

CrazyDrill™ Cool XL



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NEW

THE TOOLING SPECIALISTS FOR PRECISION COMPONENT MACHINING



Extra long
High Performance Drills

CRAZYDRILL™
by Mikron Tool
Cool XL

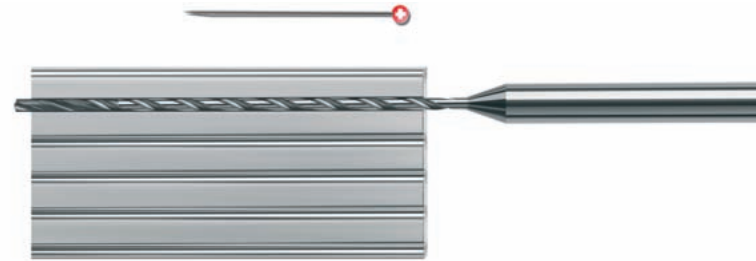
1 shot = 1 hole

CrazyDrill Cool XL for deep hole drilling

With the new CrazyDrill Cool XL, the engineers from Mikron Tool have developed a brand new deep hole drilling program for depths up to 40 x d. The CrazyDrill Cool XL due to its design produces short chips in all materials and in each phase of the drilling process. An undesired coiling of chips does not occur. High quality carbide alloy of the latest generation and the most precise grinding technology assure that this new product line meets the strictest quality requirements. With a coating, developed especially for CrazyDrill Cool XL, excellent cutting conditions and tool life are guaranteed. Simple handling and high precision guarantee trouble free, economical drilling.

Characteristics

- Through tool internal cooling
- Solid Carbide alloy
- Coated
- Diameter tolerance k6, matched to the centering program of Mikron Tool
- Standard lengths 15 x ø, 20 x ø, 30 x ø and 40 x ø
- Special lengths and special executions upon request



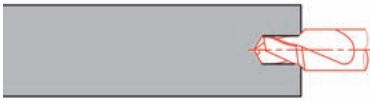
Five benefits

- No pecking cycles
- Short chips (no spiral chips)
- Maximum drilling speeds
- Highest position accuracy
- Tight diameter accuracy and surface quality

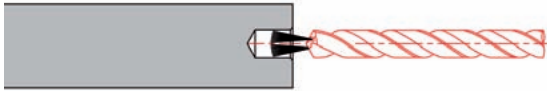


Recommendations for optimal results

Straight surface



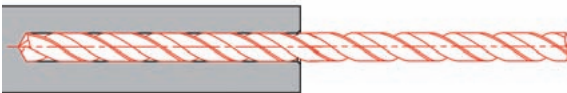
- Pilot hole with CrazyDrill Pilot
- Hole depth approx. $2 \times \varnothing$
- Guide for precision drilling with CrazyDrill Cool XL



- Start coolant supply before entering the pilot hole
- Maximum speed $n = 500$ rpm



- Enter $1 - 1.5 \times \varnothing$ into pilot hole with feed $v_f = 1000$ mm/min and reduced speed of 500 rpm
- Do not touch bottom of pilot hole with rapid feed



- Drilling with recommended speed and feed rates
- Reach desired depth in one stroke

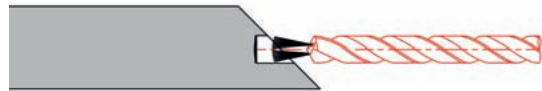


- After drilling operation retract CrazyDrill Cool XL to depth of pilot hole
- Before clearing the hole reduce speed to 500 rpm.
- Retract drill from hole with reduced speed.

