





Introduction



D2

	
Grade overview	D2
Grade description	D3
Chip grooves	D8
System characteristics for Classic	D10
Application for Classic	D13

	
System characteristics for 900	D15
Application for 900	D16



Inserts



D18

	
WCGT..	D18
XOMT..	D18
SONT..	D19

	
--	---



Tools



D20

	
MaxiDrill Classic 2D	D20
MaxiDrill Classic 3D	D22
MaxiDrill Classic 4D	D24
MaxiDrill 900 3D	D26
MaxiDrill 900 4D	D28

	
MaxiDrill 900 5D	D29



Technical information



D30

	
Cutting data for grades/materials	D30
Cutting data for Classic	D32
Cutting data for 900	D34
Offset-drilling into solid material	D40
Coolant pressure	D42

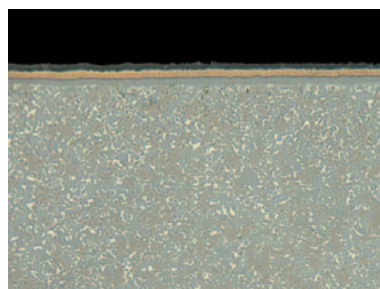
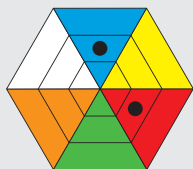
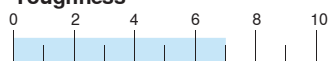
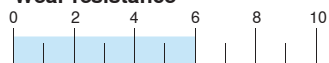
	
Formula collection	D43

Grade overview

Grade designation	Standard designation	*Cutting material	Application range								P	M	K	N	S	H				
											Steel	Stainless	Cast iron	Non ferrous metals	Heat resistant	Hard materials				
			01	05	10	15	20	25	30	35	40	45	50							
U17T	HW-M15	W																		
	HW-K15	W																		
SR226	HC-P25	C																		
	HC-K20	C																		
SR127	HC-P25	C																		
	HC-M20	C																		
	HC-K30	C																		
CTPP430	HC-P30	P																		
	HC-M25	P																		
		P																		
CTC1435	HC-P35	C																		
	HC-M30	C																		
	HC-K20	C																		
GM40	HC-P35	C																		
	HC-M30	C																		
S40T	HW-P40	W																		
	HW-M40	W																		
			01	05	10	15	20	25	30	35	40	45	50	● Main application ○ Extended application						

SR226

HC-P25
HC-K20

**Toughness****Wear resistance****Composition:**

Co 11.0%; composite carbides 12.0%; WC balance

Grain size:

1 - 2 μm

Hardness:

HV 1420

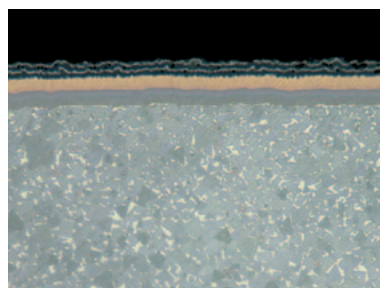
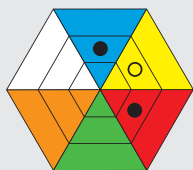
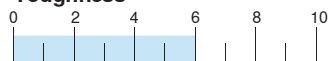
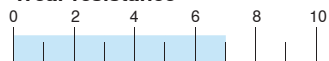
Coating specification:

CVD

Ti(C,N) + TiN + Al₂O₃; 5.5 μm

SR127

HC-P25
HC-M20
HC-K20

**Toughness****Wear resistance****Composition:**

Co 6.0%; composite carbides .6%; WC balance

Grain size:

2 μm

Hardness:

HV₃₀ 1460

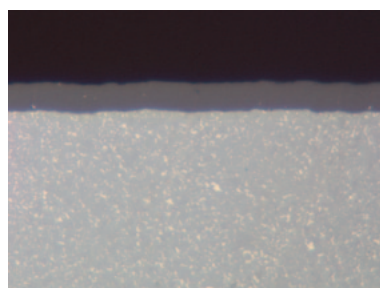
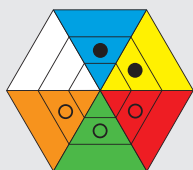
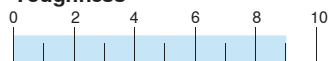
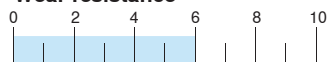
Coating specification:

CVD

Ti(C,N) + TiN + Al₂O₃; 12 μm

CTPP430

HC-P30
HC-M25

**Toughness****Wear resistance****Composition:**

Co 9.0%; WC balance

Grain size:

.85 μm

Hardness:

HV 1590

Coating specification:

PVD; TiAlN; 7 μm

Grade description

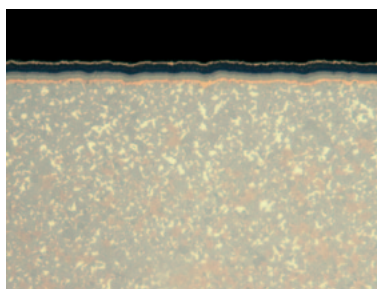
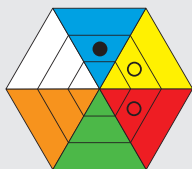
Steel

CTC1435

HC-P35

HC-M30

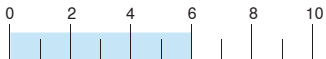
HC-K20



Toughness



Wear resistance



Composition:

Co 9.6%; mixed carbides 7.4%; WC balance

Grain size:

1 - 2 μm

Hardness:

HV 1400

Coating specification:

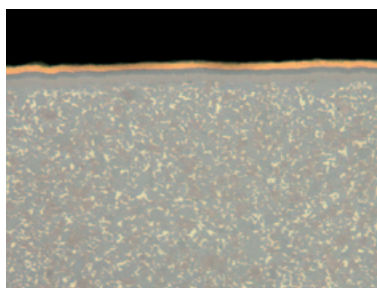
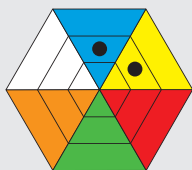
CVD

TiN + Ti (C,N) + Ti (N,B) + Al_2O_3 + Ti (C,N,B); 6 μm

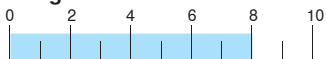
GM40

HC-P35

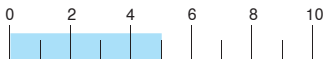
HC-M30



Toughness



Wear resistance



Composition:

Co 11.0%; composite carbides 12.0%; WC balance

Grain size:

1 - 2 μm

Hardness:

HV₃₀ 1420

Coating specification:

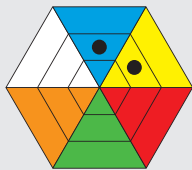
CVD

TiC + Ti(C,N) + TiN; 5.5 μm

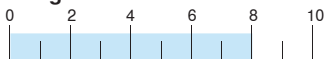
S40T

HW-P40

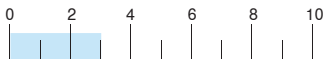
HW-M40



Toughness



Wear resistance



Composition:

Co 11.0%; mixed carbides 12.0%; WC balance

Grain size:

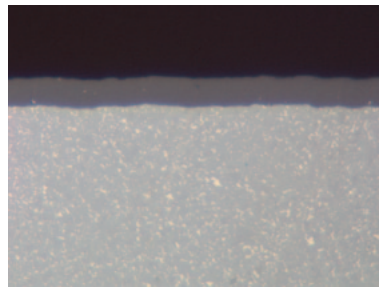
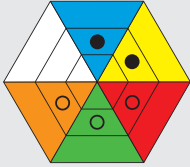
1 - 2 μm

Hardness:

HV₃₀ 1420

CTPP430

HC-P30
HC-M25



Composition:

Co 9.0%; WC balance

Grain size:

.85 μm

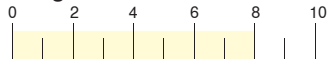
Hardness:

HV 1590

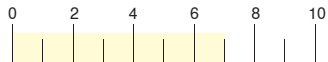
Coating specification:

PVD; TiAlN; 7 μm

Toughness

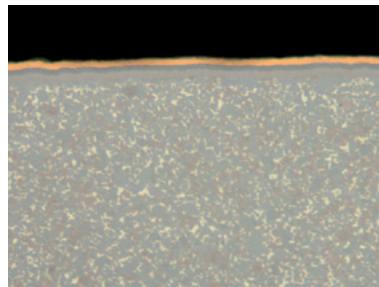
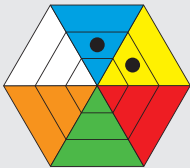


Wear resistance



GM40

HC-P35
HC-M30



Composition:

Co 11.0%; composite carbides 12.0%; WC balance

Grain size:

1 - 2 μm

Hardness:

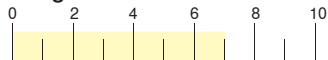
HV₃₀ 1420

Coating specification:

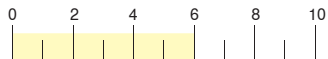
CVD

TiC + Ti(C,N) + TiN; 5.5 μm

Toughness

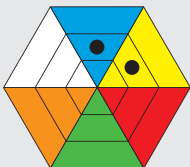


Wear resistance



S40T

HW-P40
HW-M40



Composition:

Co 11.0%; mixed carbides 12.0%; WC balance

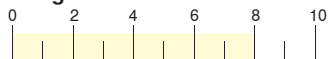
Grain size:

1 - 2 μm

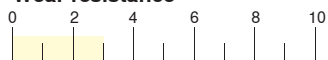
Hardness:

HV₃₀ 1420

Toughness



Wear resistance

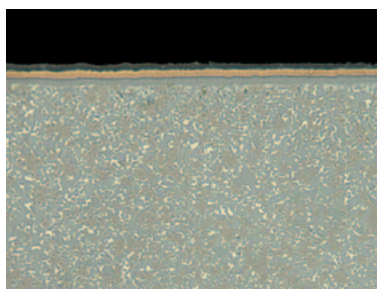
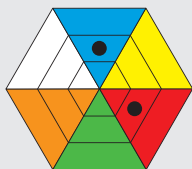


Grade description

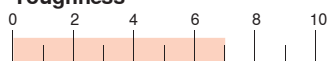
Cast iron

SR226

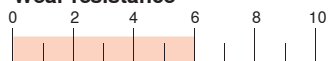
HC-P25
HC-K20



Toughness



Wear resistance



Composition:

Co 11.0%; composite carbides 12.0%; WC balance

Grain size:

1 - 2 μm

Hardness:

HV 1420

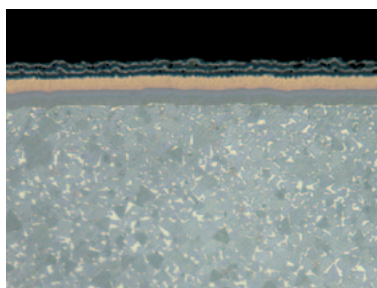
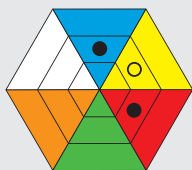
Coating specification:

CVD

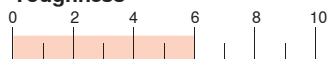
Ti(C,N) + TiN + Al₂O₃; 5.5 μm

SR127

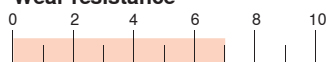
HC-P25
HC-M20
HC-K20



Toughness



Wear resistance



Composition:

Co 6.0%; composite carbides .6%; WC balance

Grain size:

2 μm

Hardness:

HV₃₀ 1460

Coating specification:

CVD

Ti(C,N) + TiN + Al₂O₃; 12 μm

Grade description

Non ferrous metals and non metals

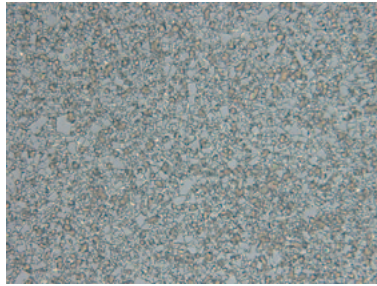
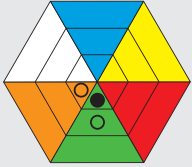


D7

U17T

HW-M15

HW-K15



Composition:

Co 6.0%; composite carbides 8.0%; WC balance

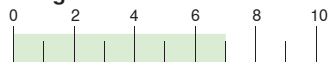
Grain size:

1.5 μm

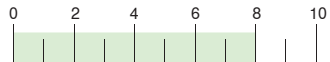
Hardness:

HV 1570

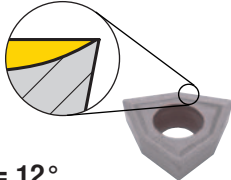
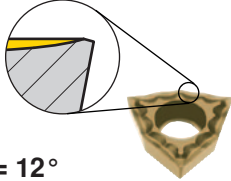
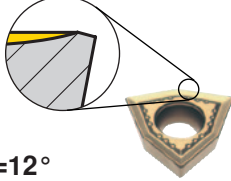
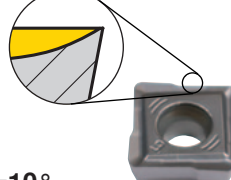
Toughness



Wear resistance



Chip grooves

Chip groove	Material	Machining situation and stability				Machining type F / M / R
						
 $\gamma = 12^\circ$ FN		X	X			 F
 $\gamma = 12^\circ$ -29		X	X	X		 M
 $\gamma = 12^\circ$ SN		X	X	X		 M
 $\gamma = 10^\circ$ -M30		X	X			 M

MasterGuide:

