E | 10 | E | 10 | E | 10 | E |
| 28 | G | 28 | G | 28 | G | 28 | G |
| 18 | G | 18 | G | 18 | G | 18 | G |
| | | | | | | | |
| 10 | E | 10 | E | 10 | E | 10 | E |
| 19 | F | 19 | F | 19 | F | 19 | F |
| 13 | E | 13 | E | 13 | E | 13 | E |
| 101 | H | 114 | H | 101 | H | 114 | H |
| 89 | H | 89 | H | 89 | H | 89 | H |
| 51 | G | 51 | G | 51 | G | 51 | G |
| 39 | G | 39 | G | 39 | G | 39 | G |
| 127 | H | 127 | H | 127 | H | 127 | H |
| 76 | H | 76 | H | 76 | H | 76 | H |
| 101 | H | 101 | H | 101 | H | 101 | H |
| 64 | H | 64 | H | 64 | H | 64 | H |
| 39 | H | 39 | H | 39 | H | 39 | H |
| 33 | H | 33 | H | 33 | H | 33 | H |
| 31 | H | 31 | H | 31 | H | 31 | H |
| 25 | H | 25 | H | 25 | H | 25 | H |
| 39 | H | 39 | H | 39 | H | 39 | H |
| 51 | H | 51 | H | 51 | H | 51 | H |

| Catalogue no. | Page | Standard | Surface | Description | Tool material | Type |
|---|---|---|---|---|---|---|
| 51146 | 51 | DIN 6537K | AlTiN | Twist drills with reinforced straight shank | Solid carbide | H |
| 51290 | 50 | Company std. | TiAlN nano | Jobber drills | Solid carbide | N |
| 51670 | 24 | DIN 6537K | AlTiN nano | SuperV drills with internal cooling | Solid carbide | SuperV-VA |
| 51673 | 16 | DIN 6537K | TiAlN nano | SuperV drills without internal coolant | Solid carbide | SuperV-U |
| 51674 | 34 | DIN 6537L | AlTiN nano | SuperV drills with internal cooling | Solid carbide | SuperV-VA |
| 51676 | 22 | DIN 6537K | TiAlN nano | SuperV drills with internal cooling | Solid carbide | SuperV-IK-U |
| 51681 | 32 | DIN 6537L | TiAlN nano | SuperV drills with internal cooling | Solid carbide | SuperV-IK-U |
| 51687 | 20 | DIN 6537L | TiAlN nano | SuperV drills without internal coolant | Solid carbide | SuperV-U |
| 51750 | 18 | DIN 6537K | TiAlSiN | SuperV drills without internal coolant | Solid carbide | SuperV-S |
| 51752 | 26 | DIN 6537K | TiAlSiN | SuperV drills with internal cooling | Solid carbide | SuperV-S |
| 51753 | 28 | DIN 6537K | TiAlSiN | SuperV drills with internal cooling | Solid carbide | SuperV-S |
| 51754 | 38 | DIN 6537L | TiAlSiN | SuperV drills with internal cooling | Solid carbide | SuperV-S |
| 51755 | 40 | DIN 6537L | TiAlSiN | SuperV drills with internal cooling | Solid carbide | SuperV-S |
| 51756 | 44 | Company std. | TiAlSiN | SuperV drills with internal cooling | Solid carbide | SuperV-S |
| 51764 | 45 | Company std. | AlTiN | SuperV drills with internal cooling | Solid carbide | SuperV-T |
| 51765 | 46 | Company std. | AlTiN | SuperV drills with internal cooling | Solid carbide | SuperV-T |
| 51766 | 47 | Company std. | AlTiN | SuperV drills with internal cooling | Solid carbide | SuperV-T |
| 51767 | 48 | Company std. | AlTiN | SuperV drills with internal cooling | Solid carbide | SuperV-T |
| 51768 | 49 | Company std. | AlTiN | SuperV drills with internal cooling | Solid carbide | SuperV-T |
