

FRÄSEN BOHREN MILLING DRILLING



SCHWARZ GmbH
Vollhartmetall Präzisionswerkzeuge

Unsere Leistungen bestehen aus Planung, Konstruktion, 3D-Simulation, Herstellung und Qualitätskontrolle von Präzisionswerkzeugen.

Wir sind spezialisiert auf Dreh- und Fräswerkzeuge, HPC-Fräser und HPC-Bohrer. Gerne verwirklichen wir Ihnen auch spezielle Anfertigungen von Präzisionswerkzeugen.

Our services consist of planning, construction, 3D-simulation, manufacturing and quality control of high precision tools.

We are specialized in Turning, Milling, Threading, HPC Endmills and HPC Drills. We are also happy to realize any wishes for special tools.



In unserem hochmodernen Maschinenpark benutzen wir ausschließlich CNC-Schleifzentren der neusten Generation, von namhaften Herstellern wie Walter und Saake.

Durch Messmaschinen der Firma Zoller, sind wir in der Lage, Ihre Bedürfnisse von Präzisions- und Sonderwerkzeugen so schnell wie möglich zu realisieren.

In our machine park, we exclusively use CNC grinding centers of the latest generation from well-known manufacturers such as Walter and Saake.

Due to our measuring machines from Zoller, we are able to realize your needs of precision

SCHWARZ

SCHWARZ ist ein Hersteller von hochpräzisen und langlebigen Zerspanungswerkzeugen. Namhafte Unternehmen der Automobilbranche sowie Unternehmen aus der Luft- und Raumfahrttechnik zählen zu unseren Kunden. Wir möchten Ihnen unsere Qualität und Technologie näher bringen und stehen Ihnen gerne auch bei der Auswahl und Verwendung unserer Werkzeuge mit Rat und Tat zur Seite.

Unsere Werkzeuge werden nach DIN ISO 9001:2008 gefertigt und erfüllen somit alle Industriestandards. Wir entwickeln sie stetig weiter, damit wir unsere Kunden mit zeitgemäßen Arbeitsmitteln ausstatten können.

SCHWARZ garantiert Ihnen ausgezeichnete Qualität und hohe Standzeiten. Mit dem Kauf unserer Werkzeuge leisten Sie außerdem einen wertvollen Beitrag zum Schutz unserer Umwelt, da wir bei der Herstellung ausschließlich grüne, saubere Technologien einsetzen.

Wir freuen uns darauf, demnächst auch Sie von unserer Kompetenz überzeugen zu dürfen!

***SCHWARZ** is a producer of high-precision and long-lasting cutting tools. Among our customers, there are well-known companies from the automobile industry as well as such from the aerospace technology. We would like to present our quality and technology to you by providing technical support from the choice to the usage of our tools.*

Our tools are produced in accordance with DIN ISO 9001:2008 and thereby all industry standards are fulfilled. Furthermore, they are always in development enabling us to meet our customer's contemporary needs.

***SCHWARZ** guarantees you an excellent quality and very high durability. Buying our tools also means to protect our environment through the exclusive use of clean and green technologies during the production process.*

We look forward to an opportunity to convince you of our competence, too!

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| | |
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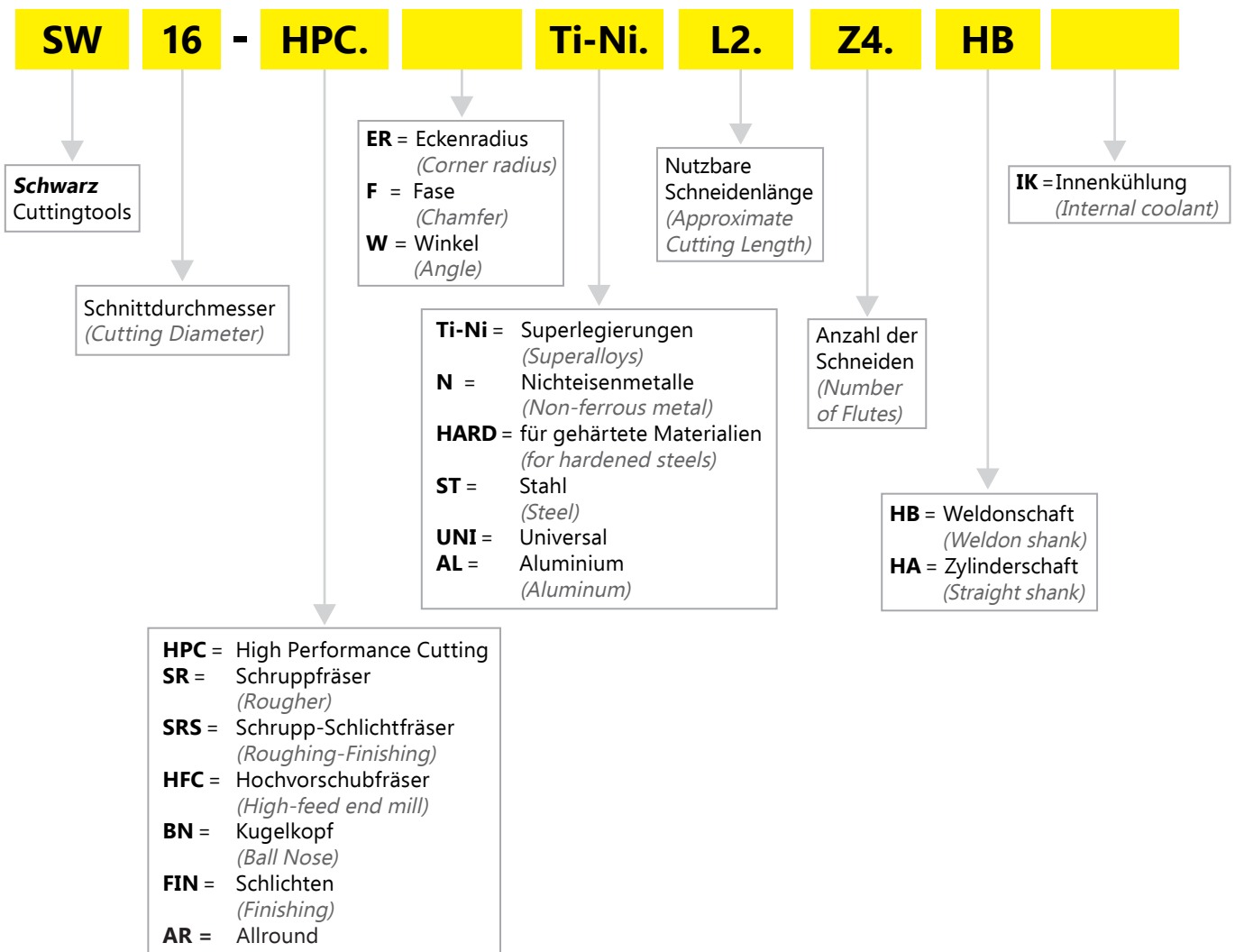


FORCE* *MILL



PRODUKTBEZEICHNUNG (PRODUCT IDENTIFICATION)

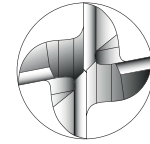
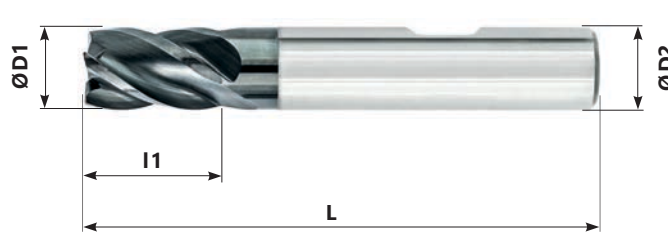
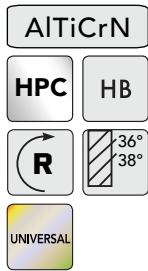
BEISPIEL (EXAMPLE): SW16-HPC.Ti-Ni.L2.Z4.HB



HPC FORCE MILL - SCHAFTFRÄSER KURZE VERSION

ENDMILL SHORT VERSION

SW 1000



Z = 4

HPC-Schaftfräser kurze Version (HPC-endmill short version)

| Bestellcode (Ordering Code) | Bezeichnung (Label) | Maße in mm (Dimensions in mm) | | | |
|--------------------------------|------------------------|-------------------------------|---------|---------|--------|
| | | D1 (h10) | D2 (h6) | L1 (SL) | L (GL) |
| SW1000-0300 | SW3-HPC.L6.Z4.HB | 3 | 6 | 6 | 54 |
| SW1000-0400 | SW4-HPC.L8.Z4.HB | 4 | 6 | 8 | 54 |
| SW1000-0500 | SW5-HPC.L9.Z4.HB | 5 | 6 | 9 | 54 |
| SW1000-0600 | SW6-HPC.L10.Z4.HB | 6 | 6 | 10 | 54 |
| SW1000-0800 | SW8-HPC.L12.Z4.HB | 8 | 8 | 12 | 58 |
| SW1000-1000 | SW10-HPC.L14.Z4.HB | 10 | 10 | 14 | 66 |
| SW1000-1200 | SW12-HPC.L16.Z4.HB | 12 | 12 | 16 | 73 |
| SW1000-1400 | SW14-HPC.L18.Z4.HB | 14 | 14 | 18 | 75 |
| SW1000-1600 | SW16-HPC.L22.Z4.HB | 16 | 16 | 22 | 82 |
| SW1000-1800 | SW18-HPC.L22.Z4.HB | 18 | 18 | 22 | 82 |
| SW1000-2000 | SW20-HPC.L26.Z4.HB | 20 | 20 | 26 | 92 |

Schnittwerte (Cutting data)

| Zu bearbeitendes Material (Material to be machined) | Beispiel (Example) | Zugfestigkeit (Tensile strength) N/mm ² | Schnittgeschwindigkeit (Cutting speed) Vc (m/min) | | |
|---|--|--|---|--------------|------------|
| | | | ae ≤ 0,25 x D | ae ≤ 0,5 x D | ae ≤ 1 x D |
| P Allgem. Baustähle, Einsatzstähle (General structural steels, case steels) | 1.0037, 1.0570, 1.0503, 1.7131 | <850 | 220 | 180 | 150 |
| | Werkzeugstähle, Vergütungsstähle (Tool steels, alloy structural steels) | 1.2367, 1.2379, 1.7225 | <1200 | 160 | 130 |
| M Rostfreie Stähle (Stainless steels) | 1.4034, 1.4301, 1.4305 | <750 | 140 | 100 | - |
| | 1.4435, 1.4571 | <850 | 100 | 80 | - |
| K Grauguß/Sphäroguß (Cast iron / spheroidal graphite) | GG25, GG40, GGG40 | <450 | 200 | 160 | 130 |
| | GGG60, GGG70 | <650 | 160 | 140 | 110 |

Alle Schnittwerte dienen zur Orientierung
(All cutting datas serve to orientation)

Die angegebenen Schnittdaten beziehen sich auf die Bearbeitung mit Kühlmittel
(The mentioned cutting data are recommended for machining with coolant)

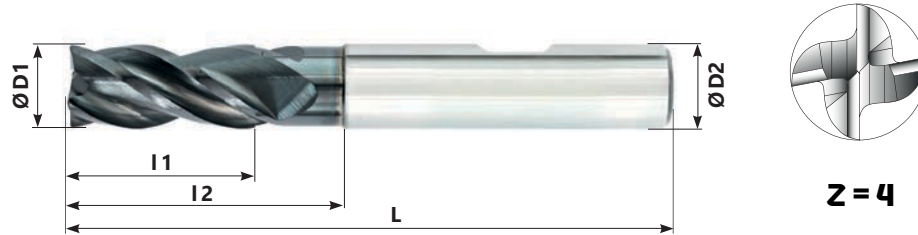
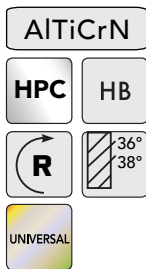
Vorschübe in vorvergüteten und rostfreien Materialien müssen um 25% reduziert werden
(Feed rate has to be reduced by 25% for pre-tempered and stainless steels)

| Ø | Zahnvorschub (Feed per tooth) fz in mm | | |
|----|--|-------|-------|
| 3 | 0,028 | 0,012 | 0,007 |
| 4 | 0,032 | 0,02 | 0,01 |
| 5 | 0,035 | 0,025 | 0,015 |
| 6 | 0,04 | 0,03 | 0,025 |
| 8 | 0,05 | 0,04 | 0,03 |
| 10 | 0,07 | 0,05 | 0,04 |
| 12 | 0,09 | 0,07 | 0,06 |
| 16 | 0,13 | 0,11 | 0,09 |
| 20 | 0,17 | 0,15 | 0,12 |

HPC FORCE MILL - SCHAFTFRÄSER LANGE VERSION

ENDMILL LONG VERSION

SW 2000



HPC-Schaftfräser lange Version (HPC-endmill long version)

| Bestellcode (Ordering Code) | Bezeichnung (Label) | Maße in mm (Dimensions in mm) | | | | |
|--------------------------------|------------------------|-------------------------------|---------|---------|---------|--------|
| | | D1 (h10) | D2 (h6) | I1 (SL) | I2 (FL) | L (GL) |
| SW2000-0300 | SW3-HPC.L8.Z4.HB | 3 | 6 | 8 | 18 | 57 |
| SW2000-0400 | SW4-HPC.11.Z4.HB | 4 | 6 | 11 | 21 | 57 |
| SW2000-0500 | SW5-HPC.L13.Z4.HB | 5 | 6 | 13 | 21 | 57 |
| SW2000-0600 | SW6-HPC.L13.Z4.HB | 6 | 6 | 13 | 21 | 57 |
| SW2000-0700 | SW7-HPC.L19.Z4.HB | 7 | 8 | 19 | 27 | 63 |
| SW2000-0800 | SW8-HPC.L19.Z4.HB | 8 | 8 | 19 | 27 | 63 |
| SW2000-0900 | SW9-HPC.L22.Z4.HB | 9 | 10 | 22 | 32 | 72 |
| SW2000-1000 | SW10-HPC.L22.Z4.HB | 10 | 10 | 22 | 32 | 72 |
| SW2000-1200 | SW12-HPC.L26.Z4.HB | 12 | 12 | 26 | 38 | 83 |
| SW2000-1400 | SW14-HPC.L26.Z4.HB | 14 | 14 | 26 | 38 | 83 |
| SW2000-1600 | SW16-HPC.L32.Z4.HB | 16 | 16 | 32 | 44 | 92 |
| SW2000-1800 | SW18-HPC.L32.Z4.HB | 18 | 18 | 32 | 44 | 92 |
| SW2000-2000 | SW20-HPC.L38.Z4.HB | 20 | 20 | 38 | 54 | 104 |

Schnittwerte (Cutting data)

| Zu bearbeitendes Material (Material to be machined) | Beispiel (Example) | Zugfestigkeit (Tensile strength) N/mm ² | Schnittgeschwindigkeit (Cutting speed) Vc (m/min) | | |
|--|--|--|---|--------------------------|------------------------|
| | | | ap = 1xD ae ≤ 0,25 x D | ap = 1xD ae ≤ 0,5 x D | ap = 1xD ae ≤ 1 x D |
| P Allgem. Baustähle, Einsatzstähle (General structural steels, case steels) | 1.0037, 1.0570, 1.0503, 1.7131 | <850 | 220 | 180 | 150 |
| | Werkzeugstähle, Vergütungsstähle (Tool steels, alloy structural steels) | 1.2367, 1.2379, 1.7225 | <1200 | 160 | 130 |
| M Rostfreie Stähle (Stainless steels) | 1.4034, 1.4301, 1.4305 | <750 | 140 | 100 | - |
| | 1.4435, 1.4571 | <850 | 100 | 80 | - |
| K Grauguß/Sphäroguß (Cast iron / spheroidal graphite) | GG25, GG40, GGG40 | <450 | 200 | 160 | 130 |
| | GGG60, GGG70 | <650 | 160 | 140 | 110 |

Alle Schnittwerte dienen zur Orientierung
(All cutting datas serve to orientation)

Die angegebenen Schnittdaten beziehen sich auf die Bearbeitung mit Kühlmittel
(The mentioned cutting data are recommended for machining with coolant)

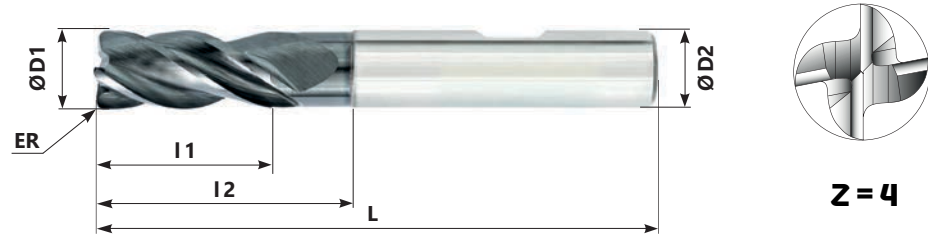
Vorschübe in vorvergüteten und rostfreien Materialien müssen um 25% reduziert werden
(Feed rate has to be reduced by 25% for pre-tempered and stainless steels)

| Ø | Zahnvorschub (Feed per tooth) fz in mm | | |
|----|--|-------|-------|
| 3 | 0,028 | 0,012 | 0,007 |
| 4 | 0,032 | 0,02 | 0,01 |
| 5 | 0,035 | 0,025 | 0,015 |
| 6 | 0,04 | 0,03 | 0,025 |
| 8 | 0,05 | 0,04 | 0,03 |
| 10 | 0,07 | 0,05 | 0,04 |
| 12 | 0,09 | 0,07 | 0,06 |
| 16 | 0,13 | 0,11 | 0,09 |
| 20 | 0,17 | 0,15 | 0,12 |

HPC FORCE MILL - SCHAFTFRÄSER MIT ECKENRADIUS

ENDMILL WITH CORNER RADIUS

SW 3000



HPC-Schaftfräser mit Eckenradius (HPC-endmill with corner radius)

| Bestellcode (Ordering Code) | Bezeichnung (Label) | Maße in mm (Dimensions in mm) | | | | | |
|--------------------------------|---------------------------|-------------------------------|---------|----------|----------|--------|----------|
| | | D1 (h10) | D2 (h6) | I 1 (SL) | I 2 (FL) | L (GL) | ER ±0,02 |
| SW3000-04025 | SW4-HPC.ER0.25.L11.Z4.HB | 4 | 6 | 11 | 20 | 57 | 0,25 |
| SW3000-04050 | SW4-HPC.ER0.50.L11.Z4.HB | 4 | 6 | 11 | 20 | 57 | 0,5 |
| SW3000-05025 | SW5-HPC.ER0.25.L13.Z4.HB | 5 | 6 | 13 | 21 | 57 | 0,25 |
| SW3000-05050 | SW5-HPC.ER0.50.L13.Z4.HB | 5 | 6 | 13 | 21 | 57 | 0,5 |
| SW3000-06050 | SW6-HPC.ER0.50.L13.Z4.HB | 6 | 6 | 13 | 21 | 57 | 0,5 |
| SW3000-06100 | SW6-HPC.ER1.00.L13.Z4.HB | 6 | 6 | 13 | 21 | 57 | 1 |
| SW3000-08050 | SW8-HPC.ER0.50.L19.Z4.HB | 8 | 8 | 19 | 27 | 63 | 0,5 |
| SW3000-08100 | SW8-HPC.ER1.00.L19.Z4.HB | 8 | 8 | 19 | 27 | 63 | 1 |
| SW3000-10050 | SW10-HPC.ER0.50.L22.Z4.HB | 10 | 10 | 22 | 32 | 72 | 0,5 |
| SW3000-10100 | SW10-HPC.ER1.00.L22.Z4.HB | 10 | 10 | 22 | 32 | 72 | 1 |
| SW3000-10200 | SW10-HPC.ER2.00.L22.Z4.HB | 10 | 10 | 22 | 32 | 72 | 2 |
| SW3000-12050 | SW12-HPC.ER0.50.L26.Z4.HB | 12 | 12 | 26 | 38 | 83 | 0,5 |
| SW3000-12100 | SW12-HPC.ER1.00.L26.Z4.HB | 12 | 12 | 26 | 38 | 83 | 1 |
| SW3000-12200 | SW12-HPC.ER2.00.L26.Z4.HB | 12 | 12 | 26 | 38 | 83 | 2 |
| SW3000-16100 | SW16-HPC.ER1.00.321.Z4.HB | 16 | 16 | 32 | 44 | 92 | 1 |
| SW3000-16200 | SW16-HPC.ER2.00.L32.Z4.HB | 16 | 16 | 32 | 44 | 92 | 2 |
| SW3000-20100 | SW20-HPC.ER1.00.L32.Z4.HB | 20 | 20 | 32 | 44 | 104 | 1 |
| SW3000-20200 | SW20-HPC.ER2.00.L32.Z4.HB | 20 | 20 | 32 | 44 | 104 | 2 |
| SW3000-20300 | SW20-HPC.ER3.00.L32.Z4.HB | 20 | 20 | 32 | 44 | 104 | 3 |

Schnittwerte (Cutting data)

| Zu bearbeitendes Material (Material to be machined) | Beispiel (Example) | Zugfestigkeit (Tensile strength) N/mm ² | Schnittgeschwindigkeit (Cutting speed) Vc (m/min) | | |
|--|-----------------------------------|--|---|------------|----------|
| | | | ae ≤ 0,25xD | ae ≤ 0,5xD | ae ≤ 1xD |
| P Allgem. Baustähle, Einsatzstähle (General structural steels, case steels) Werkzeugstähle, Vergütungsstähle (Tool steels, alloy structural steels) | 1.0037, 1.0570, 1.0503, 1.7131 | <850 | 220 | 180 | 150 |
| | 1.2367, 1.2379, 1.7225 | <1200 | 160 | 130 | 100 |
| M Rostfreie Stähle (Stainless steels) | 1.4034, 1.4301, 1.4305 | <750 | 140 | 100 | - |
| | 1.4435, 1.4571 | <850 | 100 | 80 | - |
| K Grauguß/Sphäroguß (Cast iron / spheroidal graphite) | GG25, GG40, GGG40 | <450 | 200 | 160 | 130 |
| | GGG60, GGG70 | <650 | 160 | 140 | 110 |

Alle Schnittwerte dienen zur Orientierung
(All cutting datas serve to orientation)

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(The mentioned cutting data are recommended for machining with coolant)

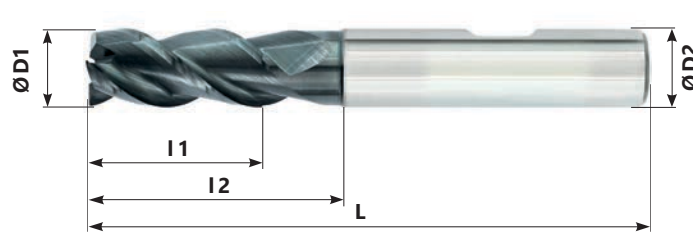
Vorschübe in vorvergüteten und rostfreien Materialien müssen um 25% reduziert werden
(Feed rate has to be reduced by 25% for pre-tempered and stainless steels)

| Ø | Zahnvorschub (Feed per tooth) fz in mm | | |
|----|--|-------|-------|
| 3 | 0,028 | 0,012 | 0,007 |
| 4 | 0,032 | 0,02 | 0,01 |
| 5 | 0,035 | 0,025 | 0,015 |
| 6 | 0,04 | 0,03 | 0,025 |
| 8 | 0,05 | 0,04 | 0,03 |
| 10 | 0,07 | 0,05 | 0,04 |
| 12 | 0,09 | 0,07 | 0,06 |
| 16 | 0,13 | 0,11 | 0,09 |
| 20 | 0,17 | 0,15 | 0,12 |

HPC FORCE MILL - SCHAFTFRÄSER MIT STAHL-GEOMETRIE

ENDMILL WITH STEEL-GEOMETRY

SW 4000



HPC-Schaftfräser mit Stahl-Geometrie (HPC-endmill with steel-geometry)

| Bestellcode (Ordering Code) | Bezeichnung (Label) | Maße in mm (Dimensions in mm) | | | | |
|--------------------------------|------------------------|-------------------------------|---------|---------|---------|--------|
| | | D1 (h10) | D2 (h6) | I1 (SL) | I2 (FL) | L (GL) |
| SW4000-0300 | SW3-HPC.ST.L8.Z3.HB | 3 | 6 | 8 | 18 | 57 |
| SW4000-0400 | SW4-HPC.ST.L11.Z3.HB | 4 | 6 | 11 | 21 | 57 |
| SW4000-0500 | SW5-HPC.ST.L13.Z3.HB | 5 | 6 | 13 | 21 | 57 |
| SW4000-0600 | SW6-HPC.ST.L13.Z3.HB | 6 | 6 | 13 | 21 | 57 |
| SW4000-0700 | SW7-HPC.ST.L19.Z3.HB | 7 | 8 | 19 | 27 | 63 |
| SW4000-0800 | SW8-HPC.ST.L19.Z3.HB | 8 | 8 | 19 | 27 | 63 |
| SW4000-0900 | SW9-HPC.ST.L22.Z3.HB | 9 | 10 | 22 | 32 | 72 |
| SW4000-1000 | SW10-HPC.ST.L22.Z3.HB | 10 | 10 | 22 | 32 | 72 |
| SW4000-1200 | SW12-HPC.ST.L26.Z3.HB | 12 | 12 | 26 | 38 | 83 |
| SW4000-1400 | SW14-HPC.ST.L26.Z3.HB | 14 | 14 | 26 | 38 | 83 |
| SW4000-1600 | SW16-HPC.ST.L32.Z3.HB | 16 | 16 | 32 | 44 | 92 |
| SW4000-1800 | SW18-HPC.ST.L32.Z3.HB | 18 | 18 | 32 | 44 | 92 |
| SW4000-2000 | SW20-HPC.ST.L38.Z3.HB | 20 | 20 | 38 | 54 | 104 |

Schnittwerte (Cutting data)

| Zu bearbeitendes Material (Material to be machined) | Beispiel (Example) | Zugfestigkeit (Tensile strength) N/mm ² | Schnittgeschwindigkeit (Cutting speed) Vc (m/min) | | |
|--|--|--|---|--------------|------------|
| | | | ae ≤ 0,25 x D | ae ≤ 0,5 x D | ae ≤ 1 x D |
| P Allgem. Baustähle, Einsatzstähle (General structural steels, case steels) | 1.0037, 1.0570, 1.0503, 1.7131 | <850 | 220 | 180 | 150 |
| | Werkzeugstähle, Vergütungsstähle (Tool steels, alloy structural steels) | 1.2367, 1.2379, 1.7225 | <1200 | 160 | 130 |
| K Grauguß/Sphäroguß (Cast iron / spheroidal graphite) | GG25, GG40, GGG40 | <450 | 200 | 160 | 130 |
| | GGG60, GGG70 | <650 | 160 | 140 | 110 |

Alle Schnittwerte dienen zur Orientierung
(All cutting datas serve to orientation)

Die angegebenen Schnittdaten beziehen sich auf die Bearbeitung mit Kühlmittel
(The mentioned cutting data are recommended for machining with coolant)

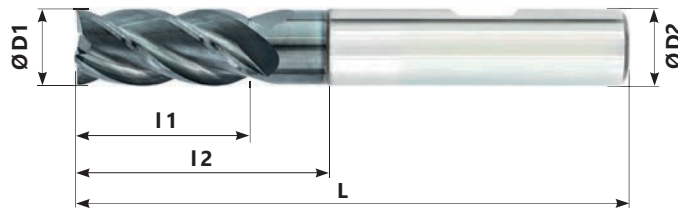
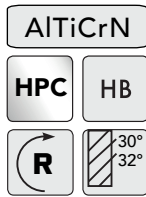
Vorschübe in vorvergüteten und rostfreien Materialien müssen um 25% reduziert werden
(Feed rate has to be reduced by 25% for pre-tempered and stainless steels)

| Ø | Zahnvorschub (Feed per tooth) fz in mm | | |
|----|--|-------|-------|
| 3 | 0,028 | 0,012 | 0,007 |
| 4 | 0,032 | 0,02 | 0,01 |
| 5 | 0,035 | 0,025 | 0,015 |
| 6 | 0,04 | 0,03 | 0,025 |
| 8 | 0,05 | 0,04 | 0,03 |
| 10 | 0,07 | 0,05 | 0,04 |
| 12 | 0,09 | 0,07 | 0,06 |
| 16 | 0,13 | 0,11 | 0,09 |
| 20 | 0,17 | 0,15 | 0,12 |

HPC FORCE MILL - SCHAFTFRÄSER FÜR SUPERLEGIERUNGEN

ENDMILL FOR SUPERALLOYS

SW 5000



Z = 4

HPC-Schaftfräser für Superlegierungen (HPC-endmill for superalloys)

| Bestellcode (Ordering Code) | Bezeichnung (Label) | Maße in mm (Dimensions in mm) | | | | |
|--------------------------------|--------------------------|-------------------------------|---------|---------|---------|--------|
| | | D1 (h10) | D2 (h6) | L1 (SL) | L2 (FL) | L (GL) |
| SW5000-0300 | SW3-HPC.Ti-Ni.L8.Z4.HB | 3 | 6 | 8 | 18 | 57 |
| SW5000-0400 | SW4-HPC.Ti-Ni.L11.Z4.HB | 4 | 6 | 11 | 21 | 57 |
| SW5000-0500 | SW5-HPC.Ti-Ni.13.Z4.HB | 5 | 6 | 13 | 21 | 57 |
| SW5000-0600 | SW6-HPC.Ti-Ni.13.Z4.HB | 6 | 6 | 13 | 21 | 57 |
| SW5000-0700 | SW7-HPC.Ti-Ni.L19.Z4.HB | 7 | 8 | 19 | 27 | 63 |
| SW5000-0800 | SW8-HPC.Ti-Ni.L19.Z4.HB | 8 | 8 | 19 | 27 | 63 |
| SW5000-0900 | SW9-HPC.Ti-Ni.L22.Z4.HB | 9 | 10 | 22 | 32 | 72 |
| SW5000-1000 | SW10-HPC.Ti-Ni.L22.Z4.HB | 10 | 10 | 22 | 32 | 72 |
| SW5000-1200 | SW12-HPC.Ti-Ni.L26.Z4.HB | 12 | 12 | 26 | 38 | 83 |
| SW5000-1400 | SW14-HPC.Ti-Ni.L26.Z4.HB | 14 | 14 | 26 | 38 | 83 |
| SW5000-1600 | SW16-HPC.Ti-Ni.L32.Z4.HB | 16 | 16 | 32 | 44 | 92 |
| SW5000-1800 | SW18-HPC.Ti-Ni.L32.Z4.HB | 18 | 18 | 32 | 44 | 92 |
| SW5000-2000 | SW20-HPC.Ti-Ni.L38.Z4.HB | 20 | 20 | 38 | 54 | 104 |

Schnittwerte (Cutting data)

| Zu bearbeitendes Material (Material to be machined) | Beispiel (Example) | Zugfestigkeit (Tensile strength) N/mm ² | Schnittgeschwindigkeit (Cutting speed) Vc (m/min) | | | |
|--|--|--|---|--------------|------------|----|
| | | | ae ≤ 0,25 x D | ae ≤ 0,5 x D | ae ≤ 1 x D | |
| M | Rostfreie Stähle (Stainless steels) | 1.4034, 1.4301, 1.4305 1.4435, 1.4571 | <750 | 140 | 100 | 80 |
| | Titanlegierungen (Titanium alloys) | 3.7124, 3.7164 | - | 80 | 65 | 55 |
| S | Nickellegierungen (Nickel alloys) | Inconel, Hastelloy, Monel | - | 55 | 50 | 40 |