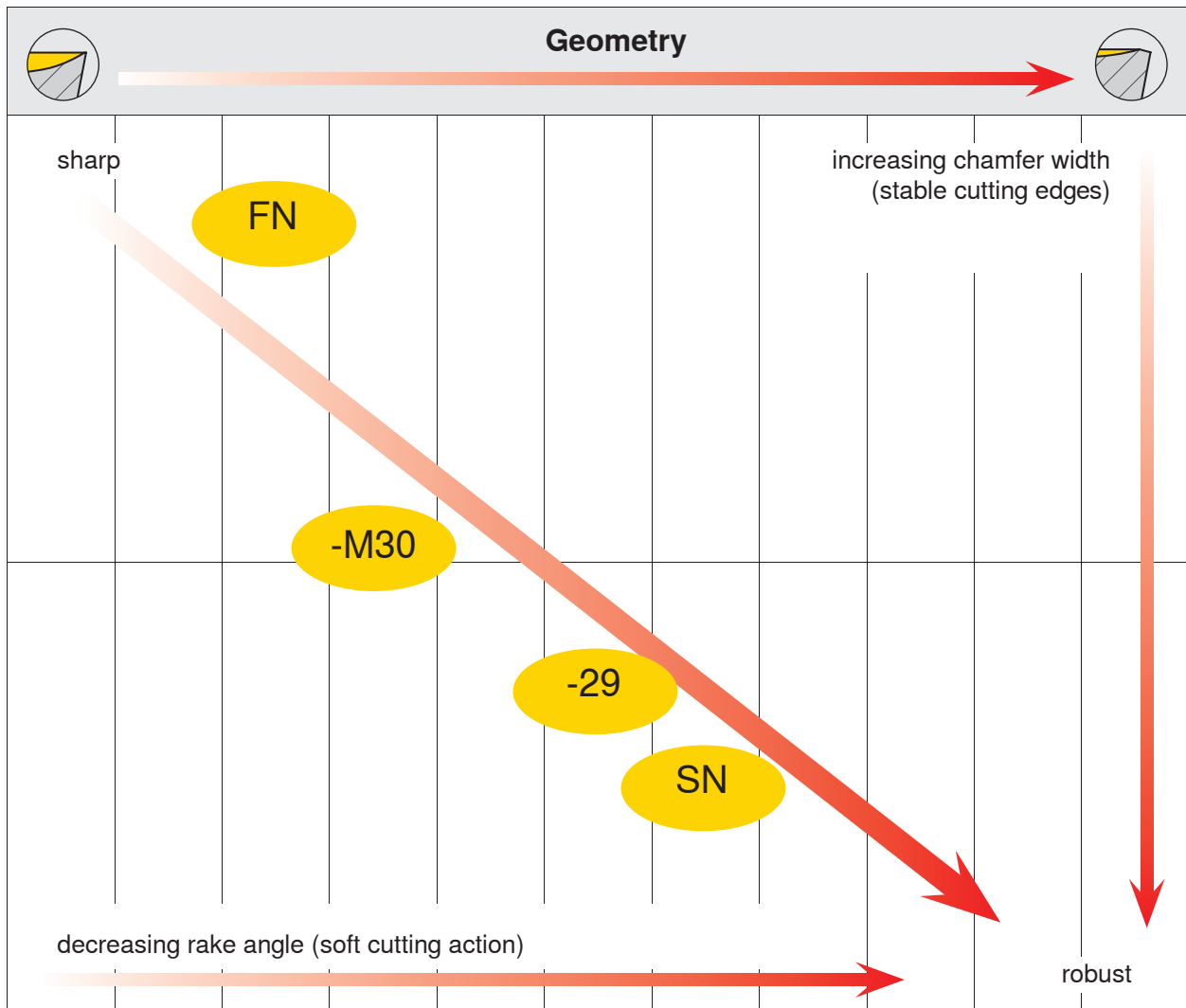
-  Steel
-  Stainless
-  Cast iron
-  Non ferrous metals
-  Heat resistant
-  Hard materials
-  Main application
-  Extended application

Machining situation and stability:

-  excellent
-  good
-  acceptable
-  difficult

Machining type:

- F** Fine machining
- M** Medium machining
- R** Rough machining



Variable application of the insert group in all drilling tools type 2D, 3D and 4D

Advantages



Coated and uncoated inserts in tried and tested geometry and the high CERATIZIT quality

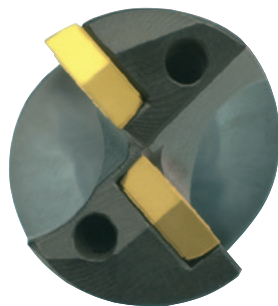


Customer benefits

- High cutting speed
- Low cutting forces
- Excellent swarf control



Optimum compensation of radial forces thanks to specially positioned inserts



- Drill will not wander
- Produces consistent true holes when deep hole drilling



Helical flute with through coolant holes on the drill point



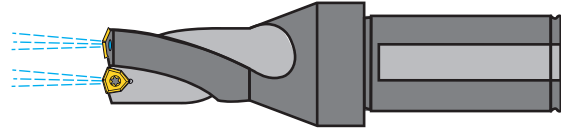
- Maximum system rigidity
- No deviation of tool
- Reduced machining noise
- Optimum chip evacuation

For fixed and rotating applications
Insert drills with helical chip flutes

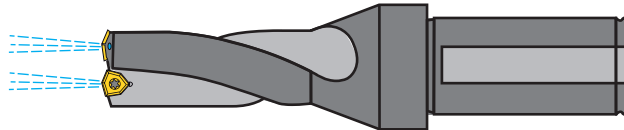
Classic



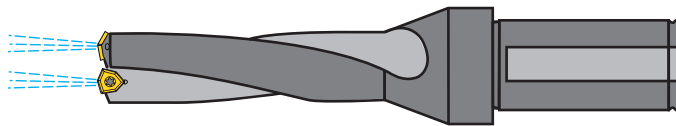
‘ □
□ □ □² □ □ □ P P



‘ □
□ □ □² □ □ □ P P



‘ □
□ □ □² □ □ □ P P



Helical chip flutes



Low deflection



Optimum chip evacuation



Possibly occurring transverse forces
are absorbed without problems

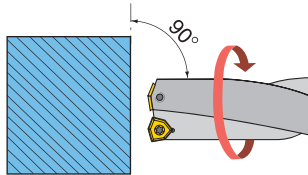
MaxiDrill Classic or MaxiDrill HFD



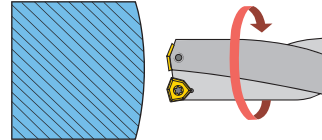
Ideal for:

- Universal application
- Less stable machines
- Low power machines
- High precision of drilled holes

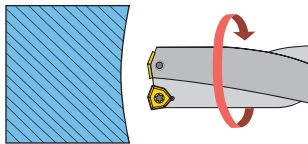
Insert drills with helical chip flutes



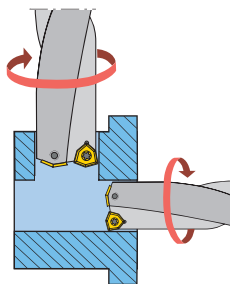
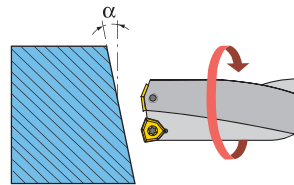
In stable conditions and with a flat surface of the work piece you can drill with maximum feed.



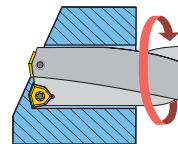
When the drill enters the convex work piece surface the central insert cuts first.



When the drill enters oblique or concave work piece surfaces the peripheral insert cuts first. It is recommended to reduce the feed by approx. 30-50 % for this application.

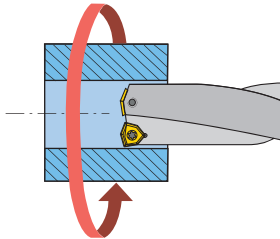


Reduce the feed when the drill enters the transverse hole. With transverse holes you should drill from both sides if possible.

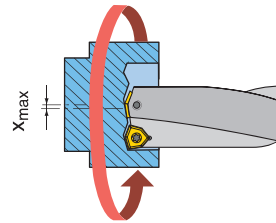


In case of drill exit on oblique work piece surfaces, reduce the feed by 30-50 %.

Insert drills with helical chip flutes



Drilling into solid material



Off-centre drilling into solid material

$X_{\max}$ = see page 40



Safety precautions

Using a fixed drill and a rotating work piece in case of bores a sharp disc will result. Safety precautions must be observed. A safety guard has to be provided as protection.

Advantages

- ✓ Minimal drill wander due to specialized insert geometries.
- ✓ Rigid construction allows maximum feed rates for holes up to 5xD.
- ✓ Insert with 4 cutting edges for solid carbide drilling.
- ✓ Peripheral and central cutting edges have the same geometry, size and grade.
- ✓ Grade for a wide range of applications

YOUR benefits

- ➔ > Excellent drilling action
- ➔ > High process security even with difficult drilling situations
- ➔ > Increased productivity combined with high process security.
- ➔ > Optimum economy.
- ➔ > The same insert fits both pockets, preventing mis-location and reducing inventory
- ➔ > Universal application
- ➔ > High flexibility

Drilling in the high-feed range

System 900

- > Optimum chip evacuation thanks to helical chip pockets adapted to the chip shape and size

hard & tough

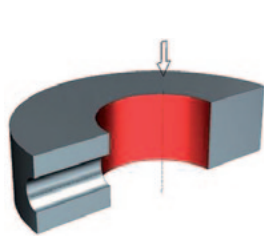
- > Long tool life thanks to hard & tough coating



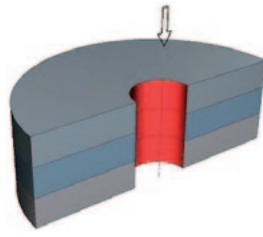
Special application options

This solid carbide tool shows its high performance capacity in a wide application range and most difficult situations.

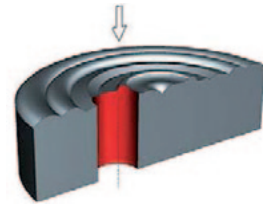
Note: feed rate reduction between 30 and 60 % is necessary in the depicted cutting situations! The machining possibilities are reduced in case of long-chipping tough materials.



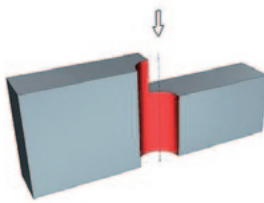
Producing a transverse through hole



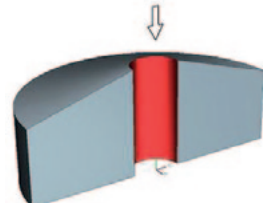
Stack drilling



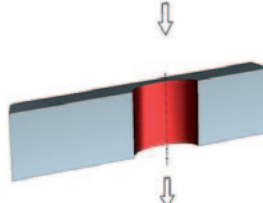
Drilling on an uneven surface



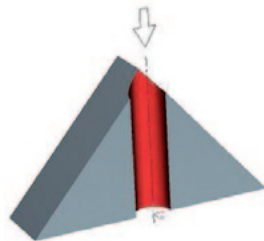
Drilling on a stepped surface



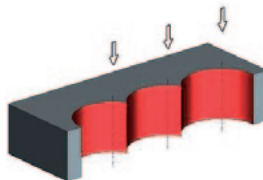
Drilling of a convex surface



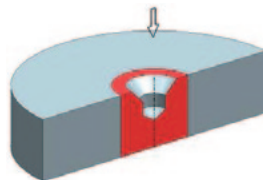
Drilling on inclined surfaces: the drill exits at an angle



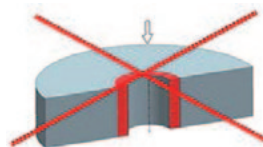
Drilling on a ridge



Chain drilling is possible depending on the material



Spot drilling in a central hole or bead



Reboring not possible!



When the drill exits the material, in the case of through-holes, a sharp-edged disk is produced.

When the tool is stationary, this sharp-edged disk may be thrown out of the clamping chuck at high speed and can cause damage and personal injury.

In order to prevent this happening, safety precautions must be taken.



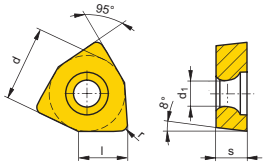
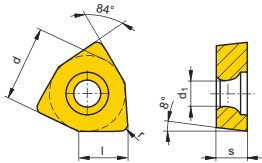




MaxiDrill Classic

WC.. XO..

		P	M	K	N	S	H	U17T	S40T	SR127	SR226	CTPP430	CTC1435	GM40	d	l	s	r	d _i
															[mm]	[mm]	[mm]	[mm]	[mm]
-FN		WCMT 030204FN	●	●	●	●	●	●	●	●	●	●	●	●	6.00	3.97	2.50	0.40	2.50
		WCMT 050304FN	●	●	●	●	●	●	●	●	●	●	●	●	8.00	5.29	3.00	0.40	2.80
		WCMT 060304FN	●	●	●	●	●	●	●	●	●	●	●	●	10.00	6.62	3.00	0.40	4.40
		WCMT 07T304FN	●	●	●	●	●	●	●	●	●	●	●	●	12.00	7.94	3.80	0.40	4.40
-29		WCMT 020204SN-29		●	●	●	●	●	●	●	●	●	●	●	5.50	3.39	2.30	0.40	2.25
		WCMT 030204SN-29		●	●	●	●	●	●	●	●	●	●	●	6.00	3.97	2.50	0.40	2.50
		WCMT 050304SN-29		●	●	●	●	●	●	●	●	●	●	●	8.00	5.29	3.00	0.40	2.80
		WCMT 060304SN-29		●	●	●	●	●	●	●	●	●	●	●	10.00	6.62	3.00	0.40	4.40
		WCMT 07T304SN-29		●	●	●	●	●	●	●	●	●	●	●	12.00	7.94	3.80	0.40	4.40
-SN		XOMT 020204SN		●	●	●	●	●	●	●	●	●	●	●	5.50	3.39	2.30	0.40	2.25
		XOMT 030204SN		●	●	●	●	●	●	●	●	●	●	●	6.00	3.97	2.50	0.40	2.50
		XOMT 050304SN		●	●	●	●	●	●	●	●	●	●	●	8.00	5.29	3.00	0.40	2.80
		XOMT 060304SN		●	●	●	●	●	●	●	●	●	●	●	10.00	6.62	3.00	0.40	4.00
		XOMT 07T304SN		●	●	●	●	●	●	●	●	●	●	●	12.00	3.97	3.80	0.40	4.40
			U17T	S40T	SR127	SR226	CTPP430	CTC1435	GM40						d	l	s	r	d _i



Inserts

Tools and inserts for drilling



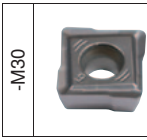
D3-D7



D32-D33



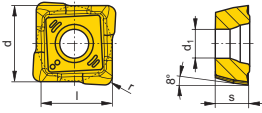
D20-D25



-M30

[illegible]

d	l	s	r	d ₁
[mm]	[mm]	[mm]	[mm]	[mm]
5.90	5.50	2.50	0.60	2.50
6.50	6.10	2.90	0.70	2.50
7.70	7.30	3.30	0.80	2.90
8.90	8.50	3.80	0.80	3.50
10.10	9.60	4.40	0.80	4.10
d	l	s	r	d ₁



D3-D7



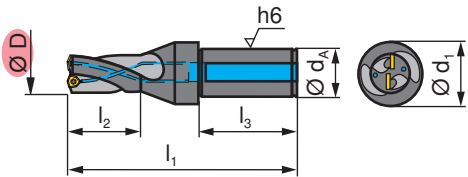
D34-D39



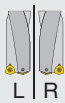
D26-D29



0 D L UO&OWIF² P P



Picture shows right-hand version

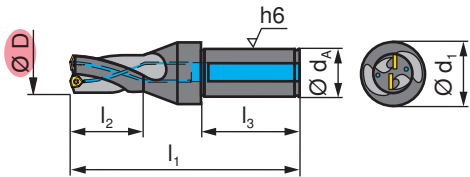
D [mm]	Type, description		d _A [mm]	d ₁ [mm]	l ₁ [mm]	l ₂ [mm]	l ₃ [mm]	
14	2D.140.R.02	R	25	32	114	30	54	WC.. / XO.. 02..
14.5	2D.145.R.02		25	32	115	31	54	
15	2D.150.R.02		25	32	116	32	54	
15.5	2D.155.R.02		25	32	117	33	54	
16	2D.160.R.02		25	32	118	34	54	
16.5	2D.165.R.02		25	32	119	35	54	
17	2D.170.R.02		25	32	120	36	54	WC.. / XO.. 03..
17.5	2D.175.R.02		25	32	121	37	54	
18	2D.180.R.03		25	32	122	38	54	
19	2D.190.R.03		25	32	124	40	54	
20	2D.200.R.03		25	32	126	42	54	
21	2D.210.R.03		25	32	128	44	54	
22	2D.220.R.03		25	32	130	46	54	WC.. / XO.. 05..
23	2D.230.R.03		25	32	132	48	54	
24	2D.240.R.05		25	32	134	50	54	
25	2D.250.R.05		25	32	136	52	54	
26	2D.260.R.05		25	32	138	54	54	
27	2D.270.R.05		25	32	140	56	54	
28	2D.280.R.05		25	32	142	58	54	
29	2D.290.R.05		25	32	144	60	54	

