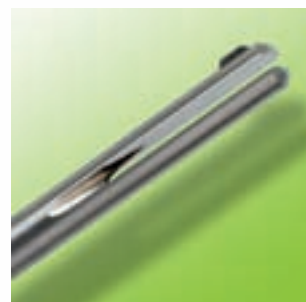




## CARBIDE DE-BURRING TOOLS

- Solid carbide de-burring fork EW 100 G standard
- Solid carbide de-burring spiral EW 100 S semistandard
- Solid carbide de-burring lance EW 100 L and solid carbide de-burring milling cutter EW 100 F special solutions



## A first for internal de-burring: Carbide tools

Guhring is the first manufacturer world-wide to offer carbide tools for internal and external de-burring operations. This, however, does not involve machining in the fullest sense of the word - as with, for example, conventional drills, milling cutters, taps, reamers and countersinks. Instead, the de-burring tool very carefully shaves off the burr and can also, if required, create a chamfer.

For the quality of a workpiece – especially with intersecting and cross holes – then internal de-burring is gaining more and more importance. This applies to, for example, oil galleries in modern high performance engines, where an optimal flow rate is dependent on perfect internal de-burring. Highly accurate de-burring and producing a chamfer is also increasingly required in crankshafts, valve blocks, steering arms, rotational housings, drive elements, injector nozzles and brake cylinders.

Whilst the de-burring of the entry to the hole hardly causes a problem, the internal de-burring of through holes in many cases involves an extensive operation that is often carried out manually and is time and cost intensive.

With the newly developed and patented carbide tools for internal de-burring, Guhring is providing the possibility to automate and rationalise this production step applying high performance tools.

There is a choice of four solutions:

1. De-burring fork EW 100 G - standard tool
2. De-burring spiral EW 100 S - semi-standard tool
3. De-burring lance EW 100 L - special tool for internal de-burring through deformation caused by very high pressure coolant.
4. De-burring milling cutter EW 100 F - special tool for external de-burring.

This not only means a considerable cost and time saving for the production, but also, more importantly, improved quality and process reliability. Moreover Guhring offers a de-burring milling cutter for external de-burring to customer's specific application tasks.



Solid carbide de-burring fork EW 100 G



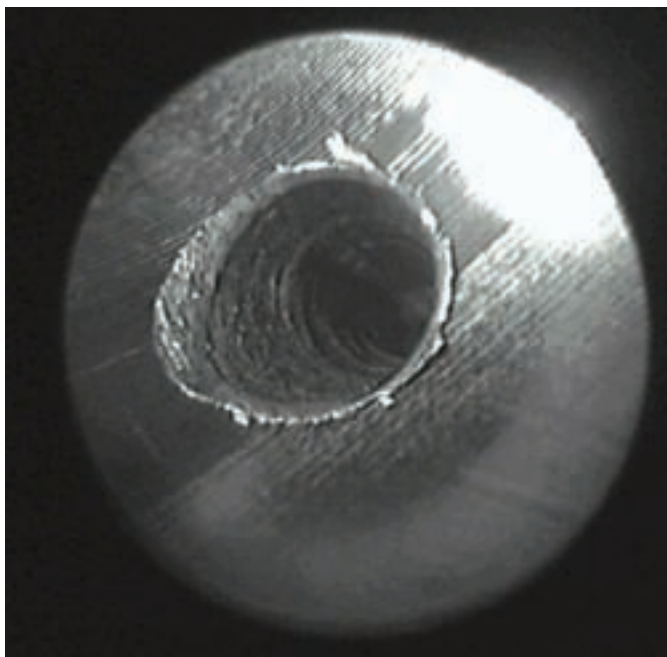
Solid carbide de-burring spiral EW 100 S



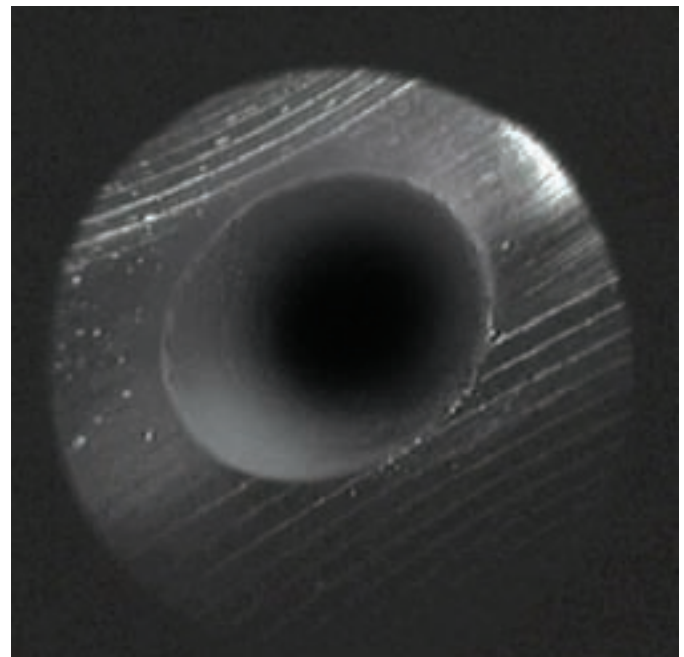
Solid carbide de-burring lance EW 100 L



Solid carbide de-burring milling cutter EW 100 F



Exit of through hole prior to ...



