

# GUHRING



- no delamination
- burr-free surfaces
- long tool life



## **CR 100** Milling Cutters for fiber-reinforced plastics

GUHRING - YOUR WORLD-WIDE PARTNER

# CR 100 – The efficient high-performance milling cutter for composite machining

The economical machining of modern materials such as carbon fibre reinforced plastics (CFRP) requires high-tech tools operating extremely efficiently. Above all, it is important to avoid delamination or fibre projections on the component as well as thermal damage. Especially with CFRP types with less resin content and unidirectional orientation of fibres, the fibres are very easily torn from the composite during machining.

Typical delamination on a milled CFRP workpiece edge



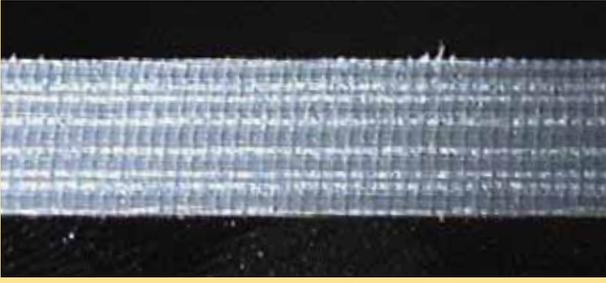
Milled CFRP workpiece edge without delamination machined with a Guhring CR 100 end mill



Therefore, Guhring developed an innovative cutting edge geometry for the CR 100 end mill. Combined with a diamond coating it enables a reliable machining process of materials without delamination with smooth running and high cutting speeds.

- Your advantages
- ⇒ no delamination
  - ⇒ very good, burr-free surfaces
  - ⇒ long tool life
  - ⇒ high feed rates and cutting speeds
  - ⇒ smooth running

# APPLICATION EXAMPLE



Workpiece: CFRP components

Tool: CR 100 Ø 8 mm (no. 6719)

Application / parameters:

slotting, roughing and edging in one pass

Coolant: air

Feed: 3,600 mm/min

No. of revolutions: 5,000 n/min

## Result:

⇒ high dimensional stability  
⇒ no delamination

⇒ increase of tool life  
⇒ increase of removal rate



# For each application the appropriate geometry

## CR 100

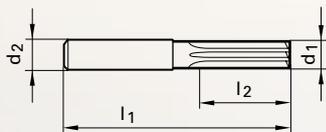
Guhring no.

6717

Guhring std.  
shank to DIN 6535 HA  
VHM ultrafine  
diamond coated



**CR 100**  
**without end face teeth**  
for slotting and edging



d1 (e10)	d2 (h6)	l1	l2	Z
mm	mm	mm	mm	
4.000	6.000	57.00	10.00	6
6.000	6.000	65.00	15.00	8
8.000	8.000	75.00	20.00	10
10.000	10.000	80.00	25.00	12
12.000	12.000	93.00	32.00	14
16.000	16.000	108.00	34.00	14

Availability



## CR 100

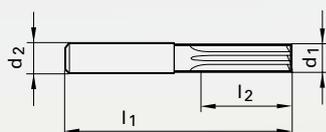
Guhring no.

6719

centre cutting  
Guhring std.  
shank to DIN 6535 HA  
VHM ultrafine  
diamond coated



**CR 100**  
**centre cutting**  
for slotting, edging and  
oblique plunging



d1 (e10)	d2 (h6)	l1	l2	Z
mm	mm	mm	mm	
4.000	6.000	57.00	10.00	6
6.000	6.000	65.00	15.00	8
8.000	8.000	75.00	20.00	10
10.000	10.000	80.00	25.00	12
12.000	12.000	93.00	32.00	14
16.000	16.000	108.00	34.00	14

Availability



## Cutting rates

Material	Type of application	Cutting speed ( $v_c$ )	fz (mm/min)					
			4	6	8	10	12	16
fiber-reinforced plastics, CFRP / GFK / aramid fibres	<b>Slotting*</b> $a_p 1 \times d, a_e 1 \times d$	140	0.015	0.030	0.040	0.050	0.060	0.080
fiber-reinforced plastics, CFRP / GFK / aramid fibres	<b>Roughing*</b> $a_p 2 \times d, a_e 0.5 \times d$	200	0.020	0.035	0.050	0.060	0.070	0.090
Material	Type of application	Cutting speed ( $v_c$ )	F/U (mm)					
			4	6	8	10	12	16
fiber-reinforced plastics, CFRP / GFK / aramid fibres	<b>Drilling</b> $a_p 1 \times d$ (with deeper holes always peck after $0.5 \times d$ )	125	0.070	0.100	0.120	0.150	0.180	0.200

\*Optimal chip evacuation with compressed air and extraction reduces machining temperature and increases tool life.

# CR 100

Guhring no.

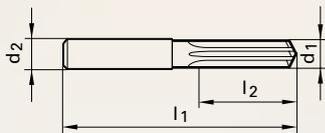
6720

with 118° drill point  
Guhring std.  
shank to DIN 6535 HA  
VHM ultrafine  
diamond coated



## CR 100 with drill point

Especially for plunging and subsequent profiling operations.



d1 (e10)	d2 (h6)	l1	l2	Z
mm	mm	mm	mm	
4.000	4.000	55.00	12.00	6
6.000	6.000	65.00	18.00	8
8.000	8.000	75.00	24.00	10
10.000	10.000	80.00	30.00	12
12.000	12.000	93.00	36.00	14
16.000	16.000	108.00	48.00	14

Availability



# CR 100

Guhring no.

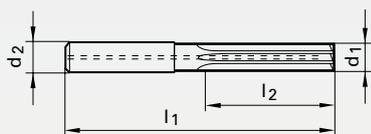
6718

with rear facing air-cooling ducts  
Guhring std.  
shank to DIN 6535 HA  
VHM ultrafine  
diamond coated



## CR 100 Air without end face teeth

Special, rear facing air-cooling ducts ensure an optimal evacuation of the CFRP dust.



d1 (e10)	d2 (h6)	l1	l2	Z
mm	mm	mm	mm	
6.000	6.000	70.00	24.00	8
8.000	8.000	80.00	32.00	10
10.000	10.000	90.00	40.00	12
12.000	12.000	110.00	48.00	14
16.000	16.000	130.00	64.00	14

Availability



# Guhring Tools for the machining of CFRP

Guhring's CR 100 high-performance end mill for CFRP and similar composites is the optimal solution for milling applications in the aerospace industry, the energy technology, the automotive and ship building industry and many other areas.

In addition to the CR 100 high-performance end mill Guhring has further tools for the machining of carbon fibre reinforced plastics included in the range.

Together with the customer, Guhring also develops made-to-measure special tools optimally adapted to the relevant requirements. We will be happy to advise you on your application and the correct tool. Please contact us!



# GUHRING

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