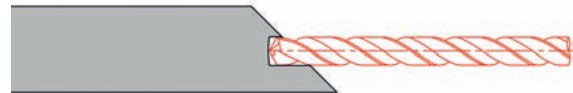
Inclined surface



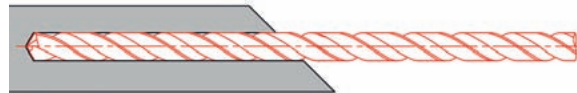
- Pilot hole with CrazyDrill Crosspilot
- Hole depth $1-2 \times \varnothing$, depending on inclination (max. 60°)
- Guide for precision drilling with CrazyDrill Cool XL



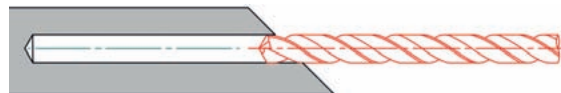
- Start coolant supply before entering the pilot hole
- Maximum speed $n = 500$ rpm



- Enter $1 - 1.5 \times \varnothing$ into pilot hole with feed $v_f = 1000$ mm/min and reduced speed of 500 rpm
- Do not touch bottom of pilot hole with rapid feed



- Drilling with recommended speed and feed rates
- Reach desired depth in one stroke



- After drilling operation retract CrazyDrill Cool XL to about $2 \times \varnothing$ from hole entrance
- Before clearing the hole reduce speed to 500 rpm.
- Retract drill from hole with reduced speed.

The CrazyDrill family

CRAZYDRILL™
by Mikron Tool
Steel



CRAZYDRILL™
by Mikron Tool
Pilot



CRAZYDRILL™
by Mikron Tool
Cool



CRAZYDRILL™
by Mikron Tool
Alu



CRAZYDRILL™
by Mikron Tool
Twicenter



CRAZYDRILL™
by Mikron Tool
Crosspilot



Usable length 15 x d

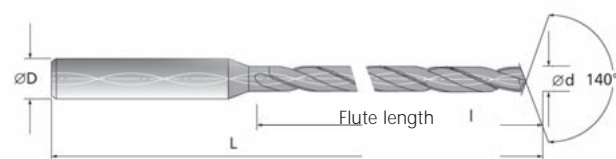
Item number	d (k6) mm	l mm	D (h6) mm	L mm
coated				
	effective length			
CD.150100.XL	1.00	18.0	4	58
CD.150105.XL	1.05	18.9	4	59
CD.150110.XL	1.10	19.8	4	60
CD.150115.XL	1.15	20.7	4	61
CD.150120.XL	1.20	21.6	4	62
CD.150125.XL	1.25	22.5	4	62
CD.150130.XL	1.30	23.4	4	63
CD.150135.XL	1.35	24.3	4	64
CD.150140.XL	1.40	25.2	4	65
CD.150145.XL	1.45	26.1	4	66
CD.150150.XL	1.50	27.0	4	67
CD.150155.XL	1.55	27.9	4	68
CD.150160.XL	1.60	28.8	4	68
CD.150165.XL	1.65	29.7	4	69
CD.150170.XL	1.70	30.6	4	70
CD.150175.XL	1.75	31.5	4	71
CD.150180.XL	1.80	32.4	4	72
CD.150185.XL	1.85	33.3	4	73
CD.150190.XL	1.90	34.2	4	74
CD.150195.XL	1.95	35.1	4	74
CD.150200.XL	2.00	36.0	4	75
CD.150205.XL	2.05	36.9	4	76
CD.150210.XL	2.10	37.8	4	77
CD.150215.XL	2.15	38.7	4	78
CD.150220.XL	2.20	39.6	4	79
CD.150225.XL	2.25	40.5	4	80
CD.150230.XL	2.30	41.4	4	80
CD.150235.XL	2.35	42.3	4	81
CD.150240.XL	2.40	43.2	4	82
CD.150245.XL	2.45	44.1	4	83
CD.150250.XL	2.50	45.0	4	84
CD.150255.XL	2.55	45.9	4	85
CD.150260.XL	2.60	46.8	4	86
CD.150265.XL	2.65	47.7	4	86
CD.150270.XL	2.70	48.6	4	87
CD.150275.XL	2.75	49.5	4	88
CD.150280.XL	2.80	50.4	4	89
CD.150285.XL	2.85	51.3	4	90
CD.150290.XL	2.90	52.2	4	91
CD.150295.XL	2.95	53.1	4	92
CD.150300.XL	3.00	54.0	4	92
CD.150305.XL	3.05	54.9	6	99
CD.150310.XL	3.10	55.8	6	100
CD.150315.XL	3.15	56.7	6	101
CD.150320.XL	3.20	57.6	6	102
CD.150325.XL	3.25	58.5	6	102
CD.150330.XL	3.30	59.4	6	103
CD.150335.XL	3.35	60.3	6	104
CD.150340.XL	3.40	61.2	6	105
CD.150345.XL	3.45	62.1	6	106
CD.150350.XL	3.50	63.0	6	107
CD.150355.XL	3.55	63.9	6	108
CD.150360.XL	3.60	64.8	6	108
CD.150365.XL	3.65	65.7	6	109
CD.150370.XL	3.70	66.6	6	110
CD.150375.XL	3.75	67.5	6	111
CD.150380.XL	3.80	68.4	6	112
CD.150385.XL	3.85	69.3	6	113
CD.150390.XL	3.90	70.2	6	114
CD.150395.XL	3.95	71.1	6	114
CD.150400.XL	4.00	72.0	6	115
CD.150410.XL	4.10	73.8	6	117
CD.150420.XL	4.20	75.6	6	119
CD.150430.XL	4.30	77.4	6	120
CD.150440.XL	4.40	79.2	6	122
CD.150450.XL	4.50	81.0	6	124
CD.150460.XL	4.60	82.8	6	126
CD.150470.XL	4.70	84.6	6	127
CD.150480.XL	4.80	86.4	6	129
CD.150490.XL	4.90	88.2	6	131
CD.150500.XL	5.00	90.0	6	133
CD.150510.XL	5.10	91.8	6	134
CD.150520.XL	5.20	93.6	6	136
CD.150530.XL	5.30	95.4	6	138
CD.150540.XL	5.40	97.2	6	139
CD.150550.XL	5.50	99.0	6	141
CD.150560.XL	5.60	100.8	6	143
CD.150570.XL	5.70	102.6	6	145
CD.150580.XL	5.80	104.4	6	146
CD.150590.XL	5.90	106.2	6	148
CD.150600.XL	6.00	108.0	6	150