...and following machining with de-burring lance.

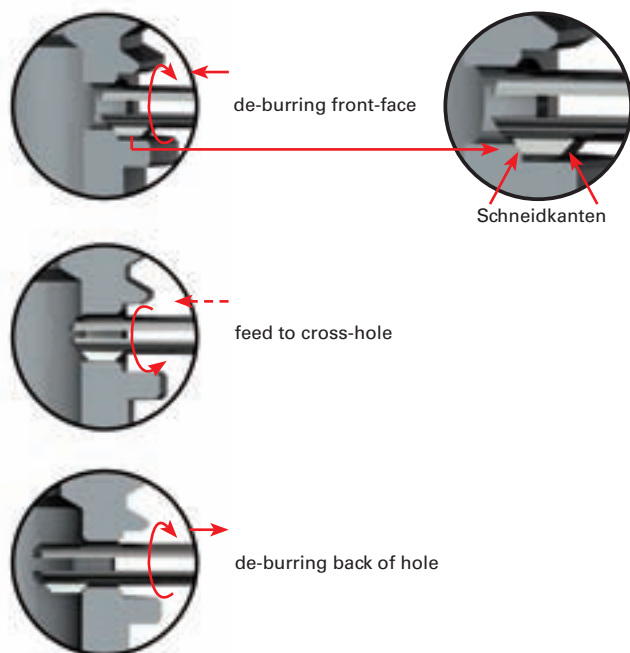
## De-burring fork EW 100 G

At EMO 2003 Guhring presented their new solid carbide de-burring tools for internal and external de-burring operations. The de-burring fork EW 100 G has now become firmly established as a standard tool!

### Advantages

- cost saving. The standard tool offers outstanding price advantages in comparison with special tooling.
- universal tooling for milling, turning and robotic applications. The range of 0.25 mm enables the application of our de-burring fork in holes with large tolerances. Reducing set-up time and cost!
- increased production. De-burring fork EW 100 G de-burrs automatically with one set-up and short cycle times. Expensive and extensive manual operations are no longer required.

### Operation



### Step by step:

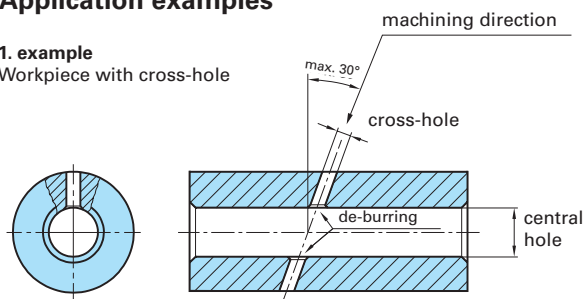
The automatically internal and external de-burring with de-burring fork EW 100 G is an easy and cost saving alternative to common, extensive manual operations. Just one tool is required for all machining steps.

Ø range (mm)	Vc m/min	fu (mm)
< Ø 4	8 - 10	0.1 - 0.2
Ø 4 - < Ø 6	10 - 14	0.1 - 0.2
6 - Ø 8	14 - 20	0.1 - 0.2

### Application examples

#### 1. example

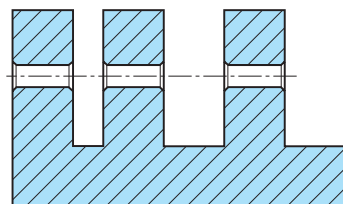
Workpiece with cross-hole



Please note when machining workpieces with cross-holes:  
 – the cross-hole must be 3.5 to 4 times smaller than the central hole  
 – the diameter of the cross-hole must be 40% larger than the cutting length  $l_6$

#### 2. example

Workpiece with multi-interrupted cut



### Universal application:

The new ex-stock de-burring fork machines workpieces with one cross-hole as well as workpieces with multi-interrupted cut and produces high quality de-burred faces and ends of the hole.

### Important:

Please note, that the cutting parameters are recommendations. They can be adapted to higher and lower cutting parameters.



