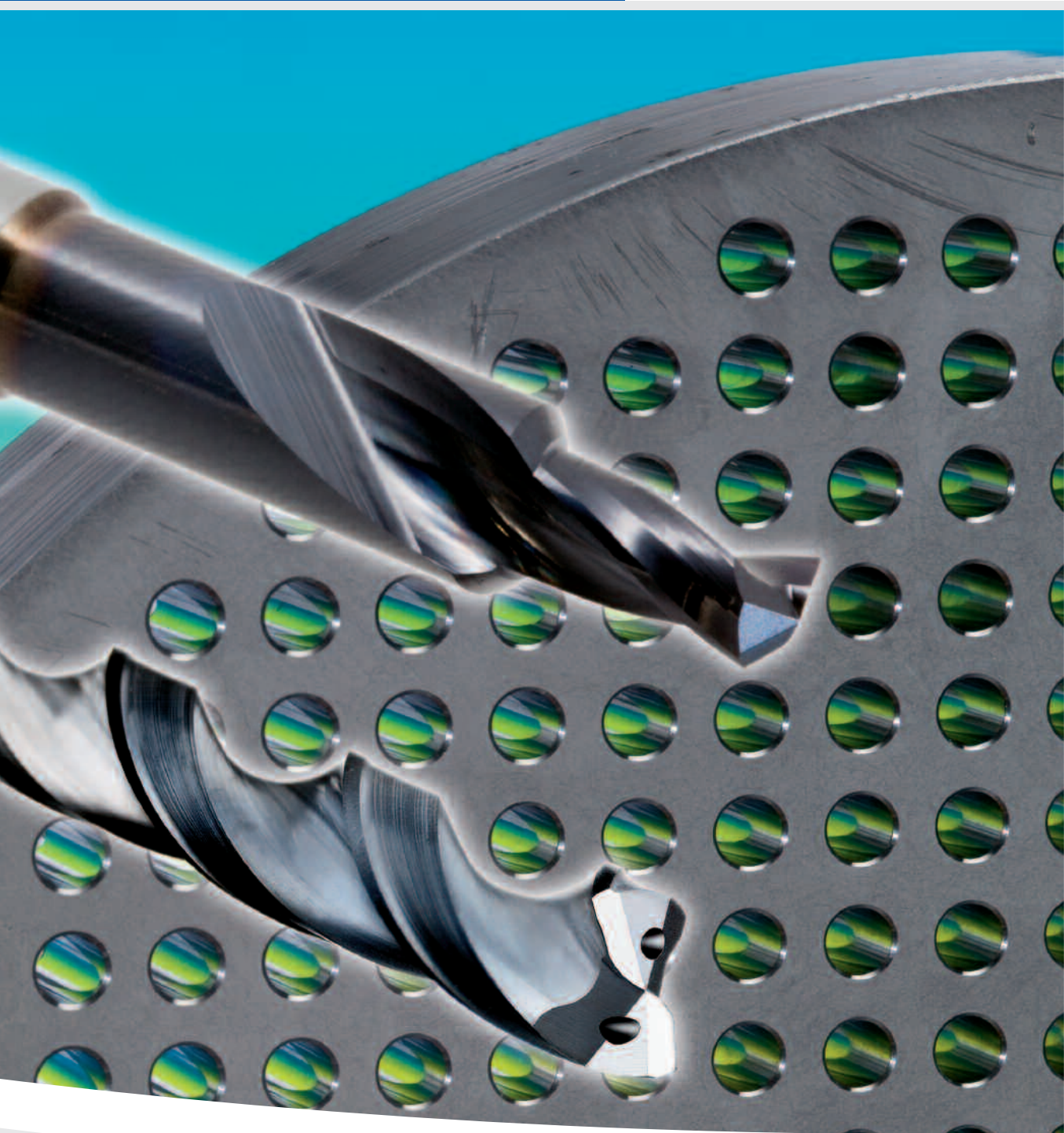


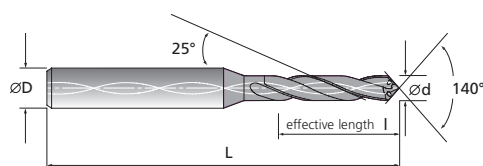
CrazyDrill™ Cool

**MIKRON**



The Mikron Tool drilling concept

**CRAZYDRILL™**  
by Mikron Tool  
Cool



### Powerchamber

Shank with Coolant Powerchamber for small drill diameters up to 2.95 mm guarantees:

