

CrazyDrill™ Flex



Flexible carbide drill up to 50 x d

CRAZYDRILL™
by Mikron Tool
Flex



Flex

Flexible like HSS, long tool life of a solid carbide drill - diameter range 0.1 to 1.2 mm

CrazyDrill Flex

The new micro drill CrazyDrill Flex is a flexible solid carbide drill, flexible and for deep hole drilling up to 50 x Ø.

Flexible carbide drill:

CrazyDrill Flex, due to its high grade carbide and particular geometry is very precise and flexible. This is advantageous when alignment errors occur, especially in applications with multi-spindle turning centers or transfer machines. CrazyDrill Flex is able to compensate effortlessly 40% of its diameter thanks to its flexible centerpart and doesn't break like a common carbide drill. Up to now, this was possible only with HSS.

Reliable:

Moreover the carbide drill offers a special tool geometry. Therefore it is possible to drill even in case of alignment errors quickly but without cutting edge break-outs. High tool life and reliability are guaranteed.



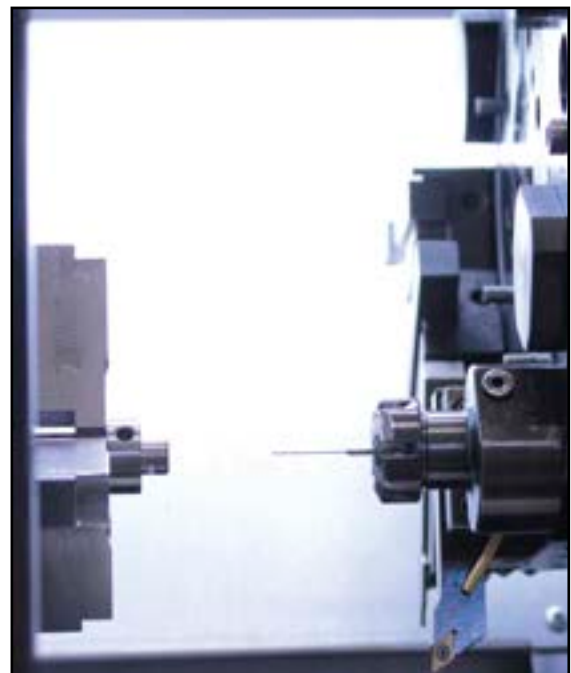
Link video clip
Flexibility:



Link video clip
Deep drilling:



Transfer machines



Automatic lathe / Multi-spindle turning center

All new: The drill, the drilling process, the drilling depth up to 50 x Ø

Cleverly devised from tip to toe

1. Special drill tip geometry:

- Feed force reduced 50%
- Less heat
- Maximum drilling speed

2. Special cutting edge protection:

- Prevent breakage of cutting edges

3. Perfect chip flute geometry:

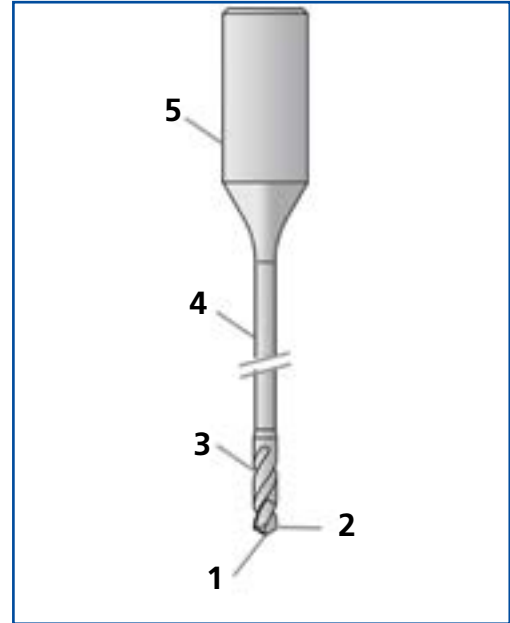
- Creates short chips

4. Flexible centerpiece:

- No breakage due to alignment errors
- Achieve drilling depth 50 x Ø

5. Robust standard shank of 3mm:

- No run-out



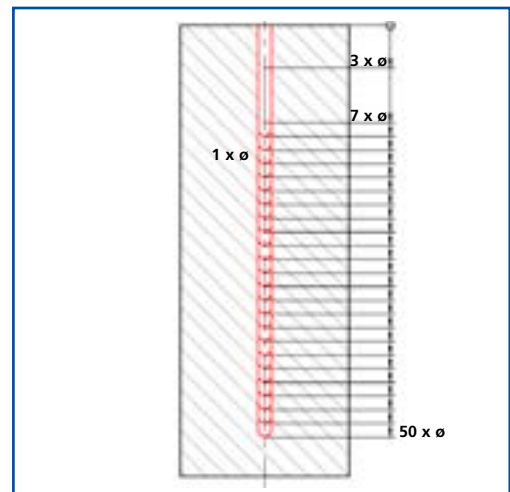
The drilling process to drill quickly and dynamically

1. Centering / Pilot drilling with CrazyDrill Flexpilot:

- 2–3 x Ø, no diameter difference between pilot hole and drilled hole.

2. Deep hole drilling up to 50 x d with CrazyDrill Flex:

- First drilling step up to 7 x Ø is obtained in one single step
- Drilling depths over 7 x Ø requires regular pecking with steps of 0,5 – 1 x Ø
- Number of drilling steps x Ø depends on the material to be machined (see tabular statement of cutting parameters)



Efficient deep hole drilling with CrazyDrill Flex

1. Short machining time:

- Fast, dynamic drilling steps
- 8–10 times faster than single flute gun-drill and
- Micro-electro-erosion

2. Standard machining:

- No special machine required for Ø < 0,8mm

3. Precision:

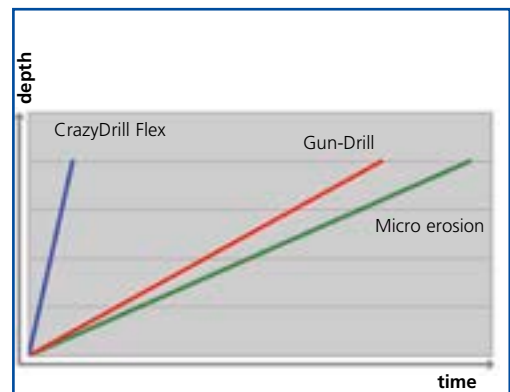
- Minimal lateral forces, highest position accuracy, no run-out

4. Reliable:

- Short chips, defined drilling steps

5. Complete drilling program:

- Pilot CrazyDrill Flexpilot
- CrazyDrill Flex with usable lengths of 20 x d, 30 x d and 50 x d



CRAZYDRILL™
by Mikron Tool
Flexpilot^{STEEL}

CRAZYDRILL™
by Mikron Tool
Flexpilot^{TITANIUM}

Right from the start precise drilling – with CrazyDrill Flexpilot



The drilling concept from Mikron Tool

CrazyDrill Flexpilot is a high precision Pilot Drill and perfectly matched to the drilling program CrazyDrill Flex.

Execution:

- Carbide alloy with 3 mm cylindrical shaft, uncoated
- New, special CrazyDrill Flex drilling geometry

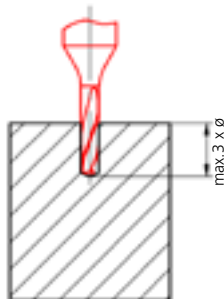
Manufacturing program:

CrazyDrill Flex is offered from stock for Ø 0.1 to 1.2 mm, with diameter increments of 0.05 mm.

Diameter increments of 0.01 mm are available on request.

Particular characteristics:

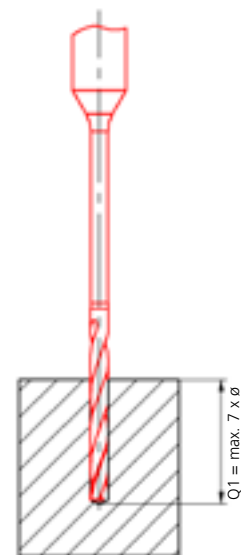
- Highest centering precision due to minimal feed force
- Perfect starter hole for deep hole drilling with CrazyDrill Flex
- Increased reliability
- Short drill for depth up to 2–3 x Ø
- Offers high speed drilling due to the latest drill geometry



Step 1:
Centering and pilot drilling up to 3 x Ø with CrazyDrill Flexpilot



Step 2:
Drill CrazyDrill Flex is perfectly guided. Initial position for precise deep hole drilling.



Step 3:
Deep hole drilling with CrazyDrill Flex without measurable diameter difference between pilot hole and bore. First drilling step up to 7 x Ø in one single step, afterwards pecking.