Ordering example: 1 piece 2D.140.R.02

	D [mm]			
WC.. / XO.. 02..	14 - 17.5	7729113/M2,0X4,8/T06		7729112/TORX T06 F
WC.. / XO.. 03..	18 - 23	7722113/M2,2X5/T07	7724105/TORX T07	
WC.. / XO.. 05..	24 - 29	7815101/M2,5X6,0/T08	7724106/TORX T08	



D18



Picture shows right-hand version

D [mm]	Type, description	 L R	d _A [mm]	d ₁ [mm]	l ₁ [mm]	l ₂ [mm]	l ₃ [mm]	
30	2D.300.R.06	R	32	49	150	62	58	WC.. / XO.. 06..
31	2D.310.R.06		32	49	152	64	58	
32	2D.320.R.06		32	49	154	66	58	
34	2D.340.R.06		32	49	158	70	58	
35	2D.350.R.06		32	49	160	72	58	
36	2D.360.R.06		32	49	162	74	58	
37	2D.370.R.06		32	49	164	76	58	WC.. / XO.. 07..
38	2D.380.R.07		32	49	166	78	58	
39	2D.390.R.07		32	49	168	80	58	
40	2D.400.R.07		32	49	170	82	58	
42	2D.420.R.07		32	49	174	86	58	
44	2D.440.R.07		32	49	178	90	58	
46	2D.460.R.07		40	59	197	94	68	
48	2D.480.R.07		40	59	201	98	68	
50	2D.500.R.07		40	59	205	102	68	
53	2D.530.R.07		40	59	211	108	68	

Ordering example: 1 piece 2D.300.R.06

Tools

Tools and inserts for drilling

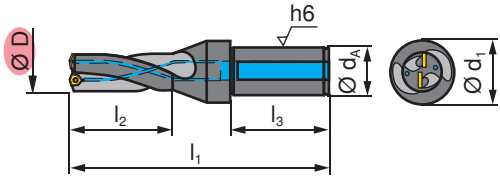
	D [mm]			
WC.. / XO.. 06..	30 - 37	7724103/TORX T15	7815102/M3,5X11,0/T15	
WC.. / XO.. 07..	38 - 53	7724103/TORX T15	7815102/M3,5X11,0/T15	



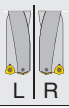
D18



0 D L UO&OWVF² P P



Picture shows right-hand version

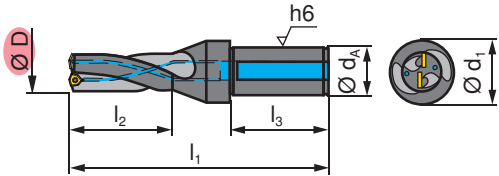
D [mm]	Type, description		d _A [mm]	d ₁ [mm]	l ₁ [mm]	l ₂ [mm]	l ₃ [mm]	
14	3D.140.R.02	R	25	32	128	44	54	WC.. / XO.. 02..
14.5	3D.145.R.02		25	32	129.5	45.5	54	
15	3D.150.R.02		25	32	131	47	54	
15.5	3D.155.R.02		25	32	132.5	48.5	54	
16	3D.160.R.02		25	32	134	50	54	
16.5	3D.165.R.02		25	32	135.5	51.5	54	
17	3D.170.R.02		25	32	137	53	54	
17.5	3D.175.R.02		25	32	138.5	54.5	54	WC.. / XO.. 03..
18	3D.180.R.03		25	32	140	56	54	
18.5	3D.185.R.03		25	32	140.5	57.5	53	
19	3D.190.R.03		25	32	143	59	54	
19.5	3D.195.R.03		25	32	144.5	60.5	54	
20	3D.200.R.03		25	32	146	62	54	
20.5	3D.205.R.03		25	32	147.5	63.5	54	
21	3D.210.R.03		25	32	149	65	54	WC.. / XO.. 05..
21.5	3D.215.R.03		25	32	150.5	66.5	54	
22	3D.220.R.03		25	32	152	68	54	
22.5	3D.225.R.03		25	32	153.5	69.5	54	
23	3D.230.R.03		25	32	155	71	54	
23.5	3D.235.R.03		25	32	156.5	72.5	54	
24	3D.240.R.05		25	32	158	74	54	
24.5	3D.245.R.05		25	32	159.5	75.5	54	
25	3D.250.R.05		25	32	161	77	54	
25.5	3D.255.R.05		25	32	162.5	78.5	54	
26	3D.260.R.05		25	32	164	80	54	
26.5	3D.265.R.05		25	32	165.5	81.5	54	
27	3D.270.R.05		25	32	167	83	54	
28	3D.280.R.05		25	32	170	86	54	
29	3D.290.R.05		25	32	173	89	54	

Ordering example: 1 piece 3D.140.R.02

	D [mm]			
WC.. / XO.. 02..	14 - 17.5	7729113/M2,0X4,8/T06		7729112/TORX T06 F
WC.. / XO.. 03..	18 - 23.5	7722113/M2,2X5/T07	7724105/TORX T07	
WC.. / XO.. 05..	24 - 29	7815101/M2,5X6,0/T08	7724106/TORX T08	



D18



Picture shows right-hand version

D [mm]	Type, description	 L R	d _A [mm]	d ₁ [mm]	l ₁ [mm]	l ₂ [mm]	l ₃ [mm]	
30	3D.300.R.06	R	32	49	180	92	58	WC.. / XO.. 06..
31	3D.310.R.06		32	49	183	95	58	
32	3D.320.R.06		32	49	186	98	58	
33	3D.330.R.06		32	49	189	101	58	
34	3D.340.R.06		32	49	192	104	58	
35	3D.350.R.06		32	49	195	107	58	
36	3D.360.R.06		32	49	198	110	58	
37	3D.370.R.06		32	49	201	113	58	
38	3D.380.R.07		32	49	204	116	58	WC.. / XO.. 07..
39	3D.390.R.07		32	49	207	119	58	
40	3D.400.R.07		32	49	210	122	58	
41	3D.410.R.07		32	49	213	125	58	
42	3D.420.R.07		32	49	216	128	58	
43	3D.430.R.07		32	49	219	131	58	
44	3D.440.R.07		32	49	222	134	58	
45	3D.450.R.07		40	59	240	137	68	
46	3D.460.R.07		40	59	243	140	68	
47	3D.470.R.07		40	59	246	143	68	
48	3D.480.R.07		40	59	249	146	68	
49	3D.490.R.07		40	59	252	149	68	
50	3D.500.R.07		40	59	255	152	68	
51	3D.510.R.07		40	59	258	155	68	
52	3D.520.R.07		40	59	261	158	68	
53	3D.530.R.07		40	59	264	161	68	

Ordering example: 1 piece 3D.300.R.06

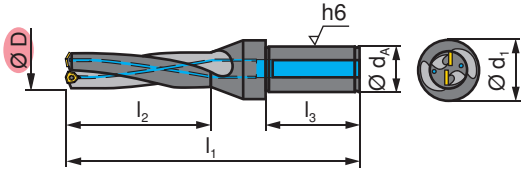
	D [mm]			
WC.. / XO.. 06..	30 - 37	7815102/M3,5X11,0/T15	7724103/TORX T15	
WC.. / XO.. 07..	38 - 53	7815102/M3,5X11,0/T15	7724103/TORX T15	



D18



0 D L UO&OWIF² P P



Picture shows right-hand version

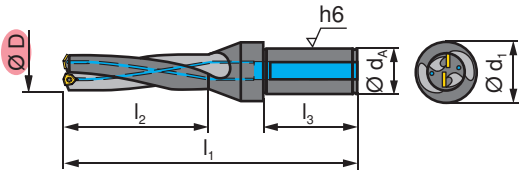
D [mm]	Type, description	L R	d _A [mm]	d ₁ [mm]	l ₁ [mm]	l ₂ [mm]	l ₃ [mm]	
18	4D.180.R.03	R	25	32	158	74	54	WC.. / XO.. 03..
18.5	4D.185.R.03		25	32	160	76	54	
19	4D.190.R.03		25	32	162	78	54	
19.5	4D.195.R.03		25	32	164	80	54	
20	4D.200.R.03		25	32	166	82	54	
20.5	4D.205.R.03		25	32	168	84	54	
21	4D.210.R.03		25	32	170	86	54	
21.5	4D.215.R.03		25	32	172	88	54	
22	4D.220.R.03		25	32	174	90	54	
22.5	4D.225.R.03		25	32	176	92	54	
23	4D.230.R.03		25	32	178	94	54	WC.. / XO.. 05..
23.5	4D.235.R.03		25	32	180	96	54	
24	4D.240.R.05		25	32	182	98	54	
24.5	4D.245.R.05		25	32	184	100	54	
25	4D.250.R.05		25	32	186	102	54	
25.5	4D.255.R.05		25	32	188	104	54	
26	4D.260.R.05		25	32	190	106	54	
26.5	4D.265.R.05		25	32	192	108	54	
27	4D.270.R.05		25	32	194	110	54	
28	4D.280.R.05		25	32	198	114	54	
29	4D.290.R.05		25	32	202	118	54	

Ordering example: 1 piece 4D.180.R.03

	D [mm]			
WC.. / XO.. 03..	18 - 23.5	7722113/M2,2X5/T07	7724105/TORX T07	
WC.. / XO.. 05..	24 - 29	7815101/M2,5X6,0/T08	7724106/TORX T08	



D18



Picture shows right-hand version

D [mm]	Type, description	 L R	d _A [mm]	d ₁ [mm]	l ₁ [mm]	l ₂ [mm]	l ₃ [mm]	
30	4D.300.R.06	R	32	49	210	122	58	WC.. / XO.. 06..
31	4D.310.R.06		32	49	214	126	58	
32	4D.320.R.06		32	49	218	130	58	
33	4D.330.R.06		32	49	222	134	58	
34	4D.340.R.06		32	49	226	138	58	
35	4D.350.R.06		32	49	230	142	58	
36	4D.360.R.06		32	49	234	146	58	
37	4D.370.R.06		32	49	238	150	58	
38	4D.380.R.07		32	49	242	154	58	WC.. / XO.. 07..
39	4D.390.R.07		32	49	246	158	58	
40	4D.400.R.07		32	49	250	162	58	
41	4D.410.R.07		32	49	254	166	58	
42	4D.420.R.07		32	49	258	170	58	
43	4D.430.R.07		32	49	262	174	58	
44	4D.440.R.07		32	49	266	178	58	
45	4D.450.R.07		40	59	285	182	68	
46	4D.460.R.07		40	59	289	186	68	
47	4D.470.R.07		40	59	293	190	68	
48	4D.480.R.07		40	59	297	194	68	
49	4D.490.R.07		40	59	301	198	68	
50	4D.500.R.07		40	59	305	202	68	

Ordering example: 1 piece 4D.300.R.06

Tools

Tools and inserts for drilling

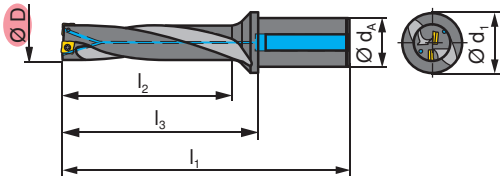
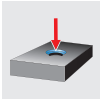
	D [mm]			
WC.. / XO.. 06..	30 - 37	7815102/M3,5X11,0/T15	7724103/TORX T15	
WC.. / XO.. 07..	38 - 50	7815102/M3,5X11,0/T15	7724103/TORX T15	



D18



6 VWP □ □ □² □
' □ □ □² □ □ □ P P



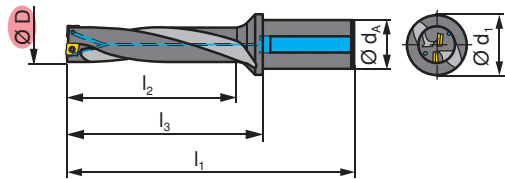
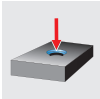
D [mm]	Type, description		d _A [mm]	d ₁ [mm]	l ₁ [mm]	l ₂ [mm]	l ₃ [mm]	
19	C900.3D.190.R.06	R	25	32	131	57	75	SONT 06..
19.5	C900.3D.195.R.06		25	32	133	59	77	
20	C900.3D.200.R.06		25	32	134	60	78	
20.5	C900.3D.205.R.06		25	32	136	62	80	
21	C900.3D.210.R.07		25	32	138	63	82	SONT 07..
21.5	C900.3D.215.R.07		25	32	140	65	84	
22	C900.3D.220.R.07		25	32	141	66	85	
22.5	C900.3D.225.R.07		25	32	143	68	87	
23	C900.3D.230.R.07		25	32	144	69	88	SONT 08..
23.5	C900.3D.235.R.07		25	32	146	71	90	
24	C900.3D.240.R.08		32	40	155	72	95	
24.5	C900.3D.245.R.08		32	40	157	74	97	
25	C900.3D.250.R.08		32	40	158	75	98	SONT 09..
25.5	C900.3D.255.R.08		32	40	160	77	100	
26	C900.3D.260.R.08		32	40	161	78	101	
26.5	C900.3D.265.R.08		32	40	163	80	103	
27	C900.3D.270.R.08		32	40	164	81	104	SONT 09..
27.5	C900.3D.275.R.08		32	40	166	83	106	
28	C900.3D.280.R.09		32	40	167	84	107	
28.5	C900.3D.285.R.09		32	40	169	86	109	
29	C900.3D.290.R.09		32	40	170	87	110	SONT 09..
29.5	C900.3D.295.R.09		32	40	172	89	112	
30	C900.3D.300.R.09		32	40	173	90	113	
30.5	C900.3D.305.R.09		32	40	175	92	115	
31	C900.3D.310.R.09		32	40	176	93	116	SONT 09..
31.5	C900.3D.315.R.09		32	40	178	95	118	
32	C900.3D.320.R.09		32	40	179	96	119	

Ordering example: 1 piece C900.3D.190.R.06

	D [mm]			
SONT 06..	19 - 20.5	M2,2x5-07IP/10009244	10006918/TORX 07IP	DMSD 1,0Nm/SORT 07IP
SONT 07..	21 - 23.5	M2,2x5-07IP/10009244	10006918/TORX 07IP	DMSD 1,0Nm/SORT 07IP
SONT 08..	24 - 27.5	M2,5x6-08IP/10009243	10000276/TORX 08IP	DMSD 1,2NM/SORT 08IP
SONT 09..	28 - 32	M3x7-09IP/10003007	10009333/TORX 09IP	DMSD 2,2NM/SORT 09IP



D19



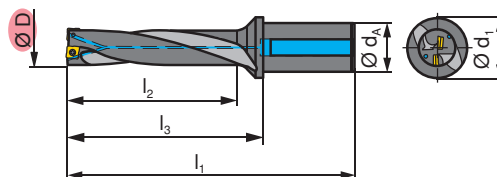
D [mm]	Type, description	 L R	d _A [mm]	d ₁ [mm]	l ₁ [mm]	l ₂ [mm]	l ₃ [mm]	
32.5	C900.3D.325.R.10	R	40	50	192	98	124	SONT 10..
33	C900.3D.330.R.10		40	50	193	99	125	
33.5	C900.3D.335.R.10		40	50	195	101	127	
34	C900.3D.340.R.10		40	50	196	102	128	
34.5	C900.3D.345.R.10		40	50	198	104	130	
35	C900.3D.350.R.10		40	50	199	105	131	
35.5	C900.3D.355.R.10		40	50	201	107	133	
36	C900.3D.360.R.10		40	50	202	108	134	
36.5	C900.3D.365.R.10		40	50	204	110	136	

