TOLLING SYSTEMS PROCESS OPTIMIZATION CONSULTING IN MILLING STRATEGIES

FGT SOLID CARBIDE END MILLS

FGT BALL NOSE- AND CORNER RADIUS END MILLS

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PRODUCT INFORMATION FGT SOLID CARBIDE END MILLS

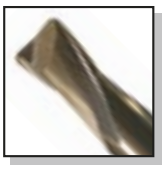
Innovations – for 3-D-machining of shallow contours and profiles:

- new ball- and corner-radius geometry
- improved transition curves between shank and cutting edge
- new coating PVTiH
- new carbide substrate UMGC
- reduced diameter- and radius-tolerances
- avoiding vibrations
- remarkably increased tool-life
- better rigidity

for machining of:

- tool steels
- die steels
- hardened steels up to 58 HRC

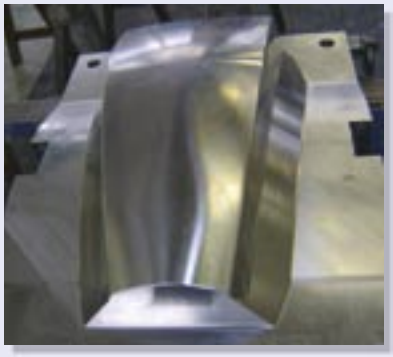
17 22 85

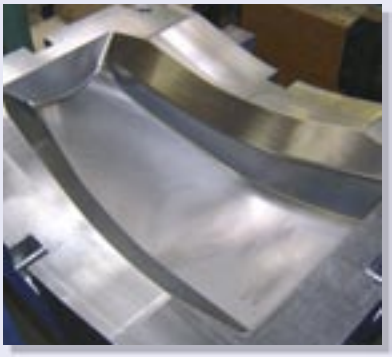


07 22 85

EXAMPLES FOR APPLICATIONS FROM PRACTICE

customers data:	3-D-milling of male and female mould, finishing
material:	1.2312
machine:	Mikron
tool:	1722 85 100
tool diam.:	Ø 10 mm
ae (width of cut):	0,20 mm
ap (depth of cut):	0,20 mm
Vf (feed/min.):	1700 mm/min
n:	8500 1/min
Vc (speed):	267 m/min
machining time:	15 hours
result:	very economic
surface:	clean and good (Ra=0,25)
wear:	none





Operation data

OPERATION DATA 1722 85 | 0722 85	Drm. 0,4 - 0,8 mm	Drm. 1 - 3 mm	Drm. 4 - 6 mm	Drm. 8 - 12 mm
tool steel				
fz (mm)	0,005 - 0,02	0,01 - 0,05	0,05 - 0,1	0,08 - 0,12
ap (mm)	0,01 - 0,05	0,01 - 0,1	0,1 - 0,25	0,1 - 0,35
Vc (m/min)	150 - 300	150 - 300	150 - 300	150 - 300
high-temperature alloys				
fz (mm)	0,005 - 0,02	0,01 - 0,05	0,05 - 0,1	0,08 - 0,12
ap (mm)	0,01 - 0,05	0,01 - 0,1	0,1 - 0,25	0,1 - 0,35
Vc (m/min)	60 - 100	60 - 100	60 - 100	60 - 100
hardened steel up to 58 HRC				
fz (mm)	0,005 - 0,02	0,01 - 0,05	0,05 - 0,1	0,08 - 0,12
ap (mm)	0,01 - 0,03	0,01 - 0,1	0,1 - 0,25	0,1 - 0,35
Vc (m/min)	150 - 300	150 - 300	150 - 300	150 - 300

DIMENSIONS

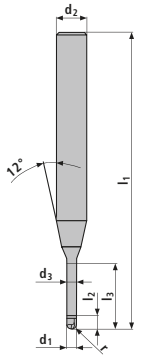
Ball Nose End Mills FGT

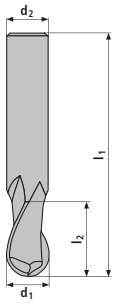
2 teeth, for steel | without working depth | high-precision