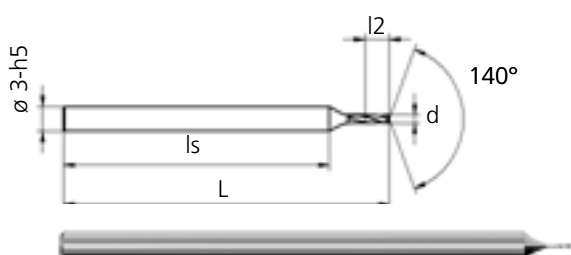
CrazyDrill Flexpilot Steel

Pilot drilling up to 3 x ø

from stock Δ upon request	Item Nr. uncoated	d + 0.003 0 (k4) mm	l2 mm	ls mm	L mm
■	PFS.010.0	0.10	0.30	36	40
Δ	PFS.011.0	0.11	0.33	36	40
Δ	PFS.012.0	0.12	0.36	36	40
Δ	PFS.013.0	0.13	0.39	36	40
Δ	PFS.014.0	0.14	0.42	36	40
■	PFS.015.0	0.15	0.45	36	40
Δ	PFS.016.0	0.16	0.48	36	40
Δ	PFS.017.0	0.17	0.51	36	40
Δ	PFS.018.0	0.18	0.54	36	40
Δ	PFS.019.0	0.19	0.57	36	40
■	PFS.020.0	0.20	0.60	36	40
Δ	PFS.021.0	0.21	0.63	36	40
Δ	PFS.022.0	0.22	0.66	36	40
Δ	PFS.023.0	0.23	0.69	36	40
Δ	PFS.024.0	0.24	0.72	36	40
■	PFS.025.0	0.25	0.75	36	40
Δ	PFS.026.0	0.26	0.78	36	40
Δ	PFS.027.0	0.27	0.81	35	40
Δ	PFS.028.0	0.28	0.84	35	40
Δ	PFS.029.0	0.29	0.87	35	40
■	PFS.030.0	0.30	0.90	35	40
Δ	PFS.031.0	0.31	0.93	35	40
Δ	PFS.032.0	0.32	0.96	35	40
Δ	PFS.033.0	0.33	0.99	35	40
Δ	PFS.034.0	0.34	1.02	35	40
■	PFS.035.0	0.35	1.05	35	40
Δ	PFS.036.0	0.36	1.08	35	40
Δ	PFS.037.0	0.37	1.11	35	40
Δ	PFS.038.0	0.38	1.14	35	40
Δ	PFS.039.0	0.39	1.17	35	40
■	PFS.040.0	0.40	1.20	35	40
Δ	PFS.041.0	0.41	1.23	35	40
Δ	PFS.042.0	0.42	1.26	35	40
Δ	PFS.043.0	0.43	1.29	35	40
Δ	PFS.044.0	0.44	1.32	35	40
■	PFS.045.0	0.45	1.35	35	40
Δ	PFS.046.0	0.46	1.38	35	40
Δ	PFS.047.0	0.47	1.41	35	40
Δ	PFS.048.0	0.48	1.44	34	40
Δ	PFS.049.0	0.49	1.47	34	40
■	PFS.050.0	0.50	1.50	34	40
Δ	PFS.051.0	0.51	1.53	34	40
Δ	PFS.052.0	0.52	1.56	34	40
Δ	PFS.053.0	0.53	1.59	34	40
Δ	PFS.054.0	0.54	1.62	34	40
■	PFS.055.0	0.55	1.65	34	40
Δ	PFS.056.0	0.56	1.68	34	40
Δ	PFS.057.0	0.57	1.71	34	40
Δ	PFS.058.0	0.58	1.74	34	40
Δ	PFS.059.0	0.59	1.77	34	40
■	PFS.060.0	0.60	1.80	34	40
Δ	PFS.061.0	0.61	1.83	34	40
Δ	PFS.062.0	0.62	1.86	34	40
Δ	PFS.063.0	0.63	1.89	34	40
Δ	PFS.064.0	0.64	1.92	34	40

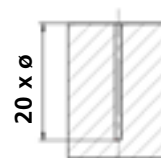
■ Article in stock

Δ Price and delivery term upon request, minimum quantity 5 pcs.



Pilot drilling up to 3 x ø

from stock Δ upon request	Item Nr. uncoated	d + 0.003 0 (k4) mm	l2 mm	ls mm	L mm
■	PFS.065.0	0.65	1.95	34	40
Δ	PFS.066.0	0.66	1.98	34	40
Δ	PFS.067.0	0.67	2.01	34	40
Δ	PFS.068.0	0.68	2.04	34	40
Δ	PFS.069.0	0.69	2.07	34	40
■	PFS.070.0	0.70	2.10	34	40
Δ	PFS.071.0	0.71	2.13	34	40
Δ	PFS.072.0	0.72	2.16	33	40
Δ	PFS.073.0	0.73	2.19	33	40
Δ	PFS.074.0	0.74	2.22	33	40
■	PFS.075.0	0.75	2.25	33	40
Δ	PFS.076.0	0.76	2.28	33	40
Δ	PFS.077.0	0.77	2.31	33	40
Δ	PFS.078.0	0.78	2.34	33	40
Δ	PFS.079.0	0.79	2.37	33	40
■	PFS.080.0	0.80	2.40	33	40
Δ	PFS.081.0	0.81	2.43	33	40
Δ	PFS.082.0	0.82	2.46	33	40
Δ	PFS.083.0	0.83	2.49	33	40
Δ	PFS.084.0	0.84	2.52	33	40
■	PFS.085.0	0.85	2.55	33	40
Δ	PFS.086.0	0.86	2.58	33	40
Δ	PFS.087.0	0.87	2.61	33	40
Δ	PFS.088.0	0.88	2.64	33	40
Δ	PFS.089.0	0.89	2.67	33	40
■	PFS.090.0	0.90	2.70	33	40
Δ	PFS.091.0	0.91	2.73	33	40
Δ	PFS.092.0	0.92	2.76	33	40
Δ	PFS.093.0	0.93	2.79	33	40
Δ	PFS.094.0	0.94	2.82	33	40
■	PFS.095.0	0.95	2.85	33	40
Δ	PFS.096.0	0.96	2.88	33	40
Δ	PFS.097.0	0.97	2.91	32	40
Δ	PFS.098.0	0.98	2.94	32	40
Δ	PFS.099.0	0.99	2.97	32	40
■	PFS.100.0	1.00	3.00	32	40
Δ	PFS.101.0	1.01	3.03	32	40
Δ	PFS.102.0	1.02	3.06	32	40
Δ	PFS.103.0	1.03	3.09	32	40
Δ	PFS.104.0	1.04	3.12	32	40
■	PFS.105.0	1.05	3.15	32	40
Δ	PFS.106.0	1.06	3.18	32	40
Δ	PFS.107.0	1.07	3.21	32	40
Δ	PFS.108.0	1.08	3.24	32	40
Δ	PFS.109.0	1.09	3.27	32	40
■	PFS.110.0	1.10	3.30	32	40
Δ	PFS.111.0	1.11	3.33	32	40
Δ	PFS.112.0	1.12	3.36	32	40
Δ	PFS.113.0	1.13	3.39	32	40
Δ	PFS.114.0	1.14	3.42	32	40
■	PFS.115.0	1.15	3.45	32	40
Δ	PFS.116.0	1.16	3.48	32	40
Δ	PFS.117.0	1.17	3.51	32	40
Δ	PFS.118.0	1.18	3.54	32	40
Δ	PFS.119.0	1.19	3.57	32	40
■	PFS.120.0	1.20	3.60	32	40



Drilling program – for flexible and / or deep hole drilling

Maximum drilling depth 20 x Ø

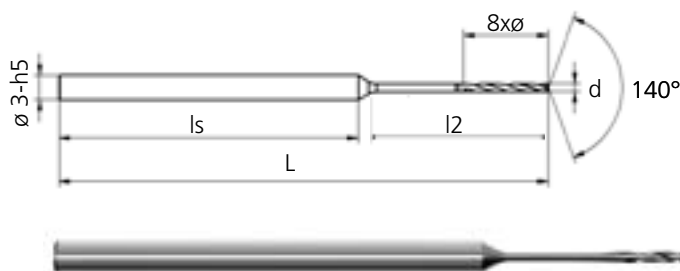
from stock Δ upon request	Item Nr. uncoated	d - 0.003 - 0.006 mm	l2 mm	ls mm	L mm
■	CFS.20010.0	0.10	2.00	35	40
Δ	CFS.20011.0	0.11	2.20	35	40
Δ	CFS.20012.0	0.12	2.40	34	40
Δ	CFS.20013.0	0.13	2.60	34	40
Δ	CFS.20014.0	0.14	2.80	34	40
■	CFS.20015.0	0.15	3.00	34	40
Δ	CFS.20016.0	0.16	3.20	33	40
Δ	CFS.20017.0	0.17	3.40	33	40
Δ	CFS.20018.0	0.18	3.60	33	40
Δ	CFS.20019.0	0.19	3.80	33	40
■	CFS.20020.0	0.20	4.00	38	45
Δ	CFS.20021.0	0.21	4.20	37	45
Δ	CFS.20022.0	0.22	4.40	37	45
Δ	CFS.20023.0	0.23	4.60	37	45
Δ	CFS.20024.0	0.24	4.80	37	45
■	CFS.20025.0	0.25	5.00	37	45
Δ	CFS.20026.0	0.26	5.20	36	45
Δ	CFS.20027.0	0.27	5.40	36	45
Δ	CFS.20028.0	0.28	5.60	36	45
Δ	CFS.20029.0	0.29	5.80	36	45
■	CFS.20030.0	0.30	6.00	36	45
Δ	CFS.20031.0	0.31	6.20	35	45
Δ	CFS.20032.0	0.32	6.40	35	45
Δ	CFS.20033.0	0.33	6.60	35	45
Δ	CFS.20034.0	0.34	6.80	35	45
■	CFS.20035.0	0.35	7.00	34	45
Δ	CFS.20036.0	0.36	7.20	34	45
Δ	CFS.20037.0	0.37	7.40	34	45
Δ	CFS.20038.0	0.38	7.60	34	45
Δ	CFS.20039.0	0.39	7.80	34	45
■	CFS.20040.0	0.40	8.00	33	45
Δ	CFS.20041.0	0.41	8.20	33	45
Δ	CFS.20042.0	0.42	8.40	33	45
Δ	CFS.20043.0	0.43	8.60	33	45
Δ	CFS.20044.0	0.44	8.80	33	45
■	CFS.20045.0	0.45	9.00	32	45
Δ	CFS.20046.0	0.46	9.20	32	45
Δ	CFS.20047.0	0.47	9.40	32	45
Δ	CFS.20048.0	0.48	9.60	32	45
Δ	CFS.20049.0	0.49	9.80	32	45
■	CFS.20050.0	0.50	10.00	36	50
Δ	CFS.20051.0	0.51	10.20	36	50
Δ	CFS.20052.0	0.52	10.40	36	50
Δ	CFS.20053.0	0.53	10.60	36	50
Δ	CFS.20054.0	0.54	10.80	36	50
■	CFS.20055.0	0.55	11.00	35	50
Δ	CFS.20056.0	0.56	11.20	35	50
Δ	CFS.20057.0	0.57	11.40	35	50
Δ	CFS.20058.0	0.58	11.60	35	50
Δ	CFS.20059.0	0.59	11.80	35	50
■	CFS.20060.0	0.60	12.00	34	50
Δ	CFS.20061.0	0.61	12.20	34	50
Δ	CFS.20062.0	0.62	12.40	34	50
Δ	CFS.20063.0	0.63	12.60	34	50
Δ	CFS.20064.0	0.64	12.80	34	50

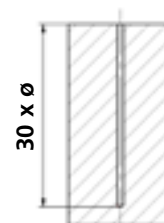
■ Article in stock

Δ Price and delivery term upon request, minimum quantity 5 pcs.