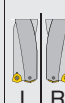
Ordering example: 1 piece C900.3D.325.R.10

	D [mm]			
SONT 10..	32.5 - 36.5	M3,5X8,6-15IP/10008749	10006919/TORX 15IP	DMSD 3,2Nm/SORT 15IP



D19



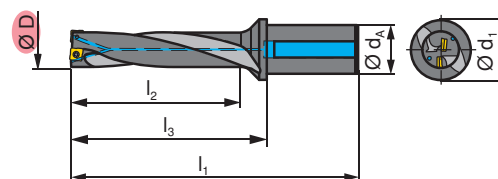
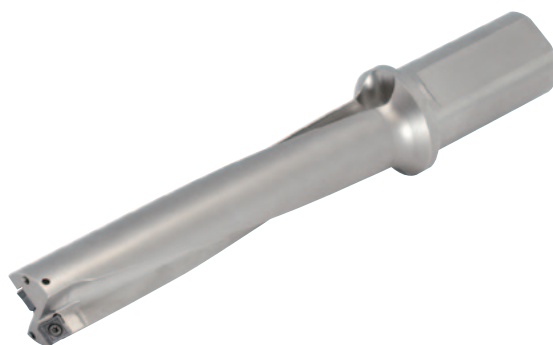
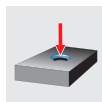
D [mm]	Type, description		d _A [mm]	d ₁ [mm]	l ₁ [mm]	l ₂ [mm]	l ₃ [mm]	
19	C900.4D.190.R.06	R	25	32	150	76	94	SONT 06..
20	C900.4D.200.R.06		25	32	154	80	98	
21	C900.4D.210.R.07		25	40	159	84	103	
22	C900.4D.220.R.07		25	40	163	88	107	SONT 07..
23	C900.4D.230.R.07		25	40	167	92	111	
24	C900.4D.240.R.08		32	40	179	96	119	
25	C900.4D.250.R.08		32	40	183	100	123	SONT 08..
26	C900.4D.260.R.08		32	40	187	104	127	
27	C900.4D.270.R.08		32	40	191	108	131	
28	C900.4D.280.R.09		32	40	195	112	135	SONT 09..
29	C900.4D.290.R.09		32	40	199	116	139	
30	C900.4D.300.R.09		32	40	203	120	143	
31	C900.4D.310.R.09		32	40	207	124	147	SONT 10..
32	C900.4D.320.R.09		32	40	211	128	151	
33	C900.4D.330.R.10		40	50	226	132	159	
34	C900.4D.340.R.10		40	50	230	136	162	
35	C900.4D.350.R.10		40	50	234	140	166	
36	C900.4D.360.R.10		40	50	238	144	170	

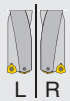
Ordering example: 1 piece C900.4D.190.R.06

	D [mm]			
SONT 06..	19 - 20	M2,2x5-07IP/10009244	10006918/TORX 07IP	DMSD 1,0Nm/SORT 07IP
SONT 07..	21 - 23	M2,2x5-07IP/10009244	10006918/TORX 07IP	DMSD 1,0Nm/SORT 07IP
SONT 08..	24 - 27	M2,5x6-08IP/10009243	10000276/TORX 08IP	DMSD 1,2Nm/SORT 08IP
SONT 09..	28 - 32	M3x7-09IP/10003007	10009333/TORX 09IP	DMSD 2,2Nm/SORT 09IP
SONT 10..	33 - 36	M3,5X8,6-15IP/10008749	10006919/TORX 15IP	DMSD 3,2Nm/SORT 15IP



D19



D [mm]	Type, description	 L R	d _A [mm]	d ₁ [mm]	l ₁ [mm]	l ₂ [mm]	l ₃ [mm]	
19	C900.5D.190.R.06	R	25	32	169	95	113	SONT 06..
20	C900.5D.200.R.06		25	32	174	100	118	
21	C900.5D.210.R.07		25	32	180	105	124	SONT 07..
22	C900.5D.220.R.07		25	32	184	110	128	
23	C900.5D.230.R.07		25	32	189	115	133	SONT 08..
24	C900.5D.240.R.08		32	40	203	120	143	
25	C900.5D.250.R.08		32	40	208	125	148	
26	C900.5D.260.R.08		32	40	212	130	152	
27	C900.5D.270.R.08		32	40	217	135	157	SONT 09..
28	C900.5D.280.R.09		32	40	221	140	161	
29	C900.5D.290.R.09		32	40	226	145	166	
30	C900.5D.300.R.09		32	40	230	150	170	
31	C900.5D.310.R.09		32	40	235	155	175	SONT 10..
32	C900.5D.320.R.09		32	40	239	160	179	
33	C900.5D.330.R.10		40	50	259	165	191	
34	C900.5D.340.R.10		40	50	264	170	196	
35	C900.5D.350.R.10		40	50	269	175	201	SONT 10..
36	C900.5D.360.R.10		40	50	274	180	206	

Ordering example: 1 piece C900.5D.190.R.06

	D [mm]			
SONT 06..	19 - 20	M2,2x5-07IP/10009244	10006918/TORX 07IP	DMSD 1,0Nm/SORT 07IP
SONT 07..	21 - 23	M2,2x5-07IP/10009244	10006918/TORX 07IP	DMSD 1,0Nm/SORT 07IP
SONT 08..	24 - 27	M2,5x6-08IP/10009243	10000276/TORX 08IP	DMSD 1,2Nm/SORT 08IP
SONT 09..	28 - 32	M3x7-09IP/10003007	10009333/TORX 09IP	DMSD 2,2Nm/SORT 09IP
SONT 10..	33 - 36	M3,5X8,6-15IP/10008749	10006919/TORX 15IP	DMSD 3,2Nm/SORT 15IP



D19

Cutting data

Grades, material

Work piece material		Type of treatment / alloy		VDI 3323 group	Hardness HB
A	Non alloyed steel	annealed	≤ .15% C	1	125
		annealed	.15% - .45% C	2	150 - 250
		tempered	≥ .45% C	3	300
	Low alloyed steel	annealed		6	180
		tempered		7 / 8	250 - 300
		tempered		9	350
	High alloyed steel	annealed		10	200
		tempered		11	350
	Corrosion resistant steel	annealed	ferritic	12	200
		tempered	martensitic	13	325
R	Stainless steel	annealed	ferritic / martensitic	14	200
		quenched	austenitic	14	180
		quenched	duplex	14	230 - 260
		hardened	martensitic / austenitic	14	330
F	Grey cast iron		pearlitic / ferritic	15	180
			pearlitic / martensitic	16	260
	Spheroidal cast iron		ferritic	17	160
			pearlitic	18	2
	Malleable cast iron		ferritic	19	130
			pearlitic	20	230
N	Aluminium wrought alloys	non hardened		21	60
		hardened		22	100
	Aluminium cast alloys	non hardened	< 12% Si	23	80
		hardened	< 12% Si	24	90
		non hardened	> 12% Si	25	130
	Copper and copper alloys (bronze, brass)		machining alloy stock (1% Pb)	26	2
			brass, red bronze	27	90
			bronze	28	100
			lead-free copper and electrolytic copper	29	100
	Non-metallic materials		thermosetting plastics	29	2
			fibre-reinforced plastics	29	2
			hard rubber	30	2
S	Heat resistant alloys	annealed	Fe-base	31	200
		hardened	Fe-base	32	280
		annealed	Ni or Co-base	33	250
		hardened	Ni or Co-base 30 - 58 HRC	34	2
		cast	1.4571, 1.4572, 1.4573, 1.4574, 1.4575, 1.4576, 1.4577, 1.4578, 1.4579, 1.4580, 1.4581, 1.4582, 1.4583, 1.4584, 1.4585, 1.4586, 1.4587, 1.4588, 1.4589, 1.4590, 1.4591, 1.4592, 1.4593, 1.4594, 1.4595, 1.4596, 1.4597, 1.4598, 1.4599, 1.4600, 1.4601, 1.4602, 1.4603, 1.4604, 1.4605, 1.4606, 1.4607, 1.4608, 1.4609, 1.4610, 1.4611, 1.4612, 1.4613, 1.4614, 1.4615, 1.4616, 1.4617, 1.4618, 1.4619, 1.4620, 1.4621, 1.4622, 1.4623, 1.4624, 1.4625, 1.4626, 1.4627, 1.4628, 1.4629, 1.4630, 1.4631, 1.4632, 1.4633, 1.4634, 1.4635, 1.4636, 1.4637, 1.4638, 1.4639, 1.4640, 1.4641, 1.4642, 1.4643, 1.4644, 1.4645, 1.4646, 1.4647, 1.4648, 1.4649, 1.4650, 1.4651, 1.4652, 1.4653, 1.4654, 1.4655, 1.4656, 1.4657, 1.4658, 1.4659, 1.4660, 1.4661, 1.4662, 1.4663, 1.4664, 1.4665, 1.4666, 1.4667, 1.4668, 1.4669, 1.4670, 1.4671, 1.4672, 1.4673, 1.4674, 1.4675, 1.4676, 1.4677, 1.4678, 1.4679, 1.4680, 1.4681, 1.4682, 1.4683, 1.4684, 1.4685, 1.4686, 1.4687, 1.4688, 1.4689, 1.4690, 1.4691, 1.4692, 1.4693, 1.4694, 1.4695, 1.4696, 1.4697, 1.4698, 1.4699, 1.4700, 1.4701, 1.4702, 1.4703, 1.4704, 1.4705, 1.4706, 1.4707, 1.4708, 1.4709, 1.4710, 1.4711, 1.4712, 1.4713, 1.4714, 1.4715, 1.4716, 1.4717, 1.4718, 1.4719, 1.4720, 1.4721, 1.4722, 1.4723, 1.4724, 1.4725, 1.4726, 1.4727, 1.4728, 1.4729, 1.4730, 1.4731, 1.4732, 1.4733, 1.4734, 1.4735, 1.4736, 1.4737, 1.4738, 1.4739, 1.4740, 1.4741, 1.4742, 1.4743, 1.4744, 1.4745, 1.4746, 1.4747, 1.4748, 1.4749, 1.4750, 1.4751, 1.4752, 1.4753, 1.4754, 1.4755, 1.4756, 1.4757, 1.4758, 1.4759, 1.4760, 1.4761, 1.4762, 1.4763, 1.4764, 1.4765, 1.4766, 1.4767, 1.4768, 1.4769, 1.4770, 1.4771, 1.4772, 1.4773, 1.4774, 1.4775, 1.4776, 1.4777, 1.4778, 1.4779, 1.4780, 1.4781, 1.4782, 1.4783, 1.4784, 1.4785, 1.4786, 1.4787, 1.4788, 1.4789, 1.4790, 1.4791, 1.4792, 1.4793, 1.4794, 1.4795, 1.4796, 1.4797, 1.4798, 1.4799, 1.4800, 1.4801, 1.4802, 1.4803, 1.4804, 1.4805, 1.4806, 1.4807, 1.4808, 1.4809, 1.4810, 1.4811, 1.4812, 1.4813, 1.4814, 1.4815, 1.4816, 1.4817, 1.4818, 1.4819, 1.4820, 1.4821, 1.4822, 1.4823, 1.4824, 1.4825, 1.4826, 1.4827, 1.4828, 1.4829, 1.4830, 1.4831, 1.4832, 1.4833, 1.4834, 1.4835, 1.4836, 1.4837, 1.4838, 1.4839, 1.4840, 1.4841, 1.4842, 1.4843, 1.4844, 1.4845, 1.4846, 1.4847, 1.4848, 1.4849, 1.4850, 1.4851, 1.4852, 1.4853, 1.4854, 1.4855, 1.4856, 1.4857, 1.4858, 1.4859, 1.4860, 1.4861, 1.4862, 1.4863, 1.4864, 1.4865, 1.4866, 1.4867, 1.4868, 1.4869, 1.4870, 1.4871, 1.4872, 1.4873, 1.4874, 1.4875, 1.4876, 1.4877, 1.4878, 1.4879, 1.4880, 1.4881, 1.4882, 1.4883, 1.4884, 1.4885, 1.4886, 1.4887, 1.4888, 1.4889, 1.4890, 1.4891, 1.4892, 1.4893, 1.4894, 1.4895, 1.4896, 1.4897, 1.4898, 1.4899, 1.4900, 1.4901, 1.4902, 1.4903, 1.4904, 1.4905, 1.4906, 1.4907, 1.4908, 1.4909, 1.4910, 1.4911, 1.4912, 1.4913, 1.4914, 1.4915, 1.4916, 1.4917, 1.4918, 1.4919, 1.4920, 1.4921, 1.4922, 1.4923, 1.4924, 1.4925, 1.4926, 1.4927, 1.4928, 1.4929, 1.4930, 1.4931, 1.4932, 1.4933, 1.4934, 1.4935, 1.4936, 1.4937, 1.4938, 1.4939, 1.4940, 1.4941, 1.4942, 1.4943, 1.4944, 1.4945, 1.4946, 1.4947, 1.4948, 1.4949, 1.4950, 1.4951, 1.4952, 1.4953, 1.4954, 1.4955, 1.4956, 1.4957, 1.4958, 1.4959, 1.4960, 1.4961, 1.4962, 1.4963, 1.4964, 1.4965, 1.4966, 1.4967, 1.4968, 1.4969, 1.4970, 1.4971, 1.4972, 1.4973, 1.4974, 1.4975, 1.4976, 1.4977, 1.4978, 1.4979, 1.4980, 1.4981, 1.4982, 1.4983, 1.4984, 1.4985, 1.4986, 1.4987, 1.4988, 1.4989, 1.4990, 1.4991, 1.4992, 1.4993, 1.4994, 1.4995, 1.4996, 1.4997, 1.4998, 1.4999, 1.5000	35	2
	Titanium alloys		pure titanium	36	R _m 440*
			alpha + beta alloys	37	R _m 1050*
H	Tempered steel	hardened and tempered		38	55 HRC
		hardened and tempered		39	60 HRC
	Chilled castings	cast		40	400
	Tempered cast iron	hardened and tempered		40	55 HRC

