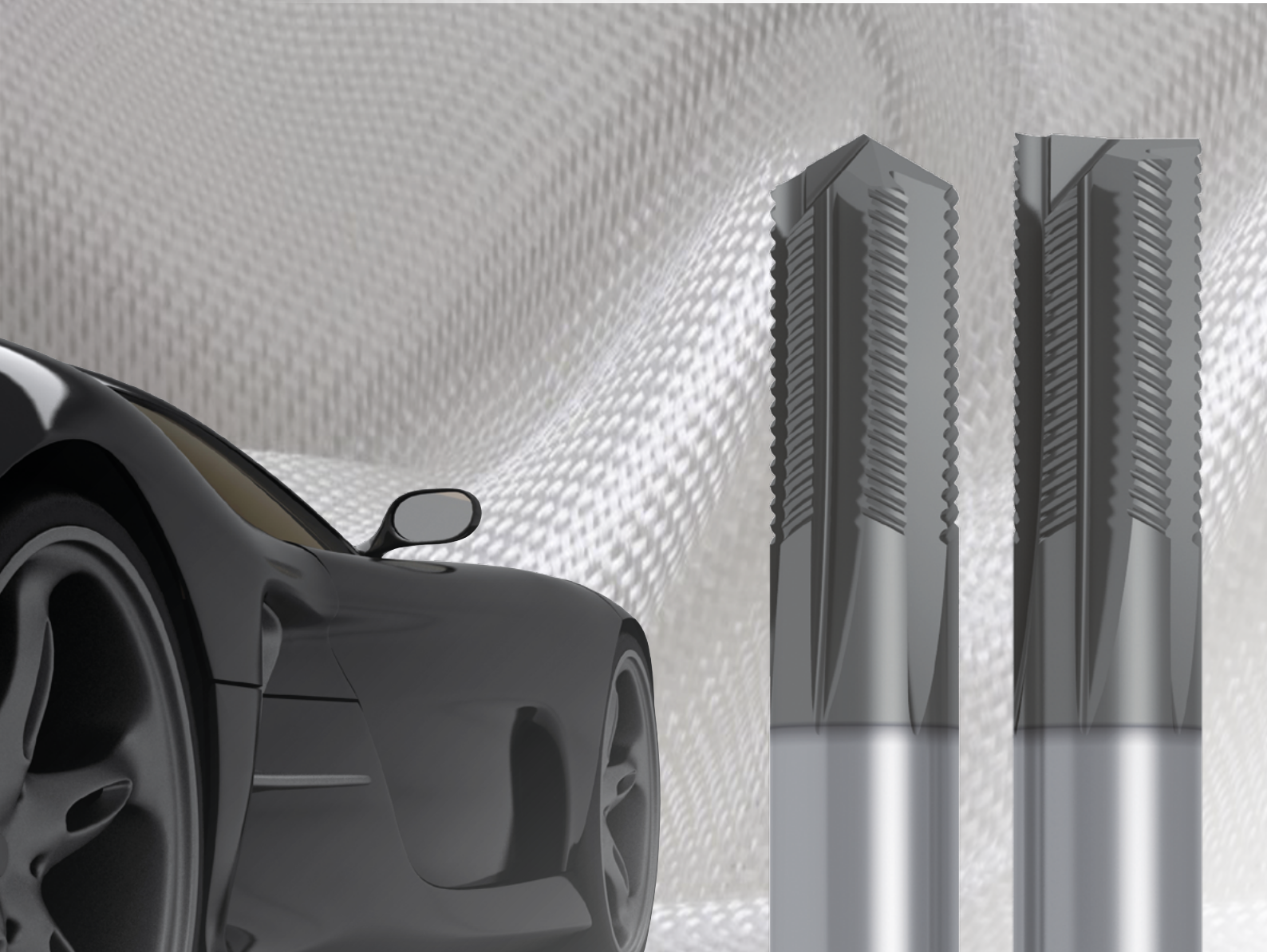


GUHRING

- »»» optimal component surface finish
- »»» edges without fibre fraying or delamination
- »»» long tool life



FR 100 milling cutters for the machining of **CFRP** and **GFRP** components

GUHRING – YOUR WORLD-WIDE PARTNER

FR 100

high-performance milling cutters for the machining of automotive CFRP and GFRP components

Economical machining of modern fibre reinforced plastic composites (FRPC) such as carbon fibre and glass fibre reinforced plastics (CFRP/GFRP) requires high-tech tool especially for series production. With this type of application the aim is foremost to prevent delamination or fibre projections as well as thermal damage. The adapted macro and micro geometry of the FR 100 milling cutter enables a reliable cutting of all fibres, auxiliary fibres and matrix parts without projections even with complex multi-layer 3D fibre structure – regardless of fibre orientation.