Maximum drilling depth 20 x Ø

from stock Δ upon request	Item Nr. uncoated	d - 0.003 - 0.006 mm	l2 mm	ls mm	L mm
■	CFS.20065.0	0.65	13.00	33	50
Δ	CFS.20066.0	0.66	13.20	33	50
Δ	CFS.20067.0	0.67	13.40	33	50
Δ	CFS.20068.0	0.68	13.60	33	50
Δ	CFS.20069.0	0.69	13.80	33	50
■	CFS.20070.0	0.70	14.00	35	53
Δ	CFS.20071.0	0.71	14.20	35	53
Δ	CFS.20072.0	0.72	14.40	35	53
Δ	CFS.20073.0	0.73	14.60	35	53
Δ	CFS.20074.0	0.74	14.80	35	53
■	CFS.20075.0	0.75	15.00	34	53
Δ	CFS.20076.0	0.76	15.20	34	53
Δ	CFS.20077.0	0.77	15.40	34	53
Δ	CFS.20078.0	0.78	15.60	34	53
Δ	CFS.20079.0	0.79	15.80	34	53
■	CFS.20080.0	0.80	16.00	33	53
Δ	CFS.20081.0	0.81	16.20	33	53
Δ	CFS.20082.0	0.82	16.40	33	53
Δ	CFS.20083.0	0.83	16.60	33	53
Δ	CFS.20084.0	0.84	16.80	33	53
■	CFS.20085.0	0.85	17.00	33	53
Δ	CFS.20086.0	0.86	17.20	33	53
Δ	CFS.20087.0	0.87	17.40	32	53
Δ	CFS.20088.0	0.88	17.60	32	53
Δ	CFS.20089.0	0.89	17.80	32	53
■	CFS.20090.0	0.90	18.00	31	53
Δ	CFS.20091.0	0.91	18.20	31	53
Δ	CFS.20092.0	0.92	18.40	31	53
Δ	CFS.20093.0	0.93	18.60	31	53
Δ	CFS.20094.0	0.94	18.80	31	53
■	CFS.20095.0	0.95	19.00	30	53
Δ	CFS.20096.0	0.96	19.20	30	53
Δ	CFS.20097.0	0.97	19.40	30	53
Δ	CFS.20098.0	0.98	19.60	30	53
Δ	CFS.20099.0	0.99	19.80	30	53
■	CFS.20100.0	1.00	20.00	36	60
Δ	CFS.20101.0	1.01	20.20	36	60
Δ	CFS.20102.0	1.02	20.40	36	60
Δ	CFS.20103.0	1.03	20.60	36	60
Δ	CFS.20104.0	1.04	20.80	36	60
■	CFS.20105.0	1.05	21.00	36	60
Δ	CFS.20106.0	1.06	21.20	35	60
Δ	CFS.20107.0	1.07	21.40	35	60
Δ	CFS.20108.0	1.08	21.60	35	60
Δ	CFS.20109.0	1.09	21.80	35	60
■	CFS.20110.0	1.10	22.00	35	60
Δ	CFS.20111.0	1.11	22.20	34	60
Δ	CFS.20112.0	1.12	22.40	34	60
Δ	CFS.20113.0	1.13	22.60	34	60
Δ	CFS.20114.0	1.14	22.80	34	60
■	CFS.20115.0	1.15	23.00	34	60
Δ	CFS.20116.0	1.16	23.20	33	60
Δ	CFS.20117.0	1.17	23.40	33	60
Δ	CFS.20118.0	1.18	23.60	33	60
Δ	CFS.20119.0	1.19	23.80	33	60
■	CFS.20120.0	1.20	24.00	33	60





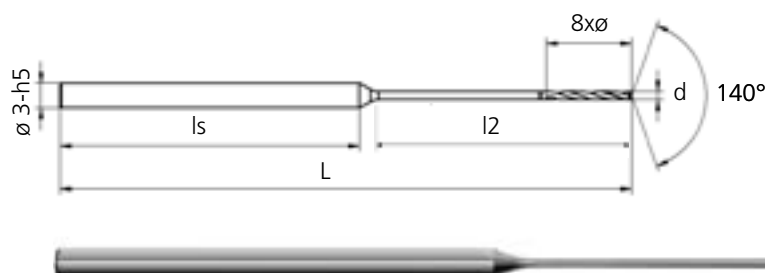
Maximum drilling depth 30 x Ø

■ from stock Δ upon request	Item Nr. uncoated	d - 0.003 - 0.006 mm	l2 mm	l1 mm	L mm
■	CFS.30010.0	0.10	3.00	39	45
Δ	CFS.30011.0	0.11	3.30	38	45
Δ	CFS.30012.0	0.12	3.60	38	45
Δ	CFS.30013.0	0.13	3.90	38	45
Δ	CFS.30014.0	0.14	4.20	38	45
■	CFS.30015.0	0.15	4.50	37	45
Δ	CFS.30016.0	0.16	4.80	37	45
Δ	CFS.30017.0	0.17	5.10	37	45
Δ	CFS.30018.0	0.18	5.40	36	45
Δ	CFS.30019.0	0.19	5.70	36	45
■	CFS.30020.0	0.20	6.00	36	45
Δ	CFS.30021.0	0.21	6.30	35	45
Δ	CFS.30022.0	0.22	6.60	35	45
Δ	CFS.30023.0	0.23	6.90	35	45
Δ	CFS.30024.0	0.24	7.20	34	45
■	CFS.30025.0	0.25	7.50	34	45
Δ	CFS.30026.0	0.26	7.80	34	45
Δ	CFS.30027.0	0.27	8.10	33	45
Δ	CFS.30028.0	0.28	8.40	33	45
Δ	CFS.30029.0	0.29	8.70	33	45
■	CFS.30030.0	0.30	9.00	38	50
Δ	CFS.30031.0	0.31	9.30	37	50
Δ	CFS.30032.0	0.32	9.60	37	50
Δ	CFS.30033.0	0.33	9.90	37	50
Δ	CFS.30034.0	0.34	10.20	36	50
■	CFS.30035.0	0.35	10.50	36	50
Δ	CFS.30036.0	0.36	10.80	36	50
Δ	CFS.30037.0	0.37	11.10	35	50
Δ	CFS.30038.0	0.38	11.40	35	50
Δ	CFS.30039.0	0.39	11.70	35	50
■	CFS.30040.0	0.40	12.00	34	50
Δ	CFS.30041.0	0.41	12.30	34	50
Δ	CFS.30042.0	0.42	12.60	34	50
Δ	CFS.30043.0	0.43	12.90	34	50
Δ	CFS.30044.0	0.44	13.20	33	50
■	CFS.30045.0	0.45	13.50	33	50
Δ	CFS.30046.0	0.46	13.80	33	50
Δ	CFS.30047.0	0.47	14.10	32	50
Δ	CFS.30048.0	0.48	14.40	32	50
Δ	CFS.30049.0	0.49	14.70	32	50
■	CFS.30050.0	0.50	15.00	34	53
Δ	CFS.30051.0	0.51	15.30	34	53
Δ	CFS.30052.0	0.52	15.60	34	53
Δ	CFS.30053.0	0.53	15.90	34	53
Δ	CFS.30054.0	0.54	16.20	33	53
■	CFS.30055.0	0.55	16.50	33	53
Δ	CFS.30056.0	0.56	16.80	33	53
Δ	CFS.30057.0	0.57	17.10	32	53
Δ	CFS.30058.0	0.58	17.40	32	53
Δ	CFS.30059.0	0.59	17.70	32	53
■	CFS.30060.0	0.60	18.00	31	53
Δ	CFS.30061.0	0.61	18.30	31	53
Δ	CFS.30062.0	0.62	18.60	31	53
Δ	CFS.30063.0	0.63	18.90	31	53
Δ	CFS.30064.0	0.64	19.20	30	53

■ Article in stock
Δ Price and delivery term upon request, minimum quantity 5 pcs.

Maximum drilling depth 30 x Ø

■ from stock Δ upon request	Item Nr. uncoated	d - 0.003 - 0.006 mm	l2 mm	l1 mm	L mm
■	CFS.30065.0	0.65	19.50	30	53
Δ	CFS.30066.0	0.66	19.80	30	53
Δ	CFS.30067.0	0.67	20.10	29	53
Δ	CFS.30068.0	0.68	20.40	29	53
Δ	CFS.30069.0	0.69	20.70	29	53
■	CFS.30070.0	0.70	21.00	35	60
Δ	CFS.30071.0	0.71	21.30	35	60
Δ	CFS.30072.0	0.72	21.60	35	60
Δ	CFS.30073.0	0.73	21.90	35	60
Δ	CFS.30074.0	0.74	22.20	34	60
■	CFS.30075.0	0.75	22.50	34	60
Δ	CFS.30076.0	0.76	22.80	34	60
Δ	CFS.30077.0	0.77	23.10	33	60
Δ	CFS.30078.0	0.78	23.40	33	60
Δ	CFS.30079.0	0.79	23.70	33	60
■	CFS.30080.0	0.80	24.00	32	60
Δ	CFS.30081.0	0.81	24.30	32	60
Δ	CFS.30082.0	0.82	24.60	32	60
Δ	CFS.30083.0	0.83	24.90	32	60
Δ	CFS.30084.0	0.84	25.20	31	60
■	CFS.30085.0	0.85	25.50	35	64
Δ	CFS.30086.0	0.86	25.80	35	64
Δ	CFS.30087.0	0.87	26.10	34	64
Δ	CFS.30088.0	0.88	26.40	34	64
Δ	CFS.30089.0	0.89	26.70	34	64
■	CFS.30090.0	0.90	27.00	33	64
Δ	CFS.30091.0	0.91	27.30	33	64
Δ	CFS.30092.0	0.92	27.60	33	64
Δ	CFS.30093.0	0.93	27.90	33	64
Δ	CFS.30094.0	0.94	28.20	32	64
■	CFS.30095.0	0.95	28.50	32	64
Δ	CFS.30096.0	0.96	28.80	32	64
Δ	CFS.30097.0	0.97	29.10	31	64
Δ	CFS.30098.0	0.98	29.40	31	64
Δ	CFS.30099.0	0.99	29.70	31	64
■	CFS.30100.0	1.00	30.00	36	70
Δ	CFS.30101.0	1.01	30.30	36	70
Δ	CFS.30102.0	1.02	30.60	36	70
Δ	CFS.30103.0	1.03	30.90	36	70
Δ	CFS.30104.0	1.04	31.20	35	70
■	CFS.30105.0	1.05	31.50	35	70
Δ	CFS.30106.0	1.06	31.80	35	70
Δ	CFS.30107.0	1.07	32.10	34	70
Δ	CFS.30108.0	1.08	32.40	34	70
Δ	CFS.30109.0	1.09	32.70	34	70
■	CFS.30110.0	1.10	33.00	34	70
Δ	CFS.30111.0	1.11	33.30	33	70
Δ	CFS.30112.0	1.12	33.60	33	70
Δ	CFS.30113.0	1.13	33.90	33	70
Δ	CFS.30114.0	1.14	34.20	32	70
■	CFS.30115.0	1.15	34.50	32	70
Δ	CFS.30116.0	1.16	34.80	32	70
Δ	CFS.30117.0	1.17	35.10	31	70
Δ	CFS.30118.0	1.18	35.40	31	70
Δ	CFS.30119.0	1.19	35.70	31	70
■	CFS.30120.0	1.20	36.00	31	70