1722

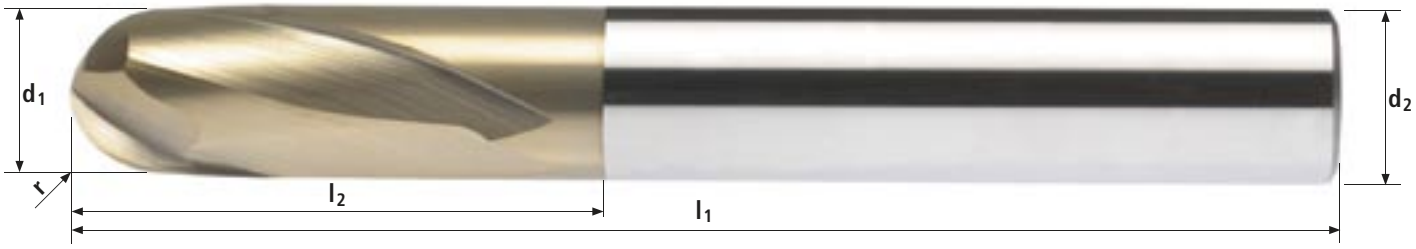
2 teeth, plain shank, ball nose, centre cutting, right hand helix, PVTiH-coated

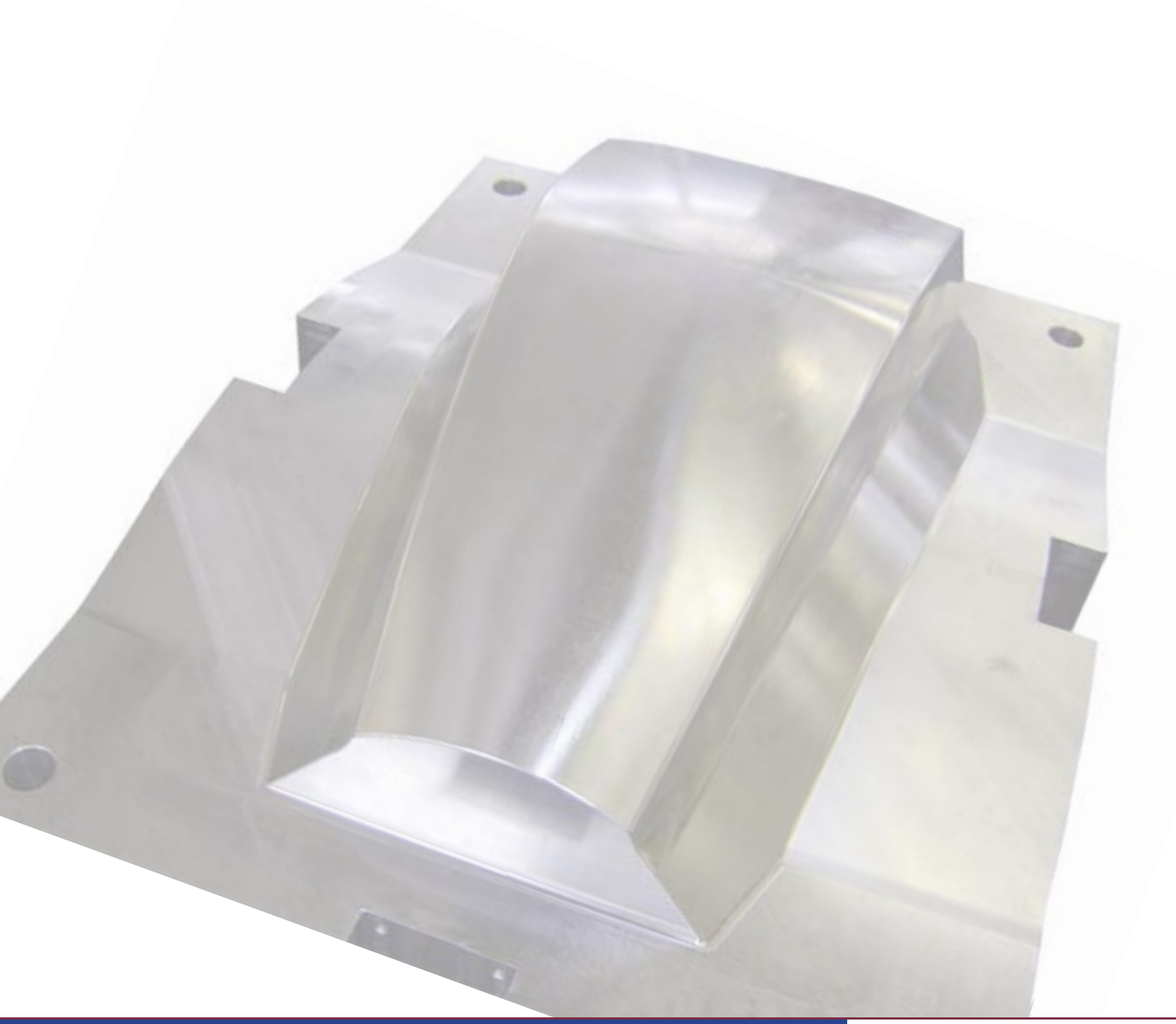
- new ultra-micrograin carbide
- modified coating
- optimized geometry
- high precision, r = +/- 0,005, d1 = - 0,015





