

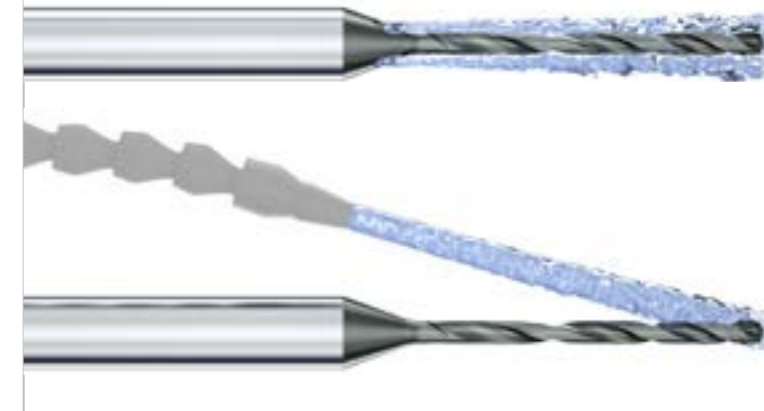
PATENTED

CrazyDrill SST-Inox



CRAZYDRILL
SST-Inox

HIGH PROCESS RELIABILITY WITH PATENTED GEOMETRY



With CrazyDrill SST-Inox Mikron Tool offers two exclusive drill types for drilling in stainless steel up to 12 x d in the diameter range of 0.2 to 2.0 mm.

Both variants of this drill meet the challenge very well for machining of stainless steel, chromium-cobalt alloys or heat resistant steel very well. Their geometry differs significantly from other products available in the market today and guarantees short machining time and process reliability. Cutting parameters are increased with the efficient through-tool cooling.

06

PATENTED

Revolutionary: Drilling of stainless steel and Co.

2 SOLUTIONS FOR STAINLESS, ACID-RESISTANT AND HEAT-RESISTANT STEELS

Type IN

- External cooling
- Coated

Type IK

- Integrated cooling
- Coated

With CrazyDrill SST-Inox Mikron Tool offers two exclusive drill types for drilling in stainless steel up to 12 x d in the diameter range of 0.2 to 2.0 mm.

- CrazyDrill SST-Inox IK, drilling depth 8 x d / 12 x d, integrated cooling.
- CrazyDrill SST-Inox IN, drilling depth 8 x d / 12 x d, external cooling.



1 | SHAFT

The robust carbide shaft allows stable drilling without vibrations.

2 | NEW COOLING CONCEPT

The integrated coolant through the shank provides efficient cooling to the drill tip. The result is a reliable process and an increased productivity.

3 | CARBIDE

The carbide especially developed for CrazyDrill SST-Inox fulfills perfectly all requirements for the machining of stainless and heat resistant steel.

4 | COATING

The especially developed high-performance coating eXedur RIP is abrasion and heat resistant. It prevents build up material and supports a smooth chip removal. The result is a long tool life.

5 | DIGRESSIVE FLUTE

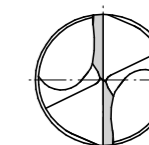
The newest patented digressive flute technology guarantees a quick chip evacuation and a high stiffness.

6 | CUTTING GEOMETRY

The drill point geometry is especially developed for stainless and acid resistant steels:

- high cutting edge stability
- short chips
- self-centering

Drill tip



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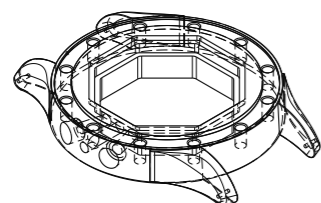
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Benefits and applications



FOR MORE PERFORMANCE IN STAINLESS, HEAT AND ACID RESISTANT STEELS

- **SHORT MACHINING TIME** | up to 10 times faster
- **LONG TOOL LIFE** | up to 15 times longer
- **HIGH DEGREE OF PROCESS RELIABILITY** | due to excellent chip evacuation
- **HIGH DEGREE OF PRECISION** | due to small tolerances
- **LOW PRODUCTION COSTS** | quick and reliable processes