Drilling with CrazyDrill Flex – easy and fast

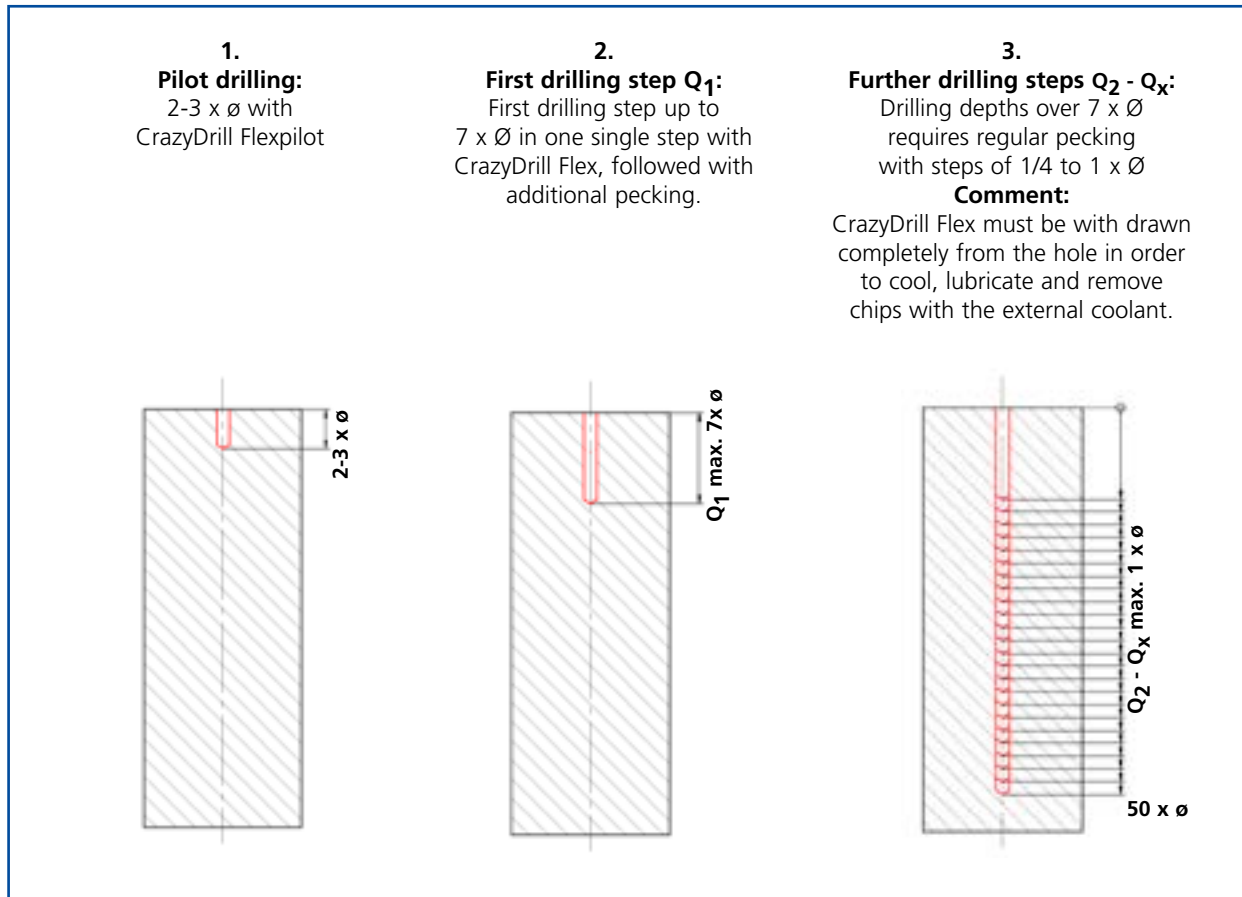


Figure: Drilling process CrazyDrill Flex

Technical information:

Toolholder equipment

CrazyDrill Flex requires high precision clamping, with minimal run-out and secure friction-type locking.

Cooling 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 acceptable as an alternative.

For CrazyDrill Flex 50 x ϕ (with internal cooling) we recommend a minimum pressure of 10 bar at the spindle.

Fast, precise and reliable drilling – with Mikron Tool cutting parameters

Cutting parameter for CrazyDrill Flex Steel: Pilot, 20 x Ø and 30 x Ø

Material group	Material to be machined	Examples	Cutting speed v _c [m/min]		Feed f and stroke Q ₁ resp. Q ₂ - Q _x in relation to drill diameter															
					ø 0.1		ø 0.2		ø 0.3		ø 0.4		ø 0.6		ø 0.8		ø 1.0 - 1.2			
			ø < 0.4 mm	ø > 0.41 mm	Q ₁ Q ₂ - Q _x [mm] U	f [mm] U	Q ₁ Q ₂ - Q _x [mm] U	f [mm] U	Q ₁ Q ₂ - Q _x [mm] U	f [mm] U	Q ₁ Q ₂ - Q _x [mm] U	f [mm] U	Q ₁ Q ₂ - Q _x [mm] U	f [mm] U	Q ₁ Q ₂ - Q _x [mm] U	f [mm] U	Q ₁ Q ₂ - Q _x [mm] U	f [mm] U		
P	Non-alloy steels, long-chipping R _m < 500 N / mm2	C10, C15, St 37, St 52, Ck45,	5 - 40	40 - 60	0.7 0.05	0.002	1.4 0.1	0.005	2.1 0.15	0.010	2.8 0.2	0.015	4.2 0.3	0.030	5.6 0.4	0.040	7.0-8.4 0.6	0.060		
	Non-alloy steels, long-chipping R _m < 700 N / mm2	16MnCr5, 14CrNi14	5 - 25	25 - 50	0.7 0.05	0.002	1.4 0.1	0.003	2.1 0.15	0.008	2.8 0.2	0.012	4.2 0.3	0.025	5.6 0.4	0.035	7.0-8.4 0.6	0.050		
	Alloy steels, short-chipping R _m < 900 N / mm2	42CrMo4, 100Cr6, 90MnCrV8	5 - 20	20 - 45	0.7 0.05	0.002	1.4 0.1-0.2	0.005	2.1 0.15-0.3	0.010	2.8 0.2-0.4	0.015	4.2 0.3-0.6	0.020	5.6 0.4-0.8	0.035	7.0-8.4 0.6-1.2	0.050		
	Alloy, high-alloy Tool Steels, short-chipping R _m < 1200 N / mm2	X210CrW12, X155CrMoV12-1 S 6-5-2, S 6-5-2-5	5 - 20	20 - 35	0.7 0.1	0.0005	1.4 0.2	0.004	2.1 0.3	0.008	2.8 0.4	0.010	4.2 0.6	0.015	5.6 0.8	0.025	7.0-8.4 1.2	0.040		
K	Cast iron	GG 20 - GG 50 GGG 40 - GGG 60	5 - 40	50 - 100 40 - 80	0.7 0.1	0.002	1.4 0.2	0.005	2.1 0.3	0.010	2.8 0.4	0.015	4.2 0.6	0.020	5.6 0.8	0.035	7.0-8.4 1.2	0.050		
N	Aluminum alloy wrought	AlMgSi1, AlSi1Mn, AlZnMgCu1.5	5 - 40	60 - 120	0.7 0.1	0.003	1.4 0.2	0.015	2.1 0.3	0.040	2.8 0.4	0.050	4.2 0.6	0.080	5.6 0.8	0.10	7.0-8.4 1.2	0.12		
	Aluminum alloy Cast	GD-AlSi9Cu3, GD-AlSi7Cu3Mg2 GD-AlSi10Mg	5 - 40	50 - 80	0.7 0.1	0.003	1.4 0.2	0.015	2.1 0.3	0.040	2.8 0.4	0.050	4.2 0.6	0.080	5.6 0.8	0.10	7.0-8.4 1.2	0.12		
	Copper	E-Cu					←-----see CrazyDrill Flex Titanium-----→													
	Brass, Bronze < 200 HB	CuZn39Pb2, CuZn36, CuSn6	5 - 40	60 - 100 40 - 60	0.7 0.1	0.004	1.4 0.2	0.010	2.1 0.3	0.030	2.8 0.4	0.040	4.2 0.6	0.060	5.6 0.8	0.080	7.0-8.4 1.2	0.10		
	Brass, Beryllium brass	CuBe2F40, CuBe2F70, CuAl5	5 - 20	20 - 40	0.25 0.05	0.002	0.5 0.1	0.004	0.75 0.15	0.006	1.0 0.2	0.010	1.5 0.3	0.015	2.0 0.4	0.025	2.5-3.0 0.5	0.040		
S	Titanium pure R _m < 700 N/mm2	Grade1, Grade2, Grade3, Grade 4					←-----see CrazyDrill Flex Titanium-----→													
	Titanium alloy R _m > 700 N/mm2	TiAl6V4, TiAl6Nb7					←-----see CrazyDrill Flex Titanium-----→													

Drilling process defined by DIN 66025 / PAL see also figure page 8:

G83 Deep drilling cycle with pecking

Q = Depth of drilling step

Example: drilling in alloy steel 100Cr6

Drilling process see fig. page 8 / indicative values see above

1. Pilot drilling: 3 x Ø with CrazyDrill Flexpilot
2. First drilling step Q_1 : drilling depth up to 7 x Ø in one single step
3. Drilling steps over 7 x Ø ($Q_2 - Q_x$) are done in multiple steps of 0,5 x Ø.

CRAZYDRILL™
by Mikron Tool
Flex^{STEEL}

Complete success thanks to integrated cooling

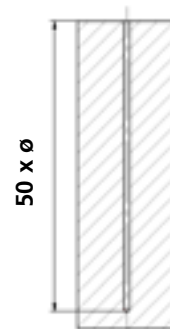


Perfect working condition:

Integrated in the shank CrazyDrill Flex 50 x Ø are 3 lubrication channels. These channels enable a perfect cooling as well as a precise removal of chips. A minimum pressure of 10 bar at the spindle is sufficient to drill 50 x Ø reliably.