Alle Schnittwerte dienen zur Orientierung
(All cutting datas serve to orientation)

Die angegebenen Schnittdaten beziehen sich auf die Bearbeitung mit Kühlmittel (The mentioned cutting data are recommended for machining with coolant)

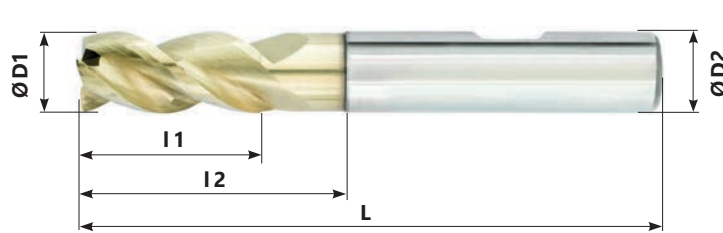
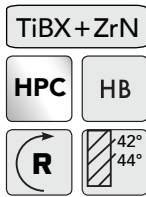
Vorschübe in vorvergüteten und rostfreien Materialien müssen um 25% reduziert werden (Feed rate has to be reduced by 25% for pre-tempered and stainless steels)

| Ø | Zahnvorschub (Feed per tooth) fz in mm | | |
|----|--|-------|-------|
| 3 | 0,02 | 0,012 | 0,007 |
| 4 | 0,025 | 0,015 | 0,01 |
| 5 | 0,03 | 0,022 | 0,015 |
| 6 | 0,035 | 0,025 | 0,02 |
| 8 | 0,05 | 0,04 | 0,03 |
| 10 | 0,065 | 0,055 | 0,045 |
| 12 | 0,075 | 0,065 | 0,055 |
| 16 | 0,1 | 0,08 | 0,07 |
| 20 | 0,12 | 0,1 | 0,08 |

HPC FORCE MILL - SCHAFTFRÄSER FÜR NICHTEISENMETALLE

ENDMILL FOR NON-FERROUS METALS

SW 6000



Z = 3

HPC-Schaftfräser für Nichteisenmetalle (HPC-endmill for non-ferrous metals)

| Bestellcode (Ordering Code) | Bezeichnung (Label) | Maße in mm (Dimensions in mm) | | | | |
|--------------------------------|------------------------|-------------------------------|---------|---------|---------|--------|
| | | D1 (h10) | D2 (h6) | I1 (SL) | I2 (FL) | L (GL) |
| SW6000-0300 | SW3-HPC.N.L8.Z3.HB | 3 | 6 | 8 | 18 | 57 |
| SW6000-0400 | SW4-HPC.N.L11.Z3.HB | 4 | 6 | 11 | 21 | 57 |
| SW6000-0500 | SW5-HPC.N.L13.Z3.HB | 5 | 6 | 13 | 21 | 57 |
| SW6000-0600 | SW6-HPC.N.L13.Z3.HB | 6 | 6 | 13 | 21 | 57 |
| SW6000-0700 | SW7-HPC.N.L19.Z3.HB | 7 | 8 | 19 | 27 | 63 |
| SW6000-0800 | SW8-HPC.N.L19.Z3.HB | 8 | 8 | 19 | 27 | 63 |
| SW6000-0900 | SW9-HPC.N.L22.Z3.HB | 9 | 10 | 22 | 32 | 72 |
| SW6000-1000 | SW10-HPC.N.L22.Z3.HB | 10 | 10 | 22 | 32 | 72 |
| SW6000-1200 | SW12-HPC.N.L26.Z3.HB | 12 | 12 | 26 | 38 | 83 |
| SW6000-1400 | SW14-HPC.N.L26.Z3.HB | 14 | 14 | 26 | 38 | 83 |
| SW6000-1600 | SW16-HPC.N.L32.Z3.HB | 16 | 16 | 32 | 44 | 92 |
| SW6000-1800 | SW18-HPC.N.L32.Z3.HB | 18 | 18 | 32 | 44 | 92 |
| SW6000-2000 | SW20-HPC.N.L38.Z3.HB | 20 | 20 | 38 | 54 | 104 |

Schnittwerte (Cutting data)

| Zu bearbeitendes Material (Material to be machined) | Beispiel (Example) | Schnittgeschwindigkeit (Cutting speed) Vc (m/min) | | | |
|--|---|---|-----|-----|-----|
| | | | | | |
| N Aluminium Si-Gehalt 0,5-9% (Aluminum Si-content 0,5-9%) | 3.1645, 3.2163 | 450 | 380 | 300 | |
| | Aluminium Si-Gehalt 10-15% (Aluminum Si-content 10-15%) | 3.2523 | 350 | 300 | 250 |
| | Kupfer, Messing, Bronze (Copper, brass, bronze) | 2.0321, 2.1030 | 230 | 180 | 150 |

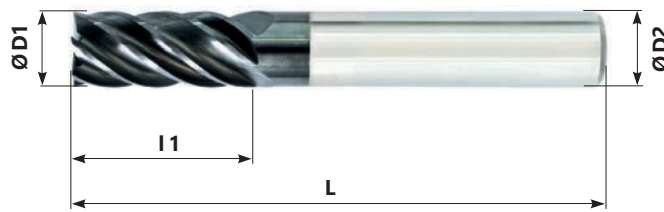
Alle Schnittwerte dienen zur Orientierung
(All cutting datas serve to orientation)

Die angegebenen Schnittdaten beziehen sich auf die Bearbeitung mit Kühlmittel
(The mentioned cutting data are recommended for machining with coolant)

| Ø | Zahnvorschub (Feed per tooth) fz in mm | | |
|----|--|-------|-------|
| 3 | 0,016 | 0,012 | 0,008 |
| 4 | 0,022 | 0,016 | 0,01 |
| 5 | 0,03 | 0,024 | 0,018 |
| 6 | 0,04 | 0,03 | 0,022 |
| 8 | 0,05 | 0,04 | 0,03 |
| 10 | 0,065 | 0,055 | 0,04 |
| 12 | 0,08 | 0,065 | 0,05 |
| 16 | 0,1 | 0,085 | 0,065 |
| 20 | 0,14 | 0,12 | 0,09 |

HPC FORCE MILL - SCHLICHTFRÄSER FINISHING-ENDMILL

SW 7000



Z = 6

HPC-Schlichtfräser (HPC-finishing-endmill)

| Bestellcode (Ordering Code) | Bezeichnung (Label) | Maße in mm (Dimensions in mm) | | | |
|--------------------------------|------------------------|-------------------------------|---------|---------|--------|
| | | D1 (h10) | D2 (h6) | L1 (SL) | L (GL) |
| SW7000-0400 | SW4-HPC.FIN.L14.Z6.HA | 4 | 6 | 14 | 57 |
| SW7000-0500 | SW5-HPC.FIN.L15.Z6.HA | 5 | 6 | 15 | 57 |
| SW7000-0600 | SW6-HPC.FIN.L16.Z6.HA | 6 | 6 | 16 | 57 |
| SW7000-0800 | SW8-HPC.FIN.L20.Z6.HA | 8 | 8 | 20 | 63 |
| SW7000-1000 | SW10-HPC.FIN.L22.Z6.HA | 10 | 10 | 22 | 72 |
| SW7000-1200 | SW12-HPC.FIN.L26.Z6.HA | 12 | 12 | 26 | 83 |
| SW7000-1600 | SW16-HPC.FIN.L32.Z6.HA | 16 | 16 | 32 | 92 |
| SW7000-2000 | SW20-HPC.FIN.L38.Z6.HA | 20 | 20 | 38 | 104 |

Schnittwerte (Cutting data)

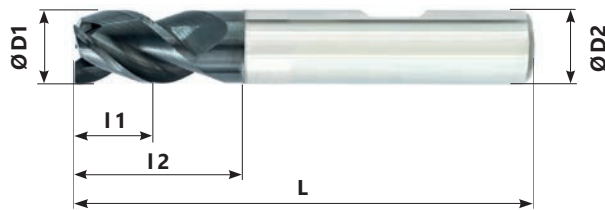
| | Zu bearbeitendes Material (Material to be machined) | Beispiel (Example) | Zugfestigkeit (Tensile strength) N/mm ² | Schnittgeschwindigkeit (Cutting speed) Vc (m/min) |
|----------|--|-----------------------------------|--|---|
| | | | | |
| P | Allgem. Baustähle, Einsatzstähle (General structural steels, case steels) | 1.0037, 1.0570, 1.0503, 1.7131 | <850 | 260 |
| | Werkzeugstähle, Vergütungsstähle (Tool steels, alloy structural steels) | 1.2367, 1.2379, 1.7225 | <1200 | 200 |
| M | Rostfreie Stähle (Stainless steels) | 1.4034, 1.4301, 1.4305 | <750 | 150 |
| | | 1.4435, 1.4571 | <850 | 130 |
| K | Grauguß/Sphäroguß (Cast iron / spheroidal graphite) | GG25, GG40, GGG40 | <450 | 200 |
| | | GGG60, GGG70 | <650 | 160 |
| S | Titanlegierungen (Titanium alloys) | 3.7124, 3.7164 | - | 140 |
| | Nickellegierungen (Nickel alloys) | Inconel, Hastelloy, Monel | - | 75 |
| | | | Ø | Zahnvorschub (Feed per tooth) fz in mm |
| | | | 4 | 0,02 |
| | | | 5 | 0,025 |
| | | | 6 | 0,03 |
| | | | 8 | 0,04 |
| | | | 10 | 0,05 |
| | | | 12 | 0,06 |
| | | | 16 | 0,08 |
| | | | 20 | 0,10 |

Alle Schnittwerte dienen zur Orientierung
(All cutting datas serve to orientation)

Für Sonderlegierungen Vorschübe um 30% reduzieren
(For super-alloys the feed rate has to be reduced by 30%)

UNI FORCE MILL - SCHAFTFRÄSER KURZE VERSION ENDMILL SHORT VERSION

SW 8000



Z = 3

UNI-Schaftfräser kurze Version (UNI-endmill short version)

| Bestellcode (Ordering Code) | Bezeichnung (Label) | Maße in mm (Dimensions in mm) | | | | |
|--------------------------------|------------------------|-------------------------------|---------|---------|---------|--------|
| | | D1 (h10) | D2 (h6) | I1 (SL) | I2 (FL) | L (GL) |
| SW8000-0200 | SW2-SF.UNI.L3.Z3.HB | 2 | 6 | 3 | 12 | 50 |
| SW8000-0250 | SW2.5-SF.UNI.L3.Z3.HB | 2,5 | 6 | 3 | 12 | 50 |
| SW8000-0300 | SW3-SF.UNI.L4.Z3.HB | 3 | 6 | 4 | 12 | 50 |
| SW8000-0350 | SW3.5-SF.UNI.L4.Z3.HB | 3,5 | 6 | 4 | 12 | 50 |
| SW8000-0400 | SW4-SF.UNI.L5.Z3.HB | 4 | 6 | 5 | 16 | 54 |
| SW8000-0450 | SW4.5-SF.UNI.L5.Z3.HB | 4 | 6 | 5 | 16 | 54 |
| SW8000-0500 | SW5-SF.UNI.L6.Z3.HB | 5 | 6 | 6 | 16 | 54 |
| SW8000-0550 | SW5.5-SF.UNI.L6.Z3.HB | 5,5 | 6 | 6 | 16 | 54 |
| SW8000-0575 | SW5.75-SF.UNI.L7.Z3.HB | 5,75 | 6 | 7 | 16 | 54 |
| SW8000-0600 | SW6-SF.UNI.L7.Z3.HB | 6 | 6 | 7 | 16 | 54 |
| SW8000-0675 | SW6.75-SF.UNI.L8.Z3.HB | 6,75 | 8 | 8 | 20 | 58 |
| SW8000-0700 | SW7-SF.UNI.L8.Z3.HB | 7 | 8 | 8 | 20 | 58 |
| SW8000-0775 | SW7.75-SF.UNI.L8.Z3.HB | 7,75 | 8 | 8 | 20 | 58 |
| SW8000-0800 | SW8-SF.UNI.L9.Z3.HB | 8 | 8 | 9 | 20 | 58 |
| SW8000-0870 | SW8.7-SF.UNI.L11.Z3.HB | 8,7 | 10 | 11 | 24 | 66 |
| SW8000-0900 | SW9-SF.UNI.L11.Z3.HB | 9 | 10 | 11 | 24 | 66 |
| SW8000-0970 | SW9.7-SF.UNI.L11.Z3.HB | 9,7 | 10 | 11 | 24 | 66 |
| SW8000-1000 | SW10-SF.UNI.L11.Z3.HB | 10 | 10 | 11 | 24 | 66 |
| SW8000-1200 | SW12-SF.UNI.L12.Z3.HB | 12 | 12 | 12 | 26 | 73 |
| SW8000-1400 | SW14-SF.UNI.L14.Z3.HB | 14 | 14 | 14 | 28 | 75 |
| SW8000-1600 | SW16-SF.UNI.L16.Z3.HB | 16 | 16 | 16 | 32 | 82 |
| SW8000-1800 | SW18-SF.UNI.L18.Z3.HB | 18 | 18 | 18 | 32 | 82 |
| SW8000-2000 | SW20-SF.UNI.L20.Z3.HB | 20 | 20 | 20 | 40 | 92 |

Schnittwerte (Cutting data)

| Zu bearbeitendes Material (Material to be machined) | Beispiel (Example) | Zugfestigkeit (Tensile strength) N/mm ² | Schnittgeschwindigkeit (Cutting speed) Vc (m/min) | | |
|---|--------------------------------|--|---|-----|----|
| | | | | | |
| P Allgem. Baustähle, Einsatzstähle (General structural steels, case steels) Werkzeugstähle, Vergütungsstähle (Tool steels, alloy structural steels) | 1.0037, 1.0570, 1.0503, 1.7131 | <850 | 130 | 110 | 80 |
| | 1.2367, 1.2379, 1.7225 | <1200 | 100 | 85 | 60 |
| M Rostfreie Stähle (Stainless steels) | 1.4034, 1.4301, 1.4305 | <750 | 70 | 60 | 50 |
| | 1.4435, 1.4571 | <850 | 70 | 60 | 50 |
| K Grauguß/Sphäroguß (Cast iron / spheroidal graphite) | GG25, GG40, GGG40 | <450 | 120 | 100 | 80 |
| | GGG60, GGG70 | <650 | 110 | 95 | 70 |

Alle Schnittwerte dienen zur Orientierung
(All cutting datas serve to orientation)

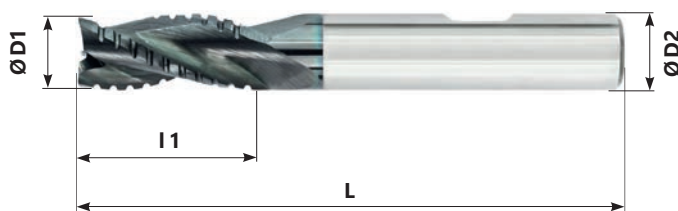
Die angegebenen Schnittdaten beziehen sich auf die Bearbeitung mit Kühlmittel
(The mentioned cutting data are recommended for machining with coolant)

Vorschübe in vorvergüteten und rostfreien Materialien müssen um 25% reduziert werden
(Feed rate has to be reduced by 25% for pre-tempered and stainless steels)

| Ø | Zahnvorschub (Feed per tooth) fz in mm | | |
|----|--|-------|-------|
| 3 | 0,024 | 0,018 | 0,014 |
| 4 | 0,03 | 0,024 | 0,018 |
| 5 | 0,036 | 0,028 | 0,022 |
| 6 | 0,045 | 0,035 | 0,028 |
| 8 | 0,055 | 0,044 | 0,035 |
| 10 | 0,065 | 0,052 | 0,04 |
| 12 | 0,075 | 0,06 | 0,045 |
| 16 | 0,09 | 0,07 | 0,055 |
| 20 | 0,1 | 0,08 | 0,065 |

UNI FORCE MILL - SCHRUPP/SCHLICHTFRÄSER ROUGHING/FINISHING-ENDMILL

SW 9000



Z = 3-4

UNI-Schrupp/Schlichtfräser (UNI-roughing/finishing-endmill)

| Bestellcode (Ordering Code) | Bezeichnung (Label) | Maße in mm (Dimensions in mm) | | | | |
|--------------------------------|------------------------|-------------------------------|---------|---------|--------|----------------|
| | | D1 (h10) | D2 (h6) | I1 (SL) | L (GL) | Zähne (Flutes) |
| SW9000-0600 | SW6-SRS.UNI.L13.Z3.HB | 6 | 6 | 13 | 57 | 3 |
| SW9000-0800 | SW8-SRS.UNI.L19.Z3.HB | 8 | 8 | 19 | 63 | 3 |
| SW9000-1000 | SW10-SRS.UNI.L22.Z4.HB | 10 | 10 | 22 | 72 | 4 |
| SW9000-1200 | SW12-SRS.UNI.L26.Z4.HB | 12 | 12 | 26 | 83 | 4 |
| SW9000-1400 | SW14-SRS.UNI.L26.Z4.HB | 14 | 14 | 26 | 83 | 4 |
| SW9000-1600 | SW16-SRS.UNI.L32.Z4.HB | 16 | 16 | 32 | 92 | 4 |
| SW9000-1800 | SW18-SRS.UNI.L32.Z4.HB | 18 | 18 | 32 | 92 | 4 |
| SW9000-2000 | SW20-SRS.UNI.L38.Z4.HB | 20 | 20 | 38 | 104 | 4 |

Schnittwerte (Cutting data)

| Zu bearbeitendes Material (Material to be machined) | Beispiel (Example) | Zugfestigkeit (Tensile strength) N/mm ² | Schnittgeschwindigkeit (Cutting speed) Vc (m/min) | | | |
|--|--|--|---|--------------|------------|-----|
| | | | ae ≤ 0,25 x D | ae ≤ 0,5 x D | ae ≤ 1 x D | |
| P | Allgem. Baustähle, Einsatzstähle (General structural steels, case steels) | 1.0037, 1.0570, 1.0503, 1.7131 | <850 | 220 | 180 | 150 |
| | Werkzeugstähle, Vergütungsstähle (Tool steels, alloy structural steels) | 1.2367, 1.2379, 1.7225 | <1200 | 160 | 130 | 100 |
| K | Grauguß/Sphäroguß (Cast iron / spheroidal graphite) | GG25, GG40, GGG40 | <450 | 200 | 160 | 130 |
| | | GGG60, GGG70 | <650 | 160 | 140 | 110 |

Alle Schnittwerte dienen zur Orientierung
(All cutting datas serve to orientation)

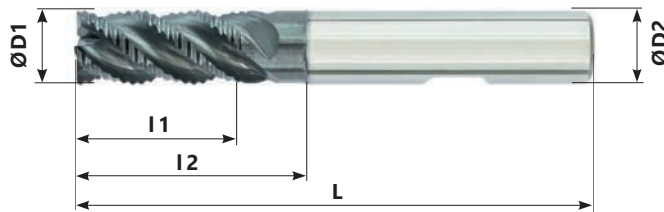
Die angegebenen Schnittdaten beziehen sich auf die Bearbeitung mit Kühlmittel
(The mentioned cutting data are recommended for machining with coolant)

Vorschübe in vorvergüteten und rostfreien Materialien müssen um 25% reduziert werden
(Feed rate has to be reduced by 25% for pre-tempered and stainless steels)

| Ø | Zahnvorschub (Feed per tooth) fz in mm | | |
|----|--|-------|-------|
| 6 | 0,065 | 0,055 | 0,04 |
| 8 | 0,08 | 0,065 | 0,05 |
| 10 | 0,011 | 0,08 | 0,065 |
| 12 | 0,13 | 0,1 | 0,075 |
| 16 | 0,16 | 0,12 | 0,09 |
| 20 | 0,2 | 0,15 | 0,12 |

UNI FORCE MILL - SCHRUPPFRÄSER ROUGHING-ENDMILL

SW 10000



Z = 4-6

UNI-Schruppfräser (UNI-roughing-endmill)

| Bestellcode (Ordering Code) | Bezeichnung (Label) | Maße in mm (Dimensions in mm) | | | | | |
|--------------------------------|------------------------|-------------------------------|---------|---------|---------|--------|----------------|
| | | D1 (h10) | D2 (h6) | I1 (SL) | I2 (FL) | L (GL) | Zähne (Flutes) |
| SW10000-0600 | SW6-SR.UNI.L15.Z4.HB | 6 | 6 | 15 | 20 | 57 | 4 |
| SW10000-0800 | SW8-SR.UNI.L19.Z4.HB | 8 | 8 | 19 | 25 | 63 | 4 |
| SW10000-1000 | SW10-SR.UNI.L22.Z4.HB | 10 | 10 | 22 | 30 | 72 | 4 |
| SW10000-1200 | SW12-SR.UNI.L26.Z4.HB | 12 | 12 | 26 | 36 | 83 | 4 |
| SW10000-1400 | SW14-SR.UNI.L26.Z4.HB | 14 | 14 | 26 | 36 | 83 | 4 |
| SW10000-1600 | SW16-SR.UNI.L32.Z5.HB | 16 | 16 | 32 | 42 | 92 | 5 |
| SW10000-1800 | SW18-SR.UNI.L32.Z5.HB | 18 | 18 | 32 | 42 | 92 | 5 |
| SW10000-2000 | SW20-SR.UNI.L38.Z6.HB | 20 | 20 | 38 | 55 | 104 | 6 |

Schnittwerte (Cutting data)

| Zu bearbeitendes Material (Material to be machined) | Beispiel (Example) | Zugfestigkeit (Tensile strength) N/mm ² | Schnittgeschwindigkeit (Cutting speed) Vc (m/min) | | |
|--|--|--|---|------------------------|----------------------|
| | | | ap = 1xD ae ≤ 0,25xD | ap = 1xD ae ≤ 0,5xD | ap = 1xD ae ≤ 1xD |
| P Allgem. Baustähle, Einsatzstähle (General structural steels, case steels) | 1.0037, 1.0570, 1.0503, 1.7131 | <850 | 180 | 150 | 100 |
| | Werkzeugstähle, Vergütungsstähle (Tool steels, alloy structural steels) | 1.2367, 1.2379, 1.7225 | <1200 | 130 | 110 |
| M Rostfreie Stähle (Stainless steels) | 1.4034, 1.4301, 1.4305 | <750 | 80 | 60 | - |
| | 1.4435, 1.4571 | <850 | 70 | 55 | - |
| K Grauguß/Sphäroguß (Cast iron / spheroidal graphite) | GG25, GG40, GGG40 | <450 | 150 | 120 | 90 |
| | GGG60, GGG70 | <650 | 130 | 110 | 80 |

Alle Schnittwerte dienen zur Orientierung
(All cutting datas serve to orientation)

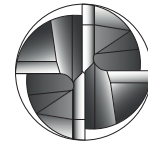
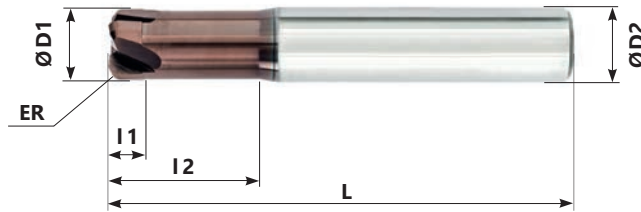
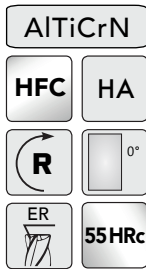
Die angegebenen Schnittdaten beziehen sich auf die Bearbeitung mit Kühlmittel
(The mentioned cutting data are recommended for machining with coolant)

Vorschübe in vorvergüteten und rostfreien Materialien müssen um 25% reduziert werden
(Feed rate has to be reduced by 25% for pre-tempered and stainless steels)

| Ø | Zahnvorschub (Feed per tooth) fz in mm | | |
|----|--|-------|-------|
| 6 | 0,065 | 0,055 | 0,04 |
| 8 | 0,08 | 0,065 | 0,05 |
| 10 | 0,011 | 0,08 | 0,065 |
| 12 | 0,13 | 0,1 | 0,075 |
| 16 | 0,16 | 0,12 | 0,09 |
| 20 | 0,2 | 0,15 | 0,12 |

HFC FORCE MILL - HOCHVORSCHUBFRÄSER HIGH-FEED-ENDMILL

SW 11000



Z = 4

HFC-Hochvorschubfräser (High-feed-endmill)

| Bestellcode (Ordering Code) | Bezeichnung (Label) | Maße in mm (Dimensions in mm) | | | | | |
|--------------------------------|----------------------------|-------------------------------|---------|---------|---------|--------|----------|
| | | D1 (h10) | D2 (h6) | I1 (SL) | I2 (FL) | L (GL) | ER ±0,02 |
| SW11000-03075 | SW3-HFC.ER0.75.Z4.L1.2.HA | 3 | 6 | 1,2 | 8 | 50 | 0,75 |
| SW11000-04100 | SW4-HFC.ER1.00.Z4.L1.6.HA | 4 | 6 | 1,6 | 10 | 50 | 1 |
| SW11000-05125 | SW5-HFC.ER1.25.Z4.L2.0.HA | 5 | 6 | 2 | 12 | 50 | 1,25 |
| SW11000-06100 | SW6-HFC.ER1.00.Z4.L2.5.HA | 6 | 6 | 2,5 | 12 | 50 | 1 |
| SW11000-06150 | SW6-HFC.ER1.50.Z4.L2.5.HA | 6 | 6 | 2,5 | 12 | 50 | 1,5 |
| SW11000-08100 | SW8-HFC.ER1.00.Z4.L.5.HA | 8 | 8 | 3,5 | 16 | 60 | 1 |
| SW11000-08200 | SW8-HFC.ER2.00.Z4.L.5.HA | 8 | 8 | 3,5 | 16 | 60 | 2 |
| SW11000-10100 | SW10-HFC.ER1.00.Z4.L4.0.HA | 10 | 10 | 4 | 17 | 72 | 1 |
| SW11000-10200 | SW10-HFC.ER2.00.Z4.L4.0.HA | 10 | 10 | 4 | 17 | 72 | 2 |
| SW11000-10250 | SW10-HFC.ER2.50.Z4.L4.5.HA | 10 | 10 | 4,5 | 17 | 72 | 2,5 |
| SW11000-12200 | SW12-HFC.ER2.00.Z4.L5.0.HA | 12 | 12 | 5 | 24 | 75 | 2 |
| SW11000-12300 | SW12-HFC.ER3.00.Z4.L5.0.HA | 12 | 12 | 5 | 24 | 75 | 3 |

1. Nur mit hochgenauen Maschinen und Werkzeugaufnahmen zu verwenden
(Only use with high precise machines and tool holders)
2. Mit Luft oder Minimalmengenschmierung MMS kühlen
(Use air blow or minimum oil mist cooling MQL)
3. Empfohlene Fräsmethode: Gleichlaufräsen
(Down milling is recommended in side milling)
4. Wählen Sie die möglichst kürzeste Auskraglänge
(Use the shortest possible overhang)
5. Für Auskraglängen L/D > 4 bitte folgende Korrekturfaktoren verwenden
(For overhang L/D > 4 please use correction value as shown below)

| L/D | V _c | a _e | f |
|---------|----------------|----------------|-----|
| L/D = 5 | 80% | 80% | 80% |
| L/D = 6 | 60% | 60% | 60% |

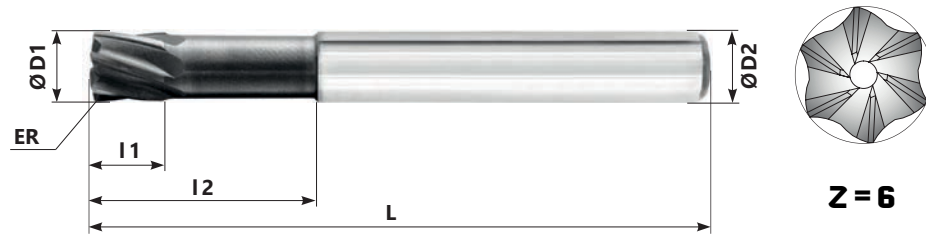
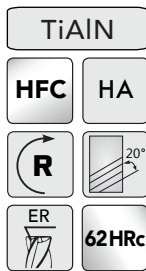
Schnittwerte (Cutting data)

| Zu bearbeitendes Material (Material to be machined) | Härte (Hardness) HRc | Schnittgeschwindigkeit (Cutting speed) V _c m/min | Vorschub f mm/U (Feed rate f mm/rev) | | | | | | | max.ap (mm) |
|---|----------------------------|--|---|------|------|-----|-----|-----|-----|----------------|
| | | | Ø3 | Ø4 | Ø5 | Ø6 | Ø8 | Ø10 | Ø12 | |
| Grauguß, Kohlenstoffstahl, Leg. Stahl (Gray cast iron, carbon steel, Leg. steel) | <30 | 100 | 0,6 | 0,8 | 1,1 | 1,3 | 1,5 | 2,0 | 2,5 | 0,5 |
| | <40 | 80 | 0,5 | 0,7 | 1,0 | 1,2 | 1,4 | 1,8 | 2,3 | 0,5 |
| Vergütete Stähle (Tempered steels) | <45 | 65 | 0,5 | 0,65 | 0,9 | 1,0 | 1,3 | 1,7 | 2,2 | 0,5 |
| | <50 | 50 | 0,4 | 0,55 | 0,75 | 0,9 | 1,1 | 1,5 | 1,9 | 0,4 |
| | <55 | 30 | 0,3 | 0,4 | 0,6 | 0,7 | 0,9 | 1,1 | 1,4 | 0,2 |

Alle Schnittwerte dienen zur Orientierung
(All cutting datas serve to orientation)

HFC FORCE MILL - HOCHVORSCHUBFRÄSER HIGH-FEED-ENDMILL

SW 11500



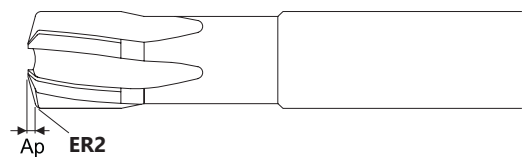
HFC-Hochvorschubfräser (High-feed-endmill)

| Bestellcode (Ordering Code) | Bezeichnung (Label) | Maße in mm (Dimensions in mm) | | | | | | |
|--------------------------------|------------------------|-------------------------------|---------|---------|---------|--------|------|------|
| | | D1 (h10) | D2 (h6) | I1 (SL) | I2 (FL) | L (GL) | ER | ER2 |
| SW11500-0600 | SW6-HFC.Z6.L4.8.HA | 6 | 6 | 4,8 | 18 | 63 | 0,63 | 0,37 |
| SW11500-0800 | SW8-HFC.Z6.L6.4.HA | 8 | 8 | 6,4 | 24 | 76 | 0,83 | 0,50 |
| SW11500-1000 | SW10-HFC.Z6.L8.0.HA | 10 | 10 | 8 | 30 | 89 | 1,04 | 0,62 |
| SW11500-1200 | SW12-HFC.Z6.L9.6.HA | 12 | 12 | 9,6 | 36 | 100 | 1,24 | 0,75 |
| SW11500-1600 | SW16-HFC.Z6.L12.8.HA | 16 | 16 | 12,8 | 48 | 110 | 1,66 | 1,00 |
| SW11500-2000 | SW20-HFC.Z6.L16.0.HA | 20 | 20 | 16 | 60 | 125 | 2,07 | 1,25 |

