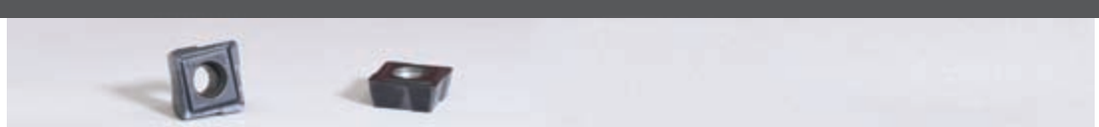
hard material matters

CERATIZIT

hard material matters

MaxiDrill 900



EN

CERATIZIT – secrets of success

Secrets of success

- CERATIZIT is your partner for exceptional hard material solutions. Hard materials and tools from CERATIZIT - our solutions to complex problems are an integral part of our customers' success. Our products guarantee: economy - long life - speed! And it is precisely this combination which gives our business partners a direct competitive advantage.
- Premier performance is only possible through a total appreciation of the requirements of our business partners. A performance achieved through flexible thinking and continuous dialogue with our customers. A pioneering spirit and a deep understanding of powder metallurgy characterize the history of CERATIZIT. One of the attributes of our company philosophy is the search for perfection: target oriented - sustainably - passionately!
- Intensive research and development activities, taking into account the precise requirements and working processes of the customer, are today's investment for the solutions of tomorrow - and beyond.

Corporate values

1. The views and focus of our business partners matter
2. Innovative and flexible thinking matters
3. Communication matters
4. Employee development matters
5. Professionalism matters
6. Our environment matters

Tailored cutting tool solutions

- Cutting materials, coatings, inserts, tooling systems and machining solutions - all this is included in the cutting tool division at CERATIZIT.
- Worldwide well-known companies process advanced materials applying cutting tool products from CERATIZIT: from the automotive industry to the aerospace industry, mechanical engineering and tool construction to the oil industry.
- The basis of these long-term business relations is the faith of the customers in the extensive know-how of the carbide specialists.

System characteristics

Advantages	YOUR benefits
Minimal drill wander due to specialized insert geometries.	> Excellent drilling action > High process security even with difficult drilling situations
Rigid construction allows maximum feed rates for holes up to 5xD.	Increased productivity combined with high process security.
Insert with 4 cutting edges for solid carbide drilling.	Optimum economy.
Peripheral and central cutting edges have the same geometry, size and grade.	> The same insert fits both pockets, preventing mis- location and reducing inventory
Grade for a wide range of applications	> 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

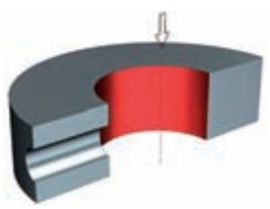
> Long tool life thanks to hard & tough coating

Application

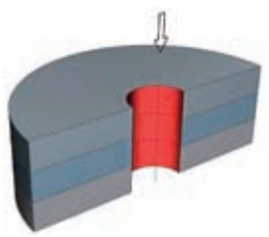
Special application options

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

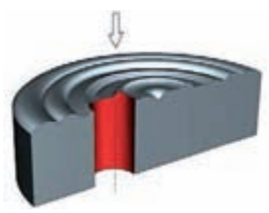
Note: feed rate reduction between 30 and 60 % is necessary in the depicted cutting situations! The machining possibilities are reduced in case of long-chipping tough materials.