Deep hole drilling up to 50 x Ø - with integrated cooling



Maximum drilling depth 50 x Ø

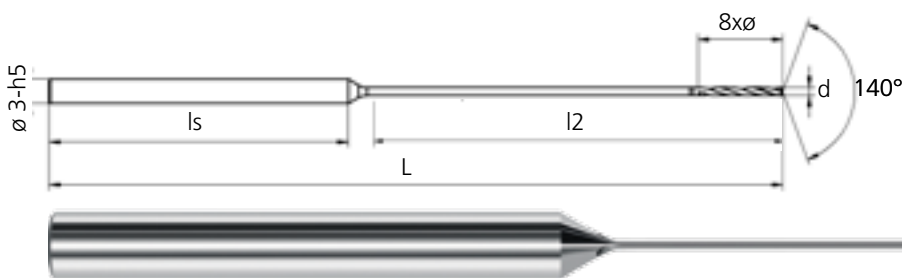
from stock Δ upon request	Item Nr. uncoated	d - 0.003 - 0.006 mm	l2 mm	l1 mm	L mm
■	CFS.50030.IK.0	0.30	15.00	35	53
Δ	CFS.50031.IK.0	0.31	15.50	34	53
Δ	CFS.50032.IK.0	0.32	16.00	34	53
Δ	CFS.50033.IK.0	0.33	16.50	33	53
Δ	CFS.50034.IK.0	0.34	17.00	33	53
■	CFS.50035.IK.0	0.35	17.60	39	53
Δ	CFS.50036.IK.0	0.36	18.00	38	53
Δ	CFS.50037.IK.0	0.37	18.50	38	53
Δ	CFS.50038.IK.0	0.38	19.00	37	53
Δ	CFS.50039.IK.0	0.39	19.50	37	53
■	CFS.50040.IK.0	0.40	20.00	36	53
Δ	CFS.50041.IK.0	0.41	20.50	36	60
Δ	CFS.50042.IK.0	0.42	21.00	35	60
Δ	CFS.50043.IK.0	0.43	21.50	35	60
Δ	CFS.50044.IK.0	0.44	22.00	34	60
■	CFS.50045.IK.0	0.45	22.60	34	60
Δ	CFS.50046.IK.0	0.46	23.00	33	60
Δ	CFS.50047.IK.0	0.47	23.50	33	60
Δ	CFS.50048.IK.0	0.48	24.00	32	60
Δ	CFS.50049.IK.0	0.49	24.50	32	60
■	CFS.50050.IK.0	0.50	25.00	35	64
Δ	CFS.50051.IK.0	0.51	25.50	35	64
Δ	CFS.50052.IK.0	0.52	26.00	34	64
Δ	CFS.50053.IK.0	0.53	26.50	34	64
Δ	CFS.50054.IK.0	0.54	27.00	33	64
■	CFS.50055.IK.0	0.55	27.60	33	64
Δ	CFS.50056.IK.0	0.56	28.00	32	64
Δ	CFS.50057.IK.0	0.57	28.50	32	64
Δ	CFS.50058.IK.0	0.58	29.00	31	64
Δ	CFS.50059.IK.0	0.59	29.50	31	64
■	CFS.50060.IK.0	0.60	30.00	36	70
Δ	CFS.50061.IK.0	0.61	30.50	36	70
Δ	CFS.50062.IK.0	0.62	31.00	35	70
Δ	CFS.50063.IK.0	0.63	31.50	35	70
Δ	CFS.50064.IK.0	0.64	32.00	34	70
■	CFS.50065.IK.0	0.65	32.60	34	70
Δ	CFS.50066.IK.0	0.66	33.00	33	70
Δ	CFS.50067.IK.0	0.67	33.50	33	70
Δ	CFS.50068.IK.0	0.68	34.00	32	70
Δ	CFS.50069.IK.0	0.69	34.50	32	70
■	CFS.50070.IK.0	0.70	35.00	36	75
Δ	CFS.50071.IK.0	0.71	35.50	36	75
Δ	CFS.50072.IK.0	0.72	36.00	35	75
Δ	CFS.50073.IK.0	0.73	36.50	35	75
Δ	CFS.50074.IK.0	0.74	37.00	34	75

■ Article in stock

Δ Price and delivery term upon request, minimum quantity 5 pcs.

Maximum drilling depth 50 x Ø

from stock Δ upon request	Item Nr. uncoated	d - 0.003 - 0.006 mm	l2 mm	l1 mm	L mm
■	CFS.50075.IK.0	0.75	37.60	34	75
Δ	CFS.50076.IK.0	0.76	38.00	33	75
Δ	CFS.50077.IK.0	0.77	38.50	33	75
Δ	CFS.50078.IK.0	0.78	39.00	32	75
Δ	CFS.50079.IK.0	0.79	39.50	32	75
■	CFS.50080.IK.0	0.80	40.00	36	80
Δ	CFS.50081.IK.0	0.81	40.50	36	80
Δ	CFS.50082.IK.0	0.82	41.00	35	80
Δ	CFS.50083.IK.0	0.83	41.50	35	80
Δ	CFS.50084.IK.0	0.84	42.00	34	80
■	CFS.50085.IK.0	0.85	42.60	34	80
Δ	CFS.50086.IK.0	0.86	43.00	33	80
Δ	CFS.50087.IK.0	0.87	43.50	33	80
Δ	CFS.50088.IK.0	0.88	44.00	32	80
Δ	CFS.50089.IK.0	0.89	44.50	32	80
■	CFS.50090.IK.0	0.90	45.00	36	85
Δ	CFS.50091.IK.0	0.91	45.50	36	85
Δ	CFS.50092.IK.0	0.92	46.00	35	85
Δ	CFS.50093.IK.0	0.93	46.50	35	85
Δ	CFS.50094.IK.0	0.94	47.00	34	85
■	CFS.50095.IK.0	0.95	47.60	34	85
Δ	CFS.50096.IK.0	0.96	48.00	33	85
Δ	CFS.50097.IK.0	0.97	48.50	33	85
Δ	CFS.50098.IK.0	0.98	49.00	32	85
Δ	CFS.50099.IK.0	0.99	49.50	32	85
■	CFS.50100.IK.0	1.00	50.00	36	90
Δ	CFS.50101.IK.0	1.01	50.50	36	90
Δ	CFS.50102.IK.0	1.02	51.00	35	90
Δ	CFS.50103.IK.0	1.03	51.50	35	90
Δ	CFS.50104.IK.0	1.04	52.00	35	90
■	CFS.50105.IK.0	1.05	52.60	34	90
Δ	CFS.50106.IK.0	1.06	53.00	34	90
Δ	CFS.50107.IK.0	1.07	53.50	33	90
Δ	CFS.50108.IK.0	1.08	54.00	33	90
Δ	CFS.50109.IK.0	1.09	54.50	32	90
■	CFS.50110.IK.0	1.10	55.00	37	95
Δ	CFS.50111.IK.0	1.11	55.50	36	95
Δ	CFS.50112.IK.0	1.12	56.00	36	95
Δ	CFS.50113.IK.0	1.13	56.50	35	95
Δ	CFS.50114.IK.0	1.14	57.00	35	95
■	CFS.50115.IK.0	1.15	57.60	34	95
Δ	CFS.50116.IK.0	1.16	58.00	34	95
Δ	CFS.50117.IK.0	1.17	58.50	33	95
Δ	CFS.50118.IK.0	1.18	59.00	33	95
Δ	CFS.50119.IK.0	1.19	59.50	32	95
■	CFS.50120.IK.0	1.20	60.00	32	95



Micro drilling - with maximum of precision

The micro drill CrazyDrill Flex has a double functionality. Straight holes are achieved because of the stable middle part of the tool (axial direction) and an ingenious polished tip section which reduces the drilling force up to 50%.



Technical information:

Toolholder equipment

CrazyDrill Flex requires high precision clamping, with minimal run-out and secure friction-type locking.

Cooling 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 acceptable as an alternative.

For CrazyDrill Flex 50 x Ø (with internal cooling) we recommend a minimum pressure of 10 bar at the spindle.

Fast, precise and reliable drilling – with Mikron Tool cutting parameters

Cutting paramtere for CrazyDrill Flex Steel: 50 x Ø

Material group	Material to be machined	Examples	Cutting speed v_c [m/min]		Feed f and stroke Q_1 resp. $Q_2 - Q_x$ in relation to drill diameter									
					Ø 0.3		Ø 0.4		Ø 0.6		Ø 0.8		Ø 1.0 - 1.2	
			Ø < 0.4 mm	Ø > 0.41 mm	Q_1 $Q_2 - Q_x$ [mm] U	f [mm] U	Q_1 $Q_2 - Q_x$ [mm] U	f [mm] U	Q_1 $Q_2 - Q_x$ [mm] U	f [mm] U	Q_1 $Q_2 - Q_x$ [mm] U	f [mm] U	Q_1 $Q_2 - Q_x$ [mm] U	f [mm] U
P	Non-alloy steels, long-chipping $R_m < 500$ N / mm ²	C10, C15, St 37, St 52, Ck45,	5 - 40	40 - 60	2.1 0.15	0.010	2.8 0.2	0.015	4.2 0.3	0.030	5.6 0.4	0.040	7.0-8.4 0.6	0.060
	Non-alloy steels, long-chipping $R_m < 700$ N / mm ²	16MnCr5, 14CrNi14	5 - 25	25 - 50	2.1 0.15	0.008	2.8 0.2	0.012	4.2 0.3	0.025	5.6 0.4	0.035	7.0-8.4 0.6	0.050
	Alloy steels, short-chipping $R_m < 900$ N / mm ²	42CrMo4, 100Cr6, 90MnCrV8	5 - 20	20 - 45	2.1 0.15	0.010	2.8 0.2	0.015	4.2 0.3	0.020	5.6 0.4	0.035	7.0-8.4 0.6	0.050
	Alloy, high-alloy Tool Steels, short-chipping $R_m < 1200$ N / mm ²	X210CrW12, X155CrMoV12-1 S 6-5-2, S 6-5-2-5	5 - 20	20 - 35	2.1 0.15	0.008	2.8 0.2	0.010	4.2 0.3	0.015	5.6 0.4	0.025	7.0-8.4 0.6	0.040
K	Cast iron	GG 20 - GG 50 GGG 40 - GGG 60	5 - 40	50 - 100 40 - 80	2.1 0.15	0.010	2.8 0.2	0.015	4.2 0.3	0.020	5.6 0.4	0.035	7.0-8.4 0.6	0.050
N	Aluminum alloy wrought	AlMgSi1, AlSi1Mn, AlZnMgCu1.5	5 - 40	60 - 120	2.1 0.3	0.040	2.8 0.4	0.050	4.2 0.6	0.080	5.6 0.8	0.10	7.0-8.4 1.2	0.12
	Aluminum alloy Cast	GD-AlSi9Cu3, GD-AlSi7Cu3Mg2 GD-AlSi10Mg	5 - 40	50 - 80	2.1 0.3	0.040	2.8 0.4	0.050	4.2 0.6	0.080	5.6 0.8	0.10	7.0-8.4 1.2	0.12
	Copper	E-Cu	<-----see CrazyDrill Flex Titanium----->											
	Brass, Bronze < 200 HB	CuZn39Pb2, CuZn36, CuSn6	5 - 40	60 - 100 40 - 60	2.1 0.3	0.030	2.8 0.4	0.040	4.2 0.6	0.060	5.6 0.8	0.080	7.0-8.4 1.2	0.10
	Brass, Beryllium brass	CuBe2F40, CuBe2F70, CuAl5	5 - 20	20 - 40	0.75 0.15	0.006	1.0 0.2	0.010	1.5 0.3	0.015	2.0 0.4	0.025	2.5-3.0 0.5	0.040
S	Titanium pure $R_m < 700$ N/mm ²	Grade 1, Grade 2 Grade 3, Grade 4	<-----see CrazyDrill Flex Titanium----->											
	Titanium alloy $R_m > 700$ N/mm ²	TiAl6V4, TiAl6Nb7	<-----see CrazyDrill Flex Titanium----->											