* R_m = ultimate tensile strength, measured in MPa

Uncoated carbide			Coated carbide				
U17T v_c [m/min]	S40T v_c [m/min]		SR127 v_c [m/min]	SR226 v_c [m/min]	CTC1435 v_c [m/min]	CTPP430 v_c [m/min]	GM40 v_c [m/min]
2	2		2	150 - 280	220 - 300	200-300	220 - 300
2	2		2	120 - 200	180 - 250	160-250	180 - 250
2	2		2	100 - 180	180 - 250	160-250	180 - 250
2	2		2	120 - 200	200 - 280	180-280	200 - 280
2	2		2	90 - 160	180 - 220	150-220	180 - 220
2	2		2	80 - 140	120 - 200	100-200	120 - 200
2	2		2	110 - 180	140 - 220	130-200	140 - 220
2	2		2	80 - 140	120 - 160	100-160	120 - 160
2	2		2	2	180 - 250	150-250	180 - 250
2	2		2	2	100 - 150	80-150	100 - 150
60 - 150	2		2	2	180 - 250	100-160	180 - 250
60 - 150	2		2	2	180 - 250	100-180	180 - 250
50 - 100	2		2	2	100 - 140	80-140	100 - 140
30 - 100	2		2	2	80 - 140	80-140	80 - 140
2	2		100 - 150	100 - 150	2	120-200	2
2	2		100 - 150	100 - 150	2	100-180	2
2	2		100 - 140	100 - 140	2	120-200	2
2	2		100 - 140	100 - 140	2	100-180	2
2	2		100 - 162	100 - 160	2	80-160	2
2	2		100 - 160	100 - 160	2	70-150	2
2	200 - 500		100 - 500	100 - 500	2	150-500	2
2	200 - 500		100 - 300	100 - 300	2	150-450	2
2	200 - 500		100 - 500	100 - 500	2	150-350	2
2	200 - 500		100 - 300	100 - 300	2	150-300	2
2	200 - 500		100 - 300	100 - 300	2	150-250	2
2	250 - 350		100 - 500	100 - 500	2	150-350	2
2	180 - 240		100 - 500	100 - 500	2	150-350	2
2	180 - 240		100 - 300	100 - 300	2	150-350	2
2	180 - 240		100 - 300	100 - 300	2	200-400	2
2	50 - 180		80 - 180	80 - 180	2	50-150	2
2	50 - 150		60 - 150	60 - 150	2	50-140	2
2	50 - 200		100 - 250	100 - 250	2	80-200	2
20 - 40	2		2	2	20 - 80	20-80	2
20 - 40	2		2	2	20 - 80	20-80	2
20 - 40	2		2	2	20 - 80	20-80	2
20 - 40	2		2	2	20 - 80	20-80	2
20 - 40	2		2	2	20 - 80	20-80	2
30 - 80	40 - 120		50 - 120	50 - 120	40 - 100	40-100	2
30 - 80	40 - 120		30 - 50	30 - 50	40 - 100	40-100	2
2	2		2	2	2	2	2
2	2		2	2	2	2	2
2	2		2	2	2	2	2
2	2		2	2	2	2	2

Work piece material		Type of treatment / alloy		VDI 3323 group	Hardness HB
A	Non alloyed steel	annealed	≤ .15% C	1	125
		annealed	.15% - .45% C	2	150 - 250
		tempered	≥ .45% C	3	300
	Low alloyed steel	annealed		6	180
		tempered		7 / 8	250 - 300
		tempered		9	350
	High alloyed steel	annealed		10	200
		tempered		11	350
	Corrosion resistant steel	annealed	ferritic	12	200
		tempered	martensitic	13	325
R	Stainless steel	annealed	ferritic / martensitic	14	200
		quenched	austenitic	14	180
		quenched	duplex	14	230 - 260
		hardened	martensitic / austenitic	14	330
F	Grey cast iron		pearlitic / ferritic	15	180
			pearlitic / martensitic	16	260
	Spheroidal cast iron		ferritic	17	160
			pearlitic	18	2
	Malleable cast iron		ferritic	19	130
			pearlitic	20	230
N	Aluminium wrought alloys	non hardened		21	60
		hardened		22	100
	Aluminium cast alloys	non hardened	< 12% Si	23	80
		hardened	< 12% Si	24	90
		non hardened	> 12% Si	25	130
	Copper and copper alloys (bronze, brass)		machining alloy stock (1% Pb)	26	2
			brass, red bronze	27	90
			bronze	28	100
			lead-free copper and electrolytic copper	29	100
	Non-metallic materials		thermosetting plastics	29	2
			fibre-reinforced plastics	29	2
			hard rubber	30	2
S	Heat resistant alloys	annealed	Fe-base	31	200
		hardened	Fe-base	32	280
		annealed	Ni or Co-base	33	250
		hardened	Ni or Co-base 30 - 58 HRC	34	2
		cast	1.4571, 1.4572, 1.4573, 1.4574, 1.4575, 1.4576, 1.4577, 1.4578, 1.4579, 1.4580, 1.4581, 1.4582, 1.4583, 1.4584, 1.4585, 1.4586, 1.4587, 1.4588, 1.4589, 1.4590, 1.4591, 1.4592, 1.4593, 1.4594, 1.4595, 1.4596, 1.4597, 1.4598, 1.4599, 1.4600, 1.4601, 1.4602, 1.4603, 1.4604, 1.4605, 1.4606, 1.4607, 1.4608, 1.4609, 1.4610, 1.4611, 1.4612, 1.4613, 1.4614, 1.4615, 1.4616, 1.4617, 1.4618, 1.4619, 1.4620, 1.4621, 1.4622, 1.4623, 1.4624, 1.4625, 1.4626, 1.4627, 1.4628, 1.4629, 1.4630, 1.4631, 1.4632, 1.4633, 1.4634, 1.4635, 1.4636, 1.4637, 1.4638, 1.4639, 1.4640, 1.4641, 1.4642, 1.4643, 1.4644, 1.4645, 1.4646, 1.4647, 1.4648, 1.4649, 1.4650, 1.4651, 1.4652, 1.4653, 1.4654, 1.4655, 1.4656, 1.4657, 1.4658, 1.4659, 1.4660, 1.4661, 1.4662, 1.4663, 1.4664, 1.4665, 1.4666, 1.4667, 1.4668, 1.4669, 1.4670, 1.4671, 1.4672, 1.4673, 1.4674, 1.4675, 1.4676, 1.4677, 1.4678, 1.4679, 1.4680, 1.4681, 1.4682, 1.4683, 1.4684, 1.4685, 1.4686, 1.4687, 1.4688, 1.4689, 1.4690, 1.4691, 1.4692, 1.4693, 1.4694, 1.4695, 1.4696, 1.4697, 1.4698, 1.4699, 1.4700, 1.4701, 1.4702, 1.4703, 1.4704, 1.4705, 1.4706, 1.4707, 1.4708, 1.4709, 1.4710, 1.4711, 1.4712, 1.4713, 1.4714, 1.4715, 1.4716, 1.4717, 1.4718, 1.4719, 1.4720, 1.4721, 1.4722, 1.4723, 1.4724, 1.4725, 1.4726, 1.4727, 1.4728, 1.4729, 1.4730, 1.4731, 1.4732, 1.4733, 1.4734, 1.4735, 1.4736, 1.4737, 1.4738, 1.4739, 1.4740, 1.4741, 1.4742, 1.4743, 1.4744, 1.4745, 1.4746, 1.4747, 1.4748, 1.4749, 1.4750, 1.4751, 1.4752, 1.4753, 1.4754, 1.4755, 1.4756, 1.4757, 1.4758, 1.4759, 1.4760, 1.4761, 1.4762, 1.4763, 1.4764, 1.4765, 1.4766, 1.4767, 1.4768, 1.4769, 1.4770, 1.4771, 1.4772, 1.4773, 1.4774, 1.4775, 1.4776, 1.4777, 1.4778, 1.4779, 1.4780, 1.4781, 1.4782, 1.4783, 1.4784, 1.4785, 1.4786, 1.4787, 1.4788, 1.4789, 1.4790, 1.4791, 1.4792, 1.4793, 1.4794, 1.4795, 1.4796, 1.4797, 1.4798, 1.4799, 1.4800, 1.4801, 1.4802, 1.4803, 1.4804, 1.4805, 1.4806, 1.4807, 1.4808, 1.4809, 1.4810, 1.4811, 1.4812, 1.4813, 1.4814, 1.4815, 1.4816, 1.4817, 1.4818, 1.4819, 1.4820, 1.4821, 1.4822, 1.4823, 1.4824, 1.4825, 1.4826, 1.4827, 1.4828, 1.4829, 1.4830, 1.4831, 1.4832, 1.4833, 1.4834, 1.4835, 1.4836, 1.4837, 1.4838, 1.4839, 1.4840, 1.4841, 1.4842, 1.4843, 1.4844, 1.4845, 1.4846, 1.4847, 1.4848, 1.4849, 1.4850, 1.4851, 1.4852, 1.4853, 1.4854, 1.4855, 1.4856, 1.4857, 1.4858, 1.4859, 1.4860, 1.4861, 1.4862, 1.4863, 1.4864, 1.4865, 1.4866, 1.4867, 1.4868, 1.4869, 1.4870, 1.4871, 1.4872, 1.4873, 1.4874, 1.4875, 1.4876, 1.4877, 1.4878, 1.4879, 1.4880, 1.4881, 1.4882, 1.4883, 1.4884, 1.4885, 1.4886, 1.4887, 1.4888, 1.4889, 1.4890, 1.4891, 1.4892, 1.4893, 1.4894, 1.4895, 1.4896, 1.4897, 1.4898, 1.4899, 1.4900, 1.4901, 1.4902, 1.4903, 1.4904, 1.4905, 1.4906, 1.4907, 1.4908, 1.4909, 1.4910, 1.4911, 1.4912, 1.4913, 1.4914, 1.4915, 1.4916, 1.4917, 1.4918, 1.4919, 1.4920, 1.4921, 1.4922, 1.4923, 1.4924, 1.4925, 1.4926, 1.4927, 1.4928, 1.4929, 1.4930, 1.4931, 1.4932, 1.4933, 1.4934, 1.4935, 1.4936, 1.4937, 1.4938, 1.4939, 1.4940, 1.4941, 1.4942, 1.4943, 1.4944, 1.4945, 1.4946, 1.4947, 1.4948, 1.4949, 1.4950, 1.4951, 1.4952, 1.4953, 1.4954, 1.4955, 1.4956, 1.4957, 1.4958, 1.4959, 1.4960, 1.4961, 1.4962, 1.4963, 1.4964, 1.4965, 1.4966, 1.4967, 1.4968, 1.4969, 1.4970, 1.4971, 1.4972, 1.4973, 1.4974, 1.4975, 1.4976, 1.4977, 1.4978, 1.4979, 1.4980, 1.4981, 1.4982, 1.4983, 1.4984, 1.4985, 1.4986, 1.4987, 1.4988, 1.4989, 1.4990, 1.4991, 1.4992, 1.4993, 1.4994, 1.4995, 1.4996, 1.4997, 1.4998, 1.4999, 1.5000	35	2
	Titanium alloys		pure titanium	36	R _m 440*
			alpha + beta alloys	37	R _m 1050*
H	Tempered steel	hardened and tempered		38	55 HRC
		hardened and tempered		39	60 HRC
	Chilled castings	cast		40	400
	Tempered cast iron	hardened and tempered		40	55 HRC

* R_m = ultimate tensile strength, measured in MPa

	Drill diameter (mm)				
	‘ 14 - 17,5	‘ 18 - 23,5	‘ 24 - 29	‘ 30 - 42	‘ 38 - 53
N/mm ²	f (mm/rev.)	f (mm/rev.)	f (mm/rev.)	f (mm/rev.)	f (mm/rev.)
420	2	2	2	2	2
500 - 850	0,03 - 0,10	0,05 - 0,12	0,08 - 0,12	0,08 - 0,15	0,1 - 0,25
1000	0,03 - 0,10	0,05 - 0,12	0,08 - 0,12	0,08 - 0,15	0,1 - 0,25
600	0,03 - 0,10	0,05 - 0,14	0,08 - 0,14	0,10 - 0,17	0,1 - 0,20
850 - 1000	0,03 - 0,10	0,05 - 0,14	0,08 - 0,14	0,10 - 0,17	0,1 - 0,20
1180	0,03 - 0,10	0,05 - 0,14	0,08 - 0,14	0,10 - 0,17	0,1 - 0,20
680	00,3 - 0,10	0,05 - 0,14	0,08 - 0,14	0,10 - 0,17	0,1 - 0,20
1180	00,3 - 0,10	0,05 - 0,14	0,08 - 0,14	0,10 - 0,17	0,1 - 0,20
2	0,03 - 0,10	0,04 - 0,14	0,08 - 0,16	0,10 - 0,18	0,12 - 0,20
2	0,03 - 0,10	0,04 - 0,14	0,08 - 0,16	0,10 - 0,18	0,12 - 0,20
1100	0,03 - 0,10	0,04 - 0,14	0,08 - 0,16	0,10 - 0,18	0,12 - 0,20
2	0,03 - 0,10	0,04 - 0,12	0,08 - 0,14	0,10 - 0,16	0,1 - 0,18
2	0,03 - 0,10	0,04 - 0,12	0,08 - 0,14	0,10 - 0,16	0,1 - 0,18
2	0,03 - 0,10	0,04 - 0,12	0,08 - 0,14	0,10 - 0,16	0,1 - 0,18
2	0,04 - 0,12	0,06 - 0,16	0,12 - 0,18	0,14 - 0,22	0,15 - 0,25
2	0,04 - 0,12	0,06 - 0,16	0,12 - 0,18	0,14 - 0,22	0,15 - 0,25
2	0,04 - 0,10	0,08 - 0,14	0,12 - 0,18	0,14 - 0,20	0,15 - 0,22
2	0,04 - 0,10	0,08 - 0,14	0,12 - 0,18	0,14 - 0,20	0,15 - 0,22
2	0,04 - 0,12	0,08 - 0,16	0,10 - 0,18	0,12 - 0,20	0,15 - 0,25
2	0,04 - 0,12	0,08 - 0,16	0,10 - 0,18	0,12 - 0,20	0,15 - 0,25
2	2	0,06 - 0,16	0,10 - 0,18	0,12 - 0,22	0,14 - 0,25
2	2	0,06 - 0,16	0,10 - 0,18	0,12 - 0,22	0,14 - 0,25
2	2	0,06 - 0,16	0,10 - 0,18	0,12 - 0,22	0,14 - 0,25
2	2	0,06 - 0,16	0,10 - 0,18	0,12 - 0,22	0,14 - 0,25
2	2	0,06 - 0,16	0,10 - 0,18	0,12 - 0,22	0,14 - 0,25
2	2	0,06 - 0,16	0,10 - 0,18	0,12 - 0,22	0,14 - 0,25
2	2	0,06 - 0,16	0,10 - 0,18	0,12 - 0,22	0,14 - 0,25
2	2	0,06 - 0,16	0,10 - 0,18	0,12 - 0,22	0,14 - 0,25
2	2	0,05 - 0,10	0,08 - 0,12	0,10 - 0,15	0,10 - 0,20
2	2	0,05 - 0,10	0,08 - 0,12	0,10 - 0,15	0,10 - 0,20
2	2	0,05 - 0,10	0,08 - 0,12	0,10 - 0,15	0,10 - 0,20
2	2	0,04 - 0,08	0,06 - 0,10	0,08 - 0,12	0,09 - 0,14
2	2	0,04 - 0,08	0,06 - 0,10	0,08 - 0,12	0,09 - 0,14
2	2	0,04 - 0,08	0,06 - 0,10	0,08 - 0,12	0,09 - 0,14
2	2	0,04 - 0,08	0,06 - 0,10	0,08 - 0,12	0,09 - 0,14
2	2	0,05 - 0,12	0,08 - 0,12	0,10 - 0,15	0,1 - 0,20
2	2	0,05 - 0,12	0,08 - 0,12	0,10 - 0,15	0,1 - 0,20
2	2	2	2	2	2
2	2	2	2	2	2
2	2	2	2	2	2
2	2	2	2	2	2