COMPONENT
Watch housing

MATERIAL
X2CrNiMo 18-14-3 / 1.4435 / AISI 316L

MACHINING

- Drilling
- d = 0.6 mm
- Drilling depth 3 mm


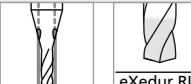
DRILLING TOOL
Mikron Tool - CrazyDrill SST-Inox IK - 8 x d

DATA	MIKRON TOOL
Tool type	CrazyDrill SST-Inox - Carbide - Coated - Integrated cooling
Item number	2.CD.080060.IK
Cutting data	$v_c = 40$ m/min $f = 0.025$ mm/rev $Q_1 = 1.2$ mm $Q_x = 0.9$ mm

APPLICATION DOMAINS	COMPONENTS EXAMPLES
Dental	Dental implants
Aerospace industry	Engine parts Spherical joint
Medical technology	Component for endoscope
Automotive industry	Components for gasoline direct injection
Mechanical engineering	Locking bolt
Watches	Watch housing
Hydraulics / Pneumatics	Hydraulic valve
Electronics / Electrics	Neon Pin
Food industry	Nozzle
Power industry	Blade

MATERIALS GROUPS	EXAMPLES		
	Mat. no.	DIN	AISI / ASTM / UNS
Group M Stainless steel	1.4105	X6CrMoS17	430F
	1.4112	X90CrMoV18	440B
	1.4542	X5CrNiCuNb 16-4	630
	1.4305	X8CrNiS 18-9	303
	1.4435	X2CrNiMo 18-14-3	316L
Group N Copper and Brass lead free	2.004	Cu-OF / CW008A	C10100
	2.0321	CuZn37 CW508L	C27400
Group S1 Super alloys	2.4856		INCONEL 625
	2.4665	NiCr22Fe18Mo	HASTELLOY X
Group S3 CrCo alloys	2.4964	CoCr20W15Ni	HAYNES 25

Type IK 8 x d / 12 x d

Carbide		Z2	
	130°		
	Ø d ₁	0.1 - 3.0 mm	
	Tolerance	+ 0.004 mm 0	

DRILLING WITH INTEGRATED COOLING



CrazyDrill SST-Inox Type IK 8 x d / 12 x d has 3 - 4 cooling channels going through the shaft which guarantee an efficient coolant jet. This jet keeps the temperature under control and flushes the chips from the hole, the result is a better tool life. Cutting parameters of this drill type increase 20 - 30 % in comparison to externally cooled variants.

The geometry of this solid carbide drill differs significantly from today's standards. The polished tip section with small transverse cutting reduces the feed force and gives the drill good centering properties. The special tip geometry produces short chips even in materials where long chips are the norm and avoids cutting edge breakages. The digressive helical flute is responsible for good chip removal.

CrazyDrill SST-Inox IK 8 x d can be used on regular and straight surfaces without a centering or pilot hole, because of the high degree of self-centering capability.

Mikron Tool recommends:

- **Variant IK 8 x d** - Only for higher requirements: For high-precision position accuracy or irregular surfaces use the centering drill CrazyDrill Twicenter respectively the pilot drill CrazyDrill Pilot SST-Inox or CrazyDrill Crosspilot on inclined surfaces. For details see drilling process.
- **Variant IK 12 x d** - Use of the centering drill CrazyDrill Twicenter respectively the pilot drill CrazyDrill Pilot SST-Inox or CrazyDrill Crosspilot on inclined surfaces. For details see drilling process.

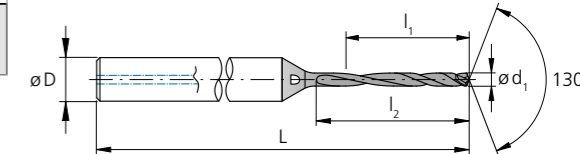
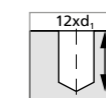
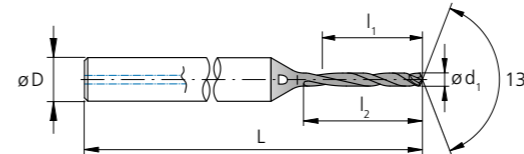
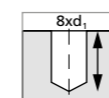
Coolant type, pressure and filtration

Recommendations for coolant type, pressure and filtration are on page "drilling process".

Please note

You couldn't find your suitable version of the CrazyDrill SST-Inox IK (diameter, length, cutting direction...)? Ask us about our customized versions!