Drilling process defined by DIN 66025 / PAL see also figure page 8:

G83 Deep drilling cycle with pecking

Q = Depth of drilling step

Example: drilling in alloy steel 100Cr6 / CrazyDrill Flex 50 x Ø

Drilling process see fig. page 8 / indicative values see above

1. Pilot drilling: 3 x Ø with CrazyDrill Flexpilot
2. First drilling step Q_1 : drilling depth up to 7 x Ø in one single step
3. Drilling steps over 7 x Ø ($Q_2 - Q_x$) are done in multiple steps of 0,5 x Ø.

Efficient drilling of Titanium and other tough materials – CrazyDrill Flex Titanium

The Engineers of Mikron Tool developed a special geometry for CrazyDrill Flex Titanium to machine tough and long chipping materials. Due to that, drilling applications in the swatch-, jewelry-, medical- as well as in the aerospace industry are done faster and more reliably.



CrazyDrill Flexpilot Titanium

Pilot drilling up to 3 x ϕ

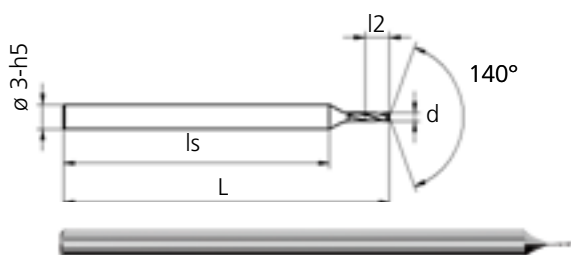
from stock ■ Δ upon request	Item Nr. uncoated	d + 0.003 0 (k4) mm	l2 mm	l _s mm	L mm
■	PFT.010.0	0.10	0.30	36	40
Δ	PFT.011.0	0.11	0.33	36	40
Δ	PFT.012.0	0.12	0.36	36	40
Δ	PFT.013.0	0.13	0.39	36	40
Δ	PFT.014.0	0.14	0.42	36	40
■	PFT.015.0	0.15	0.45	36	40
Δ	PFT.016.0	0.16	0.48	36	40
Δ	PFT.017.0	0.17	0.51	36	40
Δ	PFT.018.0	0.18	0.54	36	40
Δ	PFT.019.0	0.19	0.57	36	40
■	PFT.020.0	0.20	0.60	36	40
Δ	PFT.021.0	0.21	0.63	36	40
Δ	PFT.022.0	0.22	0.66	36	40
Δ	PFT.023.0	0.23	0.69	36	40
Δ	PFT.024.0	0.24	0.72	36	40
■	PFT.025.0	0.25	0.75	36	40
Δ	PFT.026.0	0.26	0.78	36	40
Δ	PFT.027.0	0.27	0.81	35	40
Δ	PFT.028.0	0.28	0.84	35	40
Δ	PFT.029.0	0.29	0.87	35	40
■	PFT.030.0	0.30	0.90	35	40
Δ	PFT.031.0	0.31	0.93	35	40
Δ	PFT.032.0	0.32	0.96	35	40
Δ	PFT.033.0	0.33	0.99	35	40
Δ	PFT.034.0	0.34	1.02	35	40
■	PFT.035.0	0.35	1.05	35	40
Δ	PFT.036.0	0.36	1.08	35	40
Δ	PFT.037.0	0.37	1.11	35	40
Δ	PFT.038.0	0.38	1.14	35	40
Δ	PFT.039.0	0.39	1.17	35	40
■	PFT.040.0	0.40	1.20	35	40
Δ	PFT.041.0	0.41	1.23	35	40
Δ	PFT.042.0	0.42	1.26	35	40
Δ	PFT.043.0	0.43	1.29	35	40
Δ	PFT.044.0	0.44	1.32	35	40
■	PFT.045.0	0.45	1.35	35	40
Δ	PFT.046.0	0.46	1.38	35	40
Δ	PFT.047.0	0.47	1.41	35	40
Δ	PFT.048.0	0.48	1.44	34	40
Δ	PFT.049.0	0.49	1.47	34	40
■	PFT.050.0	0.50	1.50	34	40
Δ	PFT.051.0	0.51	1.53	34	40
Δ	PFT.052.0	0.52	1.56	34	40
Δ	PFT.053.0	0.53	1.59	34	40
Δ	PFT.054.0	0.54	1.62	34	40
■	PFT.055.0	0.55	1.65	34	40
Δ	PFT.056.0	0.56	1.68	34	40
Δ	PFT.057.0	0.57	1.71	34	40
Δ	PFT.058.0	0.58	1.74	34	40
Δ	PFT.059.0	0.59	1.77	34	40
■	PFT.060.0	0.60	1.80	34	40
Δ	PFT.061.0	0.61	1.83	34	40
Δ	PFT.062.0	0.62	1.86	34	40
Δ	PFT.063.0	0.63	1.89	34	40
Δ	PFT.064.0	0.64	1.92	34	40

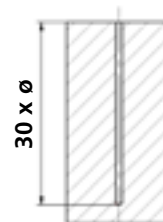
■ Article in stock

Δ Price and delivery term upon request, minimum quantity 5 pcs.

Pilot drilling up to 3 x ϕ

from stock ■ Δ upon request	Item Nr. uncoated	d + 0.003 0 (k4) mm	l2 mm	l _s mm	L mm
■	PFT.065.0	0.65	1.95	34	40
Δ	PFT.066.0	0.66	1.98	34	40
Δ	PFT.067.0	0.67	2.01	34	40
Δ	PFT.068.0	0.68	2.04	34	40
Δ	PFT.069.0	0.69	2.07	34	40
■	PFT.070.0	0.70	2.10	34	40
Δ	PFT.071.0	0.71	2.13	34	40
Δ	PFT.072.0	0.72	2.16	33	40
Δ	PFT.073.0	0.73	2.19	33	40
Δ	PFT.074.0	0.74	2.22	33	40
■	PFT.075.0	0.75	2.25	33	40
Δ	PFT.076.0	0.76	2.28	33	40
Δ	PFT.077.0	0.77	2.31	33	40
Δ	PFT.078.0	0.78	2.34	33	40
Δ	PFT.079.0	0.79	2.37	33	40
■	PFT.080.0	0.80	2.40	33	40
Δ	PFT.081.0	0.81	2.43	33	40
Δ	PFT.082.0	0.82	2.46	33	40
Δ	PFT.083.0	0.83	2.49	33	40
Δ	PFT.084.0	0.84	2.52	33	40
■	PFT.085.0	0.85	2.55	33	40
Δ	PFT.086.0	0.86	2.58	33	40
Δ	PFT.087.0	0.87	2.61	33	40
Δ	PFT.088.0	0.88	2.64	33	40
Δ	PFT.089.0	0.89	2.67	33	40
■	PFT.090.0	0.90	2.70	33	40
Δ	PFT.091.0	0.91	2.73	33	40
Δ	PFT.092.0	0.92	2.76	33	40
Δ	PFT.093.0	0.93	2.79	33	40
Δ	PFT.094.0	0.94	2.82	33	40
■	PFT.095.0	0.95	2.85	33	40
Δ	PFT.096.0	0.96	2.88	33	40
Δ	PFT.097.0	0.97	2.91	32	40
Δ	PFT.098.0	0.98	2.94	32	40
Δ	PFT.099.0	0.99	2.97	32	40
■	PFT.100.0	1.00	3.00	32	40
Δ	PFT.101.0	1.01	3.03	32	40
Δ	PFT.102.0	1.02	3.06	32	40
Δ	PFT.103.0	1.03	3.09	32	40
Δ	PFT.104.0	1.04	3.12	32	40
■	PFT.105.0	1.05	3.15	32	40
Δ	PFT.106.0	1.06	3.18	32	40
Δ	PFT.107.0	1.07	3.21	32	40
Δ	PFT.108.0	1.08	3.24	32	40
Δ	PFT.109.0	1.09	3.27	32	40
■	PFT.110.0	1.10	3.30	32	40
Δ	PFT.111.0	1.11	3.33	32	40
Δ	PFT.112.0	1.12	3.36	32	40
Δ	PFT.113.0	1.13	3.39	32	40
Δ	PFT.114.0	1.14	3.42	32	40
■	PFT.115.0	1.15	3.45	32	40
Δ	PFT.116.0	1.16	3.48	32	40
Δ	PFT.117.0	1.17	3.51	32	40
Δ	PFT.118.0	1.18	3.54	32	40
Δ	PFT.119.0	1.19	3.57	32	40
■	PFT.120.0	1.20	3.60	32	40