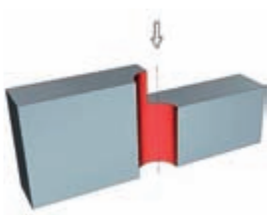
Producing a transverse through hole



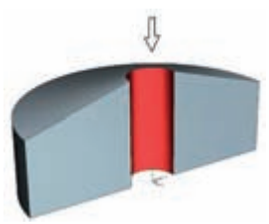
Stack drilling



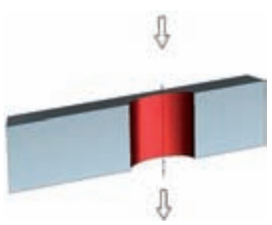
Drilling on an uneven surface



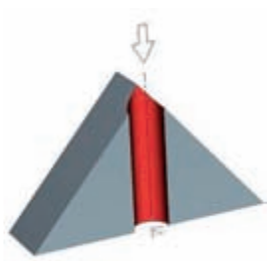
Drilling on a stepped surface



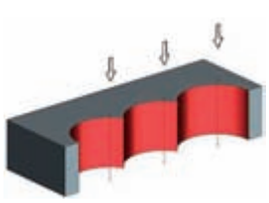
Drilling of a convex surface



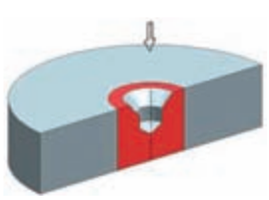
Drilling on inclined surfaces: the drill exits at an angle



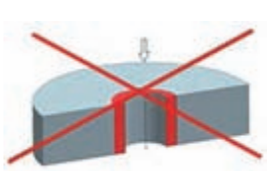
Drilling on a ridge



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.

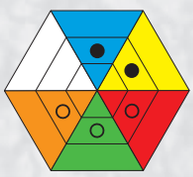
When the tool is stationary, this sharp-edged disk may be thrown out of the clamping chuck at high speed and can cause damage and personal injury.

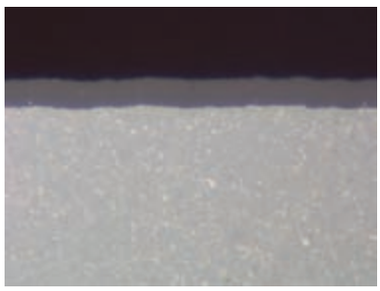
In order to prevent this happening, safety precautions must be taken.

Grade description, chip groove

CTPP430

HC-P30
HC-M25





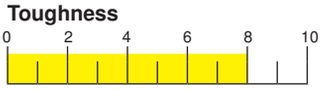
Composition:
Co 9.0%; WC balance

Grain size:
0.85 µm

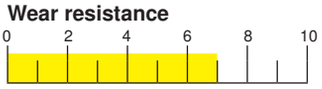
Hardness:
HV 1590

Coating specification:
PVD; TiAlN; 7 µm

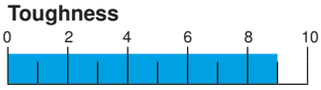
Toughness



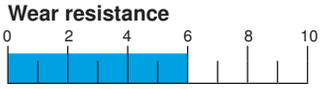
Wear resistance



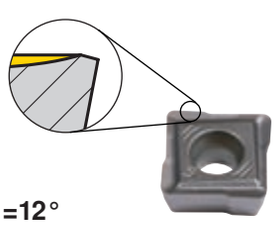
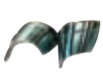
Toughness



Wear resistance



The geometry

	Chip groove	Material	Machining situation and stability				Machining type
			○	○	◔	⬡	F / M / R
 γ =12°	SN	▼ ▼ ▼	✗	✗	✗		 M

MasterGuide:

- ▼ Steel
- ▼ Stainless
- ▼ Cast iron
- ▼ Non ferrous metals
- ▼ Heat resistant
- ▽ Hard materials

- ▼ Main application
- ▽ Extended application

Machining situation and stability:

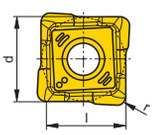
- ○ excellent
- ○ good
- ◔ acceptable
- ⬡ difficult

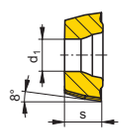
Machining type:
F Fine machining
M Medium machining
R Rough machining