Cutting data

MaxiDrill 900 3D

Work piece material		Type of treatment / alloy		VDI 3323 group	Hardness HB
A	Non alloyed steel	annealed	≤ .15% C	1	125
		annealed	.15% - .45% C	2	150 - 250
		tempered	≥ .45% C	3	300
	Low alloyed steel	annealed		6	180
		tempered		7 / 8	250 - 300
		tempered		9	350
	High alloyed steel	annealed		10	200
		tempered		11	350
	Corrosion resistant steel	annealed	ferritic	12	200
		tempered	martensitic	13	325
R	Stainless steel	annealed	ferritic / martensitic	14	200
		quenched	austenitic	14	180
		quenched	duplex	14	230 - 260
		hardened	martensitic / austenitic	14	330
F	Grey cast iron		pearlitic / ferritic	15	180
			pearlitic / martensitic	16	260
	Spheroidal cast iron		ferritic	17	160
			pearlitic	18	2
	Malleable cast iron		ferritic	19	130
			pearlitic	20	230
N	Aluminium wrought alloys	non hardened		21	60
		hardened		22	100
	Aluminium cast alloys	non hardened	< 12% Si	23	80
		hardened	< 12% Si	24	90
		non hardened	> 12% Si	25	130
	Copper and copper alloys (bronze, brass)		machining alloy stock (1% Pb)	26	2
			brass, red bronze	27	90
			bronze	28	100
			lead-free copper and electrolytic copper	29	100
	Non-metallic materials		thermosetting plastics	29	2
			fibre-reinforced plastics	29	2
			hard rubber	30	2
S	Heat resistant alloys	annealed	Fe-base	31	200
		hardened	Fe-base	32	280
		annealed	Ni or Co-base	33	250
		hardened	Ni or Co-base 30 - 58 HRC	34	2
		cast	1.4571, 1.4572, 1.4573, 1.4574, 1.4575, 1.4576, 1.4577, 1.4578, 1.4579, 1.4580, 1.4581, 1.4582, 1.4583, 1.4584, 1.4585, 1.4586, 1.4587, 1.4588, 1.4589, 1.4590, 1.4591, 1.4592, 1.4593, 1.4594, 1.4595, 1.4596, 1.4597, 1.4598, 1.4599, 1.4600, 1.4601, 1.4602, 1.4603, 1.4604, 1.4605, 1.4606, 1.4607, 1.4608, 1.4609, 1.4610, 1.4611, 1.4612, 1.4613, 1.4614, 1.4615, 1.4616, 1.4617, 1.4618, 1.4619, 1.4620, 1.4621, 1.4622, 1.4623, 1.4624, 1.4625, 1.4626, 1.4627, 1.4628, 1.4629, 1.4630, 1.4631, 1.4632, 1.4633, 1.4634, 1.4635, 1.4636, 1.4637, 1.4638, 1.4639, 1.4640, 1.4641, 1.4642, 1.4643, 1.4644, 1.4645, 1.4646, 1.4647, 1.4648, 1.4649, 1.4650, 1.4651, 1.4652, 1.4653, 1.4654, 1.4655, 1.4656, 1.4657, 1.4658, 1.4659, 1.4660, 1.4661, 1.4662, 1.4663, 1.4664, 1.4665, 1.4666, 1.4667, 1.4668, 1.4669, 1.4670, 1.4671, 1.4672, 1.4673, 1.4674, 1.4675, 1.4676, 1.4677, 1.4678, 1.4679, 1.4680, 1.4681, 1.4682, 1.4683, 1.4684, 1.4685, 1.4686, 1.4687, 1.4688, 1.4689, 1.4690, 1.4691, 1.4692, 1.4693, 1.4694, 1.4695, 1.4696, 1.4697, 1.4698, 1.4699, 1.4700, 1.4701, 1.4702, 1.4703, 1.4704, 1.4705, 1.4706, 1.4707, 1.4708, 1.4709, 1.4710, 1.4711, 1.4712, 1.4713, 1.4714, 1.4715, 1.4716, 1.4717, 1.4718, 1.4719, 1.4720, 1.4721, 1.4722, 1.4723, 1.4724, 1.4725, 1.4726, 1.4727, 1.4728, 1.4729, 1.4730, 1.4731, 1.4732, 1.4733, 1.4734, 1.4735, 1.4736, 1.4737, 1.4738, 1.4739, 1.4740, 1.4741, 1.4742, 1.4743, 1.4744, 1.4745, 1.4746, 1.4747, 1.4748, 1.4749, 1.4750, 1.4751, 1.4752, 1.4753, 1.4754, 1.4755, 1.4756, 1.4757, 1.4758, 1.4759, 1.4760, 1.4761, 1.4762, 1.4763, 1.4764, 1.4765, 1.4766, 1.4767, 1.4768, 1.4769, 1.4770, 1.4771, 1.4772, 1.4773, 1.4774, 1.4775, 1.4776, 1.4777, 1.4778, 1.4779, 1.4780, 1.4781, 1.4782, 1.4783, 1.4784, 1.4785, 1.4786, 1.4787, 1.4788, 1.4789, 1.4790, 1.4791, 1.4792, 1.4793, 1.4794, 1.4795, 1.4796, 1.4797, 1.4798, 1.4799, 1.4800, 1.4801, 1.4802, 1.4803, 1.4804, 1.4805, 1.4806, 1.4807, 1.4808, 1.4809, 1.4810, 1.4811, 1.4812, 1.4813, 1.4814, 1.4815, 1.4816, 1.4817, 1.4818, 1.4819, 1.4820, 1.4821, 1.4822, 1.4823, 1.4824, 1.4825, 1.4826, 1.4827, 1.4828, 1.4829, 1.4830, 1.4831, 1.4832, 1.4833, 1.4834, 1.4835, 1.4836, 1.4837, 1.4838, 1.4839, 1.4840, 1.4841, 1.4842, 1.4843, 1.4844, 1.4845, 1.4846, 1.4847, 1.4848, 1.4849, 1.4850, 1.4851, 1.4852, 1.4853, 1.4854, 1.4855, 1.4856, 1.4857, 1.4858, 1.4859, 1.4860, 1.4861, 1.4862, 1.4863, 1.4864, 1.4865, 1.4866, 1.4867, 1.4868, 1.4869, 1.4870, 1.4871, 1.4872, 1.4873, 1.4874, 1.4875, 1.4876, 1.4877, 1.4878, 1.4879, 1.4880, 1.4881, 1.4882, 1.4883, 1.4884, 1.4885, 1.4886, 1.4887, 1.4888, 1.4889, 1.4890, 1.4891, 1.4892, 1.4893, 1.4894, 1.4895, 1.4896, 1.4897, 1.4898, 1.4899, 1.4900, 1.4901, 1.4902, 1.4903, 1.4904, 1.4905, 1.4906, 1.4907, 1.4908, 1.4909, 1.4910, 1.4911, 1.4912, 1.4913, 1.4914, 1.4915, 1.4916, 1.4917, 1.4918, 1.4919, 1.4920, 1.4921, 1.4922, 1.4923, 1.4924, 1.4925, 1.4926, 1.4927, 1.4928, 1.4929, 1.4930, 1.4931, 1.4932, 1.4933, 1.4934, 1.4935, 1.4936, 1.4937, 1.4938, 1.4939, 1.4940, 1.4941, 1.4942, 1.4943, 1.4944, 1.4945, 1.4946, 1.4947, 1.4948, 1.4949, 1.4950, 1.4951, 1.4952, 1.4953, 1.4954, 1.4955, 1.4956, 1.4957, 1.4958, 1.4959, 1.4960, 1.4961, 1.4962, 1.4963, 1.4964, 1.4965, 1.4966, 1.4967, 1.4968, 1.4969, 1.4970, 1.4971, 1.4972, 1.4973, 1.4974, 1.4975, 1.4976, 1.4977, 1.4978, 1.4979, 1.4980, 1.4981, 1.4982, 1.4983, 1.4984, 1.4985, 1.4986, 1.4987, 1.4988, 1.4989, 1.4990, 1.4991, 1.4992, 1.4993, 1.4994, 1.4995, 1.4996, 1.4997, 1.4998, 1.4999, 1.5000	35	2
	Titanium alloys		pure titanium	36	R _m 440*
			alpha + beta alloys	37	R _m 1050*
H	Tempered steel	hardened and tempered		38	55 HRC
		hardened and tempered		39	60 HRC
	Chilled castings	cast		40	400
	Tempered cast iron	hardened and tempered		40	55 HRC

* R_m = ultimate tensile strength, measured in MPa

SONT 06 ‘ 00 00 00 f [mm/rev]	SONT 07 ‘ 21-23,5 f [mm/rev]	SONT 08 ‘ 24 - 27,5 f [mm/rev]	SONT 09 ‘ 28 - 32 f [mm/rev]	SONT 10 ‘ 32,5 - 36,5 f [mm/rev]
0,05-0,15	0,07-0,15	0,08-0,17	0,08-0,18	0,09-0,19
0,05-0,16	0,07-0,17	0,08-0,19	0,08-0,20	0,09-0,21
0,05-0,18	0,08-0,20	0,09-0,22	0,09-0,23	0,10-0,24
0,05-0,20	0,08-0,22	0,09-0,23	0,09-0,24	0,10-0,25
0,05-0,18	0,08-0,20	0,09-0,21	0,09-0,22	0,10-0,23
0,05-0,18	0,08-0,20	0,09-0,21	0,09-0,22	0,10-0,23
0,05-0,18	0,08-0,20	0,09-0,21	0,09-0,22	0,10-0,23
0,05-0,18	0,08-0,20	0,09-0,21	0,09-0,22	0,10-0,23
0,05-0,15	0,08-0,15	0,08-0,17	0,08-0,18	0,09-0,19
0,05-0,15	0,08-0,15	0,08-0,17	0,08-0,18	0,09-0,19
0,05-0,14	0,05-0,16	0,05-0,18	0,07-0,18	0,08-0,21
0,05-0,13	0,05-0,15	0,06-0,16	0,07-0,16	0,08-0,20
0,05-0,13	0,05-0,15	0,06-0,15	0,07-0,16	0,08-0,20
0,05-0,12	0,05-0,14	0,05-0,15	0,06-0,15	0,07-0,19
0,08-0,24	0,10-0,25	0,1-0,28	0,1-0,28	0,1-0,30
0,08-0,22	0,10-0,24	0,1-0,26	0,1-0,26	0,1-0,28
0,08-0,22	0,10-0,25	0,1-0,28	0,1-0,28	0,1-0,28
0,08-0,20	0,10-0,23	0,1-0,25	0,1-0,25	0,1-0,25
0,08-0,21	0,10-0,25	0,1-0,28	0,1-0,28	0,1-0,30
0,08-0,21	0,10-0,25	0,1-0,28	0,1-0,28	0,1-0,30
0,08-0,15	0,10-0,15	0,10-0,15	0,10-0,17	0,10-0,17
0,08-0,15	0,10-0,15	0,10-0,15	0,10-0,17	0,10-0,17
0,08-0,15	0,10-0,18	0,10-0,18	0,10-0,19	0,10-0,19
0,08-0,15	0,10-0,18	0,10-0,18	0,10-0,19	0,10-0,19
0,08-0,15	0,13-0,20	0,13-0,20	0,13-0,22	0,13-0,22
0,08-0,15	0,10-0,16	0,10-0,16	0,10-0,17	0,10-0,17
0,08-0,18	0,10-0,18	0,10-0,18	0,10-0,20	0,10-0,20
0,08-0,18	0,10-0,18	0,10-0,18	0,10-0,20	0,10-0,20
0,08-0,16	0,10-0,16	0,10-0,16	0,10-0,17	0,10-0,17
0,05-0,10	0,05-0,12	0,05-0,12	0,05-0,12	0,05-0,12
0,08-0,15	0,10-0,16	0,10-0,16	0,10-0,16	0,10-0,16
0,06-0,12	0,08-0,14	0,08-0,14	0,08-0,14	0,08-0,14
0,04-0,08	0,05-0,08	0,05-0,10	0,05-0,10	0,05-0,12
0,04-0,08	0,05-0,08	0,05-0,10	0,05-0,10	0,05-0,12
0,04-0,08	0,05-0,08	0,05-0,10	0,05-0,10	0,05-0,12
0,04-0,08	0,05-0,08	0,05-0,10	0,05-0,10	0,05-0,12
0,07-0,10	0,05-0,12	0,06-0,12	0,07-0,15	0,07-0,15
0,07-0,10	0,05-0,12	0,06-0,12	0,07-0,15	0,07-0,15
2	2	2	2	2
2	2	2	2	2
2	2	2	2	2
2 □	2	2	2	2