Regrinding: This product is not suitable for regrinding.



d ₁	d ₁	l ₁	l ₂	D (h6)	L	Item number	Availability
[mm]	[inch]	[mm]	[mm]	[mm]	[mm]		
0.20		1.6	2.0	3	38	2.CD.080020.IK	■
0.25		2.0	2.5	3	38	2.CD.080025.IK	■
0.30		2.4	2.9	3	38	2.CD.080030.IK	■
0.35		2.8	3.4	3	38	2.CD.080035.IK	■
0.396	1/64	3.2	3.9	3	38	2.CD.080F164.IK	■
0.40		3.2	3.9	3	38	2.CD.080040.IK	■
0.45		3.6	4.4	3	42	2.CD.080045.IK	■
0.50		4.0	4.9	3	42	2.CD.080050.IK	■
0.55		4.4	5.4	3	42	2.CD.080055.IK	■
0.60		4.8	5.9	3	42	2.CD.080060.IK	■
0.65		5.2	6.4	3	45	2.CD.080065.IK	■
0.70		5.6	6.9	3	45	2.CD.080070.IK	■
0.75		6.0	7.4	3	45	2.CD.080075.IK	■
0.793	1/32	6.4	7.8	3	45	2.CD.080F132.IK	■
0.80		6.4	7.8	3	45	2.CD.080080.IK	■
0.85		6.8	8.3	3	45	2.CD.080085.IK	■
0.90		7.2	8.8	3	45	2.CD.080090.IK	■
0.95		7.6	9.3	3	48	2.CD.080095.IK	■
1.00		8.0	9.8	3	48	2.CD.080100.IK	■
1.05		8.4	10.3	3	48	2.CD.080105.IK	■
1.10		8.8	10.8	3	48	2.CD.080110.IK	■
1.15		9.2	11.3	3	48	2.CD.080115.IK	■
1.20		9.6	11.8	3	48	2.CD.080120.IK	■
1.25		10.0	12.3	4	52	2.CD.080125.IK	■
1.30		10.4	12.7	4	52	2.CD.080130.IK	■
1.35		10.8	13.2	4	52	2.CD.080135.IK	■
1.40		11.2	13.7	4	52	2.CD.080140.IK	■
1.45		11.6	14.2	4	52	2.CD.080145.IK	■
1.50		12.0	14.7	4	52	2.CD.080150.IK	■
1.55		12.4	15.2	4	55	2.CD.080155.IK	■
1.587	1/16	12.8	15.7	4	55	2.CD.080F116.IK	■
1.60		12.8	15.7	4	55	2.CD.080160.IK	■
1.65		13.2	16.2	4	55	2.CD.080165.IK	■
1.70		13.6	16.7	4	55	2.CD.080170.IK	■
1.75		14.0	17.2	4	55	2.CD.080175.IK	■
1.80		14.4	17.6	4	55	2.CD.080180.IK	■
1.85		14.8	18.1	4	55	2.CD.080185.IK	■
1.90		15.2	18.6	4	55	2.CD.080190.IK	■
1.95		15.6	19.1	4	55	2.CD.080195.IK	■
2.00		16.0	19.6	4	55	2.CD.080200.IK	■