- sufficiently large flow of coolant even at a lower pressure
- three times greater coolant flow at identical pressure
- higher drilling speed
- improved tool life and chip evacuation



### Helix

- Special flute form for optimized chip removal

### Cuting edge

- Cooling, lubrication and chip evacuation
- High performance CrazyDrill cutting geometry



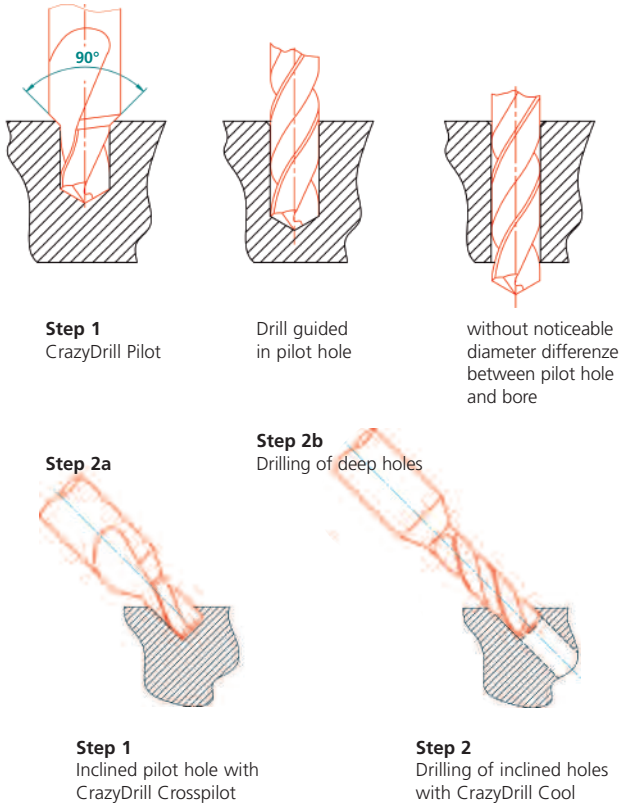
## Usable length 6 x d

Item number		d (k5) mm	l (± 0.1) mm	D (h6) mm	L mm
coated	uncoated				
CD.060075.CS	CD.060075.CA	0.75	5.7	3	51.5
CD.060080.CS	CD.060080.CA	0.80	6.1	3	51.5
CD.060085.CS	CD.060085.CA	0.85	6.5	3	51.5
CD.060090.CS	CD.060090.CA	0.90	6.9	3	51.5
CD.060095.CS	CD.060095.CA	0.95	7.3	3	51.5
CD.060100.CS	CD.060100.CA	1.00	7.7	4	55.0
CD.060105.CS	CD.060105.CA	1.05	8.1	4	55.0
CD.060110.CS	CD.060110.CA	1.10	8.5	4	55.0
CD.060115.CS	CD.060115.CA	1.15	8.9	4	55.0
CD.060120.CS	CD.060120.CA	1.20	9.3	4	55.0
CD.060125.CS	CD.060125.CA	1.25	9.7	4	55.0
CD.060130.CS	CD.060130.CA	1.30	10.1	4	57.0
CD.060135.CS	CD.060135.CA	1.35	10.5	4	57.0
CD.060140.CS	CD.060140.CA	1.40	10.9	4	57.0
CD.060145.CS	CD.060145.CA	1.45	11.3	4	57.0
CD.060150.CS	CD.060150.CA	1.50	11.7	4	57.0
CD.060155.CS	CD.060155.CA	1.55	12.1	4	59.0
CD.060160.CS	CD.060160.CA	1.60	12.5	4	59.0
CD.060165.CS	CD.060165.CA	1.65	12.9	4	59.0
CD.060170.CS	CD.060170.CA	1.70	13.3	4	59.0
CD.060175.CS	CD.060175.CA	1.75	13.7	4	59.0
CD.060180.CS	CD.060180.CA	1.80	14.1	4	61.0
CD.060185.CS	CD.060185.CA	1.85	14.5	4	61.0
CD.060190.CS	CD.060190.CA	1.90	14.9	4	61.0
CD.060195.CS	CD.060195.CA	1.95	15.3	4	61.0
CD.060200.CS	CD.060200.CA	2.00	15.7	4	63.0
CD.060205.CS	CD.060205.CA	2.05	16.1	4	63.0
CD.060210.CS	CD.060210.CA	2.10	16.5	4	63.0
CD.060215.CS	CD.060215.CA	2.15	16.9	4	63.0
CD.060220.CS	CD.060220.CA	2.20	17.3	4	63.0
CD.060225.CS	CD.060225.CA	2.25	17.7	4	63.0
CD.060230.CS	CD.060230.CA	2.30	18.1	4	65.0
CD.060235.CS	CD.060235.CA	2.35	18.5	4	65.0
CD.060240.CS	CD.060240.CA	2.40	18.9	4	65.0
CD.060245.CS	CD.060245.CA	2.45	19.3	4	65.0
CD.060250.CS	CD.060250.CA	2.50	19.7	4	65.0
CD.060255.CS	CD.060255.CA	2.55	20.1	4	65.0