## De-burring fork EW 100 G - program standard

with re-inforced plain shank to DIN 6535 HA for clamping in hydraulic chucks and shrink fit chucks

										Guhring no.	<b>4101</b>
										Standard	Guhring std.
										Tool material	<b>Solid carbide</b>
										Carbide grade	K
										Surface	
										Type	<b>EW 100 G</b>
Discount group	<b>120</b>										
											<b>Availability</b>
nom. Ø	d1	for Ø range	d2	l1	l2	l3	l4	l9	h1		●
mm	mm	mm	mm	mm	mm	mm	mm	mm	mm		
2.000	1.900	1.91 - 2.15	6.000	120.00	69.00	36.00	1.00	2.05	0.35		
2.250	2.100	2.16 - 2.40	6.000	120.00	69.00	36.00	1.50	2.60	0.40		
2.500	2.400	2.41 - 2.70	6.000	120.00	69.00	36.00	1.50	2.90	0.40		
2.750	2.600	2.71 - 2.90	6.000	130.00	79.00	36.00	1.50	2.95	0.45		
3.000	2.900	2.91 - 3.25	6.000	130.00	79.00	36.00	2.00	3.65	0.45		
3.500	3.200	3.26 - 3.60	10.000	135.00	80.00	40.00	2.00	3.80	0.60		
4.000	3.600	3.61 - 4.25	10.000	135.00	80.00	40.00	2.00	4.10	0.70		
4.500	4.200	4.26 - 4.75	10.000	135.00	80.00	40.00	2.50	4.60	0.70		
5.000	4.700	4.76 - 5.30	10.000	145.00	80.00	40.00	2.50	4.85	0.75		
5.500	5.200	5.31 - 5.80	10.000	145.00	90.00	40.00	2.50	4.85	0.75		
6.000	5.600	5.81 - 6.20	10.000	155.00	90.00	40.00	3.00	5.80	0.80		
6.500	6.000	6.21 - 6.70	16.000	165.00	102.00	48.00	3.00	5.90	0.90		
7.000	6.500	6.71 - 7.10	16.000	165.00	102.00	48.00	3.00	5.85	0.85		
7.500	6.900	7.11 - 7.60	16.000	165.00	102.00	48.00	3.50	6.95	0.95		
8.000	7.300	7.61 - 8.05	16.000	165.00	102.00	48.00	3.50	7.00	1.00		



steam tempered



nitrited



TiAlN



TiCN



TiN



AlCrN



MolyGlide

## Solid carbide de-burring spiral EW 100 S

For internal de-burring through the central hole, Guhring has developed the solid carbide de-burring spiral EW 100 S. The slotted tool is available as a semi-standard tool with immediate effect, i. e. inside the diameter ranges specified in the adjacent table tools can be supplied in one-hundredth increments with the respective shank and length dimensions as well as number of cutting edges with short delivery times and at favourable prices. In addition, at any time other customer specific solutions as special tools, for example, with further reach or other shank diameters.

The principle of function of the de-burring spiral EW 100 S is based on the pre-tension of the grooved cutting portion. In the area of the cutting portion, the de-burring spiral has a fractionally larger diameter than the bore to be machined. Through the run-on, the grooved cutting portion is pressed together on entry into the hole to be machined and thereby pre-tensioned. The pre-tension ensures that inside the bore and especially in the area of the cross-hole to be de-burred there is a perfect fit of the cutting spiral at the wall of the bore or the edges of the cross-hole respectively. The burr

in the cross-hole is subsequently accurately and cleanly peeled off at the root. Thereby very small chips are created that can be evacuated problem-free from the hole.

Pre-requisite for the development of the de-burring spiral EW 100 S was a carbide as tool material that possesses an accordingly low rigidity and permits the necessary deformation in the cutting edge area. Thanks to Guhring's carbide expertise in development and production, then a carbide with such special attributes is available.