| 51786 | 36 | DIN 6537L | TiAlN nano | SuperV drills with internal cooling | Solid carbide | SuperV-X |
| 51791 | 42 | Company std. | TiAlN nano | SuperV drills with internal cooling | Solid carbide | SuperV-X |
| 52348 | 166 | DIN 335 | AlTiN | 90° Countersinks, spiral-fluted | HSS-Co | V-NX |
| 52350 | 167 | DIN 335 | AlTiN | 90° Countersinks, spiral-fluted | HSS-Co | V-NX |
| 52398 | 168 | DIN 335 | AlTiN | 90° Countersink sets, spiral-fluted | HSS-Co | V-NX |
| 52399 | 169 | DIN 335 | AlTiN | 90° Countersink sets, spiral-fluted | HSS-Co | V-NX |
| 53399 | 162 | Company std. | TiAlZrN | Deburring end mills 90° | Solid carbide | SuperAF-90 |
| 53610 | 114 | ~DIN 371/376 | TiCN | Fluteless taps with coolant ducts for metric ISO threads | HSS-E-PM | Durativ N-X |
| 53612 | 116 | ~DIN 374 | TiCN | Fluteless taps with coolant ducts for ISO metric fine threads | HSS-E-PM | Durativ N-X |
| 53618 | 115 | ~DIN 371/376 | TiCN | Fluteless taps with coolant ducts for metric ISO threads | HSS-E-PM | Durativ N-X |
| 53619 | 117 | ~DIN 374 | TiCN | Fluteless taps with coolant ducts for ISO metric fine threads | HSS-E-PM | Durativ N-X |
| 53630 | 108 | ~DIN 371/376 | TiCN | Fluteless taps for ISO metric threads | HSS-E-PM | Durativ N-X |
| 53631 | 109 | ~DIN 371/376 | TiCN | Fluteless taps for ISO metric threads | HSS-E-PM | Durativ N-X |
| 53632 | 110 | ~DIN 374 | TiCN | Fluteless taps for ISO metric fine threads | HSS-E-PM | Durativ N-X |
| 53633 | 111 | ~DIN 371/376 | TiCN | Fluteless taps for UNC threads | HSS-E-PM | Durativ N-X |
| 53634 | 112 | ~DIN 371/374 | TiCN | Fluteless taps for UNF threads | HSS-E-PM | Durativ N-X |
| 53635 | 113 | DIN 2189 | TiCN | Fluteless taps for BSP threads | HSS-E-PM | Durativ N-X |
| 53640 | 87 | DIN 371/376 | TiCN | Taps for ISO metric threads | HSS-E-PM | Produktiv H |
| 53642 | 86 | DIN 371/376 | TiCN | Taps for ISO metric threads | HSS-E | Produktiv H |
| 53646 | 84 | DIN 376 | TiCN | Taps for ISO metric threads | HSS-E | H |
| 53647 | 85 | ~DIN 376 | TiCN | Taps for ISO metric threads | HSS-E | H |
| 53661 | 90 | DIN 371/376 | TiCN | Taps for ISO metric threads | HSS-E | Intensiv H |
| 53664 | 91 | DIN 371/376 | TiAlN | Taps for ISO metric threads | HSS-E-PM | Intensiv H |
| 53676 | 92 | DIN 371/376 | TiCN | Taps for ISO metric threads | HSS-E-PM | H |
| 53733 | 68 | ~DIN 371/376 | AlTiZrN | Taps for ISO metric threads | HSS-E | Produktiv N-X |
| 53734 | 69 | DIN 371/376 | AlTiZrN | Taps for ISO metric threads | HSS-E | Produktiv N-X LH |
| 53735 | 70 | DIN 371/376 | AlTiZrN | Taps for ISO metric threads | HSS-E-PM | Produktiv N-X |
| 53736 | 71 | DIN 371/376 | AlTiZrN | Taps for ISO metric threads | HSS-E-PM | Produktiv N-X |
| 53737 | 72 | DIN 371/376 | AlTiZrN | Taps for ISO metric threads | HSS-E | Produktiv N-X |