CD.060260.CS	CD.060260.CA	2.60	20.5	4	66.5
CD.060265.CS	CD.060265.CA	2.65	20.9	4	66.5
CD.060270.CS	CD.060270.CA	2.70	21.3	4	66.5
CD.060275.CS	CD.060275.CA	2.75	21.7	4	68.5
CD.060280.CS	CD.060280.CA	2.80	22.1	4	68.5
CD.060285.CS	CD.060285.CA	2.85	22.5	4	68.5
CD.060290.CS	CD.060290.CA	2.90	22.9	4	68.5
CD.060295.CS	CD.060295.CA	2.95	23.3	4	68.5
CD.060300.CS	CD.060300.CA	3.00	23.7	6	73.0
CD.060305.CS	CD.060305.CA	3.05	24.1	6	73.0
CD.060310.CS	CD.060310.CA	3.10	24.5	6	73.0
CD.060315.CS	CD.060315.CA	3.15	24.9	6	73.0
CD.060320.CS	CD.060320.CA	3.20	25.3	6	73.0
CD.060325.CS	CD.060325.CA	3.25	25.7	6	73.0
CD.060330.CS	CD.060330.CA	3.30	26.1	6	75.5
CD.060335.CS	CD.060335.CA	3.35	26.5	6	75.5
CD.060340.CS	CD.060340.CA	3.40	26.9	6	75.5
CD.060345.CS	CD.060345.CA	3.45	27.3	6	75.5
CD.060350.CS	CD.060350.CA	3.50	27.7	6	75.5
CD.060355.CS	CD.060355.CA	3.55	28.1	6	75.5
CD.060360.CS	CD.060360.CA	3.60	28.5	6	77.5
CD.060365.CS	CD.060365.CA	3.65	28.9	6	77.5
CD.060370.CS	CD.060370.CA	3.70	29.3	6	77.5
CD.060375.CS	CD.060375.CA	3.75	29.7	6	77.5
CD.060380.CS	CD.060380.CA	3.80	30.1	6	77.5
CD.060385.CS	CD.060385.CA	3.85	30.5	6	79.0
CD.060390.CS	CD.060390.CA	3.90	30.9	6	79.0
CD.060395.CS	CD.060395.CA	3.95	31.3	6	79.0
CD.060400.CS	CD.060400.CA	4.00	31.7	6	79.0
CD.060410.CS	CD.060410.CA	4.10	30.9	6	80.5
CD.060420.CS	CD.060420.CA	4.20	31.6	6	80.5
CD.060430.CS	CD.060430.CA	4.30	31.5	6	80.5
CD.060440.CS	CD.060440.CA	4.40	32.2	6	80.5
CD.060450.CS	CD.060450.CA	4.50	33.0	6	80.5
CD.060460.CS	CD.060460.CA	4.60	33.7	6	80.5
CD.060470.CS	CD.060470.CA	4.70	34.5	6	84.5
CD.060480.CS	CD.060480.CA	4.80	35.2	6	84.5
CD.060490.CS	CD.060490.CA	4.90	36.0	6	84.5
CD.060500.CS	CD.060500.CA	5.00	36.7	6	84.5
CD.060510.CS	CD.060510.CA	5.10	35.4	6	84.5
CD.060520.CS	CD.060520.CA	5.20	36.1	6	84.5
CD.060530.CS	CD.060530.CA	5.30	36.8	6	84.5
CD.060540.CS	CD.060540.CA	5.40	39.7	6	88.0
CD.060550.CS	CD.060550.CA	5.50	40.4	6	88.0
CD.060560.CS	CD.060560.CA	5.60	41.1	6	88.0
CD.060570.CS	CD.060570.CA	5.70	39.6	6	88.0
CD.060580.CS	CD.060580.CA	5.80	40.3	6	88.0
CD.060590.CS	CD.060590.CA	5.90	41.0	6	88.0
CD.060600.CS		6.00	41.7	6	88.0