+ optimal MACHINING QUALITY

+ MINIMISATION of manual re-working

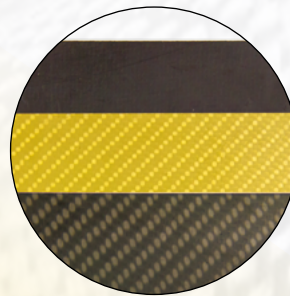
+ high PROCESS PARAMETERS

+ long TOOL LIFE



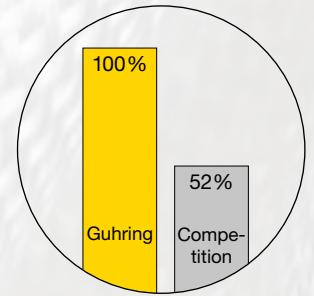
Compression cut

The new geometry of the FR 100 enables a process reliable fibre cutting in 3D fibre structures. The shearing cutting action prevents delamination, fibre fraying and thermal damage.



Surface finish quality

Machining results in CFRP, GFRP and aramid show maximum edge quality. This reduces the manual reworking and simplifies the finish machining of FRC components in series production.



Economic efficiency

In direct comparison to competitor tools FR 100 achieves up to double the tool life with considerably better component quality.

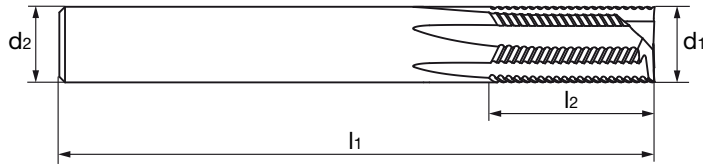
FP FR 100 end mill

Centre cutting



Tool material
Surface finish

solid carbide
Cristall



d1 e10 mm	d1 e10 inch	d2 h6 mm	l1 mm	l2 mm	z
4.000		6.000	60.0	20	4
4.775	3/16	4.775	63.5	20	4
6.000		6.000	60.0	22	4
6.350	1/4	6.350	63.5	22	4
8.000		8.000	75.0	25	6
9.525	3/8	9.525	76.2	25	6
12.700	1/2	12.700	88.9	30	8

Material number
303 054 052
303 054 053
303 054 054
303 054 055
303 054 056
303 054 057
303 054 058

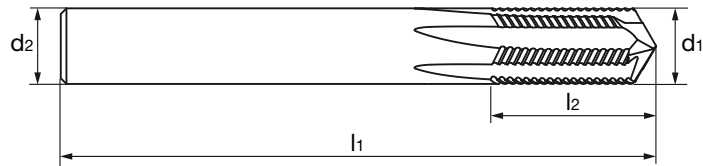
FP FR 100 end mill

With drill point



Tool material
Surface finish

solid carbide
Cristall



d1 e10 mm	d1 e10 inch	d2 h6 mm	l1 mm	l2 mm	z
4.000		6.000	60.0	20	4
4.775	3/16	4.775	63.5	20	4
6.000		6.000	60.0	22	4
6.350	1/4	6.350	63.5	22	4
8.000		8.000	75.0	25	6
9.525	3/8	9.525	76.2	25	6
12.700	1/2	12.700	88.9	30	8

Material number
303 054 059
303 054 060
303 054 061
303 054 062
303 054 063
303 054 064
303 054 065

Material	Process	Cutting speed	f (mm/rev.)						
			4	4.775	6	6.350	8	9.525	12.700
CFRP. GFRP Aramid		250-450 m/min	0.120	0.140	0.160	0.160	0.300	0.300	0.400
CFRP. GFRP Aramid		125-150 m/min	0.070	0.080	0.100	0.100	0.120	0.150	0.180

DRILLING

TAPPING/THREAD MILLING/
FLUTELESS TAPPING

MILLING

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