■ Stock item

d ₁	d ₁	l ₁	l ₂	D (h6)	L	Item number	Availability
[mm]	[inch]	[mm]	[mm]	[mm]	[mm]		
0.20		2.4	2.8	3	38	2.CD.120020.IK	■
0.25		3.0	3.5	3	38	2.CD.120025.IK	■
0.30		3.6	4.1	3	38	2.CD.120030.IK	■
0.35		4.2	4.8	3	38	2.CD.120035.IK	■
0.396	1/64	4.8	5.5	3	38	2.CD.120F164.IK	■
0.40		4.8	5.5	3	38	2.CD.120040.IK	■
0.45		5.4	6.2	3	42	2.CD.120045.IK	■
0.50		6.0	6.9	3	42	2.CD.120050.IK	■
0.55		6.6	7.6	3	42	2.CD.120055.IK	■
0.60		7.2	8.3	3	42	2.CD.120060.IK	■
0.65		7.8	9.0	3	45	2.CD.120065.IK	■
0.70		8.4	9.7	3	45	2.CD.120070.IK	■
0.75		9.0	10.4	3	45	2.CD.120075.IK	■
0.793	1/32	9.6	11.0	3	45	2.CD.120F132.IK	■
0.80		9.6	11.0	3	45	2.CD.120080.IK	■
0.85		10.2	11.7	3	45	2.CD.120085.IK	■
0.90		10.8	12.4	3	45	2.CD.120090.IK	■
0.95		11.4	13.1	3	48	2.CD.120095.IK	■
1.00		12.0	13.8	3	48	2.CD.120100.IK	■
1.05		12.6	14.5	3	48	2.CD.120105.IK	■
1.10		13.2	15.2	3	48	2.CD.120110.IK	■
1.15		13.8	15.9	3	48	2.CD.120115.IK	■
1.20		14.4	16.6	3	48	2.CD.120120.IK	■
1.25		15.0	17.3	4	55	2.CD.120125.IK	■
1.30		15.6	17.9	4	55	2.CD.120130.IK	■
1.35		16.2	18.6	4	55	2.CD.120135.IK	■
1.40		16.8	19.3	4	55	2.CD.120140.IK	■
1.45		17.4	20.0	4	55	2.CD.120145.IK	■
1.50		18.0	20.7	4	55	2.CD.120150.IK	■
1.55		18.6	21.4	4	58	2.CD.120155.IK	■
1.587	1/16	19.2	22.1	4	58	2.CD.120F116.IK	■
1.60		19.2	22.1	4	58	2.CD.120160.IK	■
1.65		19.8	22.8	4	58	2.CD.120165.IK	■
1.70		20.4	23.5	4	58	2.CD.120170.IK	■
1.75		21.0	24.2	4	58	2.CD.120175.IK	■
1.80		21.6	24.8	4	58	2.CD.120180.IK	■
1.85		22.2	25.5	4	60	2.CD.120185.IK	■
1.90		22.8	26.2	4	60	2.CD.120190.IK	■
1.95		23.4	26.9	4	60	2.CD.120195.IK	■
2.00		24.0	27.6	4	60	2.CD.120200.IK	■

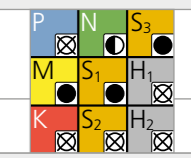
■ Stock item

Complementary products

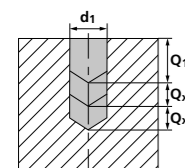
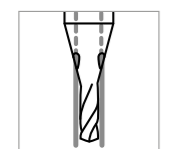
CrazyDrill Twicenter	p.85
CrazyDrill Pilot SST-Inox	p.149
CrazyDrill Crosspilot	p.175