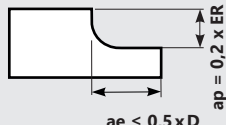
| Angaben zur Bearbeitung (Angaben zur Bearbeitung) | | Ø6 | Ø8 | Ø10 | Ø12 | Ø16 | Ø20 |
|---|----------------------------------|------|-------|-------|-------|-------|-------|
| Max.Ap (mm) | - | 0,32 | 0,42 | 0,53 | 0,63 | 0,84 | 1,05 |
| Kreisinterpolation (Circular Interpolation) | Min. Durchmesser (Min. Diameter) | 8,64 | 11,52 | 14,40 | 17,28 | 23,04 | 28,80 |
| | Max. Durchmesser (Max. Diameter) | 12 | 16 | 20 | 24 | 32 | 40 |

- Nur mit hochgenauen Maschinen und Werkzeugaufnahmen zu verwenden
(Only use with high precise machines and tool holders)
- Mit Luft oder Minimalmengenschmierung MMS kühlen
(Use air blow or minimum oil mist cooling MQL)
- Empfohlene Fräsmethode: Gleichaufräsen
(Down milling is recommended in side milling)
- Wählen Sie die möglichst kürzeste Auskraglänge
(Use the shortest possible overhang)
- Für Auskraglängen $L/D > 4$ bitte folgende Korrekturfaktoren verwenden
(For overhang $L/D > 4$ please use correction value as shown below)

| L/D | Vc | ae | f |
|---------|-----|-----|-----|
| L/D = 5 | 80% | 80% | 80% |
| L/D = 6 | 60% | 60% | 60% |



Schnittwerte (Cutting data)

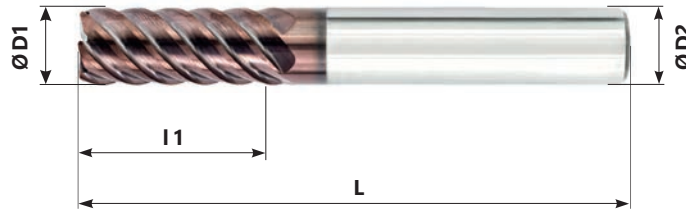
| Zu bearbeitendes Material (Material to be machined) | Härte (Hardness) HRC | Schnittgeschwindigkeit (Cutting speed) Vc m/min  | Vorschub f mm/U (Feed rate f mm/rev) | | | | | |
|--|----------------------------|--|---|------|------|------|------|------|
| | | | Ø6 | Ø8 | Ø10 | Ø12 | Ø16 | Ø20 |
| Vergütete Stähle (Tempered steels) | 48 - 52 | 100 - 120 | 0,20 | 0,25 | 0,30 | 0,40 | 0,50 | 0,60 |
| | 52 - 62 | 70 - 100 | 0,15 | 0,20 | 0,25 | 0,30 | 0,40 | 0,50 |

Alle Schnittwerte dienen zur Orientierung
(All cutting datas serve to orientation)

FORCE MILL - SCHAFTFRÄSER FÜR GEHÄRTETE MATERIALIEN

ENDMILL FOR HARDENED MATERIALS

SW 12000



Z = 6-8

Schaftfräser für gehärtete Materialien (Endmill for hardened materials)

| Bestellcode (Ordering Code) | Bezeichnung (Label) | Maße in mm (Dimensions in mm) | | | | |
|--------------------------------|------------------------|-------------------------------|---------|---------|--------|----------------|
| | | D1 (h10) | D2 (h6) | L1 (SL) | L (GL) | Zähne (Flutes) |
| SW12000-0400 | SW4-SF.HARD.L11.Z6.HA | 4 | 6 | 11 | 57 | 6 |
| SW12000-0500 | SW5-SF.HARD.L13.Z6.HA | 5 | 6 | 13 | 57 | 6 |
| SW12000-0600 | SW6-SF.HARD.L13.Z6.HA | 6 | 6 | 13 | 57 | 6 |
| SW12000-0800 | SW8-SF.HARD.L19.Z6.HA | 8 | 8 | 19 | 63 | 6 |
| SW12000-1000 | SW10-SF.HARD.L22.Z6.HA | 10 | 10 | 22 | 72 | 6 |
| SW12000-1200 | SW12-SF.HARD.L26.Z6.HA | 12 | 12 | 26 | 83 | 6 |
| SW12000-1400 | SW14-SF.HARD.L26.Z6.HA | 14 | 14 | 26 | 83 | 6 |
| SW12000-1600 | SW16-SF.HARD.L32.Z6.HA | 16 | 16 | 32 | 92 | 8 |
| SW12000-1800 | SW18-SF.HARD.L32.Z8.HA | 18 | 18 | 32 | 92 | 8 |
| SW12000-2000 | SW20-SF.HARD.L38.Z8.HA | 20 | 20 | 38 | 104 | 8 |

Schnittwerte (Cutting data)

| Zu bearbeitendes Material (Material to be machined) | Härte (Hardness) HRc | Schnittgeschwindigkeit (Cutting speed) Vc (m/min) | |
|--|----------------------------|---|--|
| | | | |
| H Gehärtete Stähle (Hardened steels) | 46 - 55 | 60 | |
| | 56 - 60 | 45 | |
| | 61 - 65 | 35 | |
| | 65 - 70 | 25 | |

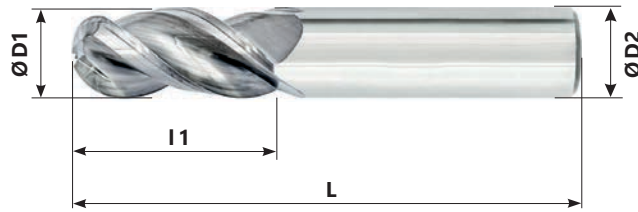
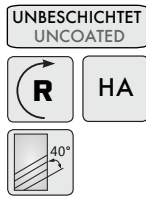
Alle Schnittwerte dienen zur Orientierung
(All cutting datas serve to orientation)

| Ø | Zahnvorschub (Feed per tooth) fz in mm |
|----|--|
| 4 | 0,026 |
| 5 | 0,032 |
| 6 | 0,04 |
| 8 | 0,05 |
| 10 | 0,06 |
| 12 | 0,07 |
| 16 | 0,085 |
| 20 | 0,1 |

BN-N-FORCE MILL - KUGELKOPFFRÄSER FÜR NICHTEISENMETALLE

BALLNOSE ENDMILL FOR NON FERROUS METALS

SW 13000



Z = 3

BN-N-Kugelkopffräser für Nichteisenmetalle (Ballnose endmill for non ferrous metals)

| Bestellcode (Ordering Code) | Bezeichnung (Label) | Maße in mm (Dimensions in mm) | | | |
|--------------------------------|------------------------|-------------------------------|---------|---------|--------|
| | | D1 (e8) | D2 (h6) | l1 (SL) | L (GL) |
| SW13000-0300 | SW3-BN.N.L12.Z3.HA | 3 | 3 | 12 | 38 |
| SW13000-0400 | SW4-BN.N.L15.Z3.HA | 4 | 4 | 15 | 51 |
| SW13000-0500 | SW5-BN.N.L20.Z3.HA | 5 | 5 | 20 | 64 |
| SW13000-0600 | SW6-BN.N.L20.Z3.HA | 6 | 6 | 20 | 64 |
| SW13000-0800 | SW8-BN.N.L20.Z3.HA | 8 | 8 | 20 | 64 |
| SW13000-1000 | SW10-BN.N.L25.Z3.HA | 10 | 10 | 25 | 70 |
| SW13000-1200 | SW12-BN.N.L25.Z3.HA | 12 | 12 | 25 | 76 |
| SW13000-1600 | SW16-BN.N.L35.Z3.HA | 16 | 16 | 35 | 89 |

Schnittwerte (Cutting data)

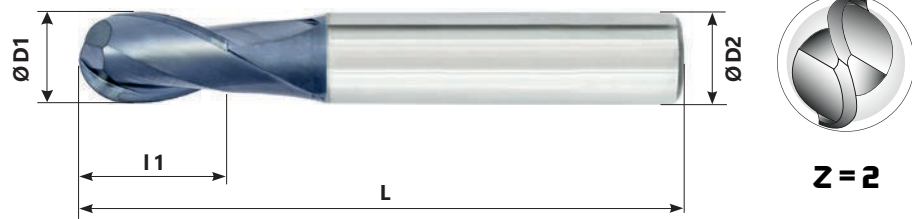
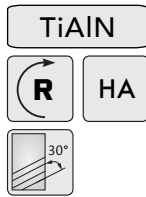
| Zu bearbeitendes Material (Material to be machined) | Beispiel (Example) | Schnittgeschwindigkeit (Cutting speed) Vc (m/min) | | | |
|--|--|---|--------------|------------|------------|
| | | ae ≤ 0,25 x D | ae ≤ 0,5 x D | ae ≤ 1 x D | |
| N | Aluminium Si-Gehalt 0,5-9 % (Aluminum Si-content 0,5-9 %) | 3.1645, 3.2163 | 500 - 2000 | 500 - 2000 | 500 - 2000 |
| | Aluminium Si-Gehalt 10-15 % (Aluminum Si-content 10-15 %) | 3.2523 | 500 - 1500 | 500 - 1500 | 500 - 1500 |
| | Kupfer, Messing, Bronze (Copper, brass, bronze) | 2.0321, 2.1030 | - | - | - |

| Ø | Zahnvorschub (Feed per tooth) fz in mm | |
|----|--|-------|
| 3 | - | 0,032 |
| 4 | - | 0,041 |
| 5 | - | 0,049 |
| 6 | - | 0,060 |
| 8 | - | 0,080 |
| 10 | - | 0,100 |
| 12 | - | 0,120 |
| 16 | - | 0,160 |

Alle Schnittwerte dienen zur Orientierung
(All cutting datas serve to orientation)

BN-UNI-FORCE MILL - KUGELKOPFFRÄSER BALLNOSE ENDMILL

SW 14000



BN-UNI-Kugelkopffräser (Ballnose endmill)

| Bestellcode (Ordering Code) | Bezeichnung (Label) | Maße in mm (Dimensions in mm) | | | |
|--------------------------------|------------------------|-------------------------------|---------|---------|--------|
| | | D1 (h10) | D2 (h6) | l1 (SL) | L (GL) |
| SW14000-0100 | SW1-BN.UNI.L3.Z2.HA | 1 | 3 | 3 | 39 |
| SW14000-0150 | SW1.5-BN.UNI.L5.Z2.HA | 1,5 | 3 | 5 | 39 |
| SW14000-0200 | SW2-BN.UNI.L7.Z2.HA | 2 | 3 | 7 | 39 |
| SW14000-0250 | SW2.5-BN.UNI.L7.Z2.HA | 2,5 | 3 | 7 | 39 |
| SW14000-0300 | SW3-BN.UNI.L9.Z2.HA | 3 | 3 | 9 | 39 |
| SW14000-0400 | SW4-BN.UNI.L14.Z2.HA | 4 | 4 | 14 | 51 |
| SW14000-0500 | SW5-BN.UNI.L16.Z2.HA | 5 | 6 | 16 | 51 |
| SW14000-0600 | SW6-BN.UNI.L19.Z2.HA | 6 | 6 | 19 | 51 |
| SW14000-0800 | SW8-BN.UNI.L21.Z2.HA | 8 | 8 | 21 | 63 |
| SW14000-1000 | SW10-BN.UNI.L22.Z2.HA | 10 | 10 | 22 | 76 |
| SW14000-1200 | SW12-BN.UNI.L25.Z2.HA | 12 | 12 | 25 | 76 |
| SW14000-1400 | SW14-BN.UNI.L30.Z2.HA | 14 | 14 | 30 | 89 |
| SW14000-1600 | SW16-BN.UNI.L32.Z2.HA | 16 | 16 | 32 | 89 |
| SW14000-1800 | SW18-BN.UNI.L35.Z2.HA | 18 | 18 | 35 | 102 |
| SW14000-2000 | SW20-BN.UNI.L38.Z2.HA | 20 | 20 | 38 | 102 |
| SW14000-2200 | SW22-BN.UNI.L38.Z2.HA | 22 | 22 | 38 | 102 |
| SW14000-2500 | SW25-BN.UNI.L38.Z2.HA | 25 | 25 | 38 | 102 |

Schnittwerte (Cutting data)

| Zu bearbeitendes Material (Material to be machined) | Beispiel (Example) | Zugfestigkeit (Tensile strength) N/mm ² | Schnittgeschwindigkeit (Cutting speed) Vc (m/min) | | |
|--|--------------------------------|--|---|------------|-----------|
| | | | ae ≤ 0,25xD | ae ≤ 0,5xD | ae ≤ 1xD |
| P Allgem. Baustähle, Einsatzstähle (General structural steels, case steels) | 1.0037, 1.0570, 1.0503, 1.7131 | <850 | 150 - 200 | 150 - 200 | 150 - 200 |
| | 1.2367, 1.2379, 1.7225 | <1200 | 150 - 200 | 150 - 200 | 150 - 200 |
| K Grauguß/Sphäroguß (Cast iron / spheroidal graphite) | GG25, GG40, GGG40 | <450 | 80 - 160 | 80 - 160 | 80 - 160 |
| | GGG60, GGG70 | <650 | 80 - 160 | 80 - 160 | 80 - 160 |

Alle Schnittwerte dienen zur Orientierung
(All cutting datas serve to orientation)

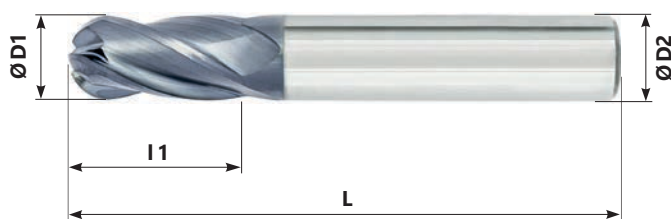
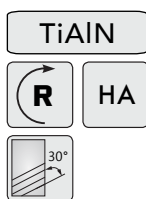
Die angegebenen Schnittdaten beziehen sich auf die Bearbeitung mit Kühlmittel
(The mentioned cutting data are recommended for machining with coolant)

Vorschübe in vorvergüteten und rostfreien Materialien müssen um 25% reduziert werden
(Feed rate has to be reduced by 25% for pre-tempered and stainless steels)

| Ø | Zahnvorschub (Feed per tooth) fz in mm | | |
|----|--|-------|------|
| 3 | 0,050 | 0,050 | 0,03 |
| 6 | 0,060 | 0,060 | 0,04 |
| 8 | 0,080 | 0,080 | 0,05 |
| 10 | 0,080 | 0,080 | 0,05 |
| 12 | 0,100 | 0,100 | 0,07 |
| 16 | 0,100 | 0,100 | 0,07 |
| 20 | 0,100 | 0,100 | 0,07 |
| 25 | 0,100 | 0,100 | 0,07 |

BN-UNI-FORCE MILL - KUGELKOPFFRÄSER BALLNOSE ENDMILL

SW 15000



Z = 4

BN-UNI-Kugelkopffräser (Ballnose endmill)

| Bestellcode (Ordering Code) | Bezeichnung (Label) | Maße in mm (Dimensions in mm) | | | |
|--------------------------------|------------------------|-------------------------------|---------|---------|--------|
| | | D1 (h10) | D2 (h6) | L1 (SL) | L (GL) |
| SW15000-0100 | SW1.BN.UNI.L3.Z4.HA | 1 | 3 | 3 | 39 |
| SW15000-0150 | SW1.5.BN.UNI.L5.Z4.HA | 1,5 | 3 | 5 | 39 |
| SW15000-0200 | SW2.BN.UNI.L7.Z4.HA | 2 | 3 | 7 | 39 |
| SW15000-0250 | SW2.5.BN.UNI.L7.Z4.HA | 2,5 | 3 | 7 | 39 |
| SW15000-0300 | SW3.BN.UNI.L9.Z4.HA | 3 | 3 | 9 | 39 |
| SW15000-0400 | SW4.BN.UNI.L14.Z4.HA | 4 | 4 | 14 | 51 |
| SW15000-0500 | SW5.BN.UNI.L16.Z4.HA | 5 | 6 | 16 | 51 |
| SW15000-0600 | SW6.BN.UNI.L19.Z4.HA | 6 | 6 | 19 | 51 |
| SW15000-0800 | SW8.BN.UNI.L21.Z4.HA | 8 | 8 | 21 | 63 |
| SW15000-1000 | SW10.BN.UNI.L22.Z4.HA | 10 | 10 | 22 | 76 |
| SW15000-1200 | SW12.BN.UNI.L25.Z4.HA | 12 | 12 | 25 | 76 |
| SW15000-1400 | SW14.BN.UNI.L30.Z4.HA | 14 | 14 | 30 | 89 |
| SW15000-1600 | SW16.BN.UNI.L32.Z4.HA | 16 | 16 | 32 | 89 |
| SW15000-1800 | SW18.BN.UNI.L35.Z4.HA | 18 | 18 | 35 | 102 |
| SW15000-2000 | SW20.BN.UNI.L38.Z4.HA | 20 | 20 | 38 | 102 |
| SW15000-2200 | SW22.BN.UNI.L38.Z4.HA | 22 | 22 | 38 | 102 |
| SW15000-2500 | SW25.BN.UNI.L38.Z4.HA | 25 | 25 | 38 | 102 |

Schnittwerte (Cutting data)

| Zu bearbeitendes Material (Material to be machined) | Beispiel (Example) | Zugfestigkeit (Tensile strength) N/mm ² | Schnittgeschwindigkeit (Cutting speed) Vc (m/min) | | |
|--|--|--|---|------------------------|----------------------|
| | | | ap = 1xD ae ≤ 0,25xD | ap = 1xD ae ≤ 0,5xD | ap = 1xD ae ≤ 1xD |
| P Allgem. Baustähle, Einsatzstähle (General structural steels, case steels) | 1.0037, 1.0570, 1.0503, 1.7131 | <850 | 150 - 200 | 150 - 200 | 150 - 200 |
| | Werkzeugstähle, Vergütungsstähle (Tool steels, alloy structural steels) | 1.2367, 1.2379, 1.7225 | <1200 | 150 - 200 | 150 - 200 |
| K Grauguß/Sphäroguß (Cast iron / spheroidal graphite) | GG25, GG40, GGG40 | <450 | 80 - 160 | 80 - 160 | 80 - 160 |
| | GGG60, GGG70 | <650 | 80 - 160 | 80 - 160 | 80 - 160 |

Alle Schnittwerte dienen zur Orientierung
(All cutting datas serve to orientation)

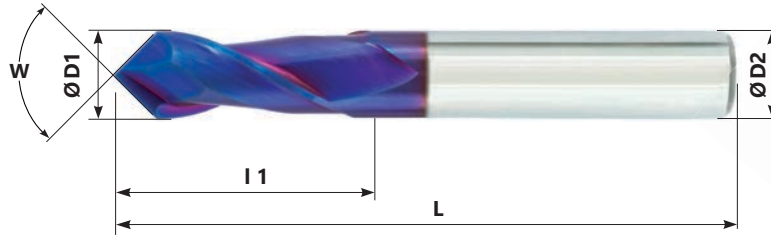
Die angegebenen Schnittdaten beziehen sich auf die Bearbeitung mit Kühlmittel
(The mentioned cutting data are recommended for machining with coolant)

Vorschübe in vorvergüteten und rostfreien Materialien müssen um 25% reduziert werden
(Feed rate has to be reduced by 25% for pre-tempered and stainless steels)

| Ø | Zahnvorschub (Feed per tooth) fz in mm | | |
|----|--|-------|------|
| 3 | 0,050 | 0,050 | 0,03 |
| 6 | 0,060 | 0,060 | 0,04 |
| 8 | 0,080 | 0,080 | 0,05 |
| 10 | 0,080 | 0,080 | 0,05 |
| 12 | 0,100 | 0,100 | 0,07 |
| 16 | 0,100 | 0,100 | 0,07 |
| 20 | 0,100 | 0,100 | 0,07 |
| 25 | 0,100 | 0,100 | 0,07 |

AR-UNI-FORCE MILL - ALLROUND-WERKZEUG ALLROUND-TOOL

SW 16000



AR-UNI - Allround-Werkzeug (Allround-Tool)

| Bestellcode (Ordering Code) | Bezeichnung (Label) | Maße in mm (Dimensions in mm) | | | | | |
|--------------------------------|------------------------|-------------------------------|---------|----------|--------|-----|-----|
| | | D1 (h10) | D2 (h6) | I 1 (SL) | L (GL) | W | T |
| SW16000-03W60 | SW3-AR.W60.L6.Z2.HA | 3,0 | 4 | 6,0 | 51 | 60° | 0,3 |
| SW16000-04W60 | SW4-AR.W60.L8.Z2.HA | 4,0 | 5 | 8,0 | 51 | 60° | 0,4 |
| SW16000-05W60 | SW5-AR.W60.L10.Z2.HA | 5,0 | 6 | 10,0 | 58 | 60° | 0,5 |
| SW16000-06W60 | SW6-AR.W60.L12.Z2.HA | 6,0 | 8 | 12,0 | 64 | 60° | 0,6 |
| SW16000-08W60 | SW8-AR.W60.L16.Z2.HA | 8,0 | 10 | 16,0 | 73 | 60° | 0,8 |
| SW16000-10W60 | SW10-AR.W60.L18.Z2.HA | 10,0 | 12 | 18,0 | 84 | 60° | 1,0 |
| SW16000-12W60 | SW12-AR.W60.L20.Z2.HA | 12,0 | 12 | 20,0 | 84 | 60° | 1,2 |

| Bestellcode (Ordering Code) | Bezeichnung (Label) | Maße in mm (Dimensions in mm) | | | | | |
|--------------------------------|------------------------|-------------------------------|---------|----------|--------|-----|-----|
| | | D1 (h10) | D2 (h6) | I 1 (SL) | L (GL) | W | T |
| SW16000-03W90 | SW3-AR.W90.L6.Z2.HA | 3,0 | 4 | 6,0 | 51 | 90° | 0,3 |
| SW16000-04W90 | SW4-AR.W90.L8.Z2.HA | 4,0 | 5 | 8,0 | 51 | 90° | 0,4 |
| SW16000-05W90 | SW5-AR.W90.L10.Z2.HA | 5,0 | 6 | 10,0 | 58 | 90° | 0,5 |
| SW16000-06W90 | SW6-AR.W90.L12.Z2.HA | 6,0 | 8 | 12,0 | 64 | 90° | 0,6 |
| SW16000-08W90 | SW8-AR.W90.L16.Z2.HA | 8,0 | 10 | 16,0 | 73 | 90° | 0,8 |
| SW16000-10W90 | SW10-AR.W90.L18.Z2.HA | 10,0 | 12 | 18,0 | 84 | 90° | 1,0 |
| SW16000-12W90 | SW12-AR.W90.L20.Z2.HA | 12,0 | 12 | 20,0 | 84 | 90° | 1,2 |

| Bestellcode (Ordering Code) | Bezeichnung (Label) | Maße in mm (Dimensions in mm) | | | | | |
|--------------------------------|------------------------|-------------------------------|---------|----------|--------|------|-----|
| | | D1 (h10) | D2 (h6) | I 1 (SL) | L (GL) | W | T |
| SW16000-03W120 | SW3-AR.W120.L6.Z2.HA | 3,0 | 4 | 6,0 | 51 | 120° | 0,3 |
| SW16000-04W120 | SW4-AR.W120.L8.Z2.HA | 4,0 | 5 | 8,0 | 51 | 120° | 0,4 |
| SW16000-05W120 | SW5-AR.W120.L10.Z2.HA | 5,0 | 6 | 10,0 | 58 | 120° | 0,5 |
| SW16000-06W120 | SW6-AR.W120.L12.Z2.HA | 6,0 | 8 | 12,0 | 64 | 120° | 0,6 |
| SW16000-08W120 | SW8-AR.W120.L16.Z2.HA | 8,0 | 10 | 16,0 | 73 | 120° | 0,8 |
| SW16000-10W120 | SW10-AR.W120.L18.Z2.HA | 10,0 | 12 | 18,0 | 84 | 120° | 1,0 |
| SW16000-12W120 | SW12-AR.W120.L20.Z2.HA | 12,0 | 12 | 20,0 | 84 | 120° | 1,2 |

Vorteile (Advantages)

- Mehrere Anwendungen mit einem Werkzeug
(Performs multiple operations with one tool)
- Werkzeugwechsel werden überflüssig
(Eliminates tool changes)
- Reduziert Programmier- und Rüstzeiten
(Reduces programming and setup times)
- Platzersparnis im Werkzeuglager
(Reduces tool inventories)
- Perfekt geeignet für Maschinen mit einer begrenzten Anzahl an Werkzeugplätzen
(Ideal for machines with a limited number of tool stations)

Anwendungen (Applications)

- Zentrieren und Bohren
(Spotting and Drilling)
- Umfangsfräsen, Seitenbearbeitung
(Contour Side Milling)
- Fasen fräsen
(Chamfering)
- Nuten fräsen
(Grooving)
- Gravieren
(Engraving)

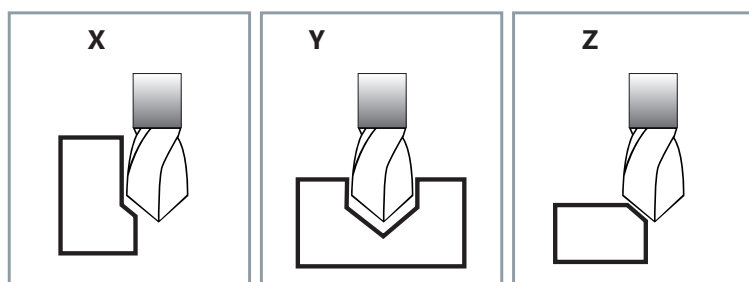
AR-UNI-FORCE MILL - ALLROUND-WERKZEUG ALLROUND-TOOL

Schnittwerte (Cutting data)

| Zu bearbeitendes Material (Material to be machined) | | Schnittgeschwindigkeit (Cutting speed) Vc (m/min) | Vorschub f mm/U (Feed rate f mm/rev) | | |
|--|--|---|--|--|--|
| | | | Ø 3-4 | Ø 5-6 | Ø 8 -12 |
| P | Niedrig- & Mittel-Legierter Kohlenstoffstahl < 0.55%C (Low & Medium, Carbon Steels <0.55%C) | 50-115 | X: 0,003-0,01 Y: 0,003-0,007 Z: 0,005-0,015 | X: 0,005-0,02 Y: 0,004-0,009 Z: 0,006-0,025 | X: 0,013-0,038 Y: 0,007-0,015 Z: 0,015-0,038 |
| | Hoch-Legierter Kohlenstoffstahl < 0.55%C (High Carbon, Steels ≥0.55%C) | 40-100 | X: 0,002-0,012 Y: 0,003-0,007 Z: 0,005-0,018 | X: 0,005-0,018 Y: 0,006-0,01 Z: 0,01-0,028 | X: 0,009-0,03 Y: 0,009-0,018 Z: 0,016-0,047 |
| | Legierter Stahl, Vergütungsstahl (Alloy Steels, Treated Steels) | 40-100 | X: 0,002-0,008 Y: 0,003-0,006 Z: 0,005-0,015 | X: 0,005-0,015 Y: 0,004-0,009 Z: 0,005-0,018 | X: 0,013-0,031 Y: 0,006-0,015 Z: 0,015-0,031 |
| M | Rostfreier Stahl, ferritisch (Stainless steels-Free Cutting) | 30-85 | X: 0,004-0,012 Y: 0,003-0,007 Z: 0,004-0,018 | X: 0,007-0,018 Y: 0,004-0,016 Z: 0,006-0,018 | X: 0,018-0,047 Y: 0,008-0,024 Z: 0,012-0,047 |
| | Rostfreier Stahl, austenitisch (Stainless Steel-Austenitic) | 25-70 | X: 0,005-0,010 Y: 0,003-0,006 Z: 0,004-0,015 | X: 0,006-0,015 Y: 0,004-0,015 Z: 0,005-0,017 | X: 0,017-0,04 Y: 0,007-0,02 Z: 0,01-0,035 |
| | Stahlguss (Cast Steels) | 40-90 | X: 0,004-0,012 Y: 0,003-0,007 Z: 0,004-0,018 | X: 0,007-0,018 Y: 0,004-0,016 Z: 0,006-0,018 | X: 0,018-0,047 Y: 0,008-0,024 Z: 0,012-0,047 |
| K | Guß (Cast Iron) | 30-120 | X: 0,003-0,01 Y: 0,003-0,007 Z: 0,005-0,015 | X: 0,005-0,02 Y: 0,004-0,009 Z: 0,006-0,025 | X: 0,013-0,038 Y: 0,007-0,015 Z: 0,015-0,038 |
| N | Aluminium ≤12%Si, Kupfer (Aluminum ≤12%Si, Copper) | 90-120 | X: 0,005-0,008 Y: 0,004-0,007 Z: 0,005-0,008 | X: 0,01-0,02 Y: 0,008-0,015 Z: 0,01-0,02 | X: 0,025-0,045 Y: 0,02-0,04 Z: 0,025-0,045 |
| | Aluminium >12%Si (Aluminum >12%Si) | 75-100 | X: 0,003-0,006 Y: 0,003-0,005 Z: 0,003-0,008 | X: 0,005-0,015 Y: 0,006-0,01 Z: 0,005-0,015 | X: 0,02-0,032 Y: 0,015-0,035 Z: 0,02-0,032 |
| | Synthetics, Duroplaste, Thermoplaste (Synthetics, Duoplastics, Thermoplastics) | 90-120 | X: 0,005-0,008 Y: 0,004-0,007 Z: 0,005-0,008 | X: 0,01-0,02 Y: 0,008-0,015 Z: 0,01-0,02 | X: 0,025-0,045 Y: 0,02-0,04 Z: 0,025-0,045 |
| S | Nickellegierung, Titanlegierung (Nickel alloys, Titanium alloys) | 20-60 | X: 0,004-0,008 Y: 0,003-0,007 Z: 0,002-0,005 | X: 0,007-0,01 Y: 0,006-0,008 Z: 0,005-0,007 | X: 0,01-0,025 Y: 0,008-0,02 Z: 0,007-0,015 |
| H | Gehärteter Stahl 45-50 HRc (Hardened Steel 45-50 HRc) | 20-60 | X: 0,005-0,009 Y: 0,004-0,008 Z: 0,003-0,006 | X: 0,008-0,015 Y: 0,007-0,009 Z: 0,006-0,008 | X: 0,015-0,03 Y: 0,009-0,025 Z: 0,008-0,02 |

Alle Schnittwerte dienen zur Orientierung (All cutting datas serve to orientation)

X: Umfangsfräsen, Fasen
(Side milling, Chamfering)
Y: Zentrieren, Bohren
(Spotting, Drilling)
Z: Gravieren, Nuten fräsen
(Engraving, Grooving)







FORCE DRILL

3xD VHM-BOHRER MIT STAHL / GUSS GEOMETRIE 3xD SC-DRILL WITH STEEL / CAST IRON GEOMETRY

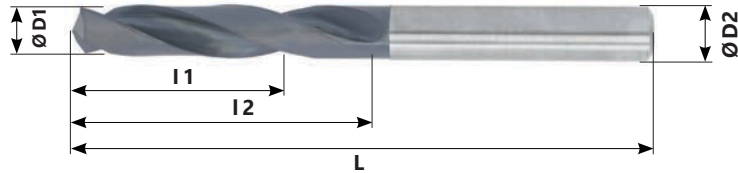
SW 10003

AlTiCrN

UNIVERSAL HA

Optional:

HB HE



| Bestellcode (Ordering Code) | Maße in mm (Dimensions in mm) | | | | |
|--------------------------------|-------------------------------|---------|----------|----------|--------|
| | D1 (h7) | D2 (h6) | I 1 (SL) | I 2 (FL) | L (GL) |
| SW10003-0300 | 3 | 6 | 14 | 20 | 62 |
| SW10003-0310 | 3,1 | 6 | 14 | 20 | 62 |
| SW10003-0320 | 3,2 | 6 | 14 | 20 | 62 |
| SW10003-0330 | 3,3 | 6 | 14 | 20 | 62 |
| SW10003-0340 | 3,4 | 6 | 14 | 20 | 62 |
| SW10003-0350 | 3,5 | 6 | 14 | 20 | 62 |
| SW10003-0360 | 3,6 | 6 | 14 | 20 | 62 |
| SW10003-0370 | 3,7 | 6 | 14 | 20 | 62 |
| SW10003-0380 | 3,8 | 6 | 17 | 24 | 66 |
| SW10003-0390 | 3,9 | 6 | 17 | 24 | 66 |
| SW10003-0400 | 4 | 6 | 17 | 24 | 66 |
| SW10003-0410 | 4,1 | 6 | 17 | 24 | 66 |
| SW10003-0420 | 4,2 | 6 | 17 | 24 | 66 |
| SW10003-0430 | 4,3 | 6 | 17 | 24 | 66 |
| SW10003-0440 | 4,4 | 6 | 17 | 24 | 66 |
| SW10003-0450 | 4,5 | 6 | 17 | 24 | 66 |
| SW10003-0460 | 4,6 | 6 | 17 | 24 | 66 |
| SW10003-0465 | 4,65 | 6 | 17 | 24 | 66 |
| SW10003-0470 | 4,7 | 6 | 17 | 24 | 66 |
| SW10003-0480 | 4,8 | 6 | 20 | 28 | 66 |
| SW10003-0490 | 4,9 | 6 | 20 | 28 | 66 |
| SW10003-0500 | 5 | 6 | 20 | 28 | 66 |
| SW10003-0510 | 5,1 | 6 | 20 | 28 | 66 |
| SW10003-0520 | 5,2 | 6 | 20 | 28 | 66 |
| SW10003-0530 | 5,3 | 6 | 20 | 28 | 66 |
| SW10003-0540 | 5,4 | 6 | 20 | 28 | 66 |
| SW10003-0550 | 5,5 | 6 | 20 | 28 | 66 |
| SW10003-0555 | 5,55 | 6 | 20 | 28 | 66 |
| SW10003-0560 | 5,6 | 6 | 20 | 28 | 66 |
| SW10003-0570 | 5,7 | 6 | 20 | 28 | 66 |
| SW10003-0580 | 5,8 | 6 | 20 | 28 | 66 |
| SW10003-0590 | 5,9 | 6 | 20 | 28 | 66 |
| SW10003-0600 | 6 | 6 | 20 | 28 | 66 |
| SW10003-0610 | 6,1 | 8 | 24 | 34 | 79 |

3xD VHM-BOHRER MIT STAHL / GUSS GEOMETRIE

3xD SC-DRILL WITH STEEL / CAST IRON GEOMETRY

SW 10003

| Bestellcode (Ordering Code) | Maße in mm (Dimensions in mm) | | | | |
|--------------------------------|-------------------------------|---------|----------|----------|--------|
| | D1 (h7) | D2 (h6) | I 1 (SL) | I 2 (FL) | L (GL) |
| SW10003-0620 | 6,2 | 8 | 24 | 34 | 79 |
| SW10003-0630 | 6,3 | 8 | 24 | 34 | 79 |
| SW10003-0640 | 6,4 | 8 | 24 | 34 | 79 |
| SW10003-0650 | 6,5 | 8 | 24 | 34 | 79 |
| SW10003-0660 | 6,6 | 8 | 24 | 34 | 79 |
| SW10003-0670 | 6,7 | 8 | 24 | 34 | 79 |
| SW10003-0680 | 6,8 | 8 | 24 | 34 | 79 |
| SW10003-0690 | 6,9 | 8 | 24 | 34 | 79 |
| SW10003-0700 | 7 | 8 | 24 | 34 | 79 |
| SW10003-0710 | 7,1 | 8 | 29 | 41 | 79 |
| SW10003-0720 | 7,2 | 8 | 29 | 41 | 79 |
| SW10003-0730 | 7,3 | 8 | 29 | 41 | 79 |
| SW10003-0740 | 7,4 | 8 | 29 | 41 | 79 |
| SW10003-0750 | 7,5 | 8 | 29 | 41 | 79 |
| SW10003-0760 | 7,6 | 8 | 29 | 41 | 79 |
| SW10003-0770 | 7,7 | 8 | 29 | 41 | 79 |
| SW10003-0780 | 7,8 | 8 | 29 | 41 | 79 |
| SW10003-0790 | 7,9 | 8 | 29 | 41 | 79 |
| SW10003-0800 | 8 | 8 | 29 | 41 | 79 |
| SW10003-0810 | 8,1 | 10 | 35 | 47 | 89 |
| SW10003-0820 | 8,2 | 10 | 35 | 47 | 89 |
| SW10003-0830 | 8,3 | 10 | 35 | 47 | 89 |
| SW10003-0840 | 8,4 | 10 | 35 | 47 | 89 |
| SW10003-0850 | 8,5 | 10 | 35 | 47 | 89 |
| SW10003-0860 | 8,6 | 10 | 35 | 47 | 89 |
| SW10003-0870 | 8,7 | 10 | 35 | 47 | 89 |
| SW10003-0880 | 8,8 | 10 | 35 | 47 | 89 |
| SW10003-0890 | 8,9 | 10 | 35 | 47 | 89 |
| SW10003-0900 | 9 | 10 | 35 | 47 | 89 |
| SW10003-0910 | 9,1 | 10 | 35 | 47 | 89 |
| SW10003-0920 | 9,2 | 10 | 35 | 47 | 89 |
| SW10003-0925 | 9,25 | 10 | 35 | 47 | 89 |
| SW10003-0930 | 9,3 | 10 | 35 | 47 | 89 |
| SW10003-0940 | 9,4 | 10 | 35 | 47 | 89 |
| SW10003-0950 | 9,5 | 10 | 35 | 47 | 89 |
| SW10003-0960 | 9,6 | 10 | 35 | 47 | 89 |
| SW10003-0970 | 9,7 | 10 | 35 | 47 | 89 |
| SW10003-0980 | 9,8 | 10 | 35 | 47 | 89 |
| SW10003-0990 | 9,9 | 10 | 35 | 47 | 89 |
| SW10003-1000 | 10 | 10 | 35 | 47 | 89 |
| SW10003-1020 | 10,2 | 12 | 40 | 55 | 102 |
| SW10003-1050 | 10,5 | 12 | 40 | 55 | 102 |
| SW10003-1080 | 10,8 | 12 | 40 | 55 | 102 |
| SW10003-1100 | 11 | 12 | 40 | 55 | 102 |
| SW10003-1150 | 11,5 | 12 | 40 | 55 | 102 |
| SW10003-1180 | 11,8 | 12 | 40 | 55 | 102 |

3xD VHM-BOHRER MIT STAHL / GUSS GEOMETRIE
3xD SC-DRILL WITH STEEL / CAST IRON GEOMETRY

SW 10003

| Bestellcode (Ordering Code) | Maße (mm) (Dimensions in mm) | | | | |
|--------------------------------|------------------------------|---------|----------|----------|--------|
| | D1 (h7) | D2 (h6) | I 1 (SL) | I 2 (FL) | L (GL) |
| SW10003-1200 | 12 | 12 | 40 | 55 | 102 |
| SW10003-1250 | 12,5 | 14 | 43 | 60 | 107 |
| SW10003-1280 | 12,8 | 14 | 43 | 60 | 107 |
| SW10003-1300 | 13 | 14 | 43 | 60 | 107 |
| SW10003-1350 | 13,5 | 14 | 43 | 60 | 107 |
| SW10003-1380 | 13,8 | 14 | 43 | 60 | 107 |
| SW10003-1400 | 14 | 14 | 43 | 60 | 107 |
| SW10003-1450 | 14,5 | 16 | 45 | 65 | 115 |
| SW10003-1480 | 14,8 | 16 | 45 | 65 | 115 |
| SW10003-1500 | 15 | 16 | 45 | 65 | 115 |
| SW10003-1550 | 15,5 | 16 | 45 | 65 | 115 |
| SW10003-1580 | 15,8 | 16 | 45 | 65 | 115 |
| SW10003-1600 | 16 | 16 | 45 | 65 | 115 |
| SW10003-1650 | 16,5 | 18 | 51 | 73 | 123 |
| SW10003-1680 | 16,8 | 18 | 51 | 73 | 123 |
| SW10003-1700 | 17 | 18 | 51 | 73 | 123 |
| SW10003-1750 | 17,5 | 18 | 51 | 73 | 123 |
| SW10003-1780 | 17,8 | 18 | 51 | 73 | 123 |
| SW10003-1800 | 18 | 18 | 51 | 73 | 123 |
| SW10003-1850 | 18,5 | 20 | 55 | 79 | 131 |
| SW10003-1880 | 18,8 | 20 | 55 | 79 | 131 |
| SW10003-1900 | 19 | 20 | 55 | 79 | 131 |
| SW10003-1950 | 19,5 | 20 | 55 | 79 | 131 |
| SW10003-1980 | 19,8 | 20 | 55 | 79 | 131 |
| SW10003-2000 | 20 | 20 | 55 | 79 | 131 |

5xD VHM-BOHRER MIT STAHL / GUSS GEOMETRIE 5xD SC-DRILL WITH STEEL / CAST IRON GEOMETRY

SW 10005

AlTiCrN

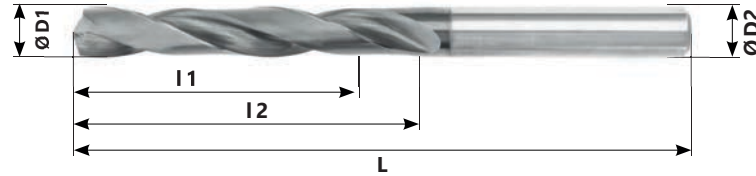
UNIVERSAL

HA

Optional:

HB

HE



| Bestellcode (Ordering Code) | Maße in mm (Dimensions in mm) | | | | |
|--------------------------------|-------------------------------|---------|---------|---------|--------|
| | D1 (h7) | D2 (h6) | L1 (SL) | L2 (FL) | L (GL) |
| SW10005-0300 | 3 | 6 | 23 | 28 | 66 |
| SW10005-0310 | 3,1 | 6 | 23 | 28 | 66 |
| SW10005-0320 | 3,2 | 6 | 23 | 28 | 66 |
| SW10005-0330 | 3,3 | 6 | 23 | 28 | 66 |
| SW10005-0340 | 3,4 | 6 | 23 | 28 | 66 |
| SW10005-0350 | 3,5 | 6 | 23 | 28 | 66 |
| SW10005-0360 | 3,6 | 6 | 23 | 28 | 66 |
| SW10005-0370 | 3,7 | 6 | 23 | 28 | 66 |
| SW10005-0380 | 3,8 | 6 | 29 | 36 | 74 |
| SW10005-0390 | 3,9 | 6 | 29 | 36 | 74 |
| SW10005-0400 | 4 | 6 | 29 | 36 | 74 |
| SW10005-0410 | 4,1 | 6 | 29 | 36 | 74 |
| SW10005-0420 | 4,2 | 6 | 29 | 36 | 74 |
| SW10005-0430 | 4,3 | 6 | 29 | 36 | 74 |
| SW10005-0440 | 4,4 | 6 | 29 | 36 | 74 |
| SW10005-0450 | 4,5 | 6 | 29 | 36 | 74 |
| SW10005-0460 | 4,6 | 6 | 29 | 36 | 74 |
| SW10005-0470 | 4,7 | 6 | 29 | 36 | 74 |
| SW10005-0480 | 4,8 | 6 | 35 | 44 | 82 |
| SW10005-0490 | 4,9 | 6 | 35 | 44 | 82 |
| SW10005-0500 | 5 | 6 | 35 | 44 | 82 |
| SW10005-0510 | 5,1 | 6 | 35 | 44 | 82 |
| SW10005-0520 | 5,2 | 6 | 35 | 44 | 82 |
| SW10005-0530 | 5,3 | 6 | 35 | 44 | 82 |
| SW10005-0540 | 5,4 | 6 | 35 | 44 | 82 |
| SW10005-0550 | 5,5 | 6 | 35 | 44 | 82 |
| SW10005-0560 | 5,6 | 6 | 35 | 44 | 82 |
| SW10005-0570 | 5,7 | 6 | 35 | 44 | 82 |
| SW10005-0580 | 5,8 | 6 | 35 | 44 | 82 |
| SW10005-0590 | 5,9 | 6 | 35 | 44 | 82 |
| SW10005-0600 | 6 | 6 | 35 | 44 | 82 |
| SW10005-0610 | 6,1 | 8 | 43 | 53 | 91 |
| SW10005-0620 | 6,2 | 8 | 43 | 53 | 91 |
| SW10005-0630 | 6,3 | 8 | 43 | 53 | 91 |

5xD VHM-BOHRER MIT STAHL / GUSS GEOMETRIE

5xD SC-DRILL WITH STEEL / CAST IRON GEOMETRY

SW 10005

| Bestellcode (Ordering Code) | Maße in mm (Dimensions in mm) | | | | |
|--------------------------------|-------------------------------|---------|----------|----------|--------|
| | D1 (h7) | D2 (h6) | I 1 (SL) | I 2 (FL) | L (GL) |
| SW10005-0640 | 6,4 | 8 | 43 | 53 | 91 |
| SW10005-0650 | 6,5 | 8 | 43 | 53 | 91 |
| SW10005-0660 | 6,6 | 8 | 43 | 53 | 91 |
| SW10005-0670 | 6,7 | 8 | 43 | 53 | 91 |
| SW10005-0680 | 6,8 | 8 | 43 | 53 | 91 |
| SW10005-0690 | 6,9 | 8 | 43 | 53 | 91 |
| SW10005-0700 | 7 | 8 | 43 | 53 | 91 |
| SW10005-0710 | 7,1 | 8 | 43 | 53 | 91 |
| SW10005-0720 | 7,2 | 8 | 43 | 53 | 91 |
| SW10005-0730 | 7,3 | 8 | 43 | 53 | 91 |
| SW10005-0740 | 7,4 | 8 | 43 | 53 | 91 |
| SW10005-0750 | 7,5 | 8 | 43 | 53 | 91 |
| SW10005-0760 | 7,6 | 8 | 43 | 53 | 91 |
| SW10005-0770 | 7,7 | 8 | 43 | 53 | 91 |
| SW10005-0780 | 7,8 | 8 | 43 | 53 | 91 |
| SW10005-0790 | 7,9 | 8 | 43 | 53 | 91 |
| SW10005-0800 | 8 | 8 | 43 | 53 | 91 |
| SW10005-0810 | 8,1 | 10 | 49 | 61 | 103 |
| SW10005-0820 | 8,2 | 10 | 49 | 61 | 103 |
| SW10005-0830 | 8,3 | 10 | 49 | 61 | 103 |
| SW10005-0840 | 8,4 | 10 | 49 | 61 | 103 |
| SW10005-0850 | 8,5 | 10 | 49 | 61 | 103 |
| SW10005-0860 | 8,6 | 10 | 49 | 61 | 103 |
| SW10005-0870 | 8,7 | 10 | 49 | 61 | 103 |
| SW10005-0880 | 8,8 | 10 | 49 | 61 | 103 |
| SW10005-0890 | 8,9 | 10 | 49 | 61 | 103 |
| SW10005-0900 | 9 | 10 | 49 | 61 | 103 |
| SW10005-0910 | 9,1 | 10 | 49 | 61 | 103 |
| SW10005-0920 | 9,2 | 10 | 49 | 61 | 103 |
| SW10005-0930 | 9,3 | 10 | 49 | 61 | 103 |
| SW10005-0940 | 9,4 | 10 | 49 | 61 | 103 |
| SW10005-0950 | 9,5 | 10 | 49 | 61 | 103 |
| SW10005-0960 | 9,6 | 10 | 49 | 61 | 103 |
| SW10005-0970 | 9,7 | 10 | 49 | 61 | 103 |
| SW10005-0980 | 9,8 | 10 | 49 | 61 | 103 |
| SW10005-0990 | 9,9 | 10 | 49 | 61 | 103 |
| SW10005-1000 | 10 | 10 | 49 | 61 | 103 |
| SW10005-1020 | 10,2 | 12 | 56 | 71 | 118 |
| SW10005-1050 | 10,5 | 12 | 56 | 71 | 118 |
| SW10005-1080 | 10,8 | 12 | 56 | 71 | 118 |
| SW10005-1100 | 11 | 12 | 56 | 71 | 118 |
| SW10005-1150 | 11,5 | 12 | 56 | 71 | 118 |
| SW10005-1180 | 11,8 | 12 | 56 | 71 | 118 |
| SW10005-1200 | 12 | 12 | 56 | 71 | 118 |
| SW10005-1250 | 12,5 | 14 | 60 | 77 | 124 |
| SW10005-1280 | 12,8 | 14 | 60 | 77 | 124 |

5xD VHM-BOHRER MIT STAHL / GUSS GEOMETRIE
5xD SC-DRILL WITH STEEL / CAST IRON GEOMETRY

SW 10005

| Bestellcode (Ordering Code) | Maße in mm (Dimensions in mm) | | | | |
|--------------------------------|-------------------------------|---------|----------|----------|--------|
| | D1 (h7) | D2 (h6) | I 1 (SL) | I 2 (FL) | L (GL) |
| SW10005-1300 | 13 | 14 | 60 | 77 | 124 |
| SW10005-1350 | 13,5 | 14 | 60 | 77 | 124 |
| SW10005-1380 | 13,8 | 14 | 60 | 77 | 124 |
| SW10005-1400 | 14 | 14 | 60 | 77 | 124 |
| SW10005-1450 | 14,5 | 16 | 63 | 83 | 133 |
| SW10005-1480 | 14,8 | 16 | 63 | 83 | 133 |
| SW10005-1500 | 15 | 16 | 63 | 83 | 133 |
| SW10005-1550 | 15,5 | 16 | 63 | 83 | 133 |
| SW10005-1580 | 15,8 | 16 | 63 | 83 | 133 |
| SW10005-1600 | 16 | 16 | 63 | 83 | 133 |
| SW10005-1650 | 16,5 | 18 | 71 | 93 | 143 |
| SW10005-1680 | 16,8 | 18 | 71 | 93 | 143 |
| SW10005-1700 | 17 | 18 | 71 | 93 | 143 |
| SW10005-1750 | 17,5 | 18 | 71 | 93 | 143 |
| SW10005-1780 | 17,8 | 18 | 71 | 93 | 143 |
| SW10005-1800 | 18 | 18 | 71 | 93 | 143 |
| SW10005-1850 | 18,5 | 20 | 77 | 101 | 153 |
| SW10005-1880 | 18,8 | 20 | 77 | 101 | 153 |
| SW10005-1900 | 19 | 20 | 77 | 101 | 153 |
| SW10005-1950 | 19,5 | 20 | 77 | 101 | 153 |
| SW10005-1980 | 19,8 | 20 | 77 | 101 | 153 |
| SW10005-2000 | 20 | 20 | 77 | 101 | 153 |

SW 11003

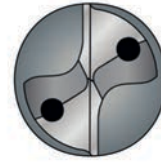
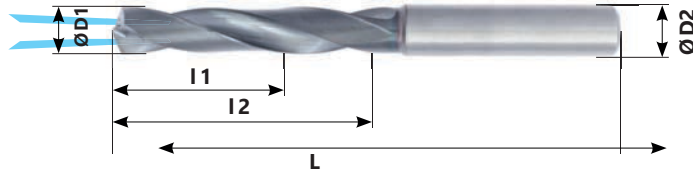
AlTiCrN

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IK

Optional:

HB HE



| Bestellcode (Ordering Code) | Maße in mm (Dimensions in mm) | | | | |
|--------------------------------|-------------------------------|---------|----------|----------|--------|
| | D1 (h7) | D2 (h6) | I 1 (SL) | I 2 (FL) | L (GL) |
| SW11003-0300 | 3 | 6 | 14 | 20 | 62 |
| SW11003-0310 | 3,1 | 6 | 14 | 20 | 62 |
| SW11003-0315 | 3,15 | 6 | 14 | 20 | 62 |
| SW11003-0320 | 3,2 | 6 | 14 | 20 | 62 |
| SW11003-0330 | 3,3 | 6 | 14 | 20 | 62 |
| SW11003-0340 | 3,4 | 6 | 14 | 20 | 62 |
| SW11003-0350 | 3,5 | 6 | 14 | 20 | 62 |
| SW11003-0360 | 3,6 | 6 | 14 | 20 | 62 |
| SW11003-0365 | 3,65 | 6 | 14 | 20 | 62 |
| SW11003-0370 | 3,7 | 6 | 14 | 20 | 62 |
| SW11003-0380 | 3,8 | 6 | 17 | 24 | 66 |
| SW11003-0385 | 3,85 | 6 | 17 | 24 | 66 |
| SW11003-0390 | 3,9 | 6 | 17 | 24 | 66 |
| SW11003-0400 | 4 | 6 | 17 | 24 | 66 |
| SW11003-0410 | 4,1 | 6 | 17 | 24 | 66 |
| SW11003-0420 | 4,2 | 6 | 17 | 24 | 66 |
| SW11003-0430 | 4,3 | 6 | 17 | 24 | 66 |
| SW11003-0440 | 4,4 | 6 | 17 | 24 | 66 |
| SW11003-0445 | 4,45 | 6 | 17 | 24 | 66 |
| SW11003-0450 | 4,5 | 6 | 17 | 24 | 66 |
| SW11003-0460 | 4,6 | 6 | 17 | 24 | 66 |
| SW11003-0465 | 4,65 | 6 | 17 | 24 | 66 |
| SW11003-0470 | 4,7 | 6 | 17 | 24 | 66 |
| SW11003-0480 | 4,8 | 6 | 20 | 28 | 66 |
| SW11003-0490 | 4,9 | 6 | 20 | 28 | 66 |
| SW11003-0500 | 5 | 6 | 20 | 28 | 66 |
| SW11003-0505 | 5,05 | 6 | 20 | 28 | 66 |
| SW11003-0510 | 5,1 | 6 | 20 | 28 | 66 |
| SW11003-0520 | 5,2 | 6 | 20 | 28 | 66 |
| SW11003-0530 | 5,3 | 6 | 20 | 28 | 66 |
| SW11003-0540 | 5,4 | 6 | 20 | 28 | 66 |
| SW11003-0550 | 5,5 | 6 | 20 | 28 | 66 |
| SW11003-0555 | 5,55 | 6 | 20 | 28 | 66 |
| SW11003-0560 | 5,6 | 6 | 20 | 28 | 66 |

SW 11003

| Bestellcode (Ordering Code) | Maße in mm (Dimensions in mm) | | | | |
|--------------------------------|-------------------------------|---------|----------|----------|--------|
| | D1 (h7) | D2 (h6) | I 1 (SL) | I 2 (FL) | L (GL) |
| SW11003-0570 | 5,7 | 6 | 20 | 28 | 66 |
| SW11003-0575 | 5,75 | 6 | 20 | 28 | 66 |
| SW11003-0580 | 5,8 | 6 | 20 | 28 | 66 |
| SW11003-0590 | 5,9 | 6 | 20 | 28 | 66 |
| SW11003-0600 | 6 | 6 | 20 | 28 | 66 |
| SW11003-0610 | 6,1 | 8 | 24 | 34 | 79 |
| SW11003-0620 | 6,2 | 8 | 24 | 34 | 79 |
| SW11003-0625 | 6,25 | 8 | 24 | 34 | 79 |
| SW11003-0630 | 6,3 | 8 | 24 | 34 | 79 |
| SW11003-0640 | 6,4 | 8 | 24 | 34 | 79 |
| SW11003-0650 | 6,5 | 8 | 24 | 34 | 79 |
| SW11003-0655 | 6,55 | 8 | 24 | 34 | 79 |
| SW11003-0660 | 6,6 | 8 | 24 | 34 | 79 |
| SW11003-0670 | 6,7 | 8 | 24 | 34 | 79 |
| SW11003-0680 | 6,8 | 8 | 24 | 34 | 79 |
| SW11003-0690 | 6,9 | 8 | 24 | 34 | 79 |
| SW11003-0700 | 7 | 8 | 24 | 34 | 79 |
| SW11003-0710 | 7,1 | 8 | 29 | 41 | 79 |
| SW11003-0720 | 7,2 | 8 | 29 | 41 | 79 |
| SW11003-0725 | 7,25 | 8 | 29 | 41 | 79 |
| SW11003-0730 | 7,3 | 8 | 29 | 41 | 79 |
| SW11003-0740 | 7,4 | 8 | 29 | 41 | 79 |
| SW11003-0745 | 7,45 | 8 | 29 | 41 | 79 |
| SW11003-0750 | 7,5 | 8 | 29 | 41 | 79 |
| SW11003-0755 | 7,55 | 8 | 29 | 41 | 79 |
| SW11003-0760 | 7,6 | 8 | 29 | 41 | 79 |
| SW11003-0770 | 7,7 | 8 | 29 | 41 | 79 |
| SW11003-0780 | 7,8 | 8 | 29 | 41 | 79 |
| SW11003-0790 | 7,9 | 8 | 29 | 41 | 79 |
| SW11003-0800 | 8 | 8 | 29 | 41 | 79 |
| SW11003-0810 | 8,1 | 10 | 35 | 47 | 89 |
| SW11003-0820 | 8,2 | 10 | 35 | 47 | 89 |
| SW11003-0830 | 8,3 | 10 | 35 | 47 | 89 |
| SW11003-0840 | 8,4 | 10 | 35 | 47 | 89 |
| SW11003-0850 | 8,5 | 10 | 35 | 47 | 89 |
| SW11003-0855 | 8,55 | 10 | 35 | 47 | 89 |
| SW11003-0860 | 8,6 | 10 | 35 | 47 | 89 |
| SW11003-0870 | 8,7 | 10 | 35 | 47 | 89 |
| SW11003-0875 | 8,75 | 10 | 35 | 47 | 89 |
| SW11003-0880 | 8,8 | 10 | 35 | 47 | 89 |
| SW11003-0890 | 8,9 | 10 | 35 | 47 | 89 |
| SW11003-0900 | 9 | 10 | 35 | 47 | 89 |
| SW11003-0910 | 9,1 | 10 | 35 | 47 | 89 |
| SW11003-0920 | 9,2 | 10 | 35 | 47 | 89 |
| SW11003-0925 | 9,25 | 10 | 35 | 47 | 89 |
| SW11003-0930 | 9,3 | 10 | 35 | 47 | 89 |

SW 11003

| Bestellcode (Ordering Code) | Maße in mm (Dimensions in mm) | | | | |
|--------------------------------|-------------------------------|---------|----------|----------|--------|
| | D1 (h7) | D2 (h6) | I 1 (SL) | I 2 (FL) | L (GL) |
| SW11003-0940 | 9,4 | 10 | 35 | 47 | 89 |
| SW11003-0950 | 9,5 | 10 | 35 | 47 | 89 |
| SW11003-0955 | 9,55 | 10 | 35 | 47 | 89 |
| SW11003-0960 | 9,6 | 10 | 35 | 47 | 89 |
| SW11003-0970 | 9,7 | 10 | 35 | 47 | 89 |
| SW11003-0980 | 9,8 | 10 | 35 | 47 | 89 |
| SW11003-0990 | 9,9 | 10 | 35 | 47 | 89 |
| SW11003-1000 | 10 | 10 | 35 | 47 | 89 |
| SW11003-1020 | 10,2 | 12 | 40 | 55 | 102 |
| SW11003-1030 | 10,3 | 12 | 40 | 55 | 102 |
| SW11003-1050 | 10,5 | 12 | 40 | 55 | 102 |
| SW11003-1080 | 10,8 | 12 | 40 | 55 | 102 |
| SW11003-1100 | 11 | 12 | 40 | 55 | 102 |
| SW11003-1120 | 11,2 | 12 | 40 | 55 | 102 |
| SW11003-1140 | 11,4 | 12 | 40 | 55 | 102 |
| SW11003-1150 | 11,5 | 12 | 40 | 55 | 102 |
| SW11003-1155 | 11,55 | 12 | 40 | 55 | 102 |
| SW11003-1170 | 11,7 | 12 | 40 | 55 | 102 |
| SW11003-1180 | 11,8 | 12 | 40 | 55 | 102 |
| SW11003-1120 | 12 | 12 | 40 | 55 | 102 |
| SW11003-1121 | 12,1 | 12 | 43 | 60 | 107 |
| SW11003-1122 | 12,2 | 12 | 43 | 60 | 107 |
| SW11003-1125 | 12,5 | 14 | 43 | 60 | 107 |
| SW11003-1128 | 12,8 | 14 | 43 | 60 | 107 |
| SW11003-1290 | 12,9 | 14 | 43 | 60 | 107 |
| SW11003-1300 | 13 | 14 | 43 | 60 | 107 |
| SW11003-1310 | 13,1 | 14 | 43 | 60 | 107 |
| SW11003-1320 | 13,2 | 14 | 43 | 60 | 107 |
| SW11003-1330 | 13,3 | 14 | 43 | 60 | 107 |
| SW11003-1350 | 13,5 | 14 | 43 | 60 | 107 |
| SW11003-1355 | 13,55 | 14 | 43 | 60 | 107 |
| SW11003-1360 | 13,6 | 14 | 43 | 60 | 107 |
| SW11003-1380 | 13,8 | 14 | 43 | 60 | 107 |
| SW11003-1400 | 14 | 14 | 43 | 60 | 107 |
| SW11003-1450 | 14,5 | 16 | 45 | 65 | 115 |
| SW11003-1480 | 14,8 | 16 | 45 | 65 | 115 |
| SW11003-1500 | 15 | 16 | 45 | 65 | 115 |
| SW11003-1505 | 15,05 | 16 | 45 | 65 | 115 |
| SW11003-1520 | 15,2 | 16 | 45 | 65 | 115 |
| SW11003-1530 | 15,3 | 16 | 45 | 65 | 115 |
| SW11003-1550 | 15,5 | 16 | 45 | 65 | 115 |
| SW11003-1555 | 15,55 | 16 | 45 | 65 | 115 |
| SW11003-1580 | 15,8 | 16 | 45 | 65 | 115 |
| SW11003-1600 | 16 | 16 | 45 | 65 | 115 |
| SW11003-1650 | 16,5 | 18 | 51 | 73 | 123 |
| SW11003-1680 | 16,8 | 18 | 51 | 73 | 123 |

SW 11003

| Bestellcode (Ordering Code) | Maße in mm (Dimensions in mm) | | | | |
|--------------------------------|-------------------------------|---------|----------|----------|--------|
| | D1 (h7) | D2 (h6) | I 1 (SL) | I 2 (FL) | L (GL) |
| SW11003-1700 | 17 | 18 | 51 | 73 | 123 |
| SW11003-1705 | 17,05 | 18 | 51 | 73 | 123 |
| SW11003-1730 | 17,3 | 18 | 51 | 73 | 123 |
| SW11003-1750 | 17,5 | 18 | 51 | 73 | 123 |
| SW11003-1755 | 17,55 | 18 | 51 | 73 | 123 |
| SW11003-1780 | 17,8 | 18 | 51 | 73 | 123 |
| SW11003-1800 | 18 | 18 | 51 | 73 | 123 |
| SW11003-1830 | 18,3 | 20 | 55 | 79 | 131 |
| SW11003-1850 | 18,5 | 20 | 55 | 79 | 131 |
| SW11003-1880 | 18,8 | 20 | 55 | 79 | 131 |
| SW11003-1900 | 19 | 20 | 55 | 79 | 131 |
| SW11003-1930 | 19,3 | 20 | 55 | 79 | 131 |
| SW11003-1950 | 19,5 | 20 | 55 | 79 | 131 |
| SW11003-1980 | 19,8 | 20 | 55 | 79 | 131 |
| SW11003-2000 | 20 | 20 | 55 | 79 | 131 |