SOLID CARBIDE END MILLS Catalogue-No.	d_1	l_2	l_3	d_3	l_1	r	d_2	z	Characteristics		
1722 85 004	0,4	0,4	-	-	50	0,2	4	2	HSC		
1722 85 005	0,5	0,5	-	-	50	0,25	4	2	HSC		
1722 85 006	0,6	0,6	-	-	50	0,3	4	2	HSC		
1722 85 008	0,8	0,8	-	-	50	0,4	4	2	HSC		
1722 85 010	1	1	-	-	50	0,5	4	2	HSC		
1722 85 0101	1	1	-	-	75	0,5	4	2	HSC		
1722 85 015	1,5	1,5	-	-	50	0,75	4	2	HSC		
1722 85 0151	1,5	1,5	-	-	75	0,75	4	2	HSC		
1722 85 020	2	2	-	-	50	1	4	2	HSC		
1722 85 0201	2	2	-	-	75	1	4	2	HSC		
1722 85 030	3	3	-	-	57	1,5	6	2	HSC		
1722 85 0301	3	3	-	-	75	1,5	6	2	HSC		
1722 85 040	4	4	-	-	57	2	6	2	HSC		
1722 85 0401	4	4	-	-	75	2	6	2	HSC		
1722 85 050	5	5	-	-	57	2,5	6	2	HSC		
1722 85 0501	5	5	-	-	75	2,5	6	2	HSC		
1722 85 060	6	6	-	-	57	3	6	2	HSC		
1722 85 0601	6	6	-	-	75	3	6	2	HSC		
1722 85 080	8	8	-	-	63	4	8	2	HSC		
1722 85 0801	8	8	-	-	90	4	8	2	HSC		
1722 85 100	10	10	-	-	72	5	10	2	HSC		
1722 85 1001	10	10	-	-	100	5	10	2	HSC		
1722 85 120	12	12	-	-	83	6	12	2	HSC		
1722 85 1201	12	12	-	-	110	6	12	2	HSC		





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DIMENSIONS

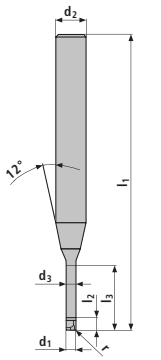
Corner Radius End Mills FGT

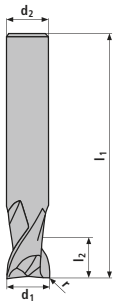
2 teeth, for steel | without working depth | high-precision

0722

2 teeth, plain shank, corner radius, centre cutting, right hand helix, PVTiH-coated

- new ultra-micrograin carbide
- modified coating
- optimized geometry
- high precision, r = +/- 0,005, d1 = - 0,015