Type IK 8 x d / 12 x d

RECOMMENDATION FOR USE
● Excellent | ● Good | ○ Acceptable | ☒ Not recommended



DRILLING WITH INTEGRATED COOLING | CUTTING DATA OVERVIEW



Materials group	Material	Mat. no.	DIN	AISI/ASTM/UNS	v _c [m/min]	Q ₁	Q ₂	Q ₃	f [mm/rev]									
									0.2–0.5 mm 1/64" f	0.6–0.8 mm 1/32" f	0.9–1.1 mm f	Ød1 1.2–1.4 mm f		1.5–1.7 mm 1/16" f	1.8–2.0 mm f			
P	Unalloyed carbon steel Rm < 800 N/mm ²	1.0301	C10	AISI 1010														
		1.0401	C15	AISI 1015														
		1.1191	C45E/CK45	AISI 1045														
		1.0044	S275JR	AISI 1020														
		1.0715	11SMn30	AISI 1215														
	Low alloyed steel Rm > 900 N/mm ²	1.5752	15NiCr13	ASTM 3415 / AISI 3310														
		1.7131	16MnCr5	AISI 5115														
		1.3505	100Cr6	AISI 52100														
		1.7225	42CrMo4	AISI 4140														
		1.2842	90MnCrV8	AISI O2														
	High alloyed tool steel Rm < 1200 N/mm ²	1.2379	X153CrMoV12	AISI D2														
		1.2436	X210CrW12	AISI D4/D6														
		1.3343	HS6-5-2C	AISI M2 / UNS T11302														
1.3355		HS18-0-1	AISI T1 / UNS T12001															
M		Stainless steel ferritic	1.4016	X6Cr17	AISI 430 / UNS S43000	35–50	1xd1–4xd1			1xd1–2xd1	0.015–0.020	0.020–0.030	0.030–0.040	0.040–0.050	0.050–0.060	0.060–0.070		
	1.4105		X6CrMoS17	AISI 430F														
	Stainless steel martensitic	1.4034	X46Cr13	AISI 420C	35–50	1xd1–4xd1			1xd1–2xd1	0.020–0.030	0.030–0.040	0.050–0.060	0.060–0.070	0.070–0.080	0.080–0.100			
		1.4112	X90CrMoV18	AISI 440B														
	Stainless steel martensitic – PH	1.4542	X5CrNiCuNb 16-4	AISI 630 / ASTM 17-4 PH	35–50	1xd1–4xd1			1xd1–2xd1	0.015–0.020	0.020–0.025	0.025–0.035	0.040–0.050	0.050–0.060	0.060–0.070			
		1.4545	X5CrNiCuNb 15-5	ASTM 15-5 PH														
	Stainless steel austenitic	1.4301	X5CrNi 18-10	AISI 304														
		1.4435	X2CrNiMo 18-14-3	AISI 316L	30–45	1xd1–4xd1			1xd1–2xd1	0.010–0.020	0.015–0.025	0.025–0.035	0.035–0.045	0.045–0.055	0.055–0.060			
		1.4441	X2CrNiMo 18-15-3	AISI 316LM														
	K	Cast iron	0.6020	GG20	ASTM 30													
0.6030			GG30	ASTM 40B														
0.7040			GGG40	ASTM 60-40-18														
0.7060			GGG60	ASTM 80-60-03														
N	Aluminium alloy wrought	3.2315	AlMgSi1	ASTM 6351														
		3.4365	AlZnMgCu1.5	ASTM 7075														
	Aluminium alloy cast	3.2163	GD-AlSi9Cu3	ASTM A380														
		3.2381	GD-AlSi10Mg	UNS A03590														
	Copper	2.0040	Cu-OF / CW008A	UNS C10100	40–100	4xd1–8xd1			4xd1	0.040–0.060	0.050–0.080	0.060–0.100	0.080–0.120	0.100–0.150	0.120–0.180			
		2.0065	Cu-ETP / CW004A	UNS C11000														
	Brass lead free	2.0321	CuZn37 CW508L	UNS C27400	40–100	4xd1–8xd1			4xd1	0.040–0.060	0.050–0.080	0.060–0.100	0.080–0.120	0.100–0.150	0.120–0.180			
		2.0360	CuZn40 CW509L	UNS C28000														
	Brass, Bronze Rm < 400 N/mm ²	2.0401	CuZn39Pb3 / CW614N	UNS C38500														
		2.1020	CuSn6	UNS C51900														
Bronze Rm < 600 N/mm ²	2.0966	CuAl10Ni5Fe4	UNS C63000															
	2.0960	CuAl9Mn2	UNS C63200															
S ₁	Super alloys	2.4856		Inconel 625	15–30	0.5xd1–1xd1			0.5xd1	0.010–0.015	0.015–0.020	0.020–0.025	0.025–0.035	0.035–0.040	0.045–0.055			
		2.4668		Inconel 718														
		2.4617	NiMo28	Hastelloy B-2														
		2.4665	NiCr22Fe18Mo	Hastelloy X														
S ₂	Titanium pure	3.7035	Gr.2	ASTM B348 / F67														
		3.7065	Gr.4	ASTM B348 / F68														
S ₃	Titanium alloys	3.7165	TiAl6V4	ASTM B348 / F136														
		9.9367	TiAl6Nb7	ASTM F1295														
H ₁	Hardened steel < 55 HRC	2.4964	CoCr20W15Ni	Haynes 25	40–50	1xd1–4xd1			1xd1–2xd1	0.020–0.030	0.030–0.040	0.050–0.060	0.060–0.070	0.070–0.080	0.080–0.100			
			CrCoMo28	ASTM F1537														
H ₂	Hardened steel ≥ 55 HRC	1.2510	100MnCrMoW4	AISI O1														
		1.2379	X153CrMoV12	AISI D2														

Drilling process CrazyDrill SST-Inox

PRECISE AND EFFICIENT DRILLING FROM Ø 0.2 MM

Coolant type, pressure and filtration

Coolant: For best results, Mikron Tool recommends the use of cutting oil as coolant. Alternatively, emulsion of 8% or more with EP-Additives (Extreme-Pressure-Additives) can be used as well.