SW 11005

AlTiCrN

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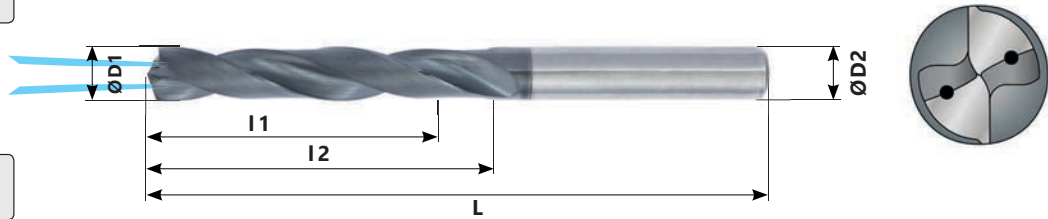
HA

IK

Optional:

HB

HE



| Bestellcode (Ordering Code) | Maße in mm (Dimensions in mm) | | | | |
|--------------------------------|-------------------------------|---------|----------|----------|--------|
| | D1 (h7) | D2 (h6) | I 1 (SL) | I 2 (FL) | L (GL) |
| SW11005-0300 | 3 | 6 | 23 | 28 | 66 |
| SW11005-0310 | 3,1 | 6 | 23 | 28 | 66 |
| SW11005-0320 | 3,2 | 6 | 23 | 28 | 66 |
| SW11005-0330 | 3,3 | 6 | 23 | 28 | 66 |
| SW11005-0340 | 3,4 | 6 | 23 | 28 | 66 |
| SW11005-0350 | 3,5 | 6 | 23 | 28 | 66 |
| SW11005-0360 | 3,6 | 6 | 23 | 28 | 66 |
| SW11005-0370 | 3,7 | 6 | 23 | 28 | 66 |
| SW11005-0380 | 3,8 | 6 | 29 | 36 | 74 |
| SW11005-0390 | 3,9 | 6 | 29 | 36 | 74 |
| SW11005-0400 | 4 | 6 | 29 | 36 | 74 |
| SW11005-0410 | 4,1 | 6 | 29 | 36 | 74 |
| SW11005-0420 | 4,2 | 6 | 29 | 36 | 74 |
| SW11005-0430 | 4,3 | 6 | 29 | 36 | 74 |
| SW11005-0440 | 4,4 | 6 | 29 | 36 | 74 |
| SW11005-0450 | 4,5 | 6 | 29 | 36 | 74 |
| SW11005-0460 | 4,6 | 6 | 29 | 36 | 74 |
| SW11005-0470 | 4,7 | 6 | 29 | 36 | 74 |
| SW11005-0480 | 4,8 | 6 | 35 | 44 | 82 |
| SW11005-0490 | 4,9 | 6 | 35 | 44 | 82 |
| SW11005-0500 | 5 | 6 | 35 | 44 | 82 |
| SW11005-0510 | 5,1 | 6 | 35 | 44 | 82 |
| SW11005-0520 | 5,2 | 6 | 35 | 44 | 82 |
| SW11005-0530 | 5,3 | 6 | 35 | 44 | 82 |
| SW11005-0540 | 5,4 | 6 | 35 | 44 | 82 |
| SW11005-0550 | 5,5 | 6 | 35 | 44 | 82 |
| SW11005-0560 | 5,6 | 6 | 35 | 44 | 82 |
| SW11005-0570 | 5,7 | 6 | 35 | 44 | 82 |
| SW11005-0580 | 5,8 | 6 | 35 | 44 | 82 |
| SW11005-0590 | 5,9 | 6 | 35 | 44 | 82 |
| SW11005-0600 | 6 | 6 | 35 | 44 | 82 |
| SW11005-0610 | 6,1 | 8 | 43 | 53 | 91 |
| SW11005-0620 | 6,2 | 8 | 43 | 53 | 91 |
| SW11005-0630 | 6,3 | 8 | 43 | 53 | 91 |

SW 11005

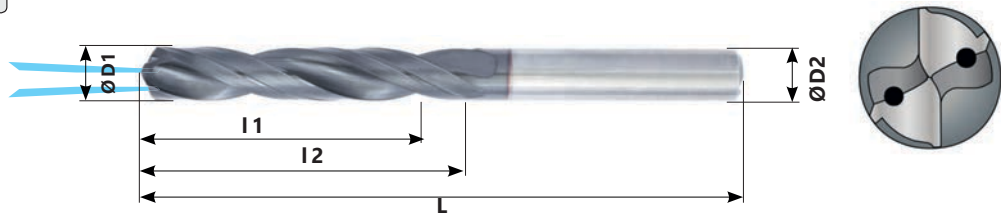
| Bestellcode (Ordering Code) | Maße in mm (Dimensions in mm) | | | | |
|--------------------------------|-------------------------------|---------|----------|----------|--------|
| | D1 (h7) | D2 (h6) | I 1 (SL) | I 2 (FL) | L (GL) |
| SW11005-0640 | 6,4 | 8 | 43 | 53 | 91 |
| SW11005-0650 | 6,5 | 8 | 43 | 53 | 91 |
| SW11005-0660 | 6,6 | 8 | 43 | 53 | 91 |
| SW11005-0670 | 6,7 | 8 | 43 | 53 | 91 |
| SW11005-0680 | 6,8 | 8 | 43 | 53 | 91 |
| SW11005-0690 | 6,9 | 8 | 43 | 53 | 91 |
| SW11005-0700 | 7 | 8 | 43 | 53 | 91 |
| SW11005-0710 | 7,1 | 8 | 43 | 53 | 91 |
| SW11005-0720 | 7,2 | 8 | 43 | 53 | 91 |
| SW11005-0730 | 7,3 | 8 | 43 | 53 | 91 |
| SW11005-0740 | 7,4 | 8 | 43 | 53 | 91 |
| SW11005-0750 | 7,5 | 8 | 43 | 53 | 91 |
| SW11005-0760 | 7,6 | 8 | 43 | 53 | 91 |
| SW11005-0770 | 7,7 | 8 | 43 | 53 | 91 |
| SW11005-0780 | 7,8 | 8 | 43 | 53 | 91 |
| SW11005-0790 | 7,9 | 8 | 43 | 53 | 91 |
| SW11005-0800 | 8 | 8 | 43 | 53 | 91 |
| SW11005-0810 | 8,1 | 10 | 49 | 61 | 103 |
| SW11005-0820 | 8,2 | 10 | 49 | 61 | 103 |
| SW11005-0830 | 8,3 | 10 | 49 | 61 | 103 |
| SW11005-0840 | 8,4 | 10 | 49 | 61 | 103 |
| SW11005-0850 | 8,5 | 10 | 49 | 61 | 103 |
| SW11005-0860 | 8,6 | 10 | 49 | 61 | 103 |
| SW11005-0870 | 8,7 | 10 | 49 | 61 | 103 |
| SW11005-0880 | 8,8 | 10 | 49 | 61 | 103 |
| SW11005-0890 | 8,9 | 10 | 49 | 61 | 103 |
| SW11005-0900 | 9 | 10 | 49 | 61 | 103 |
| SW11005-0910 | 9,1 | 10 | 49 | 61 | 103 |
| SW11005-0920 | 9,2 | 10 | 49 | 61 | 103 |
| SW11005-0930 | 9,3 | 10 | 49 | 61 | 103 |
| SW11005-0940 | 9,4 | 10 | 49 | 61 | 103 |
| SW11005-0950 | 9,5 | 10 | 49 | 61 | 103 |
| SW11005-0960 | 9,6 | 10 | 49 | 61 | 103 |
| SW11005-0970 | 9,7 | 10 | 49 | 61 | 103 |
| SW11005-0980 | 9,8 | 10 | 49 | 61 | 103 |
| SW11005-0990 | 9,9 | 10 | 49 | 61 | 103 |
| SW11005-1000 | 10 | 10 | 49 | 61 | 103 |
| SW11005-1020 | 10,2 | 12 | 56 | 71 | 118 |
| SW11005-1050 | 10,5 | 12 | 56 | 71 | 118 |
| SW11005-1080 | 10,8 | 12 | 56 | 71 | 118 |
| SW11005-1100 | 11 | 12 | 56 | 71 | 118 |
| SW11005-1150 | 11,5 | 12 | 56 | 71 | 118 |
| SW11005-1180 | 11,8 | 12 | 56 | 71 | 118 |
| SW11005-1200 | 12 | 12 | 56 | 71 | 118 |
| SW11005-1250 | 12,5 | 14 | 60 | 77 | 124 |
| SW11005-1280 | 12,8 | 14 | 60 | 77 | 124 |

SW 11005

| Bestellcode (Ordering Code) | Maße in mm (Dimensions in mm) | | | | |
|--------------------------------|-------------------------------|---------|----------|----------|--------|
| | D1 (h7) | D2 (h6) | I 1 (SL) | I 2 (FL) | L (GL) |
| SW11005-1300 | 13 | 14 | 60 | 77 | 124 |
| SW11005-1350 | 13,5 | 14 | 60 | 77 | 124 |
| SW11005-1380 | 13,8 | 14 | 60 | 77 | 124 |
| SW11005-1400 | 14 | 14 | 60 | 77 | 124 |
| SW11005-1450 | 14,5 | 16 | 63 | 83 | 133 |
| SW11005-1480 | 14,8 | 16 | 63 | 83 | 133 |
| SW11005-1500 | 15 | 16 | 63 | 83 | 133 |
| SW11005-1550 | 15,5 | 16 | 63 | 83 | 133 |
| SW11005-1580 | 15,8 | 16 | 63 | 83 | 133 |
| SW11005-1600 | 16 | 16 | 63 | 83 | 133 |
| SW11005-1650 | 16,5 | 18 | 71 | 93 | 143 |
| SW11005-1680 | 16,8 | 18 | 71 | 93 | 143 |
| SW11005-1700 | 17 | 18 | 71 | 93 | 143 |
| SW11005-1750 | 17,5 | 18 | 71 | 93 | 143 |
| SW11005-1780 | 17,8 | 18 | 71 | 93 | 143 |
| SW11005-1800 | 18 | 18 | 71 | 93 | 143 |
| SW11005-1850 | 18,5 | 20 | 77 | 101 | 153 |
| SW11005-1880 | 18,8 | 20 | 77 | 101 | 153 |
| SW11005-1900 | 19 | 20 | 77 | 101 | 153 |
| SW11005-1950 | 19,5 | 20 | 77 | 101 | 153 |
| SW11005-1980 | 19,8 | 20 | 77 | 101 | 153 |
| SW11005-2000 | 20 | 20 | 77 | 101 | 153 |

5xD VHM-BOHRER IK DOPPELFASE MIT STAHL / GUSS GEOMETRIE
5xD SC-DRILL IC WITH DOUBLE LANDS WITH STEEL / CAST IRON GEOMETRY

SW 11025



| Bestellcode (Ordering Code) | Maße in mm (Dimensions in mm) | | | | |
|--------------------------------|-------------------------------|---------|----------|----------|--------|
| | D1 (h7) | D2 (h6) | I 1 (SL) | I 2 (FL) | L (GL) |
| SW11025-0300 | 3 | 6 | 23 | 28 | 66 |
| SW11025-0310 | 3,1 | 6 | 23 | 28 | 66 |
| SW11025-0320 | 3,2 | 6 | 23 | 28 | 66 |
| SW11025-0330 | 3,3 | 6 | 23 | 28 | 66 |
| SW11025-0340 | 3,4 | 6 | 23 | 28 | 66 |
| SW11025-0350 | 3,5 | 6 | 23 | 28 | 66 |
| SW11025-0360 | 3,6 | 6 | 23 | 28 | 66 |
| SW11025-0370 | 3,7 | 6 | 23 | 28 | 66 |
| SW11025-0380 | 3,8 | 6 | 29 | 36 | 74 |
| SW11025-0390 | 3,9 | 6 | 29 | 36 | 74 |
| SW11025-0400 | 4 | 6 | 29 | 36 | 74 |
| SW11025-0410 | 4,1 | 6 | 29 | 36 | 74 |
| SW11025-0420 | 4,2 | 6 | 29 | 36 | 74 |
| SW11025-0430 | 4,3 | 6 | 29 | 36 | 74 |
| SW11025-0440 | 4,4 | 6 | 29 | 36 | 74 |
| SW11025-0450 | 4,5 | 6 | 29 | 36 | 74 |
| SW11025-0460 | 4,6 | 6 | 29 | 36 | 74 |
| SW11025-0470 | 4,7 | 6 | 29 | 36 | 74 |
| SW11025-0480 | 4,8 | 6 | 35 | 44 | 82 |
| SW11025-0490 | 4,9 | 6 | 35 | 44 | 82 |
| SW11025-0500 | 5 | 6 | 35 | 44 | 82 |
| SW11025-0510 | 5,1 | 6 | 35 | 44 | 82 |
| SW11025-0520 | 5,2 | 6 | 35 | 44 | 82 |
| SW11025-0530 | 5,3 | 6 | 35 | 44 | 82 |
| SW11025-0540 | 5,4 | 6 | 35 | 44 | 82 |
| SW11025-0550 | 5,5 | 6 | 35 | 44 | 82 |
| SW11025-0560 | 5,6 | 6 | 35 | 44 | 82 |
| SW11025-0570 | 5,7 | 6 | 35 | 44 | 82 |
| SW11025-0580 | 5,8 | 6 | 35 | 44 | 82 |
| SW11025-0590 | 5,9 | 6 | 35 | 44 | 82 |
| SW11025-0600 | 6 | 6 | 35 | 44 | 82 |
| SW11025-0610 | 6,1 | 8 | 43 | 53 | 91 |
| SW11025-0620 | 6,2 | 8 | 43 | 53 | 91 |
| SW11025-0630 | 6,3 | 8 | 43 | 53 | 91 |

SW 11025

| Bestellcode (Ordering Code) | Maße in mm (Dimensions in mm) | | | | |
|--------------------------------|-------------------------------|---------|----------|----------|--------|
| | D1 (h7) | D2 (h6) | I 1 (SL) | I 2 (FL) | L (GL) |
| SW11025-0640 | 6,4 | 8 | 43 | 53 | 91 |
| SW11025-0650 | 6,5 | 8 | 43 | 53 | 91 |
| SW11025-0660 | 6,6 | 8 | 43 | 53 | 91 |
| SW11025-0670 | 6,7 | 8 | 43 | 53 | 91 |
| SW11025-0680 | 6,8 | 8 | 43 | 53 | 91 |
| SW11025-0690 | 6,9 | 8 | 43 | 53 | 91 |
| SW11025-0700 | 7 | 8 | 43 | 53 | 91 |
| SW11025-0710 | 7,1 | 8 | 43 | 53 | 91 |
| SW11025-0720 | 7,2 | 8 | 43 | 53 | 91 |
| SW11025-0730 | 7,3 | 8 | 43 | 53 | 91 |
| SW11025-0740 | 7,4 | 8 | 43 | 53 | 91 |
| SW11025-0750 | 7,5 | 8 | 43 | 53 | 91 |
| SW11025-0760 | 7,6 | 8 | 43 | 53 | 91 |
| SW11025-0770 | 7,7 | 8 | 43 | 53 | 91 |
| SW11025-0780 | 7,8 | 8 | 43 | 53 | 91 |
| SW11025-0790 | 7,9 | 8 | 43 | 53 | 91 |
| SW11025-0800 | 8 | 8 | 43 | 53 | 91 |
| SW11025-0810 | 8,1 | 10 | 49 | 61 | 103 |
| SW11025-0820 | 8,2 | 10 | 49 | 61 | 103 |
| SW11025-0830 | 8,3 | 10 | 49 | 61 | 103 |
| SW11025-0840 | 8,4 | 10 | 49 | 61 | 103 |
| SW11025-0850 | 8,5 | 10 | 49 | 61 | 103 |
| SW11025-0860 | 8,6 | 10 | 49 | 61 | 103 |
| SW11025-0870 | 8,7 | 10 | 49 | 61 | 103 |
| SW11025-0880 | 8,8 | 10 | 49 | 61 | 103 |
| SW11025-0890 | 8,9 | 10 | 49 | 61 | 103 |
| SW11025-0900 | 9 | 10 | 49 | 61 | 103 |
| SW11025-0910 | 9,1 | 10 | 49 | 61 | 103 |
| SW11025-0920 | 9,2 | 10 | 49 | 61 | 103 |
| SW11025-0930 | 9,3 | 10 | 49 | 61 | 103 |
| SW11025-0940 | 9,4 | 10 | 49 | 61 | 103 |
| SW11025-0950 | 9,5 | 10 | 49 | 61 | 103 |
| SW11025-0960 | 9,6 | 10 | 49 | 61 | 103 |
| SW11025-0970 | 9,7 | 10 | 49 | 61 | 103 |
| SW11025-0980 | 9,8 | 10 | 49 | 61 | 103 |
| SW11025-0990 | 9,9 | 10 | 49 | 61 | 103 |
| SW11025-1000 | 10 | 10 | 49 | 61 | 103 |
| SW11025-1020 | 10,2 | 12 | 56 | 71 | 118 |
| SW11025-1050 | 10,5 | 12 | 56 | 71 | 118 |
| SW11025-1080 | 10,8 | 12 | 56 | 71 | 118 |
| SW11025-1100 | 11 | 12 | 56 | 71 | 118 |
| SW11025-1150 | 11,5 | 12 | 56 | 71 | 118 |
| SW11025-1180 | 11,8 | 12 | 56 | 71 | 118 |
| SW11025-1200 | 12 | 12 | 56 | 71 | 118 |
| SW11025-1250 | 12,5 | 14 | 60 | 77 | 124 |
| SW11025-1280 | 12,8 | 14 | 60 | 77 | 124 |

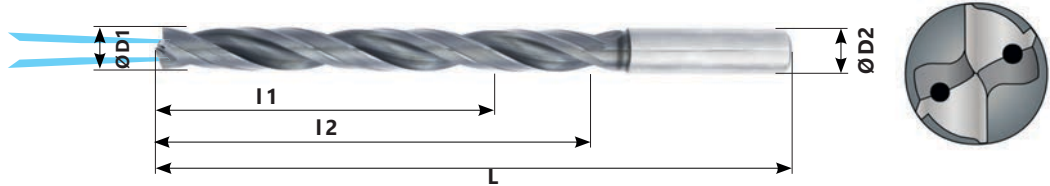
SW 11025

| Bestellcode (Ordering Code) | Maße in mm (Dimensions in mm) | | | | |
|--------------------------------|-------------------------------|---------|----------|----------|--------|
| | D1 (h7) | D2 (h6) | I 1 (SL) | I 2 (FL) | L (GL) |
| SW11025-1300 | 13 | 14 | 60 | 77 | 124 |
| SW11025-1350 | 13,5 | 14 | 60 | 77 | 124 |
| SW11025-1380 | 13,8 | 14 | 60 | 77 | 124 |
| SW11025-1400 | 14 | 14 | 60 | 77 | 124 |
| SW11025-1450 | 14,5 | 16 | 63 | 83 | 133 |
| SW11025-1480 | 14,8 | 16 | 63 | 83 | 133 |
| SW11025-1500 | 15 | 16 | 63 | 83 | 133 |
| SW11025-1550 | 15,5 | 16 | 63 | 83 | 133 |
| SW11025-1580 | 15,8 | 16 | 63 | 83 | 133 |
| SW11025-1600 | 16 | 16 | 63 | 83 | 133 |
| SW11025-1650 | 16,5 | 18 | 71 | 93 | 143 |
| SW11025-1680 | 16,8 | 18 | 71 | 93 | 143 |
| SW11025-1700 | 17 | 18 | 71 | 93 | 143 |
| SW11025-1750 | 17,5 | 18 | 71 | 93 | 143 |
| SW11025-1780 | 17,8 | 18 | 71 | 93 | 143 |
| SW11025-1800 | 18 | 18 | 71 | 93 | 143 |
| SW11025-1850 | 18,5 | 20 | 77 | 101 | 153 |
| SW11025-1880 | 18,8 | 20 | 77 | 101 | 153 |
| SW11025-1900 | 19 | 20 | 77 | 101 | 153 |
| SW11025-1950 | 19,5 | 20 | 77 | 101 | 153 |
| SW11025-1980 | 19,8 | 20 | 77 | 101 | 153 |
| SW11025-2000 | 20 | 20 | 77 | 101 | 153 |

8xD VHM-BOHRER IK DOPPELFASE MIT STAHL / GUSS GEOMETRIE
8xD SC-DRILL IC WITH DOUBLE LANDS WITH STEEL / CAST IRON GEOMETRY

SW 11028

AlTiCrN
 UNIVERSAL HA
 IK



| Bestellcode (Ordering Code) | Maße in mm (Dimensions in mm) | | | | |
|--------------------------------|-------------------------------|---------|----------|----------|--------|
| | D1 (h7) | D2 (h6) | I 1 (SL) | I 2 (FL) | L (GL) |
| SW11028-0300 | 3 | 6 | 29 | 34 | 72 |
| SW11028-0310 | 3,1 | 6 | 29 | 34 | 72 |
| SW11028-0320 | 3,2 | 6 | 29 | 34 | 72 |
| SW11028-0330 | 3,3 | 6 | 29 | 34 | 72 |
| SW11028-0340 | 3,4 | 6 | 29 | 34 | 72 |
| SW11028-0350 | 3,5 | 6 | 29 | 34 | 72 |
| SW11028-0360 | 3,6 | 6 | 29 | 34 | 72 |
| SW11028-0370 | 3,7 | 6 | 29 | 34 | 72 |
| SW11028-0380 | 3,8 | 6 | 36 | 43 | 81 |
| SW11028-0390 | 3,9 | 6 | 36 | 43 | 81 |
| SW11028-0400 | 4 | 6 | 36 | 43 | 81 |
| SW11028-0410 | 4,1 | 6 | 36 | 43 | 81 |
| SW11028-0420 | 4,2 | 6 | 36 | 43 | 81 |
| SW11028-0430 | 4,3 | 6 | 36 | 43 | 81 |
| SW11028-0440 | 4,4 | 6 | 36 | 43 | 81 |
| SW11028-0450 | 4,5 | 6 | 36 | 43 | 81 |
| SW11028-0460 | 4,6 | 6 | 36 | 43 | 81 |
| SW11028-0470 | 4,7 | 6 | 36 | 43 | 81 |
| SW11028-0480 | 4,8 | 6 | 48 | 57 | 95 |
| SW11028-0490 | 4,9 | 6 | 48 | 57 | 95 |
| SW11028-0500 | 5 | 6 | 48 | 57 | 95 |
| SW11028-0510 | 5,1 | 6 | 48 | 57 | 95 |
| SW11028-0520 | 5,2 | 6 | 48 | 57 | 95 |
| SW11028-0530 | 5,3 | 6 | 48 | 57 | 95 |
| SW11028-0540 | 5,4 | 6 | 48 | 57 | 95 |
| SW11028-0550 | 5,5 | 6 | 48 | 57 | 95 |
| SW11028-0560 | 5,6 | 6 | 48 | 57 | 95 |
| SW11028-0570 | 5,7 | 6 | 48 | 57 | 95 |
| SW11028-0580 | 5,8 | 6 | 48 | 57 | 95 |
| SW11028-0590 | 5,9 | 6 | 48 | 57 | 95 |
| SW11028-0600 | 6 | 6 | 48 | 57 | 95 |
| SW11028-0610 | 6,1 | 8 | 64 | 76 | 114 |
| SW11028-0620 | 6,2 | 8 | 64 | 76 | 114 |
| SW11028-0630 | 6,3 | 8 | 64 | 76 | 114 |

SW 11028

| Bestellcode (Ordering Code) | Maße in mm (Dimensions in mm) | | | | |
|--------------------------------|-------------------------------|---------|----------|----------|--------|
| | D1 (h7) | D2 (h6) | I 1 (SL) | I 2 (FL) | L (GL) |
| SW11028-0640 | 6,4 | 8 | 64 | 76 | 114 |
| SW11028-0650 | 6,5 | 8 | 64 | 76 | 114 |
| SW11028-0660 | 6,6 | 8 | 64 | 76 | 114 |
| SW11028-0670 | 6,7 | 8 | 64 | 76 | 114 |
| SW11028-0680 | 6,8 | 8 | 64 | 76 | 114 |
| SW11028-0690 | 6,9 | 8 | 64 | 76 | 114 |
| SW11028-0700 | 7 | 8 | 64 | 76 | 114 |
| SW11028-0710 | 7,1 | 8 | 64 | 76 | 114 |
| SW11028-0720 | 7,2 | 8 | 64 | 76 | 114 |
| SW11028-0730 | 7,3 | 8 | 64 | 76 | 114 |
| SW11028-0740 | 7,4 | 8 | 64 | 76 | 114 |
| SW11028-0750 | 7,5 | 8 | 64 | 76 | 114 |
| SW11028-0760 | 7,6 | 8 | 64 | 76 | 114 |
| SW11028-0770 | 7,7 | 8 | 64 | 76 | 114 |
| SW11028-0780 | 7,8 | 8 | 64 | 76 | 114 |
| SW11028-0790 | 7,9 | 8 | 64 | 76 | 114 |
| SW11028-0800 | 8 | 8 | 64 | 76 | 114 |
| SW11028-0810 | 8,1 | 10 | 80 | 95 | 142 |
| SW11028-0820 | 8,2 | 10 | 80 | 95 | 142 |
| SW11028-0830 | 8,3 | 10 | 80 | 95 | 142 |
| SW11028-0840 | 8,4 | 10 | 80 | 95 | 142 |
| SW11028-0850 | 8,5 | 10 | 80 | 95 | 142 |
| SW11028-0860 | 8,6 | 10 | 80 | 95 | 142 |
| SW11028-0870 | 8,7 | 10 | 80 | 95 | 142 |
| SW11028-0880 | 8,8 | 10 | 80 | 95 | 142 |
| SW11028-0890 | 8,9 | 10 | 80 | 95 | 142 |
| SW11028-0900 | 9 | 10 | 80 | 95 | 142 |
| SW11028-0910 | 9,1 | 10 | 80 | 95 | 142 |
| SW11028-0920 | 9,2 | 10 | 80 | 95 | 142 |
| SW11028-0930 | 9,3 | 10 | 80 | 95 | 142 |
| SW11028-0940 | 9,4 | 10 | 80 | 95 | 142 |
| SW11028-0950 | 9,5 | 10 | 80 | 95 | 142 |
| SW11028-0960 | 9,6 | 10 | 80 | 95 | 142 |
| SW11028-0970 | 9,7 | 10 | 80 | 95 | 142 |
| SW11028-0980 | 9,8 | 10 | 80 | 95 | 142 |
| SW11028-0990 | 9,9 | 10 | 80 | 95 | 142 |
| SW11028-1000 | 10 | 10 | 80 | 95 | 142 |
| SW11028-1020 | 10,2 | 12 | 96 | 114 | 162 |
| SW11028-1050 | 10,5 | 12 | 96 | 114 | 162 |
| SW11028-1080 | 10,8 | 12 | 96 | 114 | 162 |
| SW11028-1100 | 11 | 12 | 96 | 114 | 162 |
| SW11028-1150 | 11,5 | 12 | 96 | 114 | 162 |
| SW11028-1180 | 11,8 | 12 | 96 | 114 | 162 |
| SW11028-1200 | 12 | 12 | 96 | 114 | 162 |
| SW11028-1250 | 12,5 | 14 | 112 | 133 | 178 |
| SW11028-1280 | 12,8 | 14 | 112 | 133 | 178 |

SW 11028

| Bestellcode (Ordering Code) | Maße in mm (Dimensions in mm) | | | | |
|--------------------------------|-------------------------------|---------|----------|----------|--------|
| | D1 (h7) | D2 (h6) | I 1 (SL) | I 2 (FL) | L (GL) |
| SW11028-1300 | 13 | 14 | 112 | 133 | 178 |
| SW11028-1350 | 13,5 | 14 | 112 | 133 | 178 |
| SW11028-1380 | 13,8 | 14 | 112 | 133 | 178 |
| SW11028-1400 | 14 | 14 | 112 | 133 | 178 |
| SW11028-1450 | 14,5 | 16 | 128 | 152 | 203 |
| SW11028-1480 | 14,8 | 16 | 128 | 152 | 203 |
| SW11028-1500 | 15 | 16 | 128 | 152 | 203 |
| SW11028-1550 | 15,5 | 16 | 128 | 152 | 203 |
| SW11028-1580 | 15,8 | 16 | 128 | 152 | 203 |
| SW11028-1600 | 16 | 16 | 128 | 152 | 203 |
| SW11028-1650 | 16,5 | 18 | 144 | 171 | 222 |
| SW11028-1680 | 16,8 | 18 | 144 | 171 | 222 |
| SW11028-1700 | 17 | 18 | 144 | 171 | 222 |
| SW11028-1750 | 17,5 | 18 | 144 | 171 | 222 |
| SW11028-1780 | 17,8 | 18 | 144 | 171 | 222 |
| SW11028-1800 | 18 | 18 | 144 | 171 | 222 |
| SW11028-1850 | 18,5 | 20 | 160 | 190 | 243 |
| SW11028-1880 | 18,8 | 20 | 160 | 190 | 243 |
| SW11028-1900 | 19 | 20 | 160 | 190 | 243 |
| SW11028-1950 | 19,5 | 20 | 160 | 190 | 243 |
| SW11028-1980 | 19,8 | 20 | 160 | 190 | 243 |
| SW11028-2000 | 20 | 20 | 160 | 190 | 243 |

VHM-BOHRER MIT STAHL / GUSS GEOMETRIE
SC-DRILL WITH STEEL / CAST IRON GEOMETRY

Schnittwerte (Cutting data)

| | Zu bearbeitendes Material (Material to be machined) | Beschaffenheit (Condition) | Schnittgeschwindigkeit (Cutting speed) Vc (m/min) | Vorschub f in mm/U (Feed rate f in mm/rev) | | | | | |
|----------|--|-------------------------------|---|---|------|-------|-------|-------|-------|
| | | | | Ø6mm | Ø8mm | Ø10mm | Ø12mm | Ø16mm | Ø20mm |
| P | Stahl (Steel) | <600 N/mm ² | 100-120 | 0,15 | 0,2 | 0,25 | 0,3 | 0,36 | 0,4 |
| | | <700 N/mm ² | 90-110 | 0,15 | 0,2 | 0,25 | 0,3 | 0,36 | 0,4 |
| | | <700 N/mm ² | 80-100 | 0,15 | 0,2 | 0,25 | 0,3 | 0,36 | 0,4 |
| | Legierter Stahl (alloyed Steel) | <900 N/mm ² | 80-95 | 0,15 | 0,2 | 0,25 | 0,3 | 0,36 | 0,4 |
| | | <1000 N/mm ² | 65-80 | 0,14 | 0,18 | 0,22 | 0,26 | 0,3 | 0,35 |
| | | <1000 N/mm ² | 45-65 | 0,12 | 0,16 | 0,2 | 0,24 | 0,3 | 0,35 |
| M | Rostfreie Stähle (Stainless Steel) | - | 30-60 | 0,1 | 0,12 | 0,14 | 0,16 | 0,2 | 0,28 |
| K | Grauguss, legierter Grauguss (Grey cast iron, grey cast iron alloy) | <200 HB | 100-130 | 0,22 | 0,28 | 0,34 | 0,38 | 0,44 | 0,5 |
| | | <250 HB | 90-120 | 0,2 | 0,25 | 0,3 | 0,35 | 0,4 | 0,45 |
| | Sphäroguss, Vermikularguss (Spheroidal graphite cast iron, CGI) | <250 HB | 80-100 | 0,2 | 0,25 | 0,3 | 0,35 | 0,4 | 0,45 |
| | | <600 N/mm ² | 90-120 | 0,2 | 0,25 | 0,3 | 0,35 | 0,4 | 0,45 |
| | | <600 N/mm ² | 70-90 | 0,18 | 0,22 | 0,25 | 0,3 | 0,35 | 0,4 |
| N | Aluminium-Knetlegierungen (wrought aluminum alloy) | - | 180-250 | 0,18 | 0,24 | 0,3 | 0,35 | 0,4 | 0,5 |
| | Aluminium (Si < 10%) | - | 180-250 | 0,18 | 0,24 | 0,3 | 0,35 | 0,4 | 0,5 |
| | Aluminium (Si > 10%) | - | 160-220 | 0,18 | 0,24 | 0,3 | 0,35 | 0,4 | 0,5 |
| | Kupfer, Messing, Bronze (Copper, brass, bronze) | - | 120-200 | 0,18 | 0,24 | 0,3 | 0,35 | 0,4 | 0,5 |
| S | Titanlegierung (Titanium alloys) | - | 20-50 | 0,1 | 0,12 | 0,14 | 0,16 | 0,2 | 0,25 |
| | Nickellegierungen (Nickel alloys) | - | 20-45 | 0,1 | 0,12 | 0,14 | 0,16 | 0,18 | 0,25 |

Alle Schnittwerte dienen zur Orientierung (All cutting datas serve to orientation)

TECHNISCHE DETAILS

TECHNICAL DETAILS

Bevorzugte Anwendung unserer Bohrer mit Stahl / Guss Geometrie sind unlegierte Stähle, Stahlguß, legierte Stähle bis 1000 N/mm², Grauguß (>=GGG50) Bei erhöhten Anforderungen an die Bohrungsqualität (Rundheit, Geradheit, Toleranz).