Usable length 20 x d

Item number	d (k6) mm	l mm	D (h6) mm	L mm
coated				
CD.200100.XL	1.00	23.0	4	63
CD.200110.XL	1.10	25.3	4	65
CD.200120.XL	1.20	27.6	4	68
CD.200130.XL	1.30	29.9	4	70
CD.200140.XL	1.40	32.2	4	72
CD.200150.XL	1.50	34.5	4	74
CD.200160.XL	1.60	36.8	4	76
CD.200170.XL	1.70	39.1	4	79
CD.200180.XL	1.80	41.4	4	81
CD.200190.XL	1.90	43.7	4	83
CD.200200.XL	2.00	46.0	4	85
CD.200210.XL	2.10	48.3	4	88
CD.200220.XL	2.20	50.6	4	90
CD.200230.XL	2.30	52.9	4	92
CD.200240.XL	2.40	55.2	4	94
CD.200250.XL	2.50	57.5	4	96
CD.200260.XL	2.60	59.8	4	99
CD.200270.XL	2.70	62.1	4	101
CD.200280.XL	2.80	64.4	4	103
CD.200290.XL	2.90	66.7	4	105
CD.200300.XL	3.00	69.0	4	107
CD.200310.XL	3.10	71.3	6	115
CD.200320.XL	3.20	73.6	6	118
CD.200330.XL	3.30	75.9	6	120
CD.200340.XL	3.40	78.2	6	122
CD.200350.XL	3.50	80.5	6	124
CD.200360.XL	3.60	82.8	6	126
CD.200370.XL	3.70	85.1	6	129
CD.200380.XL	3.80	87.4	6	131
CD.200390.XL	3.90	89.7	6	133
CD.200400.XL	4.00	92.0	6	135
CD.200410.XL	4.10	94.3	6	138
CD.200420.XL	4.20	96.6	6	140
CD.200430.XL	4.30	98.9	6	142
CD.200440.XL	4.40	101.2	6	144
CD.200450.XL	4.50	103.5	6	146
CD.200460.XL	4.60	105.8	6	149
CD.200470.XL	4.70	108.1	6	151
CD.200480.XL	4.80	110.4	6	153
CD.200490.XL	4.90	112.7	6	155
CD.200500.XL	5.00	115.0	6	158
CD.200510.XL	5.10	117.3	6	160
CD.200520.XL	5.20	119.6	6	162
CD.200530.XL	5.30	121.9	6	164
CD.200540.XL	5.40	124.2	6	166
CD.200550.XL	5.50	126.5	6	169
CD.200560.XL	5.60	128.8	6	171
CD.200570.XL	5.70	131.1	6	173
CD.200580.XL	5.80	133.4	6	175
CD.200590.XL	5.90	135.7	6	177
CD.200600.XL	6.00	138.0	6	180