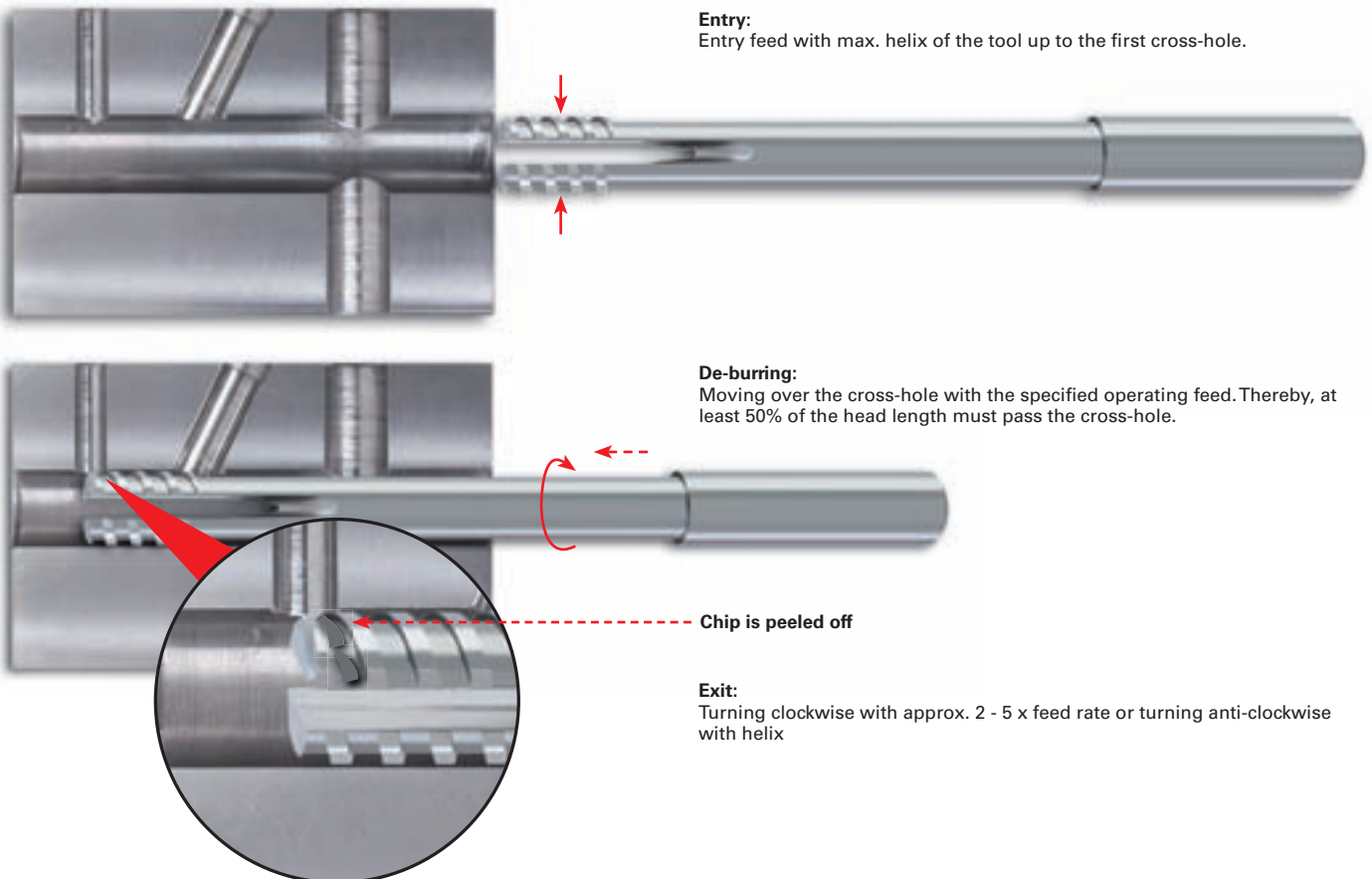
### Cutting parameters de-burring spiral

Ø range (mm)	Vc m/min	fu (mm)
< Ø 8	15 - 25	0.2 - 0.3
≥ Ø 8	15 - 25	0.4 - 0.8

### Important:

Please note, that the cutting parameters are recommendations. They can be adapted to higher and lower cutting parameters.

### Die Funktionsweise



### Entry:

Entry feed with max. helix of the tool up to the first cross-hole.

### De-burring:

Moving over the cross-hole with the specified operating feed. Thereby, at least 50% of the head length must pass the cross-hole.

### Chip is peeled off

### Exit:

Turning clockwise with approx. 2 - 5 x feed rate or turning anti-clockwise with helix

# Solid carbide de-burring spiral EW 100 S - program semistandard

Re-inforced shank to DIN 6535 HA or extra length shank for extremely deep holes



Solutions for extremely deep holes

							Standard
							Tool material
							Carbide grade
							Surface
							Type
							Discount group
							Special tool
							Guhring std.
							Solid carbide
							K
							○
							EW 100 S
							120
Dimensions d1 from ... to 1/100 increments	l4	Length Type 1		Length Type 2		Shank d2 h6	Availability
mm	mm	l1	l2	l1	l2	mm	
3.00 - 4.10	12	68.00	40			4.00	on request
4.11 - 6.10	12	76.00	40			6.00	on request
6.11 - 8.10	16	101.00	65	76.00	40	8.00	on request
8.11 - 10.10	19	101.00	61	76.00	36	10.00	on request
10.11 - 12.10	19	130.00	85	80.00	35	12.00	on request
12.11 - 14.10	22	130.00	85	80.00	35	14.00	on request
14.11 - 16.10	22	150.00	102	90.00	42	16.00	on request