Inserts
System C900

-M30

(l) [mm]	Type, description	CTPP430						d [mm]	l [mm]	s [mm]	r [mm]	d_1 [mm]
06	SONT 062506ER-M30	●						5.90	5.50	2.50	0.60	2.50
07	SONT 072907ER-M30	●						6.50	6.10	2.90	0.70	2.50
08	SONT 083308ER-M30	●						7.70	7.30	3.30	0.80	2.90
09	SONT 093808ER-M30	●						8.90	8.50	3.80	0.80	3.50
10	SONT 104408ER-M30	●						10.10	9.60	4.40	0.80	4.10
	Steel	●										
	Stainless	●										
	Cast iron	○										
	Non ferrous metals	○										
	Heat resistant	○										
	Hard materials											





● Main application

○ Extended application

● International CERATIZIT range, for present availability see price list

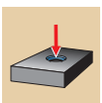
Ordering example: 10 pieces SONT 062506ER-M30 CTPP430

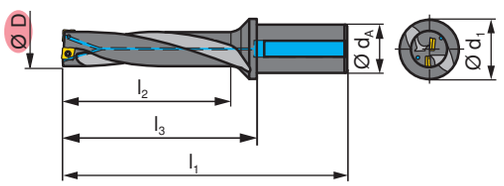

12-19


8-11

System C900 – 3xD

Ø 19 – 32 mm

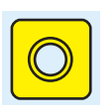




D [mm]	Type, description	L / R	d_A [mm]	d_1 [mm]	l_1 [mm]	l_2 [mm]	l_3 [mm]	
19	C900.3D.190.R.06	R	25	32	131	57	56	SONT 06..
19.5	C900.3D.195.R.06		25	32	133	59	56	
20	C900.3D.200.R.06		25	32	134	60	56	
20.5	C900.3D.205.R.06		25	32	136	62	56	
21	C900.3D.210.R.07	R	25	32	138	63	56	SONT 07..
21.5	C900.3D.215.R.07		25	32	140	65	56	
22	C900.3D.220.R.07		25	32	141	66	56	
22.5	C900.3D.225.R.07		25	32	143	68	56	
23	C900.3D.230.R.07		25	32	144	69	56	
23.5	C900.3D.235.R.07		25	32	146	71	56	
24	C900.3D.240.R.08	R	32	40	155	72	60	SONT 08..
24.5	C900.3D.245.R.08		32	40	157	74	60	
25	C900.3D.250.R.08		32	40	158	75	60	
25.5	C900.3D.255.R.08		32	40	160	77	60	
26	C900.3D.260.R.08		32	40	161	78	60	
26.5	C900.3D.265.R.08		32	40	163	80	60	
27	C900.3D.270.R.08		32	40	164	81	60	
27.5	C900.3D.275.R.08		32	40	166	83	60	
28	C900.3D.280.R.09	R	32	40	167	84	60	SONT 09..
28.5	C900.3D.285.R.09		32	40	169	86	60	
29	C900.3D.290.R.09		32	40	170	87	60	
29.5	C900.3D.295.R.09		32	40	172	89	60	
30	C900.3D.300.R.09		32	40	173	90	60	
30.5	C900.3D.305.R.09		32	40	175	92	60	
31	C900.3D.310.R.09		32	40	176	93	60	
31.5	C900.3D.315.R.09		32	40	178	95	60	
32	C900.3D.320.R.09		32	40	179	96	60	

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

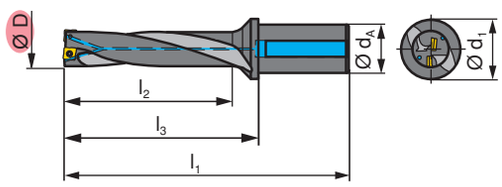
	D [mm]			
SONT 06..	19 - 20.5	M2,2x5-07IP/10009244	10006918/TORX 07IP	DMSD 1,0Nm/SORT 07IP
SONT 07..	21 - 23.5	M2,2x5-07IP/10009244	10006918/TORX 07IP	DMSD 1,0Nm/SORT 07IP
SONT 08..	24 - 27.5	M2,5x6-08IP/10009243	10000276/TORX 08IP	DMSD 1,2NM/SORT 08IP
SONT 09..	28 - 32	M3x7-09IP/10003007	10009333/TORX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