Usable length 30 x d

Item number	d (k6) mm	l mm	D (h6) mm	L mm
coated				
CD.300100.XL	1.00	33.0	4	73
CD.300110.XL	1.10	36.3	4	76
CD.300120.XL	1.20	39.6	4	80
CD.300130.XL	1.30	42.9	4	83
CD.300140.XL	1.40	46.2	4	86
CD.300150.XL	1.50	49.5	4	89
CD.300160.XL	1.60	52.8	4	92
CD.300170.XL	1.70	56.1	4	96
CD.300180.XL	1.80	59.4	4	99
CD.300190.XL	1.90	62.7	4	102
CD.300200.XL	2.00	66.0	4	105
CD.300210.XL	2.10	69.3	4	109
CD.300220.XL	2.20	72.6	4	112
CD.300230.XL	2.30	75.9	4	115
CD.300240.XL	2.40	79.2	4	118
CD.300250.XL	2.50	82.5	4	121
CD.300260.XL	2.60	85.8	4	125
CD.300270.XL	2.70	89.1	4	128
CD.300280.XL	2.80	92.4	4	131
CD.300290.XL	2.90	95.7	4	134
CD.300300.XL	3.00	99.0	4	137
CD.300310.XL	3.10	102.3	6	146
CD.300320.XL	3.20	105.6	6	150
CD.300330.XL	3.30	108.9	6	153
CD.300340.XL	3.40	112.2	6	156
CD.300350.XL	3.50	115.5	6	159
CD.300360.XL	3.60	118.8	6	162
CD.300370.XL	3.70	122.1	6	166
CD.300380.XL	3.80	125.4	6	169
CD.300390.XL	3.90	128.7	6	172
CD.300400.XL	4.00	132.0	6	175
CD.300410.XL	4.10	135.3	6	179
CD.300420.XL	4.20	138.6	6	182
CD.300430.XL	4.30	141.9	6	185
CD.300440.XL	4.40	145.2	6	188
CD.300450.XL	4.50	148.5	6	191
CD.300460.XL	4.60	151.8	6	195
CD.300470.XL	4.70	155.1	6	198
CD.300480.XL	4.80	158.4	6	201
CD.300490.XL	4.90	161.7	6	204
CD.300500.XL	5.00	165.0	6	208
CD.300510.XL	5.10	168.3	6	211
CD.300520.XL	5.20	171.6	6	214
CD.300530.XL	5.30	174.9	6	217
CD.300540.XL	5.40	178.2	6	220
CD.300550.XL	5.50	181.5	6	224
CD.300560.XL	5.60	184.8	6	227
CD.300570.XL	5.70	188.1	6	230
CD.300580.XL	5.80	191.4	6	233
CD.300590.XL	5.90	194.7	6	236
CD.300600.XL	6.00	198.0	6	240