| 53738 | 73 | DIN 371/376 | AlTiZrN | Taps for ISO metric threads | HSS-E | Produktiv N-X |
| 53739 | 74 | Company std. | AlTiZrN | Taps for ISO metric threads | HSS-E | Produktiv N-X |
| 53746 | 75 | ~DIN 371/376 | TiAlN-H | Taps for ISO metric threads | HSS-E | Intensiv N-X |
| 53747 | 76 | DIN 371/376 | TiAlN-H | Taps for ISO metric threads | HSS-E | Intensiv N-X LH |
| 53748 | 77 | DIN 371/376 | TiAlN-H | Taps for ISO metric threads | HSS-E-PM | Intensiv N-X |
| 53749 | 78 | DIN 371/376 | TiAlN-H | Taps for ISO metric threads | HSS-E-PM | Intensiv N-X |
| 53750 | 80 | DIN 371/376 | TiAlN-H | Taps for ISO metric threads | HSS-E | Intensiv N-X |
| 53751 | 81 | DIN 371/376 | TiAlN-H | Taps for ISO metric threads | HSS-E | Intensiv N-X |
| 53752 | 82 | Company std. | TiAlN-H | Taps for ISO metric threads | HSS-E | Intensiv N-X |
| 53760 | 79 | DIN 371/376 | TiAlN-H | Taps for ISO metric threads | HSS-E | Intensiv N-X |
| 53770 | 100 | DIN 374 | TiAlN-H | Taps for ISO metric fine threads | HSS-E | Intensiv N-X |
| 53775 | 107 | DIN 5156 | TiAlN-H | Taps for BSP threads | HSS-E | Intensiv N-X |
| 53778 | 93 | DIN 374 | AlTiZrN | Taps for ISO metric fine threads | HSS-E | Produktiv N-X |
| 53779 | 96 | DIN 374 | AlTiZrN | Taps for ISO metric fine threads | HSS-E | Produktiv N-X |
| 53780 | 97 | DIN 374 | TiAlN-H | Taps for ISO metric fine threads | HSS-E | Intensiv N-X |
| 53781 | 101 | DIN 374 | TiAlN-H | Taps for ISO metric fine threads | HSS-E | Intensiv N-X |
| 53782 | 103 | DIN 371/376 | AlTiZrN | Taps for UNC threads | HSS-E | Produktiv N-X |
| 53783 | 104 | DIN 371/376 | TiAlN-H | Taps for UNC threads | HSS-E | Intensiv N-X |
| 53784 | 105 | ~DIN 371/374 | AlTiZrN | Taps for UNF threads | HSS-E | Produktiv N-X |
| 53785 | 106 | ~DIN 371/374 | TiAlN-H | Taps for UNF threads | HSS-E | Intensiv N-X |
| 53789 | 94 | DIN 374 | AlTiZrN | Taps for ISO metric fine threads | HSS-E-PM | Produktiv N-X |
| 53790 | 95 | DIN 374 | AlTiZrN | Taps for ISO metric fine threads | HSS-E-PM | Produktiv N-X |
| 53791 | 98 | DIN 374 | TiAlN-H | Taps for ISO metric fine threads | HSS-E-PM | Intensiv N-X |
| 53792 | 99 | DIN 374 | TiAlN-H | Taps for ISO metric fine threads | HSS-E-PM | Intensiv N-X |

| Catalogue no. | Page | Standard | Surface | Description | Tool material | Type |
|---|---|---|---|---|---|---|
| 53831 | 124 | Company std. | TiCN | Thread milling cutters without chamfer for BSP threads | Solid carbide | TM SP |
| 53832 | 125 | Company std. | TiCN | Universal thread milling cutters for BSP threads | Solid carbide | TMU SP |
| 53840 | 127 | Company std. | TiCN | Micro thread milling cutters for ISO metric threads | Solid carbide | TM SP |
| 53841 | 129 | Company std. | TiCN | Micro thread milling cutters for BSP-threads | Solid carbide | TM SP |
| 53850 | 128 | Company std. | TiAlN | Micro thread milling cutters for ISO metric threads | Solid carbide | TM SP |