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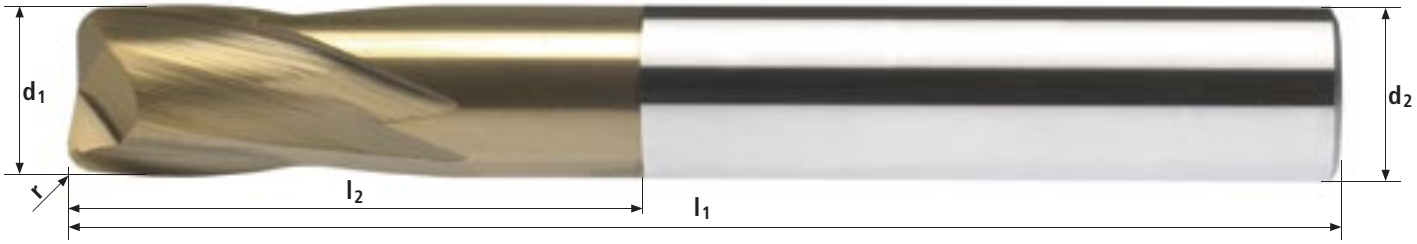
0722 85 005	0,5	0,5	-	-	50	0,1	4	2	HSC		
0722 85 006	0,6	0,6	-	-	50	0,1	4	2	HSC		
0722 85 008	0,8	0,8	-	-	50	0,1	4	2	HSC		
0722 85 010	1	1	-	-	50	0,2	4	2	HSC		
0722 85 0101	1	1	-	-	75	0,2	4	2	HSC		
0722 85 015	1,5	1,5	-	-	50	0,2	4	2	HSC		
0722 85 0151	1,5	1,5	-	-	75	0,2	4	2	HSC		
0722 85 02002	2	2	-	-	50	0,2	4	2	HSC		
0722 85 02102	2	2	-	-	75	0,2	4	2	HSC		
0722 85 02005	2	2	-	-	50	0,5	4	2	HSC		
0722 85 02105	2	2	-	-	75	0,5	4	2	HSC		
0722 85 03002	3	3	-	-	57	0,2	6	2	HSC		
0722 85 03102	3	3	-	-	75	0,2	6	2	HSC		
0722 85 03005	3	3	-	-	57	0,5	6	2	HSC		
0722 85 03105	3	3	-	-	75	0,5	6	2	HSC		
0722 85 04002	4	4	-	-	57	0,2	6	2	HSC		
0722 85 04102	4	4	-	-	75	0,2	6	2	HSC		
0722 85 04005	4	4	-	-	57	0,5	6	2	HSC		
0722 85 04105	4	4	-	-	75	0,5	6	2	HSC		
0722 85 05002	5	5	-	-	57	0,2	6	2	HSC		
0722 85 05102	5	5	-	-	75	0,2	6	2	HSC		
0722 85 05005	5	5	-	-	57	0,5	6	2	HSC		
0722 85 05105	5	5	-	-	75	0,5	6	2	HSC		
0722 85 06002	6	6	-	-	57	0,2	6	2	HSC		
0722 85 06102	6	6	-	-	75	0,2	6	2	HSC		
0722 85 06005	6	6	-	-	57	0,5	6	2	HSC		
0722 85 06105	6	6	-	-	75	0,5	6	2	HSC		
0722 85 06010	6	6	-	-	57	1	6	2	HSC		
0722 85 06110	6	6	-	-	75	1	6	2	HSC		
0722 85 08005	8	8	-	-	63	0,5	8	2	HSC		
0722 85 08105	8	8	-	-	90	0,5	8	2	HSC		
0722 85 08010	8	8	-	-	63	1	8	2	HSC		
0722 85 08110	8	8	-	-	90	1	8	2	HSC		
0722 85 10010	10	10	-	-	72	1	10	2	HSC		
0722 85 10110	10	10	-	-	100	1	10	2	HSC		
0722 85 10015	10	10	-	-	72	1,5	10	2	HSC		
0722 85 10115	10	10	-	-	100	1,5	10	2	HSC		
0722 85 12010	12	12	-	-	83	1	12	2	HSC		



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	0722 85 12110	12	12	-	-	110	1	12	2	HSC		
	0722 85 12020	12	12	-	-	83	2	12	2	HSC		
	0722 85 12120	12	12	-	-	110	2	12	2	HSC		

FGT SOLID CARBIDE END MILLS

VT-F-FGT-D 0307-engl.

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