7

System C900 – 3xD

Ø 32.5 – 36.5 mm



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		40	50	192	98	68	
33	C900.3D.330.R.10		40	50	193	99	68	
33.5	C900.3D.335.R.10		40	50	195	101	68	
34	C900.3D.340.R.10		40	50	196	102	68	
34.5	C900.3D.345.R.10	R	40	50	198	104	68	SONT 10..
35	C900.3D.350.R.10		40	50	199	105	68	
35.5	C900.3D.355.R.10		40	50	201	107	68	
36	C900.3D.360.R.10		40	50	202	108	68	
36.5	C900.3D.365.R.10		40	50	204	110	68	

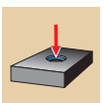
Ordering example: 1 piece C900.3D.325.R.10

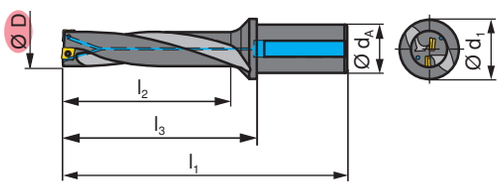
	D [mm]			
SONT 10..	32.5 - 36.5	DMSD 3,2Nm/SORT 15IP	10006919/TORX 15IP	M3,5X8,6-15IP/10008749

7

System C900 – 4xD

Ø 19 – 36 mm

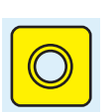




D [mm]	Type, description	L / R	d_A [mm]	d_1 [mm]	l_1 [mm]	l_2 [mm]	l_3 [mm]	
19	C900.4D.190.R.06	R	25	32	150	76	56	SONT 06..
20	C900.4D.200.R.06		25	32	154	80	56	
21	C900.4D.210.R.07	R	25	40	159	84	56	SONT 07..
22	C900.4D.220.R.07		25	40	163	88	56	
23	C900.4D.230.R.07		25	40	167	92	56	
24	C900.4D.240.R.08	R	32	40	179	96	60	SONT 08..
25	C900.4D.250.R.08		32	40	183	100	60	
26	C900.4D.260.R.08		32	40	187	104	60	
27	C900.4D.270.R.08		32	40	191	108	60	
28	C900.4D.280.R.09	R	32	40	195	112	60	SONT 09..
29	C900.4D.290.R.09		32	40	199	116	60	
30	C900.4D.300.R.09		32	40	203	120	60	
31	C900.4D.310.R.09		32	40	207	124	60	
32	C900.4D.320.R.09		32	40	211	128	60	
33	C900.4D.330.R.10	R	40	50	226	132	68	SONT 10..
34	C900.4D.340.R.10		40	50	230	136	68	
35	C900.4D.350.R.10		40	50	234	140	68	
36	C900.4D.360.R.10		40	50	238	144	68	

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

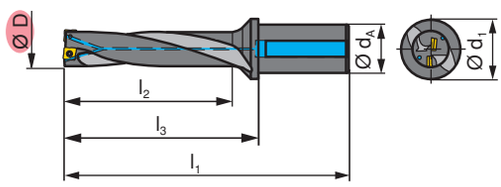
	D [mm]			
SONT 06..	19 - 20	M2,2x5-07IP/10009244	10006918/TORX 07IP	DMSD 1,0Nm/SORT 07IP
SONT 07..	21 - 23	M2,2x5-07IP/10009244	10006918/TORX 07IP	DMSD 1,0Nm/SORT 07IP
SONT 08..	24 - 27	M2,5x6-08IP/10009243	10000276/TORX 08IP	DMSD 1,2NM/SORT 08IP
SONT 09..	28 - 32	M3x7-09IP/10003007	10009333/TORX 09IP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