| 53860 | 122 | Company std. | TiCN | Thread milling cutters without chamfer for ISO metric threads | Solid carbide | TM SP |
| 53890 | 121 | Company std. | AlCrN | Thread milling cutters with chamfer for ISO metric threads | Solid carbide | TMC-NX SP |
| 53892 | 126 | Company std. | TiCN | Micro thread milling cutters for ISO metric threads | Solid carbide | MTM-NX SP |
| 53948 | 118 | Company std. | TiSiN | Drill thread milling cutters for ISO metric threads | Solid carbide | TMD-NX |
| 53949 | 119 | Company std. | TiSiN | Drill thread milling cutters for UNC/UNF threads | Solid carbide | TMD-NX |
| 53950 | 120 | Company std. | TiSiN | Drill thread milling cutters for BSP threads | Solid carbide | TMD-NX |
| 54302 | 161 | Company std. | TiAlSiN | Torus end mills | Solid carbide | NH |
| 54304 | 159 | Company std. | TiAlSiN | Torus end mills | Solid carbide | H |
| 54305 | 160 | Company std. | TiAlSiN | Torus end mills | Solid carbide | H |
| 54542 | 151 | DIN 6527L | TiAlSiN | SuperF-UT end mills VA-r | Solid carbide | SuperF-UT VA-r |
| 54550 | 148 | DIN 6527L | AlCrN | SuperF-UT end mills N-r | Solid carbide | SuperF-UT N-r |
| 54553 | 147 | Company std. | TiAlN | SuperF-UT end mills NL | Solid carbide | SuperF-UT NL |
| 54555 | 132 | Company std. | AlTiN+ | SuperF-UT milling cutter ZS-r | Solid carbide | SuperF-UT ZS-r |
| 54556 | 145 | DIN 6527L | AlTiN nano | SuperF-UT end mills S | Solid carbide | SuperF-UT S |
| 54560 | 143 | DIN 6527L | ZrN | SuperF-UT end mills Ti | Solid carbide | SuperF-UT Ti |
| 54561 | 144 | DIN 6527L | ZrN | SuperF-UT end mills Ti | Solid carbide | SuperF-UT Ti |
| 54577 | 130 | Company std. | AlTiN+ | SuperF-UT end mills Z | Solid carbide | SuperF-UT Z |
| 54578 | 131 | Company std. | AlTiN+ | SuperF-UT end mills ZS | Solid carbide | SuperF-UT ZS |
| 54581 | 133 | Company std. | AlTiN+ | SuperF-UT end mills ZS-7 | Solid carbide | SuperF-UT ZS-7 |
| 54583 | 134 | Company std. | TiAlN | SuperF-UT end mills N-5 | Solid carbide | SuperF-UT N-5 |
| 54584 | 135 | Company std. | TiAlN | SuperF-UT end mills N-5 | Solid carbide | SuperF-UT N-5 |
| 54585 | 140 | DIN 6527L | TiAlSiN | SuperF-UT milling cutter NX-IK | Solid carbide | SuperF-UT NX-IK |
| 54586 | 137 | Company std. | TiAlSiN | SuperF-UT end mills NX-3 | Solid carbide | SuperF-UT NX-3 |
| 54587 | 138 | Company std. | TiAlSiN | SuperF-UT end mills NX-3 | Solid carbide | SuperF-UT NX-3 |
| 54589 | 139 | DIN 6527K | TiAlSiN | SuperF-UT end mills NX | Solid carbide | SuperF-UT NX |
| 54592 | 156 | Company std. | DLC | SuperF-UT end mills Al-X | Solid carbide | SuperF-UT Al-X |
| 54594 | 141 | Company std. | TiSiN | SuperF-UT end mills NX Micro | Solid carbide | SuperF-UT NX Micro |
| 54595 | 142 | Company std. | TiSiN | SuperF-UT end mills NX Micro | Solid carbide | SuperF-UT NX Micro |