Usable length 40 x d

Item number	d (k6) mm	l mm	D (h6) mm	L mm
coated				
CD.400200.XL	2.00	86.0	4	125
CD.400210.XL	2.10	90.3	4	130
CD.400220.XL	2.20	94.6	4	134
CD.400230.XL	2.30	98.9	4	138
CD.400240.XL	2.40	103.2	4	142
CD.400250.XL	2.50	107.5	4	146
CD.400260.XL	2.60	111.8	4	151
CD.400270.XL	2.70	116.1	4	155
CD.400280.XL	2.80	120.4	4	159
CD.400290.XL	2.90	124.7	4	163
CD.400300.XL	3.00	129.0	4	167
CD.400310.XL	3.10	133.3	6	177
CD.400320.XL	3.20	137.6	6	182
CD.400330.XL	3.30	141.9	6	186
CD.400340.XL	3.40	146.2	6	190
CD.400350.XL	3.50	150.5	6	194
CD.400360.XL	3.60	154.8	6	198
CD.400370.XL	3.70	159.1	6	203
CD.400380.XL	3.80	163.4	6	207
CD.400390.XL	3.90	167.7	6	211
CD.400400.XL	4.00	172.0	6	215
CD.400410.XL	4.10	176.3	6	220
CD.400420.XL	4.20	180.6	6	224
CD.400430.XL	4.30	184.9	6	228
CD.400440.XL	4.40	189.2	6	232
CD.400450.XL	4.50	193.5	6	236
CD.400460.XL	4.60	197.8	6	241
CD.400470.XL	4.70	202.1	6	245
CD.400480.XL	4.80	206.4	6	249
CD.400490.XL	4.90	210.7	6	253
CD.400500.XL	5.00	215.0	6	258
CD.400510.XL	5.10	219.3	6	262
CD.400520.XL	5.20	223.6	6	266
CD.400530.XL	5.30	227.9	6	270
CD.400540.XL	5.40	232.2	6	274
CD.400550.XL	5.50	236.5	6	279
CD.400560.XL	5.60	240.8	6	283
CD.400570.XL	5.70	245.1	6	287
CD.400580.XL	5.80	249.4	6	291
CD.400590.XL	5.90	253.7	6	295
CD.400600.XL	6.00	258.0	6	300

Guidelines for cutting parameters

Materials to be machined	Examples	Cutting speed v_c m/min	Drilling depth l/d	Feed f in mm/revolution in relation to diameter (indicative)								
				1.0 mm	1.25 mm	1.5 mm	2.0 mm	2.5 mm	3.0 mm	4.0 mm	5.0 mm	6.0 mm
Non- and low-alloy steels	St 37, St 52 Ck45, 16MnCr5, 20MnCr6	50-100	15 / 20 30	0.06 0.03	0.06 0.04	0.08 0.05	0.10 0.08	0.12 0.08	0.15 0.10	0.18 0.12	0.22 0.14	0.25 0.16
Low-alloy tool steels	100Cr6, 90MnCrV8 42CrMo4, 100MnCr4	50-100	15 / 20 30	0.06 0.03	0.06 0.05	0.08 0.06	0.10 0.08	0.12 0.10	0.15 0.12	0.15 0.14	0.18 0.16	0.20 0.18
High-alloy steels	G-X100 CrMoV 51, X210CrW12, S 6-5-2, S 6-5-2-5, S 18-1-2-10	40-80	15 / 20 30	0.04 0.03	0.06 0.05	0.08 0.06	0.10 0.08	0.12 0.10	0.15 0.11	0.18 0.14	0.20 0.16	0.22 0.17
Cast iron	GG 20 - GG 50 GGG 40 - GGG 70	100-200	15 / 20 30	0.06 0.04	0.08 0.06	0.10 0.08	0.12 0.10	0.15 0.12	0.18 0.15	0.20 0.18	0.25 0.20	0.30 0.25
hardened Steels	>50HRC	25-50	15 / 20 30	0.005 0.005	0.005 0.005	0.005 0.005	0.005 0.005	0.01 0.01	0.015 0.015	0.02 0.02	0.03 0.03	0.03 0.03
Ferritic Inox steels	X17CrNi16-2, X6CrMo17-1, X20Cr13, G-X130CrSi29	30-60	15 / 20 30	0.02	0.03	0.04	0.06	0.07	0.10	0.12	0.15	0.18
Austenitic Inox steels	X5CrNi18-10	30-60	15 / 20 30	0.02	0.03	0.04	0.06	0.07	0.10	0.12	0.15	0.18
Aluminum alloy, wrought	AlSi1, AlSi1Mn, AlSi1MgMn	100-200	15 / 20 30	0.04 0.03	0.06 0.04	0.08 0.05	0.12 0.07	0.16 0.10	0.20 0.12	0.25 0.15	0.30 0.20	0.25 0.20
Aluminum alloy, cast	GD-AISI9Cu3, GD-AISI12, GD- AISi7Cu3Mg2, GD-AISI10Mg	80-150	15 / 20 30	0.04 0.03	0.06 0.04	0.08 0.05	0.10 0.06	0.12 0.08	0.15 0.10	0.20 0.12	0.25 0.15	0.30 0.20

Important: for drilling depths of $40 \times \varnothing$, the cutting parameters have to be adapted to the used machine and the specific application! Please contact our tooling technology consultants for information and support.