# The winning team for deep-hole drilling

## Mikron Tool drilling concept



## The advantage

The drilling concept from Mikron Tool is specially designed for deep holes and is based on a two-stage principle. With CrazyDrill Pilot or CrazyDrill Crosspilot centering and pilot hole is carried out in one step. The CrazyDrill Cool then reaches the maximum depth with minimum pecking. This combination enables direct drilling with an inclination angle of up to 60° and guarantees optimum guidance of the subsequent drill with a negligibly small diameter difference. This drilling concept can be used as a substitute for deep hole drilling down to a depth of max. 15 x Ø in the diameter range 0.75 – 6 mm. Without investing in expensive manufacturing systems and finish reaming operations a greater productivity is achieved.

## Characteristics

- Solid Carbide alloy
- Coated or uncoated
- Standard lengths up to 15 x Ø
- Special lengths and special executions upon request

## Five benefits

- Maximum drilling speeds and feeds
- Minimal run out
- Increased tool life thanks to pilot drilling
- Can replace deep-hole drilling
- Suitable for difficult to machine materials



# Guidelines for cutting parameters

**CRAZYDRILL™**  
by Mikron Tool  
Cool

Materials to be machined	Examples	Cutting speed vc m/min	Feed f in mm/revolution in relation to diameter (indicative)									
			0.8 mm	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
Low-alloy steels	Ck45, 16MnCr5, 20MnCr6	50-80	0.055	0.08	0.11	0.14	0.18	0.21	0.24	0.28	0.31	0.34
Low-alloy tool steels	100Cr6, 90MnCrV8	40-80	0.055	0.08	0.10	0.12	0.15	0.17	0.19	0.22	0.24	0.26
High-alloy steels	G-X 100 CrMoV 5 1, X210CrW12, S 18-1-2-10	30-60	0.02	0.05	0.065	0.08	0.11	0.13	0.15	0.18	0.20	0.22
Steels with hardness >50HRC	90MnCrV8, X40CrV5-1	20-40	0.008	0.010	0.012	0.015	0.02	0.025	0.03	0.04	0.05	0.06
Ferritic Inox steels	X17CrNi16-2, X6CrMo 17-1, X20Cr13, G-X130CrSi29	25-50	0.011	0.03	0.045	0.06	0.08	0.09	0.10	0.12	0.13	0.14
Austenitic Inox steels	X5CrNi 18-10	20-40	0.011	0.02	0.035	0.05	0.07	0.08	0.09	0.11	0.12	0.13
Titanium and Titanium alloys	Ti.Gr2, Ti.Gr.5	12-25	0.08	0.09	0.10	0.11	0.12	0.125	0.13	0.14	0.15	0.15

This data is indicative. Different conditions due to machine, spindle, coolant, etc. can influence the performance. In case of difficult conditions the feed rates should be reduced up to 30%.

In the case of drill diameters be low 1.0 mm and depths over 4 x d, Mikron Tool recommends centering or a pilot hole. It can be drilled using the CrazyDrill Pilot.