| 61131 | 56 | DIN 1897 | AlTiZrN | Stub drills | HSS-Co | V18 |
| 61232 | 58 | DIN 338 | AlTiZrN | Jobber drills | HSS-Co | V18 |
| 63033 | 83 | DIN 371/ 376 | TiN | Taps for ISO metric threads | HSS-E | Produktiv N |
| 64552 | 146 | DIN 6527L | TiAlZrN | SuperF-UT end mills $N^2$ | Solid carbide | SuperF-UT $N^2$ |
| 64553 | 150 | DIN 6527L | TiAlZrN | SuperF-UT end mills VA-$X^2$ | Solid carbide | SuperF-UT VA-$X^2$ |
| 64560 | 136 | Company std. | TiAlZrN | SuperF-UT-milling cutter $FS^2$ | Solid carbide | SuperF-UT $FS^2$ |
| 65030 | 52 | Company std. | TiN | Gun drills, type SuperT-NXL | Carbide | SuperT-NXL |
| 65031 | 53 | Company std. | TiN | Gun drills, type SuperT-NXL | Carbide | SuperT-NXL |
| 65032 | 54 | Company std. | TiN | Gun drills, type SuperT-NXL | Carbide | SuperT-NXL |
| 65033 | 55 | Company std. | TiN | Gun drills, type SuperT-NXL | Carbide | SuperT-NXL |
| 71018 | 60 | DIN 338 | Bronze-VAP | V16 Twist drills | M42 | V16 |
| 71019 | 62 | DIN 338 | Bronze-VAP | V16 Set of twist drills | M42 | V16 |
| 71020 | 63 | Company std. | | V16-Pocket set (twist drills, taps and countersinks) | | N |
| 71140 | 64 | NAS 907 | bright | Aircraft extension drills, 6 inches long | HSS | N |
| 71141 | 66 | NAS 907 | bright | Aircraft extension drills, 12 inches long | HSS | N |
| 71142 | 65 | NAS 907 | nitrided | Aircraft extension drills, 6 inches long | HSS | N |
| 71143 | 67 | NAS 907 | nitrided | Aircraft extension drills, 12 inches long | HSS | N |
| 71791 | 30 | DIN 6537L | bright | SuperV drills with internal cooling | Solid carbide | SuperV-Al |
| 72874 | 163 | Company std. | AlTiN nano | Solid carbide high-performance reamers | Solid carbide | SuperR-HS-KS |
| 72875 | 164 | Company std. | AlTiN nano | Solid carbide high-performance reamers | Solid carbide | SuperR-HS-KD |
| 73647 | 102 | DIN 374 | nitrided | Taps for ISO metric fine threads | HSS-E | Intensiv H |
| 73661 | 88 | DIN 371 | nitrided | Taps for ISO metric threads | HSS-E | Intensiv H |
| 73664 | 89 | DIN 376 | nitrided | Taps for ISO metric threads | HSS-E | Intensiv H |
| 73830 | 123 | Company std. | TiCN | Thread milling cutters without chamfer for ISO metric threads | Solid carbide | TMU SP |
| 74556 | 153 | Company std. | bright | SuperF-UT end mills Al-L | Solid carbide | SuperF-UT Al-L |
| 74558 | 154 | Company std. | bright | SuperF-UT end mills Al-XL | Solid carbide | SuperF-UT Al-XL |
| 74562 | 155 | Company std. | bright | SuperF-UT end mills Al-r | Solid carbide | SuperF-UT Al-r |
| 78719 | 165 | Company std. | bright | Shrink fit extensions | | |
| 78882 | 157 | Company std. | AlTiN+ | SuperF-UT end mill Z, sets | Solid carbide | SuperF-UT Z |
| 78883 | 158 | DIN 6527L | TiAlZrN | SuperF-UT end mill $N^2$, sets | Solid carbide | SuperF-UT $N^2$ |

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