General criteria:

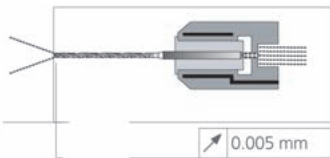
These values are intended to represent approximate ranges. This data is indicative. Different conditions due to machine, spindle, working direction vertical or horizontal, coolant, etc. can influence the performance.

Clamping equipment

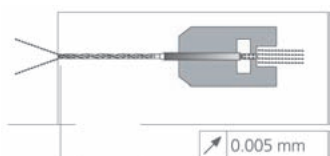
High-precision collet systems for minimal run out (T.I.R). Length presetting and axial protection with mechanical stop.



Hydraulic expansion chuck with intermediate bushing for force-closed clamping. Guaranteeing minimal run out (T.I.R).



Shrink-fit chucks guarantee minimal run out (T.I.R.) with secure friction-type locking and provides an optimum connection between tool and holder.



Cooling lubricant

Type of lubricant

For best results, Mikron Tool recommends the use of cutting oil as lubricant. The use of water based coolant with high pressure additives is also possible as an alternative.

Power chamber

The shank is provided with a power chamber for small diameters up to 3 mm.

This guarantees:

- sufficiently large flow of coolant even at lower pressure
- greater coolant flow at identical pressure



Coolant pressure

For lengths of $15 \times \varnothing$ and more, we recommend a minimum pressure of 60 bar at the spindle.

General rule: the smaller and longer the drill, the higher the needed pressure.

Filter quality

A good filter quality is particularly important for small diameters:

- Filter quality of 10 microns for diameters < 2 mm
- Filter quality of 20 microns for diameters range 2–3 mm

Pecking

No pecking cycles are required for CrazyDrill Cool XL

The chip shape is crucial



Perfect chips

Critical chips

The chip formation determines the success of deep hole drilling

Speed and feed have to be tuned for the perfect chips.

Examples:

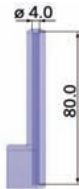
Automotive:

- Hole depth 30 x ϕ
- Ball bearing steel 100Cr6
- CrazyDrill Cool XL, ϕ 1.3 mm
- Cutting speed v_c 80 m/min
- Feed f 0.06 mm/rev
- Hole quality:
 - Perpendicularity 0.037
 - Straightness 0.013
 - Roundness 0.005



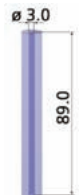
Mechanical Engineering:

- Hole depth 20 x ϕ
- GGG 40
- CrazyDrill Cool XL, ϕ 4.0 mm
- Cutting speed v_c 120 m/min
- Feed f 0.20 mm/rev



Hydraulics:

- Hole depth 30 x ϕ
- Aluminium alloy wrought (AlMgSi 1)
- CrazyDrill Cool XL, ϕ 3.0 mm
- Cutting speed v_c 150 m/min
- Feed f 0.20 mm/rev



Services that complete the concept

Engineering and Consulting

Mikron Tool supports our customers on the selection of suitable tools with respect to material and geometry, required tolerances and ideal operating parameters, and partners with them from the initial trials through mass production.

Regrinding

CrazyDrill Cool XL can be reground and recoated which considerably increases the cost-effectiveness of this drill. This service is offered at all Mikron Tool locations. The performance of a reground CrazyDrill Cool XL in regard of performance, precision and hole quality is equal to a new drill.

Certifications

Mikron Tool is certified to:
ISO 9001:2008 for quality
ISO 14001:2004 for environment
OHSAS 18001:2007 for occupational health and safety management.



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