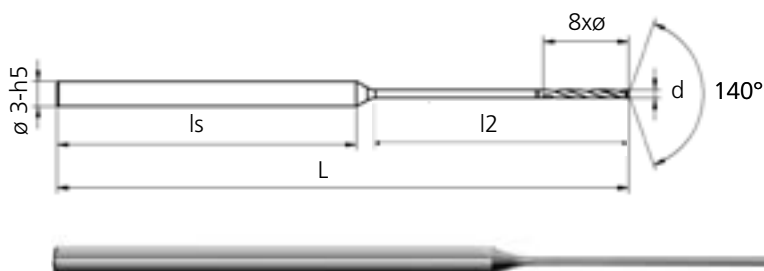
Maximum drilling depth 30 x Ø

■ from stock Δ upon request	Item Nr. uncoated	d - 0.003 - 0.006 mm	l2 mm	l5 mm	L mm
■	CFT.30010.0	0.10	3.00	39	45
Δ	CFT.30011.0	0.11	3.30	38	45
Δ	CFT.30012.0	0.12	3.60	38	45
Δ	CFT.30013.0	0.13	3.90	38	45
Δ	CFT.30014.0	0.14	4.20	38	45
■	CFT.30015.0	0.15	4.50	37	45
Δ	CFT.30016.0	0.16	4.80	37	45
Δ	CFT.30017.0	0.17	5.10	37	45
Δ	CFT.30018.0	0.18	5.40	36	45
Δ	CFT.30019.0	0.19	5.70	36	45
■	CFT.30020.0	0.20	6.00	36	45
Δ	CFT.30021.0	0.21	6.30	35	45
Δ	CFT.30022.0	0.22	6.60	35	45
Δ	CFT.30023.0	0.23	6.90	35	45
Δ	CFT.30024.0	0.24	7.20	34	45
■	CFT.30025.0	0.25	7.50	34	45
Δ	CFT.30026.0	0.26	7.80	34	45
Δ	CFT.30027.0	0.27	8.10	33	45
Δ	CFT.30028.0	0.28	8.40	33	45
Δ	CFT.30029.0	0.29	8.70	33	45
■	CFT.30030.0	0.30	9.00	38	50
Δ	CFT.30031.0	0.31	9.30	37	50
Δ	CFT.30032.0	0.32	9.60	37	50
Δ	CFT.30033.0	0.33	9.90	37	50
Δ	CFT.30034.0	0.34	10.20	36	50
■	CFT.30035.0	0.35	10.50	36	50
Δ	CFT.30036.0	0.36	10.80	36	50
Δ	CFT.30037.0	0.37	11.10	35	50
Δ	CFT.30038.0	0.38	11.40	35	50
Δ	CFT.30039.0	0.39	11.70	35	50
■	CFT.30040.0	0.40	12.00	34	50
Δ	CFT.30041.0	0.41	12.30	34	50
Δ	CFT.30042.0	0.42	12.60	34	50
Δ	CFT.30043.0	0.43	12.90	34	50
Δ	CFT.30044.0	0.44	13.20	33	50
■	CFT.30045.0	0.45	13.50	33	50
Δ	CFT.30046.0	0.46	13.80	33	50
Δ	CFT.30047.0	0.47	14.10	32	50
Δ	CFT.30048.0	0.48	14.40	32	50
Δ	CFT.30049.0	0.49	14.70	32	50
■	CFT.30050.0	0.50	15.00	34	53
Δ	CFT.30051.0	0.51	15.30	34	53
Δ	CFT.30052.0	0.52	15.60	34	53
Δ	CFT.30053.0	0.53	15.90	34	53
Δ	CFT.30054.0	0.54	16.20	33	53
■	CFT.30055.0	0.55	16.50	33	53
Δ	CFT.30056.0	0.56	16.80	33	53
Δ	CFT.30057.0	0.57	17.10	32	53
Δ	CFT.30058.0	0.58	17.40	32	53
Δ	CFT.30059.0	0.59	17.70	32	53
■	CFT.30060.0	0.60	18.00	31	53
Δ	CFT.30061.0	0.61	18.30	31	53
Δ	CFT.30062.0	0.62	18.60	31	53
Δ	CFT.30063.0	0.63	18.90	31	53
Δ	CFT.30064.0	0.64	19.20	30	53

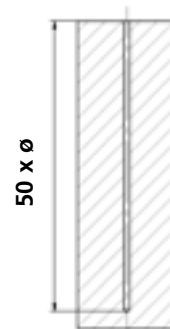
- Article in stock
 Δ Price and delivery term upon request, minimum quantity 5 pcs.

Maximum drilling depth 30 x Ø

■ from stock Δ upon request	Item Nr. uncoated	d - 0.003 - 0.006 mm	l2 mm	l5 mm	L mm
■	CFT.30065.0	0.65	19.50	30	53
Δ	CFT.30066.0	0.66	19.80	30	53
Δ	CFT.30067.0	0.67	20.10	29	53
Δ	CFT.30068.0	0.68	20.40	29	53
Δ	CFT.30069.0	0.69	20.70	29	53
■	CFT.30070.0	0.70	21.00	35	60
Δ	CFT.30071.0	0.71	21.30	35	60
Δ	CFT.30072.0	0.72	21.60	35	60
Δ	CFT.30073.0	0.73	21.90	35	60
Δ	CFT.30074.0	0.74	22.20	34	60
■	CFT.30075.0	0.75	22.50	34	60
Δ	CFT.30076.0	0.76	22.80	34	60
Δ	CFT.30077.0	0.77	23.10	33	60
Δ	CFT.30078.0	0.78	23.40	33	60
Δ	CFT.30079.0	0.79	23.70	33	60
■	CFT.30080.0	0.80	24.00	32	60
Δ	CFT.30081.0	0.81	24.30	32	60
Δ	CFT.30082.0	0.82	24.60	32	60
Δ	CFT.30083.0	0.83	24.90	32	60
Δ	CFT.30084.0	0.84	25.20	31	60
■	CFT.30085.0	0.85	25.50	35	64
Δ	CFT.30086.0	0.86	25.80	35	64
Δ	CFT.30087.0	0.87	26.10	34	64
Δ	CFT.30088.0	0.88	26.40	34	64
Δ	CFT.30089.0	0.89	26.70	34	64
■	CFT.30090.0	0.90	27.00	33	64
Δ	CFT.30091.0	0.91	27.30	33	64
Δ	CFT.30092.0	0.92	27.60	33	64
Δ	CFT.30093.0	0.93	27.90	33	64
Δ	CFT.30094.0	0.94	28.20	32	64
■	CFT.30095.0	0.95	28.50	32	64
Δ	CFT.30096.0	0.96	28.80	32	64
Δ	CFT.30097.0	0.97	29.10	31	64
Δ	CFT.30098.0	0.98	29.40	31	64
Δ	CFT.30099.0	0.99	29.70	31	64
■	CFT.30100.0	1.00	30.00	36	70
Δ	CFT.30101.0	1.01	30.30	36	70
Δ	CFT.30102.0	1.02	30.60	36	70
Δ	CFT.30103.0	1.03	30.90	36	70
Δ	CFT.30104.0	1.04	31.20	35	70
■	CFT.30105.0	1.05	31.50	35	70
Δ	CFT.30106.0	1.06	31.80	35	70
Δ	CFT.30107.0	1.07	32.10	34	70
Δ	CFT.30108.0	1.08	32.40	34	70
Δ	CFT.30109.0	1.09	32.70	34	70
■	CFT.30110.0	1.10	33.00	34	70
Δ	CFT.30111.0	1.11	33.30	33	70
Δ	CFT.30112.0	1.12	33.60	33	70
Δ	CFT.30113.0	1.13	33.90	33	70
Δ	CFT.30114.0	1.14	34.20	32	70
■	CFT.30115.0	1.15	34.50	32	70
Δ	CFT.30116.0	1.16	34.80	32	70
Δ	CFT.30117.0	1.17	35.10	31	70
Δ	CFT.30118.0	1.18	35.40	31	70
Δ	CFT.30119.0	1.19	35.70	31	70
■	CFT.30120.0	1.20	36.00	31	70



Deep hole drilling up to 50 x ø - with integrated cooling



Maximum drilling depth 50 x ø

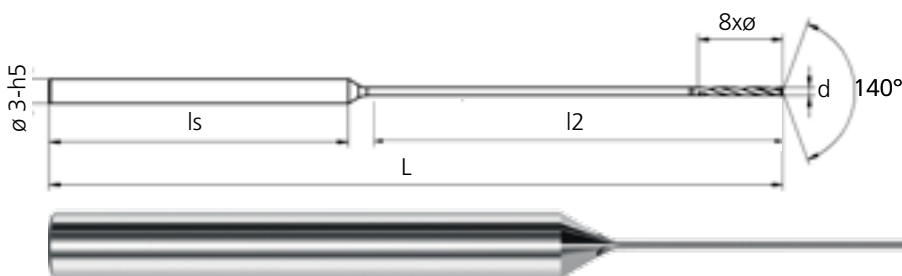
from stock Δ upon request	Item Nr. uncoated	d - 0.003 - 0.006 mm	l2 mm	l1 mm	L mm
■	CFT.50030.IK.0	0.30	15.00	35	53
Δ	CFT.50031.IK.0	0.31	15.50	34	53
Δ	CFT.50032.IK.0	0.32	16.00	34	53
Δ	CFT.50033.IK.0	0.33	16.50	33	53
Δ	CFT.50034.IK.0	0.34	17.00	33	53
■	CFT.50035.IK.0	0.35	17.60	39	53
Δ	CFT.50036.IK.0	0.36	18.00	38	53
Δ	CFT.50037.IK.0	0.37	18.50	38	53
Δ	CFT.50038.IK.0	0.38	19.00	37	53
Δ	CFT.50039.IK.0	0.39	19.50	37	53
■	CFT.50040.IK.0	0.40	20.00	36	53
Δ	CFT.50041.IK.0	0.41	20.50	36	60
Δ	CFT.50042.IK.0	0.42	21.00	35	60
Δ	CFT.50043.IK.0	0.43	21.50	35	60
Δ	CFT.50044.IK.0	0.44	22.00	34	60
■	CFT.50045.IK.0	0.45	22.60	34	60
Δ	CFT.50046.IK.0	0.46	23.00	33	60
Δ	CFT.50047.IK.0	0.47	23.50	33	60
Δ	CFT.50048.IK.0	0.48	24.00	32	60
Δ	CFT.50049.IK.0	0.49	24.50	32	60
■	CFT.50050.IK.0	0.50	25.00	35	64
Δ	CFT.50051.IK.0	0.51	25.50	35	64
Δ	CFT.50052.IK.0	0.52	26.00	34	64
Δ	CFT.50053.IK.0	0.53	26.50	34	64
Δ	CFT.50054.IK.0	0.54	27.00	33	64
■	CFT.50055.IK.0	0.55	27.60	33	64
Δ	CFT.50056.IK.0	0.56	28.00	32	64
Δ	CFT.50057.IK.0	0.57	28.50	32	64
Δ	CFT.50058.IK.0	0.58	29.00	31	64
Δ	CFT.50059.IK.0	0.59	29.50	31	64
■	CFT.50060.IK.0	0.60	30.00	36	70
Δ	CFT.50061.IK.0	0.61	30.50	36	70
Δ	CFT.50062.IK.0	0.62	31.00	35	70
Δ	CFT.50063.IK.0	0.63	31.50	35	70
Δ	CFT.50064.IK.0	0.64	32.00	34	70
■	CFT.50065.IK.0	0.65	32.60	34	70
Δ	CFT.50066.IK.0	0.66	33.00	33	70
Δ	CFT.50067.IK.0	0.67	33.50	33	70
Δ	CFT.50068.IK.0	0.68	34.00	32	70
Δ	CFT.50069.IK.0	0.69	34.50	32	70
■	CFT.50070.IK.0	0.70	35.00	36	75
Δ	CFT.50071.IK.0	0.71	35.50	36	75
Δ	CFT.50072.IK.0	0.72	36.00	35	75
Δ	CFT.50073.IK.0	0.73	36.50	35	75
Δ	CFT.50074.IK.0	0.74	37.00	34	75

■ Article in stock

Δ Price and delivery term upon request, minimum quantity 5 pcs.