## Important criteria:

For best results, Mikron Tool recommends the use of cutting oil as lubricant. The use of water based coolant with high pressure additives, or minimum quantity lubrication is also possible as an alternative. In this case, the cutting parameters have to be adjusted accordingly.

## The CrazyDrill family



# Recommendations for optimum results

## Cooling lubricant

### Type

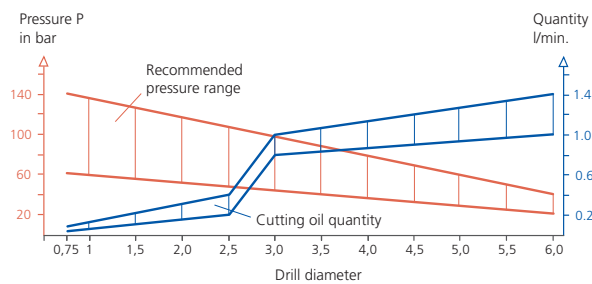
For optimum results Mikron Tool recommends the use of cutting oil as a coolant. Alternatively emulsion can also be used (with EP additives).

### Filter quality

A good filter quality is particularly important for small diameters:

- Filter quality of 10 microns for diameters < 1 mm
- Filter quality of 20 microns for diameters range 1.0 – 2.5 mm

## Pressure and Quantity



## Chip removal

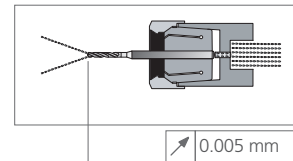
We recommend the following general procedure:

- Depths up to  $6 \times \varnothing$ ; No pecking
- Depths up to  $10 \times \varnothing$ ; 0 - 2 pecks
- Depths up to  $15 \times \varnothing$ ; 0 - 4 pecks

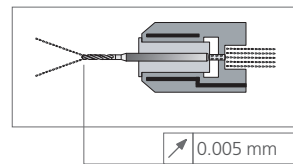
The number of pecks depends on the material. Certain materials need more pecks, for others no pecks are required. The CrazyDrill should be withdrawn completely from the drill hole for pecking.

## Clamping equipment

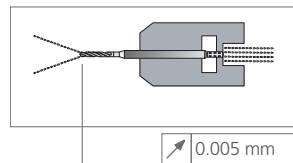
**High-precision** collet systems for minimal run out (T.I.R.). Length presetting and axial protection with stop screw.