Main application of our drills with Steel / Cast Iron Geometry is unalloyed steel, cast steel, alloyed steel up to 1000 N/mm², cast iron (>GGG50) For applications with high demand for hole quality like (roundness, straightness, tolerance).

| WERKZEUG TOOL | SW 10003 SW 10005 | SW 11003 | SW 11005 | SW 11025 | SW 11028 |
|--------------------------------------|--|--|--|-----------------------------|------------------------------|
| SPIRALE HELIX | 30° RECHTS 30° RIGHT | 30° RECHTS 30° RIGHT | 30° RECHTS 30° RIGHT | 30° RECHTS 30° RIGHT | 30° RECHTS 30° RIGHT |
| SCHNEIDRICHTUNG CUTTING DIRECTION | RECHTS R.H.C. | RECHTS R.H.C. | RECHTS R.H.C. | RECHTS R.H.C. | RECHTS R.H.C. |
| SPITZENWINKEL POINT ANGLE | 140° 140° | 140° 140° | 140° 140° | 140° 140° | 140° 140° |
| SPITZENANSCHLIFF POINT GRINDING | KEGELMANTEL RELIEVED CONE | KEGELMANTEL RELIEVED CONE | KEGELMANTEL RELIEVED CONE | DOPPELMANTEL DOUBLE CONE | KEGELMANTEL RELIEVED CONE |
| BESCHICHTUNG COATING | AlCrN AlCrN | AlCrN AlCrN | AlCrN AlCrN | AlCrN AlCrN | AlCrN AlCrN |
| KÜHLUNG COOLANT | AUSSEN EXTERNAL | INNEN INTERNAL | INNEN INTERNAL | INNEN INTERNAL | INNEN INTERNAL |
| FÜHRUNGSFASEN GUIDE LANDS | - | - | DOPPELFASE DOUBLE LANDS | DOPPELFASE DOUBLE LANDS | DOPPELFASE DOUBLE LANDS |
| SCHAFTFORM SHANK | DIN 6535 HA DIN 6535 HA | DIN 6535 HA DIN 6535 HA | DIN 6535 HA DIN 6535 HA | - | - |
| OPTIONAL OPTIONAL | WHISTLE-NOTCH-SCHAFT (HE) & WELDON-SCHAFT (HB) WHISTLE-NOTCH-SCHAFT (HE) & WELDON-SCHAFT (HB) | WHISTLE-NOTCH-SCHAFT (HE) & WELDON-SCHAFT (HB) WHISTLE-NOTCH-SCHAFT (HE) & WELDON-SCHAFT (HB) | WHISTLE-NOTCH-SCHAFT (HE) & WELDON-SCHAFT (HB) WHISTLE-NOTCH-SCHAFT (HE) & WELDON-SCHAFT (HB) | - | - |

3xD VHM-BOHRER MIT EDELSTAHLGEOMETRIE

3xD SC-DRILL WITH STAINLESS STEEL GEOMETRY

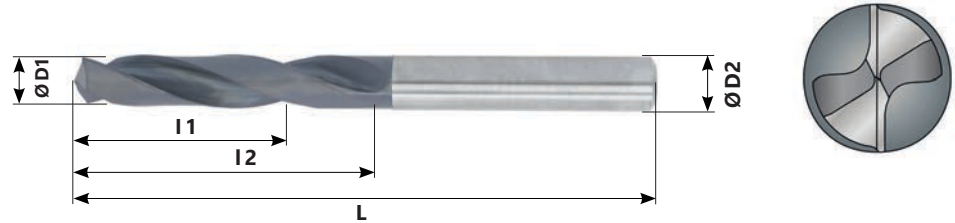
SW 20003

AlTiCrN

UNIVERSAL HA

Optional:

HB HE



| Bestellcode (Ordering Code) | Maße in mm (Dimensions in mm) | | | | |
|--------------------------------|-------------------------------|---------|----------|----------|--------|
| | D1 (h7) | D2 (h6) | I 1 (SL) | I 2 (FL) | L (GL) |
| SW20003-0300 | 3 | 6 | 14 | 20 | 62 |
| SW20003-0310 | 3,1 | 6 | 14 | 20 | 62 |
| SW20003-0320 | 3,2 | 6 | 14 | 20 | 62 |
| SW20003-0330 | 3,3 | 6 | 14 | 20 | 62 |
| SW20003-0340 | 3,4 | 6 | 14 | 20 | 62 |
| SW20003-0350 | 3,5 | 6 | 14 | 20 | 62 |
| SW20003-0360 | 3,6 | 6 | 14 | 20 | 62 |
| SW20003-0370 | 3,7 | 6 | 14 | 20 | 62 |
| SW20003-0380 | 3,8 | 6 | 17 | 24 | 66 |
| SW20003-0390 | 3,9 | 6 | 17 | 24 | 66 |
| SW20003-0400 | 4 | 6 | 17 | 24 | 66 |
| SW20003-0410 | 4,1 | 6 | 17 | 24 | 66 |
| SW20003-0420 | 4,2 | 6 | 17 | 24 | 66 |
| SW20003-0430 | 4,3 | 6 | 17 | 24 | 66 |
| SW20003-0440 | 4,4 | 6 | 17 | 24 | 66 |
| SW20003-0450 | 4,5 | 6 | 17 | 24 | 66 |
| SW20003-0460 | 4,6 | 6 | 17 | 24 | 66 |
| SW20003-0465 | 4,65 | 6 | 17 | 24 | 66 |
| SW20003-0470 | 4,7 | 6 | 17 | 24 | 66 |
| SW20003-0480 | 4,8 | 6 | 20 | 28 | 66 |
| SW20003-0490 | 4,9 | 6 | 20 | 28 | 66 |
| SW20003-0500 | 5 | 6 | 20 | 28 | 66 |
| SW20003-0510 | 5,1 | 6 | 20 | 28 | 66 |
| SW20003-0520 | 5,2 | 6 | 20 | 28 | 66 |
| SW20003-0530 | 5,3 | 6 | 20 | 28 | 66 |
| SW20003-0540 | 5,4 | 6 | 20 | 28 | 66 |
| SW20003-0550 | 5,5 | 6 | 20 | 28 | 66 |
| SW20003-0555 | 5,55 | 6 | 20 | 28 | 66 |
| SW20003-0560 | 5,6 | 6 | 20 | 28 | 66 |
| SW20003-0570 | 5,7 | 6 | 20 | 28 | 66 |
| SW20003-0580 | 5,8 | 6 | 20 | 28 | 66 |
| SW20003-0590 | 5,9 | 6 | 20 | 28 | 66 |
| SW20003-0600 | 6 | 6 | 20 | 28 | 66 |
| SW20003-0610 | 6,1 | 8 | 24 | 34 | 79 |

3xD VHM-BOHRER MIT EDELSTAHLGEOMETRIE

3xD SC-DRILL WITH STAINLESS STEEL GEOMETRY

SW 20003

| Bestellcode (Ordering Code) | Maße in mm (Dimensions in mm) | | | | |
|--------------------------------|-------------------------------|---------|----------|----------|--------|
| | D1 (h7) | D2 (h6) | I 1 (SL) | I 2 (FL) | L (GL) |
| SW20003-0620 | 6,2 | 8 | 24 | 34 | 79 |
| SW20003-0630 | 6,3 | 8 | 24 | 34 | 79 |
| SW20003-0640 | 6,4 | 8 | 24 | 34 | 79 |
| SW20003-0650 | 6,5 | 8 | 24 | 34 | 79 |
| SW20003-0660 | 6,6 | 8 | 24 | 34 | 79 |
| SW20003-0670 | 6,7 | 8 | 24 | 34 | 79 |
| SW20003-0680 | 6,8 | 8 | 24 | 34 | 79 |
| SW20003-0690 | 6,9 | 8 | 24 | 34 | 79 |
| SW20003-0700 | 7 | 8 | 24 | 34 | 79 |
| SW20003-0710 | 7,1 | 8 | 29 | 41 | 79 |
| SW20003-0720 | 7,2 | 8 | 29 | 41 | 79 |
| SW20003-0730 | 7,3 | 8 | 29 | 41 | 79 |
| SW20003-0740 | 7,4 | 8 | 29 | 41 | 79 |
| SW20003-0750 | 7,5 | 8 | 29 | 41 | 79 |
| SW20003-0760 | 7,6 | 8 | 29 | 41 | 79 |
| SW20003-0770 | 7,7 | 8 | 29 | 41 | 79 |
| SW20003-0780 | 7,8 | 8 | 29 | 41 | 79 |
| SW20003-0790 | 7,9 | 8 | 29 | 41 | 79 |
| SW20003-0800 | 8 | 8 | 29 | 41 | 79 |
| SW20003-0810 | 8,1 | 10 | 35 | 47 | 89 |
| SW20003-0820 | 8,2 | 10 | 35 | 47 | 89 |
| SW20003-0830 | 8,3 | 10 | 35 | 47 | 89 |
| SW20003-0840 | 8,4 | 10 | 35 | 47 | 89 |
| SW20003-0850 | 8,5 | 10 | 35 | 47 | 89 |
| SW20003-0860 | 8,6 | 10 | 35 | 47 | 89 |
| SW20003-0870 | 8,7 | 10 | 35 | 47 | 89 |
| SW20003-0880 | 8,8 | 10 | 35 | 47 | 89 |
| SW20003-0890 | 8,9 | 10 | 35 | 47 | 89 |
| SW20003-0900 | 9 | 10 | 35 | 47 | 89 |
| SW20003-0910 | 9,1 | 10 | 35 | 47 | 89 |
| SW20003-0920 | 9,2 | 10 | 35 | 47 | 89 |
| SW20003-0925 | 9,25 | 10 | 35 | 47 | 89 |
| SW20003-0930 | 9,3 | 10 | 35 | 47 | 89 |
| SW20003-0940 | 9,4 | 10 | 35 | 47 | 89 |
| SW20003-0950 | 9,5 | 10 | 35 | 47 | 89 |
| SW20003-0960 | 9,6 | 10 | 35 | 47 | 89 |
| SW20003-0970 | 9,7 | 10 | 35 | 47 | 89 |
| SW20003-0980 | 9,8 | 10 | 35 | 47 | 89 |
| SW20003-0990 | 9,9 | 10 | 35 | 47 | 89 |
| SW20003-1000 | 10 | 10 | 35 | 47 | 89 |
| SW20003-1020 | 10,2 | 12 | 40 | 55 | 102 |
| SW20003-1050 | 10,5 | 12 | 40 | 55 | 102 |
| SW20003-1080 | 10,8 | 12 | 40 | 55 | 102 |
| SW20003-1100 | 11 | 12 | 40 | 55 | 102 |
| SW20003-1150 | 11,5 | 12 | 40 | 55 | 102 |
| SW20003-1180 | 11,8 | 12 | 40 | 55 | 102 |

3xD VHM-BOHRER MIT EDELSTAHLGEOMETRIE

3xD SC-DRILL WITH STAINLESS STEEL GEOMETRY

SW 20003

| Bestellcode (Ordering Code) | Maße in mm (Dimensions in mm) | | | | |
|--------------------------------|-------------------------------|---------|----------|----------|--------|
| | D1 (h7) | D2 (h6) | I 1 (SL) | I 2 (FL) | L (GL) |
| SW20003-1200 | 12 | 12 | 40 | 55 | 102 |
| SW20003-1250 | 12,5 | 14 | 43 | 60 | 107 |
| SW20003-1280 | 12,8 | 14 | 43 | 60 | 107 |
| SW20003-1300 | 13 | 14 | 43 | 60 | 107 |
| SW20003-1350 | 13,5 | 14 | 43 | 60 | 107 |
| SW20003-1380 | 13,8 | 14 | 43 | 60 | 107 |
| SW20003-1400 | 14 | 14 | 43 | 60 | 107 |
| SW20003-1450 | 14,5 | 16 | 45 | 65 | 115 |
| SW20003-1480 | 14,8 | 16 | 45 | 65 | 115 |
| SW20003-1500 | 15 | 16 | 45 | 65 | 115 |
| SW20003-1550 | 15,5 | 16 | 45 | 65 | 115 |
| SW20003-1580 | 15,8 | 16 | 45 | 65 | 115 |
| SW20003-1600 | 16 | 16 | 45 | 65 | 115 |
| SW20003-1650 | 16,5 | 18 | 51 | 73 | 123 |
| SW20003-1680 | 16,8 | 18 | 51 | 73 | 123 |
| SW20003-1700 | 17 | 18 | 51 | 73 | 123 |
| SW20003-1750 | 17,5 | 18 | 51 | 73 | 123 |
| SW20003-1780 | 17,8 | 18 | 51 | 73 | 123 |
| SW20003-1800 | 18 | 18 | 51 | 73 | 123 |
| SW20003-1850 | 18,5 | 20 | 55 | 79 | 131 |
| SW20003-1880 | 18,8 | 20 | 55 | 79 | 131 |
| SW20003-1900 | 19 | 20 | 55 | 79 | 131 |
| SW20003-1950 | 19,5 | 20 | 55 | 79 | 131 |
| SW20003-1980 | 19,8 | 20 | 55 | 79 | 131 |
| SW20003-2000 | 20 | 20 | 55 | 79 | 131 |

5xD VHM-BOHRER MIT EDELSTAHLGEOMETRIE

5xD SC-DRILL WITH STAINLESS STEEL GEOMETRY

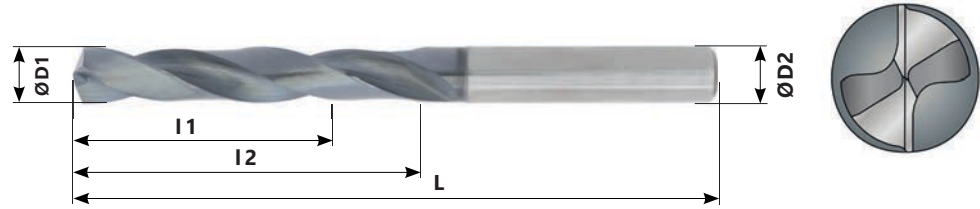
SW 20005

AlTiCrN

UNIVERSAL HA

Optional:

HB HE



| Bestellcode (Ordering Code) | Maße in mm (Dimensions in mm) | | | | |
|--------------------------------|-------------------------------|---------|----------|----------|--------|
| | D1 (h7) | D2 (h6) | I 1 (SL) | I 2 (FL) | L (GL) |
| SW20005-0300 | 3 | 6 | 23 | 28 | 66 |
| SW20005-0310 | 3,1 | 6 | 23 | 28 | 66 |
| SW20005-0320 | 3,2 | 6 | 23 | 28 | 66 |
| SW20005-0330 | 3,3 | 6 | 23 | 28 | 66 |
| SW20005-0340 | 3,4 | 6 | 23 | 28 | 66 |
| SW20005-0350 | 3,5 | 6 | 23 | 28 | 66 |
| SW20005-0360 | 3,6 | 6 | 23 | 28 | 66 |
| SW20005-0370 | 3,7 | 6 | 23 | 28 | 66 |
| SW20005-0380 | 3,8 | 6 | 29 | 36 | 74 |
| SW20005-0390 | 3,9 | 6 | 29 | 36 | 74 |
| SW20005-0400 | 4 | 6 | 29 | 36 | 74 |
| SW20005-0410 | 4,1 | 6 | 29 | 36 | 74 |
| SW20005-0420 | 4,2 | 6 | 29 | 36 | 74 |
| SW20005-0430 | 4,3 | 6 | 29 | 36 | 74 |
| SW20005-0440 | 4,4 | 6 | 29 | 36 | 74 |
| SW20005-0450 | 4,5 | 6 | 29 | 36 | 74 |
| SW20005-0460 | 4,6 | 6 | 29 | 36 | 74 |
| SW20005-0470 | 4,7 | 6 | 29 | 36 | 74 |
| SW20005-0480 | 4,8 | 6 | 35 | 44 | 82 |
| SW20005-0490 | 4,9 | 6 | 35 | 44 | 82 |
| SW20005-0500 | 5 | 6 | 35 | 44 | 82 |
| SW20005-0510 | 5,1 | 6 | 35 | 44 | 82 |
| SW20005-0520 | 5,2 | 6 | 35 | 44 | 82 |
| SW20005-0530 | 5,3 | 6 | 35 | 44 | 82 |
| SW20005-0540 | 5,4 | 6 | 35 | 44 | 82 |
| SW20005-0550 | 5,5 | 6 | 35 | 44 | 82 |
| SW20005-0560 | 5,6 | 6 | 35 | 44 | 82 |
| SW20005-0570 | 5,7 | 6 | 35 | 44 | 82 |
| SW20005-0580 | 5,8 | 6 | 35 | 44 | 82 |
| SW20005-0590 | 5,9 | 6 | 35 | 44 | 82 |
| SW20005-0600 | 6 | 6 | 35 | 44 | 82 |
| SW20005-0610 | 6,1 | 8 | 43 | 53 | 91 |
| SW20005-0620 | 6,2 | 8 | 43 | 53 | 91 |
| SW20005-0630 | 6,3 | 8 | 43 | 53 | 91 |

5xD VHM-BOHRER MIT EDELSTAHLGEOMETRIE

5xD SC-DRILL WITH STAINLESS STEEL GEOMETRY

SW 20005

| Bestellcode (Ordering Code) | Maße in mm (Dimensions in mm) | | | | |
|--------------------------------|-------------------------------|---------|----------|----------|--------|
| | D1 (h7) | D2 (h6) | I 1 (SL) | I 2 (FL) | L (GL) |
| SW20005-0640 | 6,4 | 8 | 43 | 53 | 91 |
| SW20005-0650 | 6,5 | 8 | 43 | 53 | 91 |
| SW20005-0660 | 6,6 | 8 | 43 | 53 | 91 |
| SW20005-0670 | 6,7 | 8 | 43 | 53 | 91 |
| SW20005-0680 | 6,8 | 8 | 43 | 53 | 91 |
| SW20005-0690 | 6,9 | 8 | 43 | 53 | 91 |
| SW20005-0700 | 7 | 8 | 43 | 53 | 91 |
| SW20005-0710 | 7,1 | 8 | 43 | 53 | 91 |
| SW20005-0720 | 7,2 | 8 | 43 | 53 | 91 |
| SW20005-0730 | 7,3 | 8 | 43 | 53 | 91 |
| SW20005-0740 | 7,4 | 8 | 43 | 53 | 91 |
| SW20005-0750 | 7,5 | 8 | 43 | 53 | 91 |
| SW20005-0760 | 7,6 | 8 | 43 | 53 | 91 |
| SW20005-0770 | 7,7 | 8 | 43 | 53 | 91 |
| SW20005-0780 | 7,8 | 8 | 43 | 53 | 91 |
| SW20005-0790 | 7,9 | 8 | 43 | 53 | 91 |
| SW20005-0800 | 8 | 8 | 43 | 53 | 91 |
| SW20005-0810 | 8,1 | 10 | 49 | 61 | 103 |
| SW20005-0820 | 8,2 | 10 | 49 | 61 | 103 |
| SW20005-0830 | 8,3 | 10 | 49 | 61 | 103 |
| SW20005-0840 | 8,4 | 10 | 49 | 61 | 103 |
| SW20005-0850 | 8,5 | 10 | 49 | 61 | 103 |
| SW20005-0860 | 8,6 | 10 | 49 | 61 | 103 |
| SW20005-0870 | 8,7 | 10 | 49 | 61 | 103 |
| SW20005-0880 | 8,8 | 10 | 49 | 61 | 103 |
| SW20005-0890 | 8,9 | 10 | 49 | 61 | 103 |
| SW20005-0900 | 9 | 10 | 49 | 61 | 103 |
| SW20005-0910 | 9,1 | 10 | 49 | 61 | 103 |
| SW20005-0920 | 9,2 | 10 | 49 | 61 | 103 |
| SW20005-0930 | 9,3 | 10 | 49 | 61 | 103 |
| SW20005-0940 | 9,4 | 10 | 49 | 61 | 103 |
| SW20005-0950 | 9,5 | 10 | 49 | 61 | 103 |
| SW20005-0960 | 9,6 | 10 | 49 | 61 | 103 |
| SW20005-0970 | 9,7 | 10 | 49 | 61 | 103 |
| SW20005-0980 | 9,8 | 10 | 49 | 61 | 103 |
| SW20005-0990 | 9,9 | 10 | 49 | 61 | 103 |
| SW20005-1000 | 10 | 10 | 49 | 61 | 103 |
| SW20005-1020 | 10,2 | 12 | 56 | 71 | 118 |
| SW20005-1050 | 10,5 | 12 | 56 | 71 | 118 |
| SW20005-1080 | 10,8 | 12 | 56 | 71 | 118 |
| SW20005-1100 | 11 | 12 | 56 | 71 | 118 |
| SW20005-1150 | 11,5 | 12 | 56 | 71 | 118 |
| SW20005-1180 | 11,8 | 12 | 56 | 71 | 118 |
| SW20005-1200 | 12 | 12 | 56 | 71 | 118 |
| SW20005-1250 | 12,5 | 14 | 60 | 77 | 124 |
| SW20005-1280 | 12,8 | 14 | 60 | 77 | 124 |

5xD VHM-BOHRER MIT EDELSTAHLGEOMETRIE
5xD SC-DRILL WITH STAINLESS STEEL GEOMETRY

SW 20005

| Bestellcode (Ordering Code) | Maße in mm (Dimensions in mm) | | | | |
|--------------------------------|-------------------------------|---------|----------|----------|--------|
| | D1 (h7) | D2 (h6) | I 1 (SL) | I 2 (FL) | L (GL) |
| SW20005-1300 | 13 | 14 | 60 | 77 | 124 |
| SW20005-1350 | 13,5 | 14 | 60 | 77 | 124 |
| SW20005-1380 | 13,8 | 14 | 60 | 77 | 124 |
| SW20005-1400 | 14 | 14 | 60 | 77 | 124 |
| SW20005-1450 | 14,5 | 16 | 63 | 83 | 133 |
| SW20005-1480 | 14,8 | 16 | 63 | 83 | 133 |
| SW20005-1500 | 15 | 16 | 63 | 83 | 133 |
| SW20005-1550 | 15,5 | 16 | 63 | 83 | 133 |
| SW20005-1580 | 15,8 | 16 | 63 | 83 | 133 |
| SW20005-1600 | 16 | 16 | 63 | 83 | 133 |
| SW20005-1650 | 16,5 | 18 | 71 | 93 | 143 |
| SW20005-1680 | 16,8 | 18 | 71 | 93 | 143 |
| SW20005-1700 | 17 | 18 | 71 | 93 | 143 |
| SW20005-1750 | 17,5 | 18 | 71 | 93 | 143 |
| SW20005-1780 | 17,8 | 18 | 71 | 93 | 143 |
| SW20005-1800 | 18 | 18 | 71 | 93 | 143 |
| SW20005-1850 | 18,5 | 20 | 77 | 101 | 153 |
| SW20005-1880 | 18,8 | 20 | 77 | 101 | 153 |
| SW20005-1900 | 19 | 20 | 77 | 101 | 153 |
| SW20005-1950 | 19,5 | 20 | 77 | 101 | 153 |
| SW20005-1980 | 19,8 | 20 | 77 | 101 | 153 |
| SW20005-2000 | 20 | 20 | 77 | 101 | 153 |

3xD VHM-BOHRER IK MIT EDELSTAHLGEOMETRIE

3xD SC-DRILL IC WITH STAINLESS STEEL GEOMETRIE

SW 21003

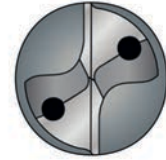
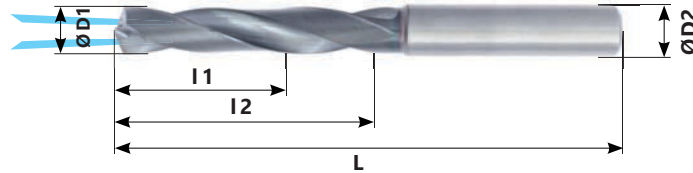
AlTiCrN

UNIVERSAL HA

IK

Optional:

HB HE



| Bestellcode (Ordering Code) | Maße in mm (Dimensions in mm) | | | | |
|--------------------------------|-------------------------------|---------|----------|----------|--------|
| | D1 (h7) | D2 (h6) | I 1 (SL) | I 2 (FL) | L (GL) |
| SW21003-0300 | 3 | 6 | 14 | 20 | 62 |
| SW21003-0310 | 3,1 | 6 | 14 | 20 | 62 |
| SW21003-0320 | 3,15 | 6 | 14 | 20 | 62 |
| SW21003-0330 | 3,2 | 6 | 14 | 20 | 62 |
| SW21003-0340 | 3,3 | 6 | 14 | 20 | 62 |
| SW21003-0350 | 3,4 | 6 | 14 | 20 | 62 |
| SW21003-0360 | 3,5 | 6 | 14 | 20 | 62 |
| SW21003-0370 | 3,6 | 6 | 14 | 20 | 62 |
| SW21003-0380 | 3,7 | 6 | 14 | 20 | 62 |
| SW21003-0390 | 3,8 | 6 | 17 | 24 | 66 |
| SW21003-0400 | 3,9 | 6 | 17 | 24 | 66 |
| SW21003-0410 | 4 | 6 | 17 | 24 | 66 |
| SW21003-0420 | 4,1 | 6 | 17 | 24 | 66 |
| SW21003-0430 | 4,2 | 6 | 17 | 24 | 66 |
| SW21003-0440 | 4,3 | 6 | 17 | 24 | 66 |
| SW21003-0450 | 4,4 | 6 | 17 | 24 | 66 |
| SW21003-0460 | 4,45 | 6 | 17 | 24 | 66 |
| SW21003-0465 | 4,5 | 6 | 17 | 24 | 66 |
| SW21003-0470 | 4,7 | 6 | 17 | 24 | 66 |
| SW21003-0480 | 4,8 | 6 | 20 | 28 | 66 |
| SW21003-0490 | 4,9 | 6 | 20 | 28 | 66 |
| SW21003-0500 | 5 | 6 | 20 | 28 | 66 |
| SW21003-0510 | 5,1 | 6 | 20 | 28 | 66 |
| SW21003-0520 | 5,2 | 6 | 20 | 28 | 66 |
| SW21003-0530 | 5,3 | 6 | 20 | 28 | 66 |
| SW21003-0540 | 5,4 | 6 | 20 | 28 | 66 |
| SW21003-0550 | 5,5 | 6 | 20 | 28 | 66 |
| SW21003-0555 | 5,55 | 6 | 20 | 28 | 66 |
| SW21003-0560 | 5,6 | 6 | 20 | 28 | 66 |
| SW21003-0570 | 5,7 | 6 | 20 | 28 | 66 |
| SW21003-0580 | 5,8 | 6 | 20 | 28 | 66 |
| SW21003-0590 | 5,9 | 6 | 20 | 28 | 66 |
| SW21003-0600 | 6 | 6 | 20 | 28 | 66 |
| SW21003-0610 | 6,1 | 8 | 24 | 34 | 79 |

3xD VHM-BOHRER IK MIT EDELSTAHLGEOMETRIE

3xD SC-DRILL IC WITH STAINLESS STEEL GEOMETRIE

SW 21003

| Bestellcode (Ordering Code) | Maße in mm (Dimensions in mm) | | | | |
|--------------------------------|-------------------------------|---------|----------|----------|--------|
| | D1 (h7) | D2 (h6) | I 1 (SL) | I 2 (FL) | L (GL) |
| SW21003-0620 | 6,2 | 8 | 24 | 34 | 79 |
| SW21003-0630 | 6,3 | 8 | 24 | 34 | 79 |
| SW21003-0640 | 6,4 | 8 | 24 | 34 | 79 |
| SW21003-0650 | 6,5 | 8 | 24 | 34 | 79 |
| SW21003-0660 | 6,6 | 8 | 24 | 34 | 79 |
| SW21003-0670 | 6,7 | 8 | 24 | 34 | 79 |
| SW21003-0680 | 6,8 | 8 | 24 | 34 | 79 |
| SW21003-0690 | 6,9 | 8 | 24 | 34 | 79 |
| SW21003-0700 | 7 | 8 | 24 | 34 | 79 |
| SW21003-0710 | 7,1 | 8 | 29 | 41 | 79 |
| SW21003-0720 | 7,2 | 8 | 29 | 41 | 79 |
| SW21003-0730 | 7,3 | 8 | 29 | 41 | 79 |
| SW21003-0740 | 7,4 | 8 | 29 | 41 | 79 |
| SW21003-0750 | 7,5 | 8 | 29 | 41 | 79 |
| SW21003-0760 | 7,6 | 8 | 29 | 41 | 79 |
| SW21003-0770 | 7,7 | 8 | 29 | 41 | 79 |
| SW21003-0780 | 7,8 | 8 | 29 | 41 | 79 |
| SW21003-0790 | 7,9 | 8 | 29 | 41 | 79 |
| SW21003-0800 | 8 | 8 | 29 | 41 | 79 |
| SW21003-0810 | 8,1 | 10 | 35 | 47 | 89 |
| SW21003-0820 | 8,2 | 10 | 35 | 47 | 89 |
| SW21003-0830 | 8,3 | 10 | 35 | 47 | 89 |
| SW21003-0840 | 8,4 | 10 | 35 | 47 | 89 |
| SW21003-0850 | 8,5 | 10 | 35 | 47 | 89 |
| SW21003-0860 | 8,6 | 10 | 35 | 47 | 89 |
| SW21003-0870 | 8,7 | 10 | 35 | 47 | 89 |
| SW21003-0880 | 8,8 | 10 | 35 | 47 | 89 |
| SW21003-0890 | 8,9 | 10 | 35 | 47 | 89 |
| SW21003-0900 | 9 | 10 | 35 | 47 | 89 |
| SW21003-0910 | 9,1 | 10 | 35 | 47 | 89 |
| SW21003-0920 | 9,2 | 10 | 35 | 47 | 89 |
| SW21003-0925 | 9,25 | 10 | 35 | 47 | 89 |
| SW21003-0930 | 9,3 | 10 | 35 | 47 | 89 |
| SW21003-0940 | 9,4 | 10 | 35 | 47 | 89 |
| SW21003-0950 | 9,5 | 10 | 35 | 47 | 89 |
| SW21003-0960 | 9,6 | 10 | 35 | 47 | 89 |
| SW21003-0970 | 9,7 | 10 | 35 | 47 | 89 |
| SW21003-0980 | 9,8 | 10 | 35 | 47 | 89 |
| SW21003-0990 | 9,9 | 10 | 35 | 47 | 89 |
| SW21003-1000 | 10 | 10 | 35 | 47 | 89 |
| SW21003-1010 | 10,1 | 12 | 40 | 55 | 102 |
| SW21003-1020 | 10,2 | 12 | 40 | 55 | 102 |
| SW21003-1030 | 10,3 | 12 | 40 | 55 | 102 |
| SW21003-1040 | 10,4 | 12 | 40 | 55 | 102 |
| SW21003-1050 | 10,5 | 12 | 40 | 55 | 102 |
| SW21003-1060 | 10,6 | 12 | 40 | 55 | 102 |