7

System C900 – 5xD

Ø 19 – 36 mm



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	56	SONT 06..
20	C900.5D.200.R.06		25	32	174	100	56	
21	C900.5D.210.R.07	R	25	32	180	105	56	SONT 07..
22	C900.5D.220.R.07		25	32	184	110	56	
23	C900.5D.230.R.07		25	32	189	115	56	
24	C900.5D.240.R.08	R	32	40	203	120	60	SONT 08..
25	C900.5D.250.R.08		32	40	208	125	60	
26	C900.5D.260.R.08		32	40	212	130	60	
27	C900.5D.270.R.08		32	40	217	135	60	
28	C900.5D.280.R.09	R	32	40	221	140	60	SONT 09..
29	C900.5D.290.R.09		32	40	226	145	60	
30	C900.5D.300.R.09		32	40	230	150	60	
31	C900.5D.310.R.09		32	40	235	155	60	
32	C900.5D.320.R.09		32	40	239	160	60	
33	C900.5D.330.R.10	R	40	50	259	165	68	SONT 10..
34	C900.5D.340.R.10		40	50	264	170	68	
35	C900.5D.350.R.10		40	50	269	175	68	
36	C900.5D.360.R.10		40	50	274	180	68	

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

7

Cutting data
Material, tool – 3xD

	Work piece material	Type of treatment / alloy		VDI 3323 group	Hard-ness HB
A	Non alloyed steel	annealed	≤ 0.15% 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	–
	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	–
			brass, red bronze	27	90
			bronze	28	100
			lead-free copper and electrolytic copper	29	100
	Non-metallic materials		thermosetting plastics	29	–
			fibre-reinforced plastics	29	–
			hard rubber	30	–
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	–
		cast	Ni or Co-base 1500 - 2200 N/mm²	35	–
	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

Cutting data
Material, tool – 3xD

SONT 06 Ø 19-20 f [mm/rev]	SONT 07 Ø 21-23 f [mm/rev]	SONT 08 Ø 24 - 27 f [mm/rev]	SONT 09 Ø 28 - 32 f [mm/rev]	SONT 10 Ø 33 - 36 f [mm/rev]
0,05-0,15	0,05-0,15	0,06-0,17	0,06-0,19	0,06-0,19
0,05-0,16	0,05-0,17	0,06-0,19	0,06-0,21	0,06-0,21
0,05-0,18	0,06-0,20	0,07-0,22	0,07-0,24	0,07-0,24
0,05-0,20	0,06-0,22	0,07-0,23	0,07-0,25	0,07-0,25
0,05-0,18	0,06-0,20	0,07-0,23	0,07-0,25	0,07-0,25
0,05-0,18	0,06-0,20	0,07-0,23	0,07-0,25	0,07-0,25
0,05-0,18	0,06-0,20	0,07-0,23	0,07-0,25	0,07-0,25
0,05-0,18	0,06-0,20	0,07-0,23	0,07-0,25	0,07-0,25
0,05-0,15	0,06-0,15	0,06-0,17	0,06-0,19	0,06-0,19
0,05-0,15	0,06-0,15	0,06-0,17	0,06-0,19	0,06-0,19
0,05-0,15	0,05-0,16	0,05-0,18	0,06-0,18	0,06-0,18
0,05-0,14	0,05-0,15	0,06-0,16	0,06-0,16	0,06-0,17
0,05-0,14	0,05-0,15	0,06-0,15	0,06-0,16	0,06-0,17
0,05-0,13	0,05-0,14	0,05-0,15	0,05-0,15	0,05-0,16
0,08-0,24	0,10-0,25	0,10-0,28	0,10-0,28	0,10-0,30
0,08-0,22	0,10-0,24	0,10-0,26	0,10-0,26	0,10-0,28
0,08-0,22	0,10-0,25	0,10-0,28	0,10-0,28	0,10-0,28
0,08-0,20	0,10-0,23	0,10-0,25	0,10-0,25	0,10-0,25
0,08-0,21	0,10-0,25	0,10-0,28	0,10-0,28	0,10-0,30
0,08-0,21	0,10-0,25	0,10-0,28	0,10-0,28	0,10-0,30
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	0,50-0,12
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
0,04-0,08	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
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–	–	–	–	–
–	–	–	–	–