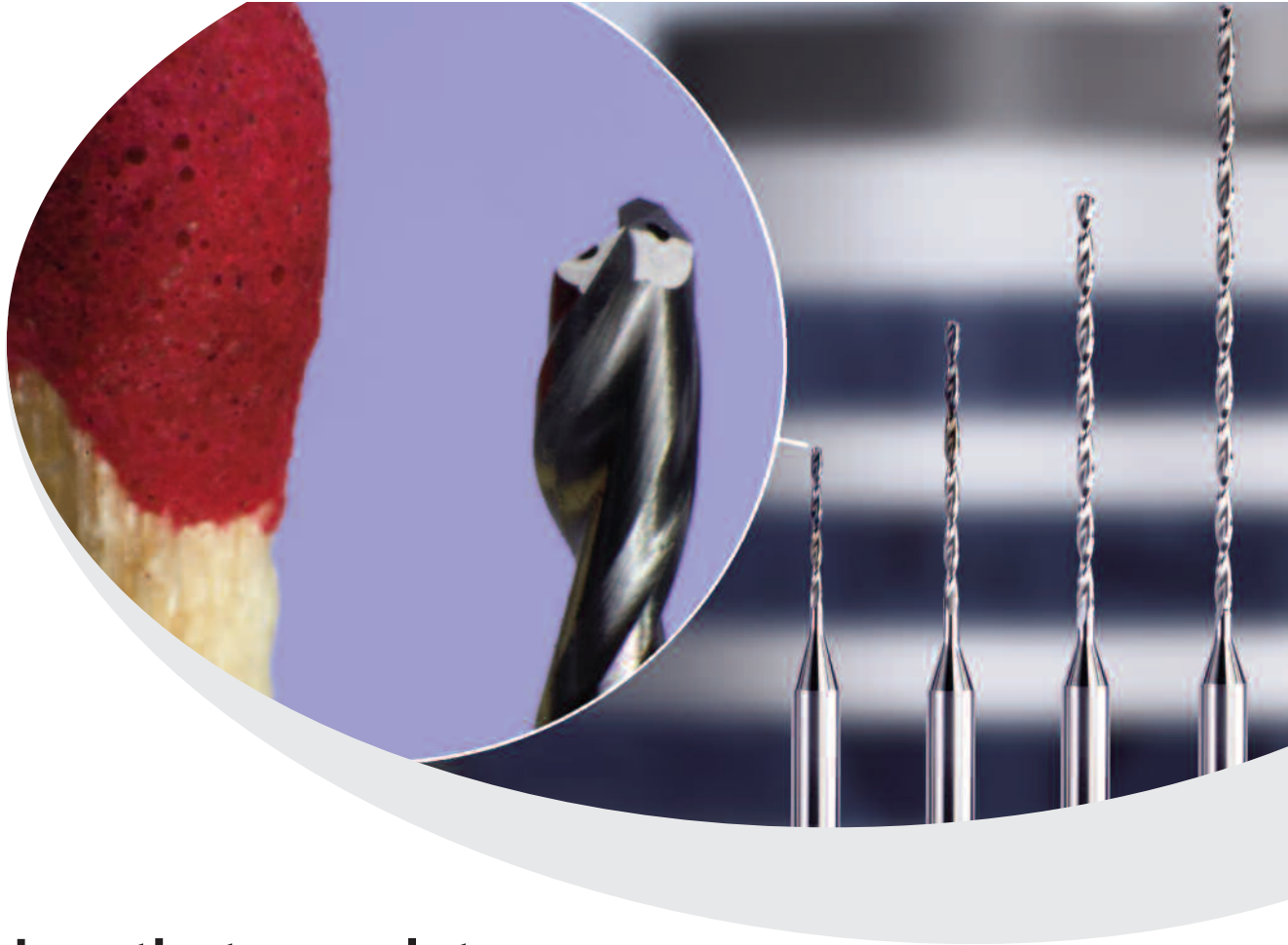


**Hydraulic** expansion chuck with intermediate bushing for force-closed clamping. Guaranteeing minimal run out (T.I.R.).



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





## Services that complete the concept

### Engineering and Consulting

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

### Star-Service

With the Star Service (Standard Tool Adjustment & Record Service), Mikron Tool also offers high-performance drills in dimensions outside the standard range.

### Regrinding

CrazyDrills with a diameter of 1.4 mm or more can be reground and recoated which considerably increases the cost-effectiveness of this drill. Mikron Tool offers this service in Agno (Switzerland) as well as in Rottweil (Germany).

### Packaging

A practical individual packaging provides optimum protection for the tool and allows easier, safer handling without the risk of personal injury or tool damage.

### Recycling

Worn tools (CrazyDrill and special tools) are taken back by Mikron Tool, and the material is recycled – holding true our statement in our environmental certificate.

### 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.

CrazyDrill products are supplied with a Quality Certificate and an instruction for safe handling.



## Your contacts

Headquarter and Production:

**Mikron Tool SA Agno**  
PO Box 340  
6934 Bioggio  
Switzerland  
Tel. +41 91 610 40 00  
Fax +41 91 610 40 10  
mto@mikron.com

Production for Germany  
and Regrinding EU:

**Mikron GmbH Rottweil**  
Abteilung Werkzeuge  
Berner Feld 71  
78628 Rottweil  
Germany  
Tel. +49 741 5380 450  
Fax +49 741 5380 480  
info.mtr@mikron.com

Japan

**Mikron Ltd. Tokyo**  
Shin-Yokohama, Kohoku-Ku  
Yokohama City 222-0033  
Japan  
Tel. +81 45 472 10 01  
Fax +81 45 472 20 22  
mfe@mikron.com

North and South America Sales

**Mikron Corp. Monroe**  
P.O. Box 268  
200 Main Street  
Monroe, CT 06468  
USA  
Tel. +1 203 261 31 00  
Fax +1 203 268 47 52  
mmo@mikron.com