SW 21003

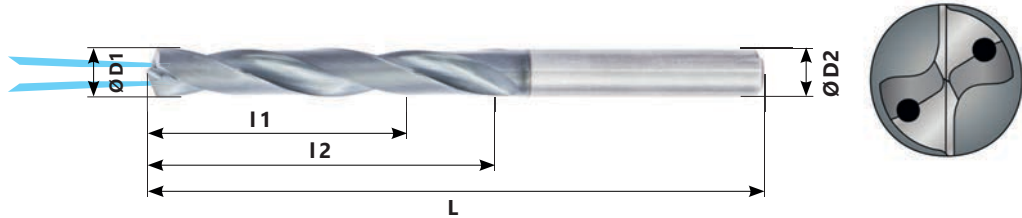
| Bestellcode (Ordering Code) | Maße in mm (Dimensions in mm) | | | | |
|--------------------------------|-------------------------------|---------|----------|----------|--------|
| | D1 (h7) | D2 (h6) | I 1 (SL) | I 2 (FL) | L (GL) |
| SW21003-1070 | 10,7 | 12 | 40 | 55 | 102 |
| SW21003-1080 | 10,8 | 12 | 40 | 55 | 102 |
| SW21003-1090 | 10,9 | 12 | 40 | 55 | 102 |
| SW21003-1100 | 11 | 12 | 40 | 55 | 102 |
| SW21003-1110 | 11,1 | 12 | 40 | 55 | 102 |
| SW21003-1120 | 11,2 | 12 | 40 | 55 | 102 |
| SW21003-1130 | 11,3 | 12 | 40 | 55 | 102 |
| SW21003-1140 | 11,4 | 12 | 40 | 55 | 102 |
| SW21003-1150 | 11,5 | 12 | 40 | 55 | 102 |
| SW21003-1160 | 11,6 | 12 | 40 | 55 | 102 |
| SW21003-1170 | 11,7 | 12 | 40 | 55 | 102 |
| SW21003-1180 | 11,8 | 12 | 40 | 55 | 102 |
| SW21003-1190 | 11,9 | 12 | 40 | 55 | 102 |
| SW21003-1200 | 12 | 12 | 40 | 55 | 102 |
| SW21003-1250 | 12,5 | 14 | 43 | 60 | 107 |
| SW21003-1280 | 12,8 | 14 | 43 | 60 | 107 |
| SW21003-1300 | 13 | 14 | 43 | 60 | 107 |
| SW21003-1350 | 13,5 | 14 | 43 | 60 | 107 |
| SW21003-1380 | 13,8 | 14 | 43 | 60 | 107 |
| SW21003-1400 | 14 | 14 | 43 | 60 | 107 |
| SW21003-1450 | 14,5 | 16 | 45 | 65 | 115 |
| SW21003-1480 | 14,8 | 16 | 45 | 65 | 115 |
| SW21003-1500 | 15 | 16 | 45 | 65 | 115 |
| SW21003-1550 | 15,5 | 16 | 45 | 65 | 115 |
| SW21003-1580 | 15,8 | 16 | 45 | 65 | 115 |
| SW21003-1600 | 16 | 16 | 45 | 65 | 115 |
| SW21003-1650 | 16,5 | 18 | 51 | 73 | 123 |
| SW21003-1680 | 16,8 | 18 | 51 | 73 | 123 |
| SW21003-1700 | 17 | 18 | 51 | 73 | 123 |
| SW21003-1750 | 17,5 | 18 | 51 | 73 | 123 |
| SW21003-1780 | 17,8 | 18 | 51 | 73 | 123 |
| SW21003-1800 | 18 | 18 | 51 | 73 | 123 |
| SW21003-1850 | 18,5 | 20 | 55 | 79 | 131 |
| SW21003-1880 | 18,8 | 20 | 55 | 79 | 131 |
| SW21003-1900 | 19 | 20 | 55 | 79 | 131 |
| SW21003-1950 | 19,5 | 20 | 55 | 79 | 131 |
| SW21003-1980 | 19,8 | 20 | 55 | 79 | 131 |
| SW21003-2000 | 20 | 20 | 55 | 79 | 131 |

5xD VHM-BOHRER IK MIT EDELSTAHL GEOMETRIE

5xD SC-DRILL IC WITH STAINLESS STEEL GEOMETRY

SW 21005

- AlTiCrN
- UNIVERSAL HA
- IK
- Optional:
- HB HE



| Bestellcode (Ordering Code) | Maße in mm (Dimensions in mm) | | | | |
|--------------------------------|-------------------------------|---------|----------|----------|--------|
| | D1 (h7) | D2 (h6) | I 1 (SL) | I 2 (FL) | L (GL) |
| SW21005-0300 | 3 | 6 | 23 | 28 | 66 |
| SW21005-0310 | 3,1 | 6 | 23 | 28 | 66 |
| SW21005-0320 | 3,2 | 6 | 23 | 28 | 66 |
| SW21005-0330 | 3,3 | 6 | 23 | 28 | 66 |
| SW21005-0340 | 3,4 | 6 | 23 | 28 | 66 |
| SW21005-0350 | 3,5 | 6 | 23 | 28 | 66 |
| SW21005-0360 | 3,6 | 6 | 23 | 28 | 66 |
| SW21005-0370 | 3,7 | 6 | 23 | 28 | 66 |
| SW21005-0380 | 3,8 | 6 | 29 | 36 | 74 |
| SW21005-0390 | 3,9 | 6 | 29 | 36 | 74 |
| SW21005-0400 | 4 | 6 | 29 | 36 | 74 |
| SW21005-0410 | 4,1 | 6 | 29 | 36 | 74 |
| SW21005-0420 | 4,2 | 6 | 29 | 36 | 74 |
| SW21005-0430 | 4,3 | 6 | 29 | 36 | 74 |
| SW21005-0440 | 4,4 | 6 | 29 | 36 | 74 |
| SW21005-0450 | 4,5 | 6 | 29 | 36 | 74 |
| SW21005-0460 | 4,6 | 6 | 29 | 36 | 74 |
| SW21005-0470 | 4,7 | 6 | 29 | 36 | 74 |
| SW21005-0480 | 4,8 | 6 | 35 | 44 | 82 |
| SW21005-0490 | 4,9 | 6 | 35 | 44 | 82 |
| SW21005-0500 | 5 | 6 | 35 | 44 | 82 |
| SW21005-0510 | 5,1 | 6 | 35 | 44 | 82 |
| SW21005-0520 | 5,2 | 6 | 35 | 44 | 82 |
| SW21005-0530 | 5,3 | 6 | 35 | 44 | 82 |
| SW21005-0540 | 5,4 | 6 | 35 | 44 | 82 |
| SW21005-0550 | 5,5 | 6 | 35 | 44 | 82 |
| SW21005-0560 | 5,6 | 6 | 35 | 44 | 82 |
| SW21005-0570 | 5,7 | 6 | 35 | 44 | 82 |
| SW21005-0580 | 5,8 | 6 | 35 | 44 | 82 |
| SW21005-0590 | 5,9 | 6 | 35 | 44 | 82 |
| SW21005-0600 | 6 | 6 | 35 | 44 | 82 |
| SW21005-0610 | 6,1 | 8 | 43 | 53 | 91 |
| SW21005-0620 | 6,2 | 8 | 43 | 53 | 91 |
| SW21005-0630 | 6,3 | 8 | 43 | 53 | 91 |

5xD VHM-BOHRER IK MIT EDELSTAHL GEOMETRIE

5xD SC-DRILL IC WITH STAINLESS STEEL GEOMETRY

SW 21005

| Bestellcode (Ordering Code) | Maße in mm (Dimensions in mm) | | | | |
|--------------------------------|-------------------------------|---------|----------|----------|--------|
| | D1 (h7) | D2 (h6) | I 1 (SL) | I 2 (FL) | L (GL) |
| SW21005-0640 | 6,4 | 8 | 43 | 53 | 91 |
| SW21005-0650 | 6,5 | 8 | 43 | 53 | 91 |
| SW21005-0660 | 6,6 | 8 | 43 | 53 | 91 |
| SW21005-0670 | 6,7 | 8 | 43 | 53 | 91 |
| SW21005-0680 | 6,8 | 8 | 43 | 53 | 91 |
| SW21005-0690 | 6,9 | 8 | 43 | 53 | 91 |
| SW21005-0700 | 7 | 8 | 43 | 53 | 91 |
| SW21005-0710 | 7,1 | 8 | 43 | 53 | 91 |
| SW21005-0720 | 7,2 | 8 | 43 | 53 | 91 |
| SW21005-0730 | 7,3 | 8 | 43 | 53 | 91 |
| SW21005-0740 | 7,4 | 8 | 43 | 53 | 91 |
| SW21005-0750 | 7,5 | 8 | 43 | 53 | 91 |
| SW21005-0760 | 7,6 | 8 | 43 | 53 | 91 |
| SW21005-0770 | 7,7 | 8 | 43 | 53 | 91 |
| SW21005-0780 | 7,8 | 8 | 43 | 53 | 91 |
| SW21005-0790 | 7,9 | 8 | 43 | 53 | 91 |
| SW21005-0800 | 8 | 8 | 43 | 53 | 91 |
| SW21005-0810 | 8,1 | 10 | 49 | 61 | 103 |
| SW21005-0820 | 8,2 | 10 | 49 | 61 | 103 |
| SW21005-0830 | 8,3 | 10 | 49 | 61 | 103 |
| SW21005-0840 | 8,4 | 10 | 49 | 61 | 103 |
| SW21005-0850 | 8,5 | 10 | 49 | 61 | 103 |
| SW21005-0860 | 8,6 | 10 | 49 | 61 | 103 |
| SW21005-0870 | 8,7 | 10 | 49 | 61 | 103 |
| SW21005-0880 | 8,8 | 10 | 49 | 61 | 103 |
| SW21005-0890 | 8,9 | 10 | 49 | 61 | 103 |
| SW21005-0900 | 9 | 10 | 49 | 61 | 103 |
| SW21005-0910 | 9,1 | 10 | 49 | 61 | 103 |
| SW21005-0920 | 9,2 | 10 | 49 | 61 | 103 |
| SW21005-0930 | 9,3 | 10 | 49 | 61 | 103 |
| SW21005-0940 | 9,4 | 10 | 49 | 61 | 103 |
| SW21005-0950 | 9,5 | 10 | 49 | 61 | 103 |
| SW21005-0960 | 9,6 | 10 | 49 | 61 | 103 |
| SW21005-0970 | 9,7 | 10 | 49 | 61 | 103 |
| SW21005-0980 | 9,8 | 10 | 49 | 61 | 103 |
| SW21005-0990 | 9,9 | 10 | 49 | 61 | 103 |
| SW21005-1000 | 10 | 10 | 49 | 61 | 103 |
| SW21005-1010 | 10,1 | 12 | 56 | 71 | 118 |
| SW21005-1020 | 10,2 | 12 | 56 | 71 | 118 |
| SW21005-1030 | 10,3 | 12 | 56 | 71 | 118 |
| SW21005-1040 | 10,4 | 12 | 56 | 71 | 118 |
| SW21005-1050 | 10,5 | 12 | 56 | 71 | 118 |
| SW21005-1060 | 10,6 | 12 | 56 | 71 | 118 |
| SW21005-1070 | 10,7 | 12 | 56 | 71 | 118 |
| SW21005-1080 | 10,8 | 12 | 56 | 71 | 118 |
| SW21005-1090 | 10,9 | 12 | 56 | 71 | 118 |

5xD VHM-BOHRER IK MIT EDELSTAHL GEOMETRIE
5xD SC-DRILL IC WITH STAINLESS STEEL GEOMETRY

SW 21005

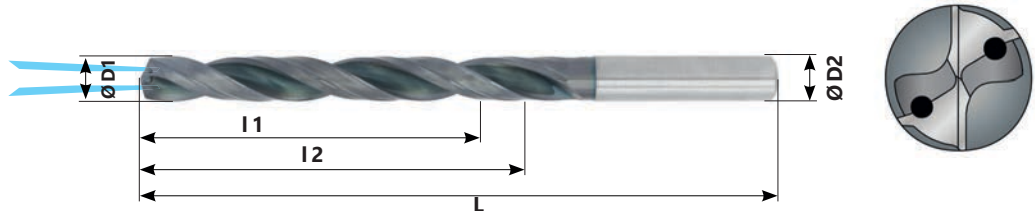
| Bestellcode (Ordering Code) | Maße in mm (Dimensions in mm) | | | | |
|--------------------------------|-------------------------------|---------|----------|----------|--------|
| | D1 (h7) | D2 (h6) | I 1 (SL) | I 2 (FL) | L (GL) |
| SW21005-1100 | 11 | 12 | 56 | 71 | 118 |
| SW21005-1110 | 11,1 | 12 | 56 | 71 | 118 |
| SW21005-1120 | 11,2 | 12 | 56 | 71 | 118 |
| SW21005-1130 | 11,3 | 12 | 56 | 71 | 118 |
| SW21005-1140 | 11,4 | 12 | 56 | 71 | 118 |
| SW21005-1150 | 11,5 | 12 | 56 | 71 | 118 |
| SW21005-1160 | 11,6 | 12 | 56 | 71 | 118 |
| SW21005-1170 | 11,7 | 12 | 56 | 71 | 118 |
| SW21005-1180 | 11,8 | 12 | 56 | 71 | 118 |
| SW21005-1190 | 11,9 | 12 | 56 | 71 | 118 |
| SW21005-1200 | 12 | 12 | 56 | 71 | 118 |
| SW21005-1250 | 12,5 | 14 | 60 | 77 | 124 |
| SW21005-1280 | 12,8 | 14 | 60 | 77 | 124 |
| SW21005-1300 | 13 | 14 | 60 | 77 | 124 |
| SW21005-1350 | 13,5 | 14 | 60 | 77 | 124 |
| SW21005-1380 | 13,8 | 14 | 60 | 77 | 124 |
| SW21005-1400 | 14 | 14 | 60 | 77 | 124 |
| SW21005-1450 | 14,5 | 16 | 63 | 83 | 133 |
| SW21005-1480 | 14,8 | 16 | 63 | 83 | 133 |
| SW21005-1500 | 15 | 16 | 63 | 83 | 133 |
| SW21005-1550 | 15,5 | 16 | 63 | 83 | 133 |
| SW21005-1580 | 15,8 | 16 | 63 | 83 | 133 |
| SW21005-1600 | 16 | 16 | 63 | 83 | 133 |
| SW21005-1650 | 16,5 | 18 | 71 | 93 | 143 |
| SW21005-1680 | 16,8 | 18 | 71 | 93 | 143 |
| SW21005-1700 | 17 | 18 | 71 | 93 | 143 |
| SW21005-1750 | 17,5 | 18 | 71 | 93 | 143 |
| SW21005-1780 | 17,8 | 18 | 71 | 93 | 143 |
| SW21005-1800 | 18 | 18 | 71 | 93 | 143 |
| SW21005-1850 | 18,5 | 20 | 77 | 101 | 153 |
| SW21005-1880 | 18,8 | 20 | 77 | 101 | 153 |
| SW21005-1900 | 19 | 20 | 77 | 101 | 153 |
| SW21005-1950 | 19,5 | 20 | 77 | 101 | 153 |
| SW21005-1980 | 19,8 | 20 | 77 | 101 | 153 |
| SW21005-2000 | 20 | 20 | 77 | 101 | 153 |

8xD VHM-BOHRER IK DOPPELFASE MIT EDELSTAHLGEOMETRIE

8xD SC-DRILL IC WITH DOUBLE LANDS WITH STAINLESS STEEL GEOMETRY

SW 21008

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| Bestellcode (Ordering Code) | Maße in mm (Dimensions in mm) | | | | |
|--------------------------------|-------------------------------|---------|----------|----------|--------|
| | D1 (h7) | D2 (h6) | I 1 (SL) | I 2 (FL) | L (GL) |
| SW21008-0300 | 3 | 6 | 29 | 34 | 72 |
| SW21008-0310 | 3,1 | 6 | 29 | 34 | 72 |
| SW21008-0320 | 3,2 | 6 | 29 | 34 | 72 |
| SW21008-0330 | 3,3 | 6 | 29 | 34 | 72 |
| SW21008-0340 | 3,4 | 6 | 29 | 34 | 72 |
| SW21008-0350 | 3,5 | 6 | 29 | 34 | 72 |
| SW21008-0360 | 3,6 | 6 | 29 | 34 | 72 |
| SW21008-0370 | 3,7 | 6 | 29 | 34 | 72 |
| SW21008-0380 | 3,8 | 6 | 36 | 43 | 81 |
| SW21008-0390 | 3,9 | 6 | 36 | 43 | 81 |
| SW21008-0400 | 4 | 6 | 36 | 43 | 81 |
| SW21008-0410 | 4,1 | 6 | 36 | 43 | 81 |
| SW21008-0420 | 4,2 | 6 | 36 | 43 | 81 |
| SW21008-0430 | 4,3 | 6 | 36 | 43 | 81 |
| SW21008-0440 | 4,4 | 6 | 36 | 43 | 81 |
| SW21008-0450 | 4,5 | 6 | 36 | 43 | 81 |
| SW21008-0460 | 4,6 | 6 | 36 | 43 | 81 |
| SW21008-0470 | 4,7 | 6 | 36 | 43 | 81 |
| SW21008-0480 | 4,8 | 6 | 48 | 57 | 95 |
| SW21008-0490 | 4,9 | 6 | 48 | 57 | 95 |
| SW21008-0500 | 5 | 6 | 48 | 57 | 95 |
| SW21008-0510 | 5,1 | 6 | 48 | 57 | 95 |
| SW21008-0520 | 5,2 | 6 | 48 | 57 | 95 |
| SW21008-0530 | 5,3 | 6 | 48 | 57 | 95 |
| SW21008-0540 | 5,4 | 6 | 48 | 57 | 95 |
| SW21008-0550 | 5,5 | 6 | 48 | 57 | 95 |
| SW21008-0560 | 5,6 | 6 | 48 | 57 | 95 |
| SW21008-0570 | 5,7 | 6 | 48 | 57 | 95 |
| SW21008-0580 | 5,8 | 6 | 48 | 57 | 95 |
| SW21008-0590 | 5,9 | 6 | 48 | 57 | 95 |
| SW21008-0600 | 6 | 6 | 48 | 57 | 95 |
| SW21008-0610 | 6,1 | 8 | 64 | 76 | 114 |
| SW21008-0620 | 6,2 | 8 | 64 | 76 | 114 |
| SW21008-0630 | 6,3 | 8 | 64 | 76 | 114 |

8xD VHM-BOHRER IK DOPPELFASE MIT EDELSTAHLGEOMETRIE
8xD SC-DRILL IC WITH DOUBLE LANDS WITH STAINLESS STEEL GEOMETRY

SW 21008

| Bestellcode (Ordering Code) | Maße in mm (Dimensions in mm) | | | | |
|--------------------------------|-------------------------------|---------|----------|----------|--------|
| | D1 (h7) | D2 (h6) | I 1 (SL) | I 2 (FL) | L (GL) |
| SW21008-0640 | 6,4 | 8 | 64 | 76 | 114 |
| SW21008-0650 | 6,5 | 8 | 64 | 76 | 114 |
| SW21008-0660 | 6,6 | 8 | 64 | 76 | 114 |
| SW21008-0670 | 6,7 | 8 | 64 | 76 | 114 |
| SW21008-0680 | 6,8 | 8 | 64 | 76 | 114 |
| SW21008-0690 | 6,9 | 8 | 64 | 76 | 114 |
| SW21008-0700 | 7 | 8 | 64 | 76 | 114 |
| SW21008-0710 | 7,1 | 8 | 64 | 76 | 114 |
| SW21008-0720 | 7,2 | 8 | 64 | 76 | 114 |
| SW21008-0730 | 7,3 | 8 | 64 | 76 | 114 |
| SW21008-0740 | 7,4 | 8 | 64 | 76 | 114 |
| SW21008-0750 | 7,5 | 8 | 64 | 76 | 114 |
| SW21008-0760 | 7,6 | 8 | 64 | 76 | 114 |
| SW21008-0770 | 7,7 | 8 | 64 | 76 | 114 |
| SW21008-0780 | 7,8 | 8 | 64 | 76 | 114 |
| SW21008-0790 | 7,9 | 8 | 64 | 76 | 114 |
| SW21008-0800 | 8 | 8 | 64 | 76 | 114 |
| SW21008-0810 | 8,1 | 10 | 80 | 95 | 142 |
| SW21008-0820 | 8,2 | 10 | 80 | 95 | 142 |
| SW21008-0830 | 8,3 | 10 | 80 | 95 | 142 |
| SW21008-0840 | 8,4 | 10 | 80 | 95 | 142 |
| SW21008-0850 | 8,5 | 10 | 80 | 95 | 142 |
| SW21008-0860 | 8,6 | 10 | 80 | 95 | 142 |
| SW21008-0870 | 8,7 | 10 | 80 | 95 | 142 |
| SW21008-0880 | 8,8 | 10 | 80 | 95 | 142 |
| SW21008-0890 | 8,9 | 10 | 80 | 95 | 142 |
| SW21008-0900 | 9 | 10 | 80 | 95 | 142 |
| SW21008-0910 | 9,1 | 10 | 80 | 95 | 142 |
| SW21008-0920 | 9,2 | 10 | 80 | 95 | 142 |
| SW21008-0930 | 9,3 | 10 | 80 | 95 | 142 |
| SW21008-0940 | 9,4 | 10 | 80 | 95 | 142 |
| SW21008-0950 | 9,5 | 10 | 80 | 95 | 142 |
| SW21008-0960 | 9,6 | 10 | 80 | 95 | 142 |
| SW21008-0970 | 9,7 | 10 | 80 | 95 | 142 |
| SW21008-0980 | 9,8 | 10 | 80 | 95 | 142 |
| SW21008-0990 | 9,9 | 10 | 80 | 95 | 142 |
| SW21008-1000 | 10 | 10 | 80 | 95 | 142 |
| SW21008-1020 | 10,2 | 12 | 96 | 114 | 162 |
| SW21008-1050 | 10,5 | 12 | 96 | 114 | 162 |
| SW21008-1080 | 10,8 | 12 | 96 | 114 | 162 |
| SW21008-1100 | 11 | 12 | 96 | 114 | 162 |
| SW21008-1150 | 11,5 | 12 | 96 | 114 | 162 |
| SW21008-1180 | 11,8 | 12 | 96 | 114 | 162 |
| SW21008-1200 | 12 | 12 | 96 | 114 | 162 |
| SW21008-1250 | 12,5 | 14 | 112 | 133 | 178 |
| SW21008-1280 | 12,8 | 14 | 112 | 133 | 178 |

8xD VHM-BOHRER IK DOPPELFASE MIT EDELSTAHLGEOMETRIE
8xD SC-DRILL IC WITH DOUBLE LANDS WITH STAINLESS STEEL GEOMETRY

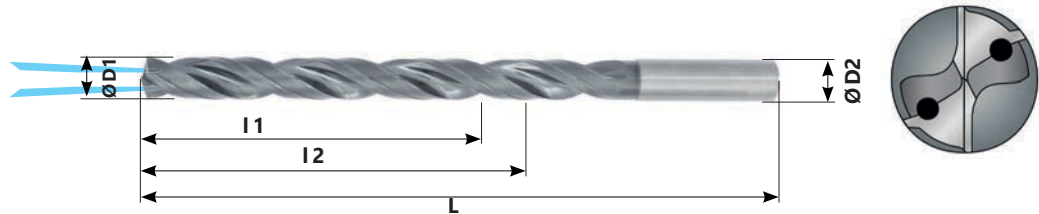
SW 21008

| Bestellcode (Ordering Code) | Maße in mm (Dimensions in mm) | | | | |
|--------------------------------|-------------------------------|---------|----------|----------|--------|
| | D1 (h7) | D2 (h6) | I 1 (SL) | I 2 (FL) | L (GL) |
| SW21008-1300 | 13 | 14 | 112 | 133 | 178 |
| SW21008-1350 | 13,5 | 14 | 112 | 133 | 178 |
| SW21008-1380 | 13,8 | 14 | 112 | 133 | 178 |
| SW21008-1400 | 14 | 14 | 112 | 133 | 178 |
| SW21008-1450 | 14,5 | 16 | 128 | 152 | 203 |
| SW21008-1480 | 14,8 | 16 | 128 | 152 | 203 |
| SW21008-1500 | 15 | 16 | 128 | 152 | 203 |
| SW21008-1550 | 15,5 | 16 | 128 | 152 | 203 |
| SW21008-1580 | 15,8 | 16 | 128 | 152 | 203 |
| SW21008-1600 | 16 | 16 | 128 | 152 | 203 |
| SW21008-1650 | 16,5 | 18 | 144 | 171 | 222 |
| SW21008-1680 | 16,8 | 18 | 144 | 171 | 222 |
| SW21008-1700 | 17 | 18 | 144 | 171 | 222 |
| SW21008-1750 | 17,5 | 18 | 144 | 171 | 222 |
| SW21008-1780 | 17,8 | 18 | 144 | 171 | 222 |
| SW21008-1800 | 18 | 18 | 144 | 171 | 222 |
| SW21008-1850 | 18,5 | 20 | 160 | 190 | 243 |
| SW21008-1880 | 18,8 | 20 | 160 | 190 | 243 |
| SW21008-1900 | 19 | 20 | 160 | 190 | 243 |
| SW21008-1950 | 19,5 | 20 | 160 | 190 | 243 |
| SW21008-1980 | 19,8 | 20 | 160 | 190 | 243 |
| SW21008-2000 | 20 | 20 | 160 | 190 | 243 |

12xD VHM-BOHRER IK DOPPELFASE MIT EDELSTAHLGEOMETRIE
12xD SC-DRILL IC WITH DOUBLE LANDS WITH STAINLESS STEEL GEOMETRY

SW21212

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| Bestellcode (Ordering Code) | Maße in mm (Dimensions in mm) | | | | |
|--------------------------------|-------------------------------|---------|----------|----------|--------|
| | D1 (h7) | D2 (h6) | I 1 (SL) | I 2 (FL) | L (GL) |
| SW21212-0300 | 3 | 6 | 48 | 54 | 92 |
| SW21212-0350 | 3,5 | 6 | 48 | 54 | 92 |
| SW21212-0400 | 4 | 6 | 58 | 64 | 102 |
| SW21212-0450 | 4,5 | 6 | 58 | 64 | 102 |
| SW21212-0500 | 5 | 6 | 70 | 78 | 116 |
| SW21212-0550 | 5,5 | 6 | 70 | 78 | 116 |
| SW21212-0600 | 6 | 6 | 70 | 78 | 116 |
| SW21212-0650 | 6,5 | 8 | 94 | 108 | 146 |
| SW21212-0700 | 7 | 8 | 94 | 108 | 146 |
| SW21212-0750 | 7,5 | 8 | 94 | 108 | 146 |
| SW21212-0800 | 8 | 8 | 94 | 108 | 146 |
| SW21212-0850 | 8,5 | 10 | 110 | 120 | 162 |
| SW21212-0900 | 9 | 10 | 110 | 120 | 162 |
| SW21212-0950 | 9,5 | 10 | 110 | 120 | 162 |
| SW21212-1000 | 10 | 10 | 110 | 120 | 162 |
| SW21212-1100 | 11 | 12 | 142 | 156 | 204 |
| SW21212-1200 | 12 | 12 | 142 | 156 | 204 |

VHM-BOHRER MIT EDELSTAHLGEOMETRIE
SC-DRILL WITH STAINLESS STEEL GEOMETRY

Schnittwerte (Cutting data)

| | Zu bearbeitendes Material (Material to be machined) | Beschaffenheit (Condition) | Schnittgeschwindigkeit (Cutting speed) Vc (m/min) | Vorschub f in mm/U (Feed rate f in mm/rev) | | | | | |
|----------|--|-------------------------------|---|---|------|-------|-------|-------|-------|
| | | | | Ø6mm | Ø8mm | Ø10mm | Ø12mm | Ø16mm | Ø20mm |
| P | Stahl (Steel) | <600 N/mm ² | 80-100 | 0,15 | 0,2 | 0,25 | 0,3 | 0,36 | 0,4 |
| | | <700 N/mm ² | 70-90 | 0,15 | 0,2 | 0,25 | 0,3 | 0,36 | 0,4 |
| | | <700 N/mm ² | 65-85 | 0,15 | 0,2 | 0,25 | 0,3 | 0,36 | 0,4 |
| | Legierter Stahl (alloyed Steel) | <900 N/mm ² | 70-90 | 0,15 | 0,2 | 0,25 | 0,3 | 0,36 | 0,4 |
| | | <1000 N/mm ² | 65-80 | 0,14 | 0,18 | 0,22 | 0,26 | 0,3 | 0,35 |
| | | <1000 N/mm ² | 45-65 | 0,12 | 0,16 | 0,2 | 0,24 | 0,3 | 0,35 |
| M | Rostfreie Stähle (Stainless Steel) | - | 30-60 | 0,1 | 0,12 | 0,14 | 0,16 | 0,2 | 0,28 |
| K | Grauguss, legierter Grauguss (Grey cast iron, grey cast iron alloy) | <200 HB | 80-100 | 0,22 | 0,28 | 0,34 | 0,38 | 0,44 | 0,5 |
| | | <250 HB | 70-90 | 0,2 | 0,25 | 0,3 | 0,35 | 0,4 | 0,45 |
| | Sphäroguss, Vermikularguss (Spheroidal graphite cast iron, CGI) | <250 HB | 65-85 | 0,2 | 0,25 | 0,3 | 0,35 | 0,4 | 0,45 |
| | | <600 N/mm ² | 70-90 | 0,2 | 0,25 | 0,3 | 0,35 | 0,4 | 0,45 |
| | | <600 N/mm ² | 65-80 | 0,18 | 0,24 | 0,25 | 0,3 | 0,35 | 0,4 |
| N | Aluminium-Knetlegierungen (wrought aluminum alloy) | - | 180-250 | 0,18 | 0,24 | 0,3 | 0,35 | 0,4 | 0,5 |
| | Aluminium (Si < 10%) | - | 180-250 | 0,18 | 0,24 | 0,3 | 0,35 | 0,4 | 0,5 |
| | Aluminium (Si > 10%) | - | 160-220 | 0,18 | 0,24 | 0,3 | 0,35 | 0,4 | 0,5 |
| | Kupfer, Messing, Bronze (Copper, brass, bronze) | - | 120-200 | 0,18 | 0,24 | 0,3 | 0,35 | 0,4 | 0,5 |
| S | Titanlegierung (Titanium alloys) | - | 20-50 | 0,1 | 0,12 | 0,14 | 0,16 | 0,2 | 0,25 |
| | Nickellegierungen (Nickel alloys) | - | 20-45 | 0,1 | 0,12 | 0,14 | 0,16 | 0,18 | 0,25 |

Alle Schnittwerte dienen zur Orientierung (All cutting datas serve to orientation)

TECHNISCHE DETAILS

TECHNICAL DETAILS

Bevorzugte Anwendung unserer Bohrer mit Edelstahlgeometrie sind rost und säurebeständige Stähle über 1000 N/mm², Titanlegierungen sowie Nickellegierungen.