Cutting data
Material, tool – 4xD

	Work piece material	Type of treatment / alloy		VDI 3323 group	Hard-ness HB
A	Non alloyed steel	annealed	≤ 0.15% 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	–
	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	–
			brass, red bronze	27	90
			bronze	28	100
			lead-free copper and electrolytic copper	29	100
	Non-metallic materials		thermosetting plastics	29	–
			fibre-reinforced plastics	29	–
			hard rubber	30	–
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	–
		cast	Ni or Co-base 1500 - 2200 N/mm²	35	–
	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

Cutting data
Material, tool – 4xD

SONT 06 Ø19-20 f [mm/rev]	SONT 07 Ø 21-23 f [mm/rev]	SONT 08 Ø 24 - 27 f [mm/rev]	SONT 09 Ø 28 - 32 f [mm/rev]	SONT 10 Ø 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
0,05-0,15	0,05-0,16	0,05-0,18	0,06-0,16	0,06-0,16
0,05-0,12	0,05-0,15	0,06-0,16	0,06-0,16	0,06-0,17
0,05-0,12	0,05-0,13	0,06-0,13	0,06-0,14	0,06-0,14
0,05-0,10	0,05-0,12	0,05-0,13	0,05-0,13	0,05-0,13
0,08-0,22	0,10-0,24	0,10-0,25	0,10-0,25	0,10-0,28
0,08-0,20	0,10-0,22	0,10-0,25	0,10-0,25	0,10-0,27
0,08-0,20	0,10-0,24	0,10-0,26	0,10-0,26	0,10-0,26
0,08-0,18	0,10-0,22	0,10-0,22	0,10-0,22	0,10-0,23
0,08-0,18	0,10-0,22	0,10-0,25	0,10-0,25	0,10-0,28
0,08-0,18	0,10-0,22	0,10-0,25	0,10-0,25	0,10-0,28
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	0,50-0,12
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
0,04-0,07	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
–	–	–	–	–
–	–	–	–	–
–	–	–	–	–
–	–	–	–	–

Cutting data
Material, tool – 5xD

	Work piece material	Type of treatment / alloy		VDI 3323 group	Hard-ness HB
A	Non alloyed steel	annealed	≤ 0.15% 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	–
	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	–
			brass, red bronze	27	90
			bronze	28	100
			lead-free copper and electrolytic copper	29	100
	Non-metallic materials		thermosetting plastics	29	–
			fibre-reinforced plastics	29	–
			hard rubber	30	–
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	–
		cast	Ni or Co-base 1500 - 2200 N/mm²	35	–
	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

Cutting data
Material, tool – 5xD

SONT 06 Ø19-20 f [mm/rev]	SONT 07 Ø 21-23 f [mm/rev]	SONT 08 Ø 24 - 27 f [mm/rev]	SONT 09 Ø 28 - 32 f [mm/rev]	SONT 10 Ø 33 - 36 f [mm/rev]
0,04-0,08	0,04-0,10	0,06-0,12	0,06-0,14	0,06-0,14
0,05-0,10	0,05-0,12	0,06-0,14	0,06-0,16	0,06-0,16
0,05-0,12	0,05-0,15	0,07-0,17	0,08-0,19	0,08-0,19
0,05-0,15	0,05-0,17	0,07-0,18	0,08-0,20	0,08-0,20
0,05-0,13	0,50-0,15	0,07-0,17	0,08-0,19	0,08-0,19
0,05-0,13	0,05-0,15	0,07-0,17	0,08-0,19	0,08-0,19-
0,05-0,13	0,05-0,15	0,07-0,17	0,08-0,19	0,08-0,19
0,05-0,13	0,05-0,15	0,07-0,17	0,08-0,19	0,08-0,19
0,04-0,08	0,04-0,10	0,06 -0,12	0,07-0,15	0,07-0,15
0,04-0,08	0,04-0,10	0,06-0,12	0,07-0,15	0,07-0,15
0,04-0,13	0,05-0,15	0,05-0,16	0,06-0,16	0,06-0,16
0,04-0,10	0,05-0,13	0,05-0,14	0,06-0,15	0,06-0,15
0,04-0,09	0,05-0,11	0,05-0,12	0,05-0,12	0,05-0,12
0,04-0,09	0,05-0,11	0,05-0,12	0,05-0,12	0,05-0,12
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
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–	–	–	–	–
–	–	–	–	–