Maximum drilling depth 50 x ø

from stock Δ upon request	Item Nr. uncoated	d - 0.003 - 0.006 mm	l2 mm	l1 mm	L mm
■	CFT.50075.IK.0	0.75	37.60	34	75
Δ	CFT.50076.IK.0	0.76	38.00	33	75
Δ	CFT.50077.IK.0	0.77	38.50	33	75
Δ	CFT.50078.IK.0	0.78	39.00	32	75
Δ	CFT.50079.IK.0	0.79	39.50	32	75
■	CFT.50080.IK.0	0.80	40.00	36	80
Δ	CFT.50081.IK.0	0.81	40.50	36	80
Δ	CFT.50082.IK.0	0.82	41.00	35	80
Δ	CFT.50083.IK.0	0.83	41.50	35	80
Δ	CFT.50084.IK.0	0.84	42.00	34	80
■	CFT.50085.IK.0	0.85	42.60	34	80
Δ	CFT.50086.IK.0	0.86	43.00	33	80
Δ	CFT.50087.IK.0	0.87	43.50	33	80
Δ	CFT.50088.IK.0	0.88	44.00	32	80
Δ	CFT.50089.IK.0	0.89	44.50	32	80
■	CFT.50090.IK.0	0.90	45.00	36	85
Δ	CFT.50091.IK.0	0.91	45.50	36	85
Δ	CFT.50092.IK.0	0.92	46.00	35	85
Δ	CFT.50093.IK.0	0.93	46.50	35	85
Δ	CFT.50094.IK.0	0.94	47.00	34	85
■	CFT.50095.IK.0	0.95	47.60	34	85
Δ	CFT.50096.IK.0	0.96	48.00	33	85
Δ	CFT.50097.IK.0	0.97	48.50	33	85
Δ	CFT.50098.IK.0	0.98	49.00	32	85
Δ	CFT.50099.IK.0	0.99	49.50	32	85
■	CFT.50100.IK.0	1.00	50.00	36	90
Δ	CFT.50101.IK.0	1.01	50.50	36	90
Δ	CFT.50102.IK.0	1.02	51.00	35	90
Δ	CFT.50103.IK.0	1.03	51.50	35	90
Δ	CFT.50104.IK.0	1.04	52.00	35	90
■	CFT.50105.IK.0	1.05	52.60	34	90
Δ	CFT.50106.IK.0	1.06	53.00	34	90
Δ	CFT.50107.IK.0	1.07	53.50	33	90
Δ	CFT.50108.IK.0	1.08	54.00	33	90
Δ	CFT.50109.IK.0	1.09	54.50	32	90
■	CFT.50110.IK.0	1.10	55.00	37	95
Δ	CFT.50111.IK.0	1.11	55.50	36	95
Δ	CFT.50112.IK.0	1.12	56.00	36	95
Δ	CFT.50113.IK.0	1.13	56.50	35	95
Δ	CFT.50114.IK.0	1.14	57.00	35	95
■	CFT.50115.IK.0	1.15	57.60	34	95
Δ	CFT.50116.IK.0	1.16	58.00	34	95
Δ	CFT.50117.IK.0	1.17	58.50	33	95
Δ	CFT.50118.IK.0	1.18	59.00	33	95
Δ	CFT.50119.IK.0	1.19	59.50	32	95
■	CFT.50120.IK.0	1.20	60.00	32	95



Fast, precise and reliable drilling – with Mikron Tool cutting parameters

Cutting parameter for CrazyDrill Flex Titanium: Pilot and 30 x Ø

Group of material	Material to be machined	Example	Cutting speed v_c [m/min]		Feed f and stroke Q_1 resp. $Q_2 - Q_x$ in relation to drill diameter															
					Ø 0.1		Ø 0.2		Ø 0.3		Ø 0.4		Ø 0.6		Ø 0.8		Ø 1.0 - 1.2			
			Ø < 0.4 mm	Ø > 0.41 mm	Q_1 $Q_2 - Q_x$ [mm] U	f [mm] U	Q_1 $Q_2 - Q_x$ [mm] U	f [mm] U	Q_1 $Q_2 - Q_x$ [mm] U	f [mm] U	Q_1 $Q_2 - Q_x$ [mm] U	f [mm] U	Q_1 $Q_2 - Q_x$ [mm] U	f [mm] U	Q_1 $Q_2 - Q_x$ [mm] U	f [mm] U	Q_1 $Q_2 - Q_x$ [mm] U	f [mm] U	Q_1 $Q_2 - Q_x$ [mm] U	f [mm] U
N	Copper	E-Cu, F-Cu, SF-Cu, SE-Cu	5 - 40	20 - 40	0.7 0.05	0.005	1.4 0.1	0.02	2.1 0.15	0.04	2.8 0.2	0.06	4.2 0.3	0.12	5.6 0.4	0.18	7.0-8.4 0.6	0.2		
S	Titanium pure Rm < 700 N/mm ²	Grade 1, Grade2, Grade 3, Grade 4	5 - 20	20 - 40	0.3 0.02	0.002	0.6 0.05	0.005	0.9 0.08	0.007	1.2 0.1	0.01	1.8 0.2	0.015	2.4 0.4	0.025	3.0-3.6 0.5	0.035		
	Titanium alloy Rm > 700 N/mm ²	TiAl6V4, TiAl6Nb7	5 - 20	20 - 40	0.3 0.05	0.002	0.6 0.05	0.01	0.9 0.1	0.015	1.2 0.2	0.02	1.8 0.3	0.05	2.4 0.4	0.09	3.0-3.6 0.5	0.14		

Cutting parameter for CrazyDrill Flex Titanium: 50 x Ø

Group of material	Material to be machined	Example	Cutting speed v_c [m/min]		Feed f and stroke Q_1 resp. $Q_2 - Q_x$ in relation to drill diameter															
					Ø 0.1		Ø 0.2		Ø 0.3		Ø 0.4		Ø 0.6		Ø 0.8		Ø 1.0 - 1.2			
			Ø < 0.4 mm	Ø > 0.41 mm	Q_1 $Q_2 - Q_x$ [mm] U	f [mm] U	Q_1 $Q_2 - Q_x$ [mm] U	f [mm] U	Q_1 $Q_2 - Q_x$ [mm] U	f [mm] U	Q_1 $Q_2 - Q_x$ [mm] U	f [mm] U	Q_1 $Q_2 - Q_x$ [mm] U	f [mm] U	Q_1 $Q_2 - Q_x$ [mm] U	f [mm] U	Q_1 $Q_2 - Q_x$ [mm] U	f [mm] U	Q_1 $Q_2 - Q_x$ [mm] U	f [mm] U
N	Copper	E-Cu, F-Cu, SF-Cu, SE-Cu	5 - 40	20 - 40					2.1 0.1	0.04	2.8 0.15	0.06	4.2 0.2	0.12	5.6 0.25	0.18	7.0-8.4 0.4	0.2		
S	Titanium pure Rm < 700 N/mm ²	Grade 1, Grade 2, Grade 3, Grade 4	5 - 20	20 - 30					0.9 0.08	0.007	1.2 0.1	0.01	1.8 0.15	0.015	2.4 0.2	0.025	3.0-3.6 0.3	0.035		
	Titanium alloy Rm > 700 N/mm ²	TiAl6V4, TiAl6Nb7	5 - 20	20 - 40					0.9 0.1	0.015	1.2 0.15	0.02	1.8 0.2	0.05	2.4 0.25	0.09	3.0-3.6 0.4	0.14		

Drilling process defined by DIN 66025 / PAL see also figure page 8:

G83 Deep drilling cycle with pecking

Q = Depth of drilling step

Example: drilling in Titanium Grade 1 / CrazyDrill Flex 50 x Ø

Drilling process see fig. page 8 / indicative values see above

1. Pilot drilling: 3 x Ø (0.9 mm) with CrazyDrill Flexpilot
2. First drilling step Q_1 : drilling depth up to 3 x Ø (0.9 mm) in one single step
3. Drilling steps over 3 x Ø ($Q_2 - Q_x$) are done in multiple steps of $1/4 \times \text{Ø}$ (0.08 mm).

Technical information:

Toolholder equipment

CrazyDrill Flex requires high precision clamping, with minimal run-out and secure friction-type locking.

Cooling 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 acceptable as an alternative.

For CrazyDrill Flex 50 x Ø (with internal cooling) we recommend a minimum pressure of 10 bar at the spindle.



Flex

CrazyDrill Flex - at a glance

Standard features

- $\varnothing$ 0.1 mm - 1.2 mm
- Wear resistant, flexible carbide drill
- Standard shaft size $\varnothing$ 3 mm
- CrazyDrill Flexpilot is highly precise and perfectly matched to the drilling program CrazyDrill Flex.
- Diameter increments of 0.05 mm are available from stock. Diameter increments of 0.01 mm are available upon request.
- Version 50 x $\varnothing$ with integrated cooling
- Resistant against lateral misalignment forces
- Fast and precise drilling
- 7 x $\varnothing$ in one stroke
- Up to 50 x $\varnothing$ with pecking
- One version for steel, cast iron, aluminum, brass and one version for Titanium and Copper
- Miniature holes can be achieved rapidly and efficiently



Flexpilot^{STEEL}



Flexpilot^{TITANIUM}



Flex^{STEEL}



Flex^{TITANIUM}

20 x $\varnothing$



30 x $\varnothing$



50 x $\varnothing$



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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