The main application of our Drills with Stainless steel geometry is Stainless steel, alloyed steel up to 1000 N/mm², Titanium and nickel alloys.

| WERKZEUG TOOL | SW 20003 | SW 20005 | SW 21003 | SW 21005 |
|--|--|--|--|--|
| SPIRALE HELIX | 30° RECHTS 30° RIGHT | 30° RECHTS 30° RIGHT | 30° RECHTS 30° RIGHT | 30° RECHTS 30° RIGHT |
| SCHNEIDRICHTUNG CUTTING DIRECTION | RECHTS R.H.C. | RECHTS R.H.C. | RECHTS R.H.C. | RECHTS R.H.C. |
| SPITZENWINKEL POINT ANGLE | 140° 140° | 140° 140° | 140° 140° | 140° 140° |
| SPITZENANSCHLIFF POINT GRINDING | 4-FLÄCHEN 4-FACET | 4-FLÄCHEN 4-FACET | 4-FLÄCHEN 4-FACET | 4-FLÄCHEN 4-FACET |
| BESCHICHTUNG COATING | AlCrN AlCrN | AlCrN AlCrN | AlCrN AlCrN | AlCrN AlCrN |
| KÜHLUNG COOLANT | AUSSEN EXTERNAL | AUSSEN EXTERNAL | INNEN INTERNAL | INNEN INTERNAL |
| SCHAFTFORM SHANK | DIN 6535 HA DIN 6535 HA | DIN 6535 HA DIN 6535 HA | DIN 6535 HA DIN 6535 HA | DIN 6535 HA DIN 6535 HA |
| OPTIONAL OPTIONAL | WHISTLE-NOTCH- SCHAFT (HE) & WELDON-SCHAFT (HB) WHISTLE-NOTCH- SCHAFT (HE) & WELDON-SCHAFT (HB) | WHISTLE-NOTCH- SCHAFT (HE) & WELDON-SCHAFT (HB) WHISTLE-NOTCH- SCHAFT (HE) & WELDON-SCHAFT (HB) | WHISTLE-NOTCH- SCHAFT (HE) & WELDON-SCHAFT (HB) WHISTLE-NOTCH- SCHAFT (HE) & WELDON-SCHAFT (HB) | WHISTLE-NOTCH- SCHAFT (HE) & WELDON-SCHAFT (HB) WHISTLE-NOTCH- SCHAFT (HE) & WELDON-SCHAFT (HB) |

VHM-BOHRER MIT EDELSTAHLGEOMETRIE 5xD UND 8xD
SC-DRILL WITH STAINLESS STEEL GEOMETRY 5xD AND 8xD

Schnittwerte (Cutting data)

| | Zu bearbeitendes Material (Material to be machined) | Beschaffenheit (Condition) | Schnittgeschwindigkeit (Cutting speed) Vc (m/min) | Vorschub f in mm/U (Feed rate f in mm/rev) | | | | | |
|----------|--|-------------------------------|---|---|------|-------|-------|-------|-------|
| | | | | Ø6mm | Ø8mm | Ø10mm | Ø12mm | Ø16mm | Ø20mm |
| P | Stahl (Steel) | <600 N/mm ² | 60-80 | 0,15 | 0,2 | 0,25 | 0,3 | 0,36 | 0,4 |
| | | <700 N/mm ² | 60-80 | 0,15 | 0,2 | 0,25 | 0,3 | 0,36 | 0,4 |
| | | <700 N/mm ² | 55-75 | 0,15 | 0,2 | 0,25 | 0,3 | 0,36 | 0,4 |
| | Legierter Stahl (alloyed Steel) | <900 N/mm ² | 50-70 | 0,15 | 0,2 | 0,25 | 0,3 | 0,36 | 0,4 |
| | | <1000 N/mm ² | 50-70 | 0,14 | 0,18 | 0,22 | 0,26 | 0,3 | 0,35 |
| | | <1000 N/mm ² | 40-60 | 0,12 | 0,16 | 0,2 | 0,24 | 0,3 | 0,35 |
| M | Rostfreie Stähle (Stainless Steel) | - | 25-50 | 0,1 | 0,12 | 0,14 | 0,16 | 0,28 | 0,2 |
| K | Grauguss, legierter Grauguss (Grey cast iron, grey cast iron alloy) | <200 HB | 70-90 | 0,22 | 0,28 | 0,34 | 0,38 | 0,44 | 0,5 |
| | | <250 HB | 60-80 | 0,2 | 0,25 | 0,3 | 0,35 | 0,4 | 0,45 |
| | Sphäroguss, Vermikularguss (Spheroidal graphite cast iron, CGI) | <250 HB | 55-75 | 0,2 | 0,25 | 0,3 | 0,35 | 0,4 | 0,45 |
| | | <600 N/mm ² | 60-75 | 0,2 | 0,25 | 0,3 | 0,35 | 0,4 | 0,45 |
| | | <600 N/mm ² | 50-65 | 0,18 | 0,22 | 0,25 | 0,3 | 0,35 | 0,4 |
| N | Aluminium- Knetlegierungen (wrought aluminum alloy) | - | 120-200 | 0,18 | 0,24 | 0,3 | 0,35 | 0,4 | 0,5 |
| | Aluminium (Si < 10%) | - | 120-200 | 0,18 | 0,24 | 0,3 | 0,35 | 0,4 | 0,5 |
| | Aluminium (Si > 10%) | - | 100-180 | 0,18 | 0,24 | 0,3 | 0,35 | 0,4 | 0,5 |
| | Kupfer, Messing, Bronze (Copper, brass, bronze) | - | 80-150 | 0,18 | 0,24 | 0,3 | 0,35 | 0,4 | 0,5 |
| S | Titanlegierung (Titanium alloys) | - | 20-35 | 0,08 | 0,12 | 0,14 | 0,16 | 0,2 | 0,25 |
| | Nickellegierungen (Nickel alloys) | - | 20-30 | 0,07 | 0,1 | 0,12 | 0,15 | 0,18 | 0,22 |

Alle Schnittwerte dienen zur Orientierung (All cutting datas serve to orientation)

Bevorzugte Anwendung unserer Bohrer mit Edelstahlgeometrie sind rost und säurebeständige Stähle über 1000 N/mm², Titanlegierungen sowie Nickellegierungen.

The main application of our Drills with Stainless steel geometry is Stainless steel, alloyed steel up to 1000 N/mm², Titanium and nickel alloys.

| WERKZEUG <i>TOOL</i> | SW 21008 SW 21212 |
|--|--|
| SPIRALE <i>HELIX</i> | 30° RECHTS <i>30° RIGHT</i> |
| SCHNEIDRICHTUNG <i>CUTTING DIRECTION</i> | RECHTS <i>R.H.C.</i> |
| SPITZENWINKEL <i>POINT ANGLE</i> | 140° <i>140°</i> |
| SPITZENANSCHLIFF <i>POINT GRINDING</i> | 4-FLÄCHEN <i>4-FACET</i> |
| BESCHICHTUNG <i>COATING</i> | AlCrN <i>AlCrN</i> |
| KÜHLUNG <i>COOLANT</i> | INNEN <i>INTERNAL</i> |
| FÜHRUNGSFASEN <i>GUIDE LANDS</i> | DOPPELFASE <i>DOUBLE LANDS</i> |
| SCHAFTFORM <i>SHANK</i> | DIN 6535 HA <i>DIN 6535 HA</i> |

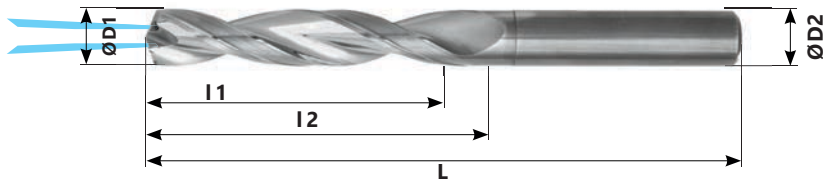
5xD VHM-BOHRER IK MIT ALUMINIUM GEOMETRIE

5xD SC-DRILL IC WITH ALUMINUM GEOMETRY

SW 31025

UNBESCHICHTET
UNCOATED

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| Bestellcode (Ordering Code) | Maße in mm (Dimensions in mm) | | | | |
|--------------------------------|-------------------------------|---------|----------|----------|--------|
| | D1 (h7) | D2 (h6) | I 1 (SL) | I 2 (FL) | L (GL) |
| SW31025-0300 | 3 | 6 | 23 | 28 | 66 |
| SW31025-0310 | 3,1 | 6 | 23 | 28 | 66 |
| SW31025-0320 | 3,2 | 6 | 23 | 28 | 66 |
| SW31025-0330 | 3,3 | 6 | 23 | 28 | 66 |
| SW31025-0340 | 3,4 | 6 | 23 | 28 | 66 |
| SW31025-0350 | 3,5 | 6 | 23 | 28 | 66 |
| SW31025-0360 | 3,6 | 6 | 23 | 28 | 66 |
| SW31025-0370 | 3,7 | 6 | 23 | 28 | 66 |
| SW31025-0380 | 3,8 | 6 | 29 | 36 | 74 |
| SW31025-0390 | 3,9 | 6 | 29 | 36 | 74 |
| SW31025-0400 | 4 | 6 | 29 | 36 | 74 |
| SW31025-0410 | 4,1 | 6 | 29 | 36 | 74 |
| SW31025-0420 | 4,2 | 6 | 29 | 36 | 74 |
| SW31025-0430 | 4,3 | 6 | 29 | 36 | 74 |
| SW31025-0440 | 4,4 | 6 | 29 | 36 | 74 |
| SW31025-0450 | 4,5 | 6 | 29 | 36 | 74 |
| SW31025-0460 | 4,6 | 6 | 29 | 36 | 74 |
| SW31025-0470 | 4,7 | 6 | 29 | 36 | 74 |
| SW31025-0480 | 4,8 | 6 | 35 | 44 | 82 |
| SW31025-0490 | 4,9 | 6 | 35 | 44 | 82 |
| SW31025-0500 | 5 | 6 | 35 | 44 | 82 |
| SW31025-0510 | 5,1 | 6 | 35 | 44 | 82 |
| SW31025-0520 | 5,2 | 6 | 35 | 44 | 82 |
| SW31025-0530 | 5,3 | 6 | 35 | 44 | 82 |
| SW31025-0540 | 5,4 | 6 | 35 | 44 | 82 |
| SW31025-0550 | 5,5 | 6 | 35 | 44 | 82 |
| SW31025-0560 | 5,6 | 6 | 35 | 44 | 82 |
| SW31025-0570 | 5,7 | 6 | 35 | 44 | 82 |
| SW31025-0580 | 5,8 | 6 | 35 | 44 | 82 |
| SW31025-0590 | 5,9 | 6 | 35 | 44 | 82 |
| SW31025-0600 | 6 | 6 | 35 | 44 | 82 |
| SW31025-0610 | 6,1 | 8 | 43 | 53 | 91 |
| SW31025-0620 | 6,2 | 8 | 43 | 53 | 91 |
| SW31025-0630 | 6,3 | 8 | 43 | 53 | 91 |

5xD VHM-BOHRER IK MIT ALUMINIUM GEOMETRIE

5xD SC-DRILL IC WITH ALUMINUM GEOMETRY

SW 31025

| Bestellcode (Ordering Code) | Maße in mm (Dimensions in mm) | | | | |
|--------------------------------|-------------------------------|---------|----------|----------|--------|
| | D1 (h7) | D2 (h6) | I 1 (SL) | I 2 (FL) | L (GL) |
| SW31025-0640 | 6,4 | 8 | 43 | 53 | 91 |
| SW31025-0650 | 6,5 | 8 | 43 | 53 | 91 |
| SW31025-0660 | 6,6 | 8 | 43 | 53 | 91 |
| SW31025-0670 | 6,7 | 8 | 43 | 53 | 91 |
| SW31025-0680 | 6,8 | 8 | 43 | 53 | 91 |
| SW31025-0690 | 6,9 | 8 | 43 | 53 | 91 |
| SW31025-0700 | 7 | 8 | 43 | 53 | 91 |
| SW31025-0710 | 7,1 | 8 | 43 | 53 | 91 |
| SW31025-0720 | 7,2 | 8 | 43 | 53 | 91 |
| SW31025-0730 | 7,3 | 8 | 43 | 53 | 91 |
| SW31025-0740 | 7,4 | 8 | 43 | 53 | 91 |
| SW31025-0750 | 7,5 | 8 | 43 | 53 | 91 |
| SW31025-0760 | 7,6 | 8 | 43 | 53 | 91 |
| SW31025-0770 | 7,7 | 8 | 43 | 53 | 91 |
| SW31025-0780 | 7,8 | 8 | 43 | 53 | 91 |
| SW31025-0790 | 7,9 | 8 | 43 | 53 | 91 |
| SW31025-0800 | 8 | 8 | 43 | 53 | 91 |
| SW31025-0810 | 8,1 | 10 | 49 | 61 | 103 |
| SW31025-0820 | 8,2 | 10 | 49 | 61 | 103 |
| SW31025-0830 | 8,3 | 10 | 49 | 61 | 103 |
| SW31025-0840 | 8,4 | 10 | 49 | 61 | 103 |
| SW31025-0850 | 8,5 | 10 | 49 | 61 | 103 |
| SW31025-0860 | 8,6 | 10 | 49 | 61 | 103 |
| SW31025-0870 | 8,7 | 10 | 49 | 61 | 103 |
| SW31025-0880 | 8,8 | 10 | 49 | 61 | 103 |
| SW31025-0890 | 8,9 | 10 | 49 | 61 | 103 |
| SW31025-0900 | 9 | 10 | 49 | 61 | 103 |
| SW31025-0910 | 9,1 | 10 | 49 | 61 | 103 |
| SW31025-0920 | 9,2 | 10 | 49 | 61 | 103 |
| SW31025-0930 | 9,3 | 10 | 49 | 61 | 103 |
| SW31025-0940 | 9,4 | 10 | 49 | 61 | 103 |
| SW31025-0950 | 9,5 | 10 | 49 | 61 | 103 |
| SW31025-0960 | 9,6 | 10 | 49 | 61 | 103 |
| SW31025-0970 | 9,7 | 10 | 49 | 61 | 103 |
| SW31025-0980 | 9,8 | 10 | 49 | 61 | 103 |
| SW31025-0990 | 9,9 | 10 | 49 | 61 | 103 |
| SW31025-1000 | 10 | 10 | 49 | 61 | 103 |
| SW31025-1020 | 10,2 | 12 | 56 | 71 | 118 |
| SW31025-1050 | 10,5 | 12 | 56 | 71 | 118 |
| SW31025-1080 | 10,8 | 12 | 56 | 71 | 118 |
| SW31025-1100 | 11 | 12 | 56 | 71 | 118 |
| SW31025-1150 | 11,5 | 12 | 56 | 71 | 118 |
| SW31025-1180 | 11,8 | 12 | 56 | 71 | 118 |
| SW31025-1200 | 12 | 12 | 56 | 71 | 118 |
| SW31025-1250 | 12,5 | 14 | 60 | 77 | 124 |
| SW31025-1280 | 12,8 | 14 | 60 | 77 | 124 |
| SW31025-1300 | 13 | 14 | 60 | 77 | 124 |

5xD VHM-BOHRER IK MIT ALUMINIUM GEOMETRIE
5xD SC-DRILL IC WITH ALUMINUM GEOMETRY

SW 31025

| Bestellcode (Ordering Code) | Maße in mm (Dimensions in mm) | | | | |
|--------------------------------|-------------------------------|---------|----------|----------|--------|
| | D1 (h7) | D2 (h6) | I 1 (SL) | I 2 (FL) | L (GL) |
| SW31025-1350 | 13,5 | 14 | 60 | 77 | 124 |
| SW31025-1380 | 13,8 | 14 | 60 | 77 | 124 |
| SW31025-1400 | 14 | 14 | 60 | 77 | 124 |
| SW31025-1450 | 14,5 | 16 | 63 | 83 | 133 |
| SW31025-1480 | 14,8 | 16 | 63 | 83 | 133 |
| SW31025-1500 | 15 | 16 | 63 | 83 | 133 |
| SW31025-1550 | 15,5 | 16 | 63 | 83 | 133 |
| SW31025-1580 | 15,8 | 16 | 63 | 83 | 133 |
| SW31025-1600 | 16 | 16 | 63 | 83 | 133 |
| SW31025-1650 | 16,5 | 18 | 71 | 93 | 143 |
| SW31025-1680 | 16,8 | 18 | 71 | 93 | 143 |
| SW31025-1700 | 17 | 18 | 71 | 93 | 143 |
| SW31025-1750 | 17,5 | 18 | 71 | 93 | 143 |
| SW31025-1780 | 17,8 | 18 | 71 | 93 | 143 |
| SW31025-1800 | 18 | 18 | 71 | 93 | 143 |
| SW31025-1850 | 18,5 | 20 | 77 | 101 | 153 |
| SW31025-1880 | 18,8 | 20 | 77 | 101 | 153 |
| SW31025-1900 | 19 | 20 | 77 | 101 | 153 |
| SW31025-1950 | 19,5 | 20 | 77 | 101 | 153 |
| SW31025-1980 | 19,8 | 20 | 77 | 101 | 153 |
| SW31025-2000 | 20 | 20 | 77 | 101 | 153 |

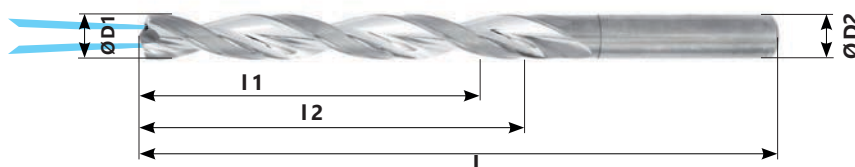
8xD VHM-BOHRER IK MIT ALUMINIUM GEOMETRIE

8xD SC-DRILL IC WITH ALUMINUM GEOMETRY

SW 31028

UNBESCHICHTET
UNCOATED

IK HA



| Bestellcode (Ordering Code) | Maße in mm (Dimensions in mm) | | | | |
|--------------------------------|-------------------------------|---------|----------|----------|--------|
| | D1 (h7) | D2 (h6) | I 1 (SL) | I 2 (FL) | L (GL) |
| SW1014-0300 | 3 | 6 | 29 | 34 | 72 |
| SW1014-0310 | 3,1 | 6 | 29 | 34 | 72 |
| SW1014-0320 | 3,2 | 6 | 29 | 34 | 72 |
| SW31028-0330 | 3,3 | 6 | 29 | 34 | 72 |
| SW31028-0340 | 3,4 | 6 | 29 | 34 | 72 |
| SW31028-0350 | 3,5 | 6 | 29 | 34 | 72 |
| SW31028-0360 | 3,6 | 6 | 29 | 34 | 72 |
| SW31028-0370 | 3,7 | 6 | 29 | 34 | 72 |
| SW31028-0380 | 3,8 | 6 | 36 | 43 | 81 |
| SW31028-0390 | 3,9 | 6 | 36 | 43 | 81 |
| SW31028-0400 | 4 | 6 | 36 | 43 | 81 |
| SW31028-0410 | 4,1 | 6 | 36 | 43 | 81 |
| SW31028-0420 | 4,2 | 6 | 36 | 43 | 81 |
| SW31028-0430 | 4,3 | 6 | 36 | 43 | 81 |
| SW31028-0440 | 4,4 | 6 | 36 | 43 | 81 |
| SW31028-0450 | 4,5 | 6 | 36 | 43 | 81 |
| SW31028-0460 | 4,6 | 6 | 36 | 43 | 81 |
| SW31028-0470 | 4,7 | 6 | 36 | 43 | 81 |
| SW31028-0480 | 4,8 | 6 | 48 | 57 | 95 |
| SW31028-0490 | 4,9 | 6 | 48 | 57 | 95 |
| SW31028-0500 | 5 | 6 | 48 | 57 | 95 |
| SW31028-0510 | 5,1 | 6 | 48 | 57 | 95 |
| SW31028-0520 | 5,2 | 6 | 48 | 57 | 95 |
| SW31028-0530 | 5,3 | 6 | 48 | 57 | 95 |
| SW31028-0540 | 5,4 | 6 | 48 | 57 | 95 |
| SW31028-0550 | 5,5 | 6 | 48 | 57 | 95 |
| SW31028-0560 | 5,6 | 6 | 48 | 57 | 95 |
| SW31028-0570 | 5,7 | 6 | 48 | 57 | 95 |
| SW31028-0580 | 5,8 | 6 | 48 | 57 | 95 |
| SW31028-0590 | 5,9 | 6 | 48 | 57 | 95 |
| SW31028-0600 | 6 | 6 | 48 | 57 | 95 |
| SW31028-0610 | 6,1 | 8 | 64 | 76 | 114 |
| SW31028-0620 | 6,2 | 8 | 64 | 76 | 114 |
| SW31028-0630 | 6,3 | 8 | 64 | 76 | 114 |
| SW31028-0640 | 6,4 | 8 | 64 | 76 | 114 |

8xD VHM-BOHRER IK MIT ALUMINIUM GEOMETRIE

8xD SC-DRILL IC WITH ALUMINUM GEOMETRY

SW 31028

| Bestellcode (Ordering Code) | Maße in mm (Dimensions in mm) | | | | |
|--------------------------------|-------------------------------|---------|----------|----------|--------|
| | D1 (h7) | D2 (h6) | I 1 (SL) | I 2 (FL) | L (GL) |
| SW31028-0650 | 6,5 | 8 | 64 | 76 | 114 |
| SW31028-0660 | 6,6 | 8 | 64 | 76 | 114 |
| SW31028-0670 | 6,7 | 8 | 64 | 76 | 114 |
| SW31028-0680 | 6,8 | 8 | 64 | 76 | 114 |
| SW31028-0690 | 6,9 | 8 | 64 | 76 | 114 |
| SW31028-0700 | 7 | 8 | 64 | 76 | 114 |
| SW31028-0710 | 7,1 | 8 | 64 | 76 | 114 |
| SW31028-0720 | 7,2 | 8 | 64 | 76 | 114 |
| SW31028-0730 | 7,3 | 8 | 64 | 76 | 114 |
| SW31028-0740 | 7,4 | 8 | 64 | 76 | 114 |
| SW31028-0750 | 7,5 | 8 | 64 | 76 | 114 |
| SW31028-0760 | 7,6 | 8 | 64 | 76 | 114 |
| SW31028-0770 | 7,7 | 8 | 64 | 76 | 114 |
| SW31028-0780 | 7,8 | 8 | 64 | 76 | 114 |
| SW31028-0790 | 7,9 | 8 | 64 | 76 | 114 |
| SW31028-0800 | 8 | 8 | 64 | 76 | 114 |
| SW31028-0810 | 8,1 | 10 | 80 | 95 | 142 |
| SW31028-0820 | 8,2 | 10 | 80 | 95 | 142 |
| SW31028-0830 | 8,3 | 10 | 80 | 95 | 142 |
| SW31028-0840 | 8,4 | 10 | 80 | 95 | 142 |
| SW31028-0850 | 8,5 | 10 | 80 | 95 | 142 |
| SW31028-0860 | 8,6 | 10 | 80 | 95 | 142 |
| SW31028-0870 | 8,7 | 10 | 80 | 95 | 142 |
| SW31028-0880 | 8,8 | 10 | 80 | 95 | 142 |
| SW31028-0890 | 8,9 | 10 | 80 | 95 | 142 |
| SW31028-0900 | 9 | 10 | 80 | 95 | 142 |
| SW31028-0910 | 9,1 | 10 | 80 | 95 | 142 |
| SW31028-0920 | 9,2 | 10 | 80 | 95 | 142 |
| SW31028-0930 | 9,3 | 10 | 80 | 95 | 142 |
| SW31028-0940 | 9,4 | 10 | 80 | 95 | 142 |
| SW31028-0950 | 9,5 | 10 | 80 | 95 | 142 |
| SW31028-0960 | 9,6 | 10 | 80 | 95 | 142 |
| SW31028-0970 | 9,7 | 10 | 80 | 95 | 142 |
| SW31028-0980 | 9,8 | 10 | 80 | 95 | 142 |
| SW31028-0990 | 9,9 | 10 | 80 | 95 | 142 |
| SW31028-1000 | 10 | 10 | 80 | 95 | 142 |
| SW31028-1020 | 10,2 | 12 | 96 | 114 | 162 |
| SW31028-1050 | 10,5 | 12 | 96 | 114 | 162 |
| SW31028-1080 | 10,8 | 12 | 96 | 114 | 162 |
| SW31028-1100 | 11 | 12 | 96 | 114 | 162 |
| SW31028-1150 | 11,5 | 12 | 96 | 114 | 162 |
| SW31028-1180 | 11,8 | 12 | 96 | 114 | 162 |
| SW31028-1200 | 12 | 12 | 96 | 114 | 162 |
| SW31028-1250 | 12,5 | 14 | 112 | 133 | 178 |
| SW31028-1280 | 12,8 | 14 | 112 | 133 | 178 |
| SW31028-1300 | 13 | 14 | 112 | 133 | 178 |
| SW31028-1350 | 13,5 | 14 | 112 | 133 | 178 |

8xD VHM-BOHRER IK MIT ALUMINIUM GEOMETRIE
8xD SC-DRILL IC WITH ALUMINUM GEOMETRY

SW 31028

| Bestellcode (Ordering Code) | Maße in mm (Dimensions in mm) | | | | |
|--------------------------------|-------------------------------|---------|----------|----------|--------|
| | D1 (h7) | D2 (h6) | I 1 (SL) | I 2 (FL) | L (GL) |
| SW31028-1380 | 13,8 | 14 | 112 | 133 | 178 |
| SW31028-1400 | 14 | 14 | 112 | 133 | 178 |
| SW31028-1450 | 14,5 | 16 | 128 | 152 | 203 |
| SW31028-1480 | 14,8 | 16 | 128 | 152 | 203 |
| SW31028-1500 | 15 | 16 | 128 | 152 | 203 |
| SW31028-1550 | 15,5 | 16 | 128 | 152 | 203 |
| SW31028-1580 | 15,8 | 16 | 128 | 152 | 203 |
| SW31028-1600 | 16 | 16 | 128 | 152 | 203 |
| SW31028-1650 | 16,5 | 18 | 144 | 171 | 222 |
| SW31028-1680 | 16,8 | 18 | 144 | 171 | 222 |
| SW31028-1700 | 17 | 18 | 144 | 171 | 222 |
| SW31028-1750 | 17,5 | 18 | 144 | 171 | 222 |
| SW31028-1780 | 17,8 | 18 | 144 | 171 | 222 |
| SW31028-1800 | 18 | 18 | 144 | 171 | 222 |
| SW31028-1850 | 18,5 | 20 | 160 | 190 | 243 |
| SW31028-1880 | 18,8 | 20 | 160 | 190 | 243 |
| SW31028-1900 | 19 | 20 | 160 | 190 | 243 |
| SW31028-1950 | 19,5 | 20 | 160 | 190 | 243 |
| SW31028-1980 | 19,8 | 20 | 160 | 190 | 243 |
| SW31028-2000 | 20 | 20 | 160 | 190 | 243 |

VHM-BOHRER MIT ALUMINIUM GEOMETRIE 5xD UND 8xD
SC-DRILL WITH ALUMINUM GEOMETRY 5xD AND 8xD

Schnittwerte (Cutting data)

| | Zu bearbeitendes Material (Material to be machined) | Beschaffenheit (Condition) | Schnittge- schwindigkeit (Cutting speed) Vc (m/min) | Vorschub f in mm/U (Feed rate f in mm/rev) | | | | | |
|----------|---|-------------------------------|--|---|------|-------|-------|-------|-------|
| | | | | Ø6mm | Ø8mm | Ø10mm | Ø12mm | Ø16mm | Ø20mm |
| N | Aluminium- Knetlegierungen (wrought aluminum alloy) | - | 200-350 | 0,3 | 0,4 | 0,5 | 0,55 | 0,7 | 0,8 |
| | Aluminium (Si < 10%) | - | 200-350 | 0,3 | 0,4 | 0,5 | 0,55 | 0,7 | 0,8 |
| | Aluminium (Si > 10%) | - | 180-250 | 0,24 | 0,32 | 0,4 | 0,45 | 0,55 | 0,6 |
| | Kupfer, Messing, Bronze (Copper, brass, bronze) | - | 120-200 | 0,18 | 0,24 | 0,3 | 0,35 | 0,4 | 0,5 |

Alle Schnittwerte dienen zur Orientierung (All cutting datas serve to orientation)

Die bevorzugte Anwendung unserer Bohrer mit Aluminiumgeometrie sind Aluminium, Kupfer sowie Bronze.

The main application of our drills with aluminum geometry is aluminum, copper and bronze.

| | |
|--|---|
| WERKZEUG <i>TOOL</i> | SW 31025 SW 31028 |
| SPIRALE <i>HELIX</i> | 30° RECHTS <i>30° RIGHT</i> |
| SCHNEIDRICHTUNG <i>CUTTING DIRECTION</i> | RECHTS <i>R.H.C.</i> |
| SPITZENANSCHLIFF <i>POINT GRINDING</i> | 4-FLÄCHEN <i>4-FACET</i> |
| BESCHICHTUNG <i>COATING</i> | UNBESCHICHTET, SPANNNUT POLIERT <i>UNCOATED,</i> <i>POLISHED FLUTE</i> |
| KÜHLUNG <i>COOLANT</i> | INNEN <i>INTERNAL</i> |
| FÜHRUNGSFASEN <i>GUIDE LANDS</i> | DOPPELFASE <i>DOUBLE LANDS</i> |
| SPITZENWINKEL <i>POINT ANGLE</i> | 140° <i>140°</i> |
| SCHAFTFORM <i>SHANK</i> | DIN 6535 HA <i>DIN 6535 HA</i> |



SONDERANFERTIGUNGEN (SPECIAL TOOLS)

Auf Anfrage erstellen wir auch gerne Sonderwerkzeuge für Sie.
Die Lieferzeit beträgt je nach Anforderung 3-5 Wochen.

*(On request, we will also be pleased to provide you with taylor made tools.
The delivery time is 3-5 weeks depending on the requirements)*



VHM SCHWARZ Präzisionswerkzeuge GmbH

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Fax: + 49 (0) 711 / 51 87 88 06

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