Cutting data
Material, grades

	Work piece material	Type of treatment / alloy		VDI 3323 group	Hard-ness HB
A	Non alloyed steel	annealed	≤ 0.15% 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	–
	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	–
			brass, red bronze	27	90
			bronze	28	100
			lead-free copper and electrolytic copper	29	100
	Non-metallic materials		thermosetting plastics	29	–
			fibre-reinforced plastics	29	–
			hard rubber	30	–
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	–
		cast	Ni or Co-base 1500 - 2200 N/mm²	35	–
	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

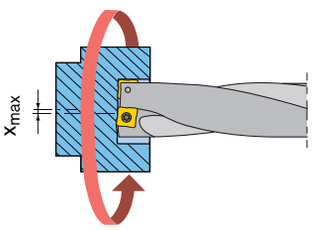
Cutting data
Material, grades

Coated carbide			
CTPP430			
☒ ☐ v_c [m/min]	☐ ☒ v_c [m/min]		
–	200-300		
	160-250		
–	160-250		
–	180-280		
–	150-220		
–	100-200		
–	130-200		
–	100-160		
–	150-250		
–	80-150		
–	100-160		
–	100-180		
–	80-140		
–	80-140		
–	120-200		
–	100-180		
–	120-200		
–	100-180		
–	80-160		
–	70-150		
–	150-500		
–	150-450		
–	150-350		
–	150-300		
–	150-250		
–	150-350		
–	150-350		
–	150-350		
–	200-400		
–	50-150		
–	50-140		
–	80-200		
–	20-80		
–	20-80		
–	20-80		
–	20-80		
–	20-80		
–	40-100		
–	40-100		
–	–		
–	–		
–	–		
–	–		

Off-centre drilling

Maximum offset 'X' when offset drilling into solid material for fixed applications

Ø [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 0.05 - 0.08 mm/rev.

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

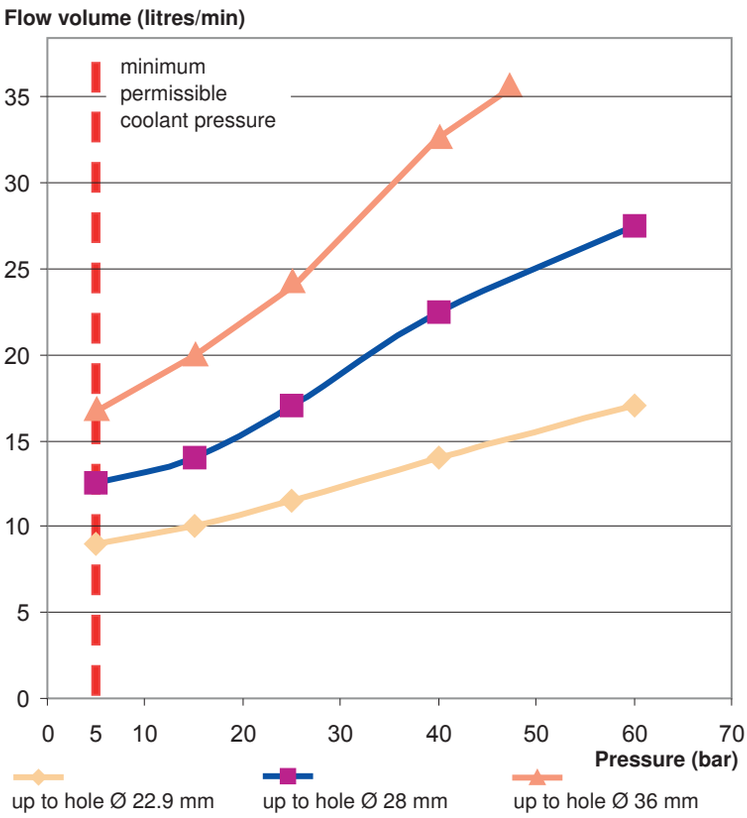
for example for D = 38 mm, X_{max} = 1.6 mm
$D_{max} = D + 3.2 = 41.2$ mm