Cutting data

MaxiDrill 900 4D

Work piece material		Type of treatment / alloy		VDI 3323 group	Hardness HB
A	Non alloyed steel	annealed	≤ .15% C	1	125
		annealed	.15% - .45% C	2	150 - 250
		tempered	≥ .45% C	3	300
	Low alloyed steel	annealed		6	180
		tempered		7 / 8	250 - 300
		tempered		9	350
	High alloyed steel	annealed		10	200
		tempered		11	350
	Corrosion resistant steel	annealed	ferritic	12	200
		tempered	martensitic	13	325
R	Stainless steel	annealed	ferritic / martensitic	14	200
		quenched	austenitic	14	180
		quenched	duplex	14	230 - 260
		hardened	martensitic / austenitic	14	330
F	Grey cast iron		pearlitic / ferritic	15	180
			pearlitic / martensitic	16	260
	Spheroidal cast iron		ferritic	17	160
			pearlitic	18	2
	Malleable cast iron		ferritic	19	130
			pearlitic	20	230
N	Aluminium wrought alloys	non hardened		21	60
		hardened		22	100
	Aluminium cast alloys	non hardened	< 12% Si	23	80
		hardened	< 12% Si	24	90
		non hardened	> 12% Si	25	130
	Copper and copper alloys (bronze, brass)		machining alloy stock (1% Pb)	26	2
			brass, red bronze	27	90
			bronze	28	100
			lead-free copper and electrolytic copper	29	100
	Non-metallic materials		thermosetting plastics	29	2
			fibre-reinforced plastics	29	2
			hard rubber	30	2
S	Heat resistant alloys	annealed	Fe-base	31	200
		hardened	Fe-base	32	280
		annealed	Ni or Co-base	33	250
		hardened	Ni or Co-base 30 - 58 HRC	34	2
		cast	1.4571, 1.4572, 1.4573, 1.4574, 1.4575, 1.4576, 1.4577, 1.4578, 1.4579, 1.4580, 1.4581, 1.4582, 1.4583, 1.4584, 1.4585, 1.4586, 1.4587, 1.4588, 1.4589, 1.4590, 1.4591, 1.4592, 1.4593, 1.4594, 1.4595, 1.4596, 1.4597, 1.4598, 1.4599, 1.4600, 1.4601, 1.4602, 1.4603, 1.4604, 1.4605, 1.4606, 1.4607, 1.4608, 1.4609, 1.4610, 1.4611, 1.4612, 1.4613, 1.4614, 1.4615, 1.4616, 1.4617, 1.4618, 1.4619, 1.4620, 1.4621, 1.4622, 1.4623, 1.4624, 1.4625, 1.4626, 1.4627, 1.4628, 1.4629, 1.4630, 1.4631, 1.4632, 1.4633, 1.4634, 1.4635, 1.4636, 1.4637, 1.4638, 1.4639, 1.4640, 1.4641, 1.4642, 1.4643, 1.4644, 1.4645, 1.4646, 1.4647, 1.4648, 1.4649, 1.4650, 1.4651, 1.4652, 1.4653, 1.4654, 1.4655, 1.4656, 1.4657, 1.4658, 1.4659, 1.4660, 1.4661, 1.4662, 1.4663, 1.4664, 1.4665, 1.4666, 1.4667, 1.4668, 1.4669, 1.4670, 1.4671, 1.4672, 1.4673, 1.4674, 1.4675, 1.4676, 1.4677, 1.4678, 1.4679, 1.4680, 1.4681, 1.4682, 1.4683, 1.4684, 1.4685, 1.4686, 1.4687, 1.4688, 1.4689, 1.4690, 1.4691, 1.4692, 1.4693, 1.4694, 1.4695, 1.4696, 1.4697, 1.4698, 1.4699, 1.4700, 1.4701, 1.4702, 1.4703, 1.4704, 1.4705, 1.4706, 1.4707, 1.4708, 1.4709, 1.4710, 1.4711, 1.4712, 1.4713, 1.4714, 1.4715, 1.4716, 1.4717, 1.4718, 1.4719, 1.4720, 1.4721, 1.4722, 1.4723, 1.4724, 1.4725, 1.4726, 1.4727, 1.4728, 1.4729, 1.4730, 1.4731, 1.4732, 1.4733, 1.4734, 1.4735, 1.4736, 1.4737, 1.4738, 1.4739, 1.4740, 1.4741, 1.4742, 1.4743, 1.4744, 1.4745, 1.4746, 1.4747, 1.4748, 1.4749, 1.4750, 1.4751, 1.4752, 1.4753, 1.4754, 1.4755, 1.4756, 1.4757, 1.4758, 1.4759, 1.4760, 1.4761, 1.4762, 1.4763, 1.4764, 1.4765, 1.4766, 1.4767, 1.4768, 1.4769, 1.4770, 1.4771, 1.4772, 1.4773, 1.4774, 1.4775, 1.4776, 1.4777, 1.4778, 1.4779, 1.4780, 1.4781, 1.4782, 1.4783, 1.4784, 1.4785, 1.4786, 1.4787, 1.4788, 1.4789, 1.4790, 1.4791, 1.4792, 1.4793, 1.4794, 1.4795, 1.4796, 1.4797, 1.4798, 1.4799, 1.4800, 1.4801, 1.4802, 1.4803, 1.4804, 1.4805, 1.4806, 1.4807, 1.4808, 1.4809, 1.4810, 1.4811, 1.4812, 1.4813, 1.4814, 1.4815, 1.4816, 1.4817, 1.4818, 1.4819, 1.4820, 1.4821, 1.4822, 1.4823, 1.4824, 1.4825, 1.4826, 1.4827, 1.4828, 1.4829, 1.4830, 1.4831, 1.4832, 1.4833, 1.4834, 1.4835, 1.4836, 1.4837, 1.4838, 1.4839, 1.4840, 1.4841, 1.4842, 1.4843, 1.4844, 1.4845, 1.4846, 1.4847, 1.4848, 1.4849, 1.4850, 1.4851, 1.4852, 1.4853, 1.4854, 1.4855, 1.4856, 1.4857, 1.4858, 1.4859, 1.4860, 1.4861, 1.4862, 1.4863, 1.4864, 1.4865, 1.4866, 1.4867, 1.4868, 1.4869, 1.4870, 1.4871, 1.4872, 1.4873, 1.4874, 1.4875, 1.4876, 1.4877, 1.4878, 1.4879, 1.4880, 1.4881, 1.4882, 1.4883, 1.4884, 1.4885, 1.4886, 1.4887, 1.4888, 1.4889, 1.4890, 1.4891, 1.4892, 1.4893, 1.4894, 1.4895, 1.4896, 1.4897, 1.4898, 1.4899, 1.4900, 1.4901, 1.4902, 1.4903, 1.4904, 1.4905, 1.4906, 1.4907, 1.4908, 1.4909, 1.4910, 1.4911, 1.4912, 1.4913, 1.4914, 1.4915, 1.4916, 1.4917, 1.4918, 1.4919, 1.4920, 1.4921, 1.4922, 1.4923, 1.4924, 1.4925, 1.4926, 1.4927, 1.4928, 1.4929, 1.4930, 1.4931, 1.4932, 1.4933, 1.4934, 1.4935, 1.4936, 1.4937, 1.4938, 1.4939, 1.4940, 1.4941, 1.4942, 1.4943, 1.4944, 1.4945, 1.4946, 1.4947, 1.4948, 1.4949, 1.4950, 1.4951, 1.4952, 1.4953, 1.4954, 1.4955, 1.4956, 1.4957, 1.4958, 1.4959, 1.4960, 1.4961, 1.4962, 1.4963, 1.4964, 1.4965, 1.4966, 1.4967, 1.4968, 1.4969, 1.4970, 1.4971, 1.4972, 1.4973, 1.4974, 1.4975, 1.4976, 1.4977, 1.4978, 1.4979, 1.4980, 1.4981, 1.4982, 1.4983, 1.4984, 1.4985, 1.4986, 1.4987, 1.4988, 1.4989, 1.4990, 1.4991, 1.4992, 1.4993, 1.4994, 1.4995, 1.4996, 1.4997, 1.4998, 1.4999, 1.5000	35	2
	Titanium alloys		pure titanium	36	R _m 440*
			alpha + beta alloys	37	R _m 1050*
H	Tempered steel	hardened and tempered		38	55 HRC
		hardened and tempered		39	60 HRC
	Chilled castings	cast		40	400
	Tempered cast iron	hardened and tempered		40	55 HRC

* R_m = ultimate tensile strength, measured in MPa

SONT 06 ‘ □ □ □ □ f [mm/rev]	SONT 07 ‘ 21-23 f [mm/rev]	SONT 08 ‘ 24 - 27 f [mm/rev]	SONT 09 ‘ 28 - 32 f [mm/rev]	SONT 10 ‘ 33 - 36 f [mm/rev]
0,05-0,12	0,05-0,13	0,06-0,15	0,06-0,17	0,06-0,17
0,05-0,14	0,05-0,15	0,06-0,17	0,06-0,19	0,06-0,19
0,05-0,16	0,06-0,18	0,07-0,20	0,07-0,22	0,07-0,22
0,05-0,18	0,06-0,20	0,07-0,20	0,07-0,23	0,07-0,23
0,05-0,15	0,06-0,17	0,07-0,20	0,07-0,23	0,07-0,23
0,05-0,15	0,06-0,18	0,07-0,21	0,07-0,23	0,07-0,23
0,05-0,15	0,06-0,18	0,07-0,20	0,07-0,23	0,07-0,23
0,05-0,15	0,06-0,18	0,07-0,20	0,07-0,23	0,07-0,23
0,05-0,12	0,06-0,12	0,06-0,15	0,06-0,17	0,06-0,17
0,05-0,12	0,06-0,12	0,06-0,15	0,06-0,17	0,06-0,17
0,05-0,13	0,05-0,15	0,05-0,16	0,07-0,16	0,08-0,20
0,05-0,11	0,05-0,13	0,06-0,14	0,07-0,15	0,08-0,19
0,05-0,11	0,05-0,12	0,06-0,12	0,07-0,14	0,08-0,17
0,05-0,10	0,05-0,11	0,05-0,12	0,06-0,13	0,07-0,16
0,08-0,22	0,10-0,24	0,1-0,25	0,1-0,25	0,1-0,28
0,08-0,20	0,10-0,22	0,1-0,25	0,1-0,25	0,1-0,27
0,08-0,20	0,10-0,24	0,1-0,26	0,1-0,26	0,1-0,26
0,08-0,18	0,10-0,22	0,1-0,22	0,1-0,22	0,1-0,23
0,08-0,18	0,10-0,22	0,1-0,25	0,1-0,25	0,1-0,28
0,08-0,18	0,10-0,22	0,1-0,25	0,1-0,25	0,1-0,28
0,08-0,15	0,10-0,15	0,10-0,15	0,10-0,17	0,10-0,17
0,08-0,15	0,10-0,15	0,10-0,15	0,10-0,17	0,10-0,17
0,08-0,15	0,10-0,18	0,10-0,18	0,10-0,19	0,10-0,19
0,08-0,15	0,10-0,18	0,10-0,18	0,10-0,19	0,10-0,19
0,08-0,15	0,13-0,20	0,13-0,20	0,13-0,22	0,13-0,22
0,08-0,15	0,10-0,16	0,10-0,16	0,10-0,17	0,10-0,17
0,08-0,18	0,10-0,18	0,10-0,18	0,10-0,20	0,10-0,20
0,08-0,18	0,10-0,18	0,10-0,18	0,10-0,20	0,10-0,20
0,08-0,16	0,10-0,16	0,10-0,16	0,10-0,17	0,10-0,17
0,05-0,08	0,05-0,10	0,05-0,10	0,05-0,12	0,05-0,12
0,08-0,14	0,10-0,15	0,10-0,16	0,10-0,16	0,10-0,16
0,06-0,10	0,08-0,12	0,08-0,14	0,08-0,14	0,08-0,14
0,04-0,07	0,04-0,07	0,05-0,08	0,05-0,08	0,05-0,10
0,04-0,07	0,04-0,07	0,05-0,08	0,05-0,08	0,05-0,10
0,04-0,07	0,04-0,07	0,05-0,08	0,05-0,08	0,05-0,10
0,04-0,07	0,04-0,07	0,05-0,08	0,05-0,08	0,05-0,10
0,05-0,10	0,05-0,12	0,05-0,12	0,06-0,15	0,07-0,15
0,05-0,10	0,05-0,12	0,05-0,12	0,06-0,15	0,07-0,15
2	2	2	2	2
2	2	2	2	2
2	2	2	2	2
2	2	2	2	2

Cutting data

MaxiDrill 900 5D

Work piece material		Type of treatment / alloy		VDI 3323 group	Hardness HB
A	Non alloyed steel	annealed	≤ .15% C	1	125
		annealed	.15% - .45% C	2	150 - 250
		tempered	≥ .45% C	3	300
	Low alloyed steel	annealed		6	180
		tempered		7 / 8	250 - 300
		tempered		9	350
	High alloyed steel	annealed		10	200
		tempered		11	350
	Corrosion resistant steel	annealed	ferritic	12	200
		tempered	martensitic	13	325
R	Stainless steel	annealed	ferritic / martensitic	14	200
		quenched	austenitic	14	180
		quenched	duplex	14	230 - 260
		hardened	martensitic / austenitic	14	330
F	Grey cast iron		pearlitic / ferritic	15	180
			pearlitic / martensitic	16	260
	Spheroidal cast iron		ferritic	17	160
			pearlitic	18	2
	Malleable cast iron		ferritic	19	130
			pearlitic	20	230
N	Aluminium wrought alloys	non hardened		21	60
		hardened		22	100
	Aluminium cast alloys	non hardened	< 12% Si	23	80
		hardened	< 12% Si	24	90
		non hardened	> 12% Si	25	130
	Copper and copper alloys (bronze, brass)		machining alloy stock (1% Pb)	26	2
			brass, red bronze	27	90
			bronze	28	100
			lead-free copper and electrolytic copper	29	100
	Non-metallic materials		thermosetting plastics	29	2
			fibre-reinforced plastics	29	2
			hard rubber	30	2
S	Heat resistant alloys	annealed	Fe-base	31	200
		hardened	Fe-base	32	280
		annealed	Ni or Co-base	33	250
		hardened	Ni or Co-base 30 - 58 HRC	34	2
		cast	1.4571, 1.4572, 1.4573, 1.4574, 1.4575, 1.4576, 1.4577, 1.4578, 1.4579, 1.4580, 1.4581, 1.4582, 1.4583, 1.4584, 1.4585, 1.4586, 1.4587, 1.4588, 1.4589, 1.4590, 1.4591, 1.4592, 1.4593, 1.4594, 1.4595, 1.4596, 1.4597, 1.4598, 1.4599, 1.4600, 1.4601, 1.4602, 1.4603, 1.4604, 1.4605, 1.4606, 1.4607, 1.4608, 1.4609, 1.4610, 1.4611, 1.4612, 1.4613, 1.4614, 1.4615, 1.4616, 1.4617, 1.4618, 1.4619, 1.4620, 1.4621, 1.4622, 1.4623, 1.4624, 1.4625, 1.4626, 1.4627, 1.4628, 1.4629, 1.4630, 1.4631, 1.4632, 1.4633, 1.4634, 1.4635, 1.4636, 1.4637, 1.4638, 1.4639, 1.4640, 1.4641, 1.4642, 1.4643, 1.4644, 1.4645, 1.4646, 1.4647, 1.4648, 1.4649, 1.4650, 1.4651, 1.4652, 1.4653, 1.4654, 1.4655, 1.4656, 1.4657, 1.4658, 1.4659, 1.4660, 1.4661, 1.4662, 1.4663, 1.4664, 1.4665, 1.4666, 1.4667, 1.4668, 1.4669, 1.4670, 1.4671, 1.4672, 1.4673, 1.4674, 1.4675, 1.4676, 1.4677, 1.4678, 1.4679, 1.4680, 1.4681, 1.4682, 1.4683, 1.4684, 1.4685, 1.4686, 1.4687, 1.4688, 1.4689, 1.4690, 1.4691, 1.4692, 1.4693, 1.4694, 1.4695, 1.4696, 1.4697, 1.4698, 1.4699, 1.4700, 1.4701, 1.4702, 1.4703, 1.4704, 1.4705, 1.4706, 1.4707, 1.4708, 1.4709, 1.4710, 1.4711, 1.4712, 1.4713, 1.4714, 1.4715, 1.4716, 1.4717, 1.4718, 1.4719, 1.4720, 1.4721, 1.4722, 1.4723, 1.4724, 1.4725, 1.4726, 1.4727, 1.4728, 1.4729, 1.4730, 1.4731, 1.4732, 1.4733, 1.4734, 1.4735, 1.4736, 1.4737, 1.4738, 1.4739, 1.4740, 1.4741, 1.4742, 1.4743, 1.4744, 1.4745, 1.4746, 1.4747, 1.4748, 1.4749, 1.4750, 1.4751, 1.4752, 1.4753, 1.4754, 1.4755, 1.4756, 1.4757, 1.4758, 1.4759, 1.4760, 1.4761, 1.4762, 1.4763, 1.4764, 1.4765, 1.4766, 1.4767, 1.4768, 1.4769, 1.4770, 1.4771, 1.4772, 1.4773, 1.4774, 1.4775, 1.4776, 1.4777, 1.4778, 1.4779, 1.4780, 1.4781, 1.4782, 1.4783, 1.4784, 1.4785, 1.4786, 1.4787, 1.4788, 1.4789, 1.4790, 1.4791, 1.4792, 1.4793, 1.4794, 1.4795, 1.4796, 1.4797, 1.4798, 1.4799, 1.4800, 1.4801, 1.4802, 1.4803, 1.4804, 1.4805, 1.4806, 1.4807, 1.4808, 1.4809, 1.4810, 1.4811, 1.4812, 1.4813, 1.4814, 1.4815, 1.4816, 1.4817, 1.4818, 1.4819, 1.4820, 1.4821, 1.4822, 1.4823, 1.4824, 1.4825, 1.4826, 1.4827, 1.4828, 1.4829, 1.4830, 1.4831, 1.4832, 1.4833, 1.4834, 1.4835, 1.4836, 1.4837, 1.4838, 1.4839, 1.4840, 1.4841, 1.4842, 1.4843, 1.4844, 1.4845, 1.4846, 1.4847, 1.4848, 1.4849, 1.4850, 1.4851, 1.4852, 1.4853, 1.4854, 1.4855, 1.4856, 1.4857, 1.4858, 1.4859, 1.4860, 1.4861, 1.4862, 1.4863, 1.4864, 1.4865, 1.4866, 1.4867, 1.4868, 1.4869, 1.4870, 1.4871, 1.4872, 1.4873, 1.4874, 1.4875, 1.4876, 1.4877, 1.4878, 1.4879, 1.4880, 1.4881, 1.4882, 1.4883, 1.4884, 1.4885, 1.4886, 1.4887, 1.4888, 1.4889, 1.4890, 1.4891, 1.4892, 1.4893, 1.4894, 1.4895, 1.4896, 1.4897, 1.4898, 1.4899, 1.4900, 1.4901, 1.4902, 1.4903, 1.4904, 1.4905, 1.4906, 1.4907, 1.4908, 1.4909, 1.4910, 1.4911, 1.4912, 1.4913, 1.4914, 1.4915, 1.4916, 1.4917, 1.4918, 1.4919, 1.4920, 1.4921, 1.4922, 1.4923, 1.4924, 1.4925, 1.4926, 1.4927, 1.4928, 1.4929, 1.4930, 1.4931, 1.4932, 1.4933, 1.4934, 1.4935, 1.4936, 1.4937, 1.4938, 1.4939, 1.4940, 1.4941, 1.4942, 1.4943, 1.4944, 1.4945, 1.4946, 1.4947, 1.4948, 1.4949, 1.4950, 1.4951, 1.4952, 1.4953, 1.4954, 1.4955, 1.4956, 1.4957, 1.4958, 1.4959, 1.4960, 1.4961, 1.4962, 1.4963, 1.4964, 1.4965, 1.4966, 1.4967, 1.4968, 1.4969, 1.4970, 1.4971, 1.4972, 1.4973, 1.4974, 1.4975, 1.4976, 1.4977, 1.4978, 1.4979, 1.4980, 1.4981, 1.4982, 1.4983, 1.4984, 1.4985, 1.4986, 1.4987, 1.4988, 1.4989, 1.4990, 1.4991, 1.4992, 1.4993, 1.4994, 1.4995, 1.4996, 1.4997, 1.4998, 1.4999, 1.5000	35	2
	Titanium alloys		pure titanium	36	R _m 440*
			alpha + beta alloys	37	R _m 1050*
H	Tempered steel	hardened and tempered		38	55 HRC
		hardened and tempered		39	60 HRC
	Chilled castings	cast		40	400
	Tempered cast iron	hardened and tempered		40	55 HRC