Filter: The large cooling channels allow a standard filter with filter quality of ≤ 0.05 mm.

For tools with external cooling no specific parameters have to be considered concerning filter.

Coolant pressure: To ensure a reliable drilling process using tools with through-tool cooling the following minimal pressures are needed (see chart). Higher pressures are needed for smaller drill size diameters. High pressure is generally better for the cooling and flushing effect.

Revolution	[rpm]	$\leq 10'000$	$> 10'000$
Minimal pressure	[bar]	15	30

For tools with external cooling no specific parameters have to be considered concerning coolant pressure. But it must be ensured that the coolant is conducted directly to the drill tip, thus cooling and lubricating the drill perfectly and flushing away the chips.

Tool holders

For detailed indications for tool holders see chapter "Technical information".

Drilling process CrazyDrill SST-Inox

PRECISE AND EFFICIENT DRILLING FROM Ø 0.2 MM

CrazyDrill SST-Inox IK / IN 8 x d

Because of the high degree of self-centering capability, CrazyDrill SST-Inox can be used on regular and straight surfaces without a centering or pilot hole for drilling depths up to $8 \times d$.

Higher requirements: For irregular respectively rough or inclined surfaces or for the highest degree of position accuracy Mikron Tool recommends:

- CrazyDrill Pilot SST-Inox as pilot drill
- CrazyDrill Twicenter as center drill
- CrazyDrill Crosspilot as pilot drill for inclined surfaces

CrazyDrill SST-Inox IK / IN 12 x d

Mikron Tool recommends a pilot hole for CrazyDrill SST-Inox $12 \times d$:

- CrazyDrill Pilot SST-Inox as pilot drill
- CrazyDrill Twicenter as center drill
- CrazyDrill Crosspilot as pilot drill for inclined surfaces

Thus highest alignment and process accuracy are guaranteed.

Centering / pilot drilling and drilling

Pilot drilling with CrazyDrill Pilot SST-Inox or centering with CrazyDrill Twicenter are the perfect combination for a precise hole (position and alignment accuracy) and a stable machining process. The pilot drill CrazyDrill Crosspilot does the same when drilling on inclined surfaces.

The drilling quality (position and alignment accuracy, no measurable transition from pilot drilling to follow-up drilling) and a stable machining process are guaranteed due to predetermined tool tolerances.

DRILLING PROCESS

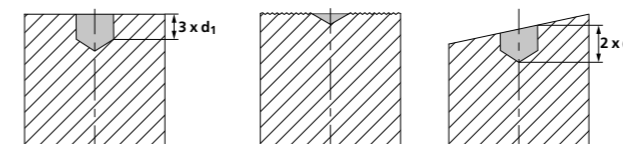
Drilling according DIN 66025 / PAL

G83 deep-drilling cycle with chip break and chip removal (pecks)

Q = depth of the respective peck

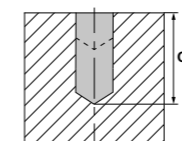
1 | CENTERING OR PILOT DRILLING

- With CrazyDrill Twicenter or CrazyDrill Pilot SST-Inox (irregular or rough surfaces) or CrazyDrill Crosspilot (inclined surfaces) for version $8 \times d$.
- With CrazyDrill Twicenter or CrazyDrill Pilot SST-Inox (straight surfaces) or CrazyDrill Crosspilot (inclined surfaces) for version $12 \times d$.

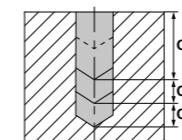


2 | DRILLING

- With CrazyDrill SST-Inox up to maximum drilling depth Q_1 in one step, followed by peck to remove chips.



- Further pecks Q_x according to cutting data table, followed by peck to remove chips.



Note:

Between pecks, take the drill completely out from the bore. After the drill reached desired cutting depth, return at increased feed rate (or in case of perfect conditions rapid traverse) to safety position.