Feed rate reduction!

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

Coolant pressure

Recommended coolant pressure and coolant flow



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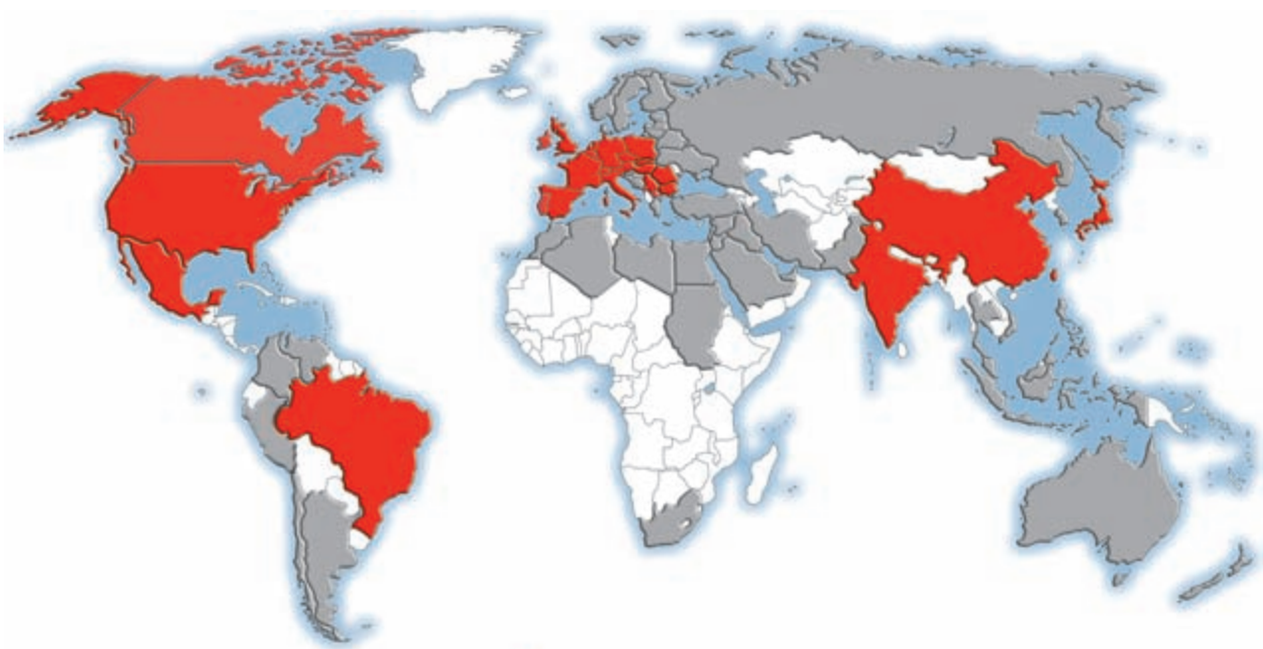

- CERATIZIT worldwide production sites and support centres
- CERATIZIT worldwide distribution partner network

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