* R_m = ultimate tensile strength, measured in MPa

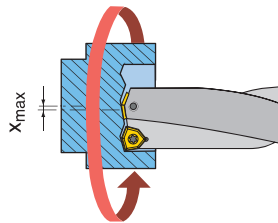
SONT 06 ' □ □ □ □ f [mm/rev]	SONT 07 ' 21-23 f [mm/rev]	SONT 08 ' 24 - 27 f [mm/rev]	SONT 09 ' 28 - 32 f [mm/rev]	SONT 10 ' 33 - 36 f [mm/rev]
0,04-0,09	0,04-0,10	0,06-0,12	0,06-0,13	0,08-0,17
0,05-0,11	0,05-0,12	0,06-0,14	0,06-0,15	0,08-0,19
0,05-0,13	0,05-0,15	0,07-0,17	0,08-0,18	0,10-0,22
0,05-0,16	0,05-0,17	0,07-0,18	0,08-0,19	0,10-0,23
0,05-0,14	0,05-0,15	0,07-0,17	0,08-0,18	0,10-0,22
0,05-0,14	0,05-0,15	0,07-0,17	0,08-0,18	0,10-0,22
0,05-0,14	0,05-0,15	0,07-0,17	0,08-0,18	0,10-0,22
0,05-0,14	0,05-0,15	0,07-0,17	0,08-0,18	0,10-0,22
0,04-0,09	0,04-0,10	0,06-0,12	0,07-0,14	0,09-0,18
0,04-0,09	0,04-0,10	0,06-0,12	0,07-0,14	0,09-0,18
0,05-0,12	0,05-0,13	0,05-0,14	0,06-0,15	0,08-0,18
0,05-0,09	0,05-0,11	0,05-0,12	0,06-0,13	0,08-0,17
0,05-0,08	0,05-0,09	0,05-0,10	0,06-0,11	0,07-0,14
0,05-0,08	0,05-0,09	0,05-0,10	0,06-0,11	0,07-0,14
0,08-0,22	0,10-0,23	0,10-0,25	0,10-0,25	0,10-0,25
0,08-0,18	0,10-0,20	0,10-0,22	0,10-0,22	0,10-0,22
0,08-0,18	0,10-0,23	0,10-0,25	0,10-0,25	0,10-0,25
0,08-0,16	0,10-0,20	0,10-0,22	0,10-0,22	0,10-0,22
0,08-0,16	0,10-0,20	0,10-0,22	0,10-0,22	0,10-0,22
0,08-0,16	0,10-0,20	0,10-0,22	0,10-0,22	0,10-0,22
0,08-0,14	0,10-0,15	0,10-0,15	0,10-0,17	0,10-0,17
0,08-0,14	0,10-0,15	0,10-0,15	0,10-0,17	0,10-0,17
0,08-0,14	0,10-0,18	0,10-0,18	0,10-0,19	0,10-0,19
0,08-0,14	0,10-0,18	0,10-0,18	0,10-0,19	0,10-0,19
0,10-0,15	0,13-0,20	0,13-0,20	0,13-0,22	0,13-0,22
0,08-0,15	0,10-0,16	0,10-0,16	0,10-0,17	0,10-0,17
0,08-0,16	0,10-0,18	0,10-0,18	0,10-0,20	0,10-0,20
0,08-0,16	0,10-0,18	0,10-0,18	0,10-0,20	0,10-0,20
0,08-0,14	0,10-0,16	0,10-0,16	0,10-0,17	0,10-0,17
0,04-0,08	0,05-0,10	0,05-0,10	0,05-0,10	0,05-0,10
0,08-0,14	0,10-0,15	0,10-0,15	0,10-0,15	0,10-0,15
0,06-0,10	0,08-0,12	0,08-0,12	0,08-0,12	0,08-0,12
0,04-0,06	0,04-0,06	0,04-0,07	0,05-0,08	0,05-0,08
0,04-0,06	0,04-0,06	0,04-0,07	0,05-0,08	0,05-0,08
0,04-0,06	0,04-0,06	0,04-0,07	0,05-0,08	0,05-0,08
0,04-0,06	0,04-0,06	0,04-0,07	0,05-0,08	0,05-0,08
0,04-0,06	0,04-0,06	0,04-0,07	0,05-0,08	0,05-0,08
0,04-0,08	0,05-0,11	0,05-0,11	0,06-0,12	0,07-0,12
0,04-0,08	0,05-0,11	0,05-0,11	0,06-0,12	0,07-0,12
2	2	2	2	2
2	2	2	2	2
2	2	2	2	2
2	2	2	2	2

Off-centre drilling

MaxiDrill Classic

0 D1 IP XP R1VHW Z KH R1VHW G100 J LM VRO G1 P DM UD RUI L HG
applications

d [mm]	Classic	
		X _{max} [mm]
14	02	2.0
15	02	1.8
16	02	1.5
17	02	1.2
18	03	2.0
19	03	1.8
20	03	1.6
21	03	1.3
22	03	1.0
23	03	0.8
24	05	2.3
25	05	2.2
26	05	2.0
27	05	1.8
28	05	1.6
29	05	1.5
30	06	3.2
31	06	3.2
32	06	3.2
33	06	3.0
34	06	2.7
35	06	2.5
36	06	2.2
37	06	1.9
38	06	1.6
39	06	1.4
40	06	1.2
41	06	1.0
42	06	0.6
38	07	3.5
39	07	3.3
40	07	3.0
41	07	2.8
42	07	2.5
43	07	2.3
44	07	2.0
45	07	1.9
46	07	1.8
47	07	1.5
48	07	1.4
49	07	1.2
50	07	1.0



Permissible feed rates for X_{max}:
f x .05 - .08 mm/rev.

With the maximum offset X_{max} the hole becomes

$$D_{\max} = D + 2X_{\max}$$

for example for D = 38 mm, X_{max} = 1.6 mm

$$D_{\max} = D + 3.2 = 41.2 \text{ mm}$$

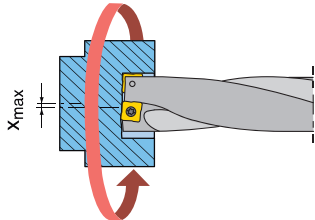
Please note:



When drilling off-centre the radial forces are not compensated, which results in instability.

0 D1 IP XP R1VHW Z KH R1VHW GU QJ QM VROGP DMUD RUI L HG DSSQ FMRQV

D [mm]	SONT	
		X _{max} [mm]
19	06	0,25
20	06	0,25
21	07	0,25
22	07	0,25
23	07	0,25
24	08	0,25
25	08	0,25
26	08	0,25
27	08	0,25
28	09	0,25
29	09	0,25
30	09	0,25
31	09	0,25
32	09	0,25
33	10	0,25
34	10	0,25
35	10	0,25
36	10	0,25



Permissible feed rates for X_{max}:
f x .05 - .08 mm/rev.

With the maximum offset X_{max} the hole becomes
D_{max} = D + 2X_{max}

for example for D = 38 mm, X_{max} = 1.6 mm
D_{max} = D + 3.2 = 41.2 mm



Feed rate reduction!

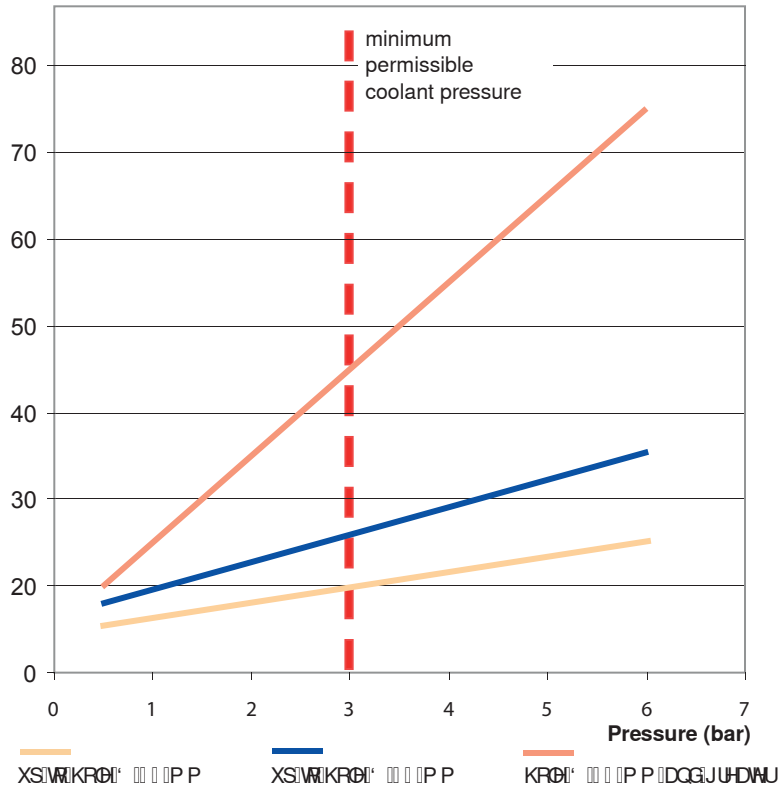
Tool 3xD = feed rate 100%
Tool 4xD = feed rate 75%
Tool 5xD = feed rate 50%

Coolant pressure

MaxiDrill Classic / C900

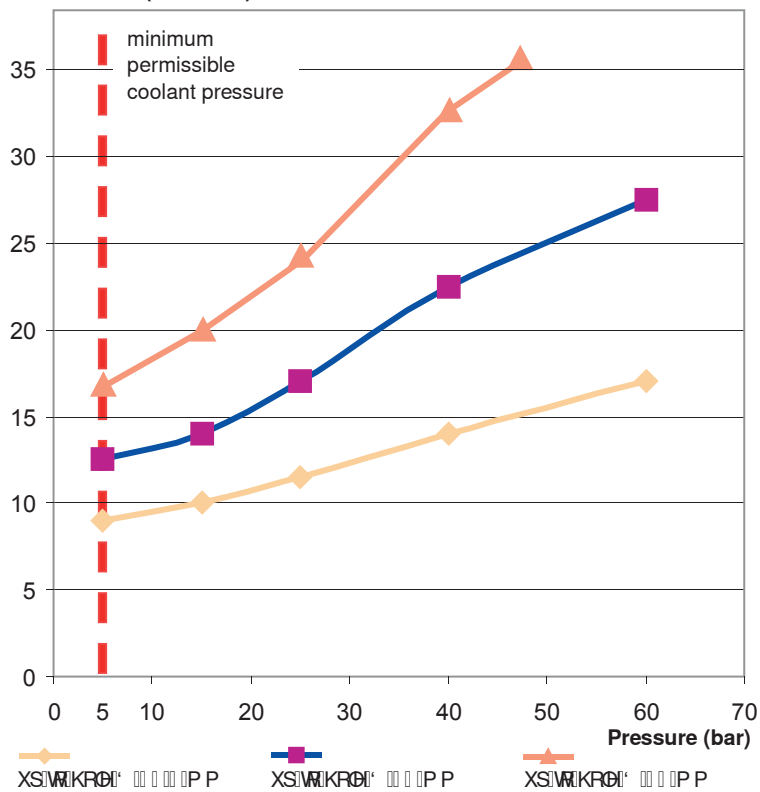
0 D L U08.0VLF² UFRP P HGHGFRDQMSUHVXUHDQGFRDQW0Z

Flow volume (litres/min)



0 D L U08.0VLF² UFRP P HGHGFRDQMSUHVXUHDQGFRDQW0Z

Flow volume (litres/min)



Formula collection for MaxiDrill tools

Revolution number	$n = \frac{vc \cdot 1000}{\pi \cdot D}$	[min ⁻¹]
Cutting speed	$v_c = \frac{\pi \cdot D \cdot n}{1000}$	[m/min]
Feed rate	f	[mm/rev.]
Feed rate	$v_f = f \cdot n$	[m/min]
Machining cross section	$A_T = \frac{\pi \cdot D^2}{4}$	[mm ²]
Metal removal rate	$Q = \frac{vf \cdot AT}{1000}$	[cm ³ /min]
Specific cutting force	$k_c =$ see table	[N/mm ²]
Power requirements	$P_c = \frac{Q}{60 \cdot 1000 \cdot \eta} \cdot k_c$	[kW]
Torque moment	$M_c = \frac{f \cdot kc}{1000} \cdot \frac{D^2}{8}$	[Nm]
Feed force (approx.)	$F_f \approx 0,7 \frac{D}{2} \cdot f \cdot k_c$	[N]
Drilling time	$T_c = \frac{L + h}{vf}$	[min]
Clearance	h	[mm]
Drilling depth	L	[mm]

Material	Specific cutting force k_c (N/mm ²)
St 37.11; St 42.11	1740
St 50.11	1950
St 60.11	2070
St 70.11	2220
C 35, C 45, Ck 45	2060/2175
C 60, Ck 60	2090
16 Mn Cr 5	2060
18 Cr Ni 6	2220
34 Cr Mo 4	2190
50 Cr V 4	2175
tempered 100 Cr 6	2335
Mn, Cr Ni alloyed steel	2335
Cr Mo alloyed steel	2570
Corrosion resistant steel	2530
Hot working steel	2570
Nitriding steel	2570
GS 45	1570
GS 52	1765
GG 22, GG 25	1140
GGG 42	1370
Aluminium cast alloys	640

Please note! The k_c -values depend on the feed. Therefore the table contains their upper limit values. The calculated power is possibly higher than the power actually needed (~ 10 - 20%).