

# GUHRING

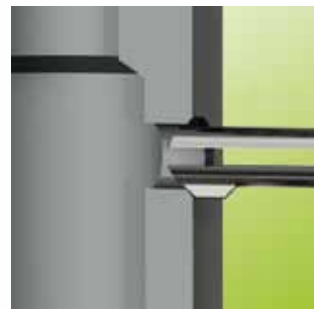
## 2010



**NEW:**  
EW 100 VR

## DE-BURRING TOOLS

- EW 100 G de-burring fork - standard tool
- EW 100 VR front/back de-burrer - standard tool
- EW 100 S de-burring spiral as semi-standard tool
- EW 100 L de-burring lance and EW 100 F de-burring milling cutter - special solutions



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

Guhring is the first manufacturer world-wide to offer carbide tools for exit 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 the workpiece – especially with intersecting and cross holes – in particular exit 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 exit 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 of the hole hardly causes a problem, exit de-burring of drilled 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 five solutions:

1. De-burring fork EW 100 G - standard tool
2. EW 100 VR front/back de-burrer - standard tool
3. De-burring spiral EW 100 S - semi-standard tool
4. De-burring lance EW 100 L - special tool  
for internal de-burring through deformation caused by very high pressure coolant.
5. 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



EW 100 VR front/back de-burrer



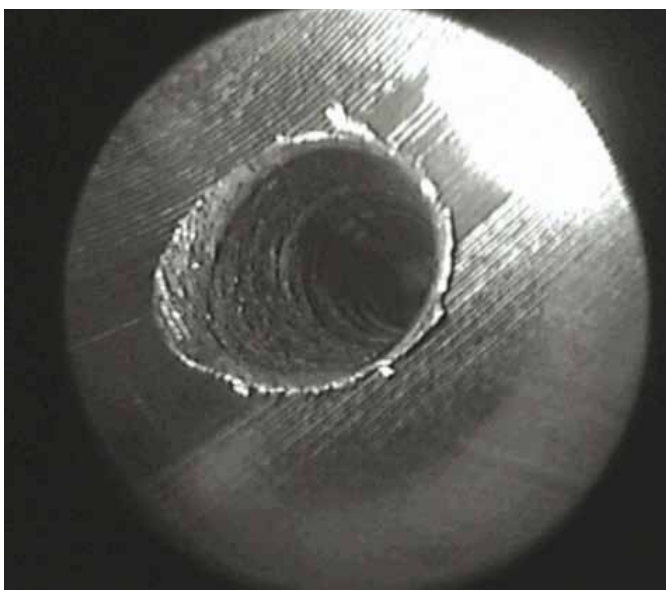
Solid carbide de-burring spiral EW 100 S



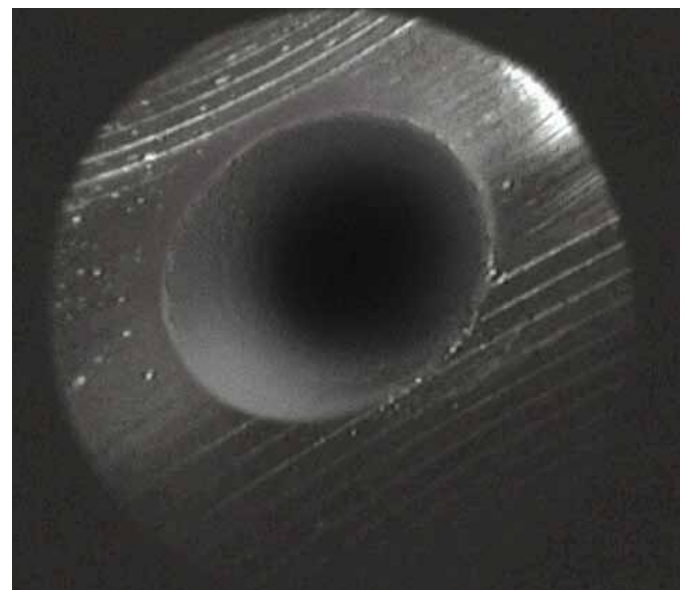
Solid carbide de-burring lance EW 100 L



Solid carbide de-burring milling cutter EW 100 F



Exit of hole drilled in component prior to ...



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

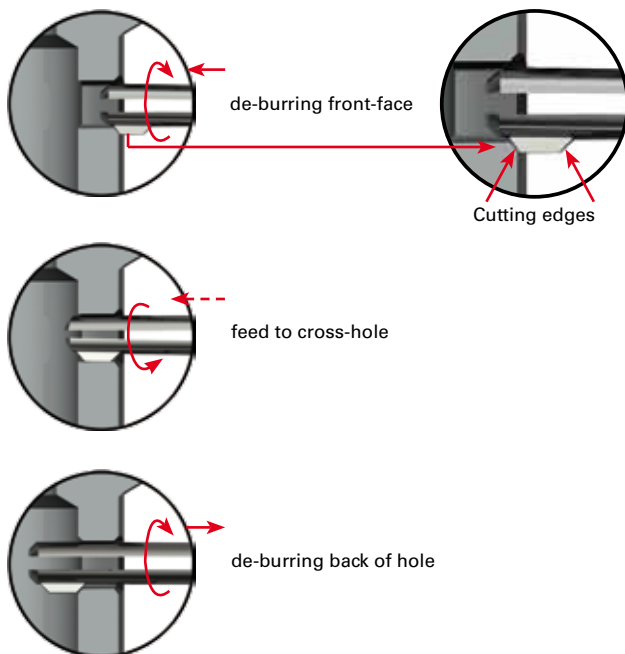
## EW 100 G de-burring fork

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



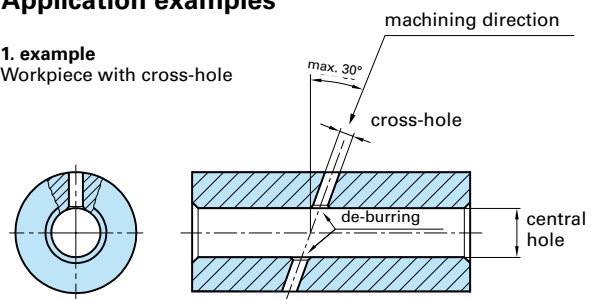
### Step by step:

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.

### Application examples

#### 1. example

Workpiece with cross-hole

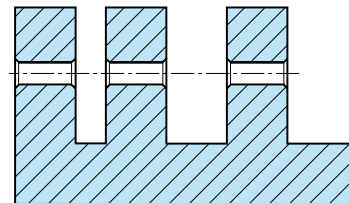


Please note when machining workpieces with cross-holes:

- the diameter of the cross-hole must be maximal 35% of the central hole
- the diameter of the cross-hole must be 40% larger than the cutting length  $l_4$

#### 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.

### Cutting parameters de-burring fork

| $\varnothing$ range (mm)          | $v_c$ m/min | $f_u$ (mm) |
|-----------------------------------|-------------|------------|
| $< \varnothing 4$                 | 8 - 10      | 0.1 - 0.2  |
| $\varnothing 4 - < \varnothing 6$ | 10 - 14     | 0.1 - 0.2  |
| $6 - \varnothing 8$               | 14 - 20     | 0.1 - 0.2  |

### Important:

Please note that the cutting parameters are recommendations. They can be adjusted up or down.



# EW 100 G de-burring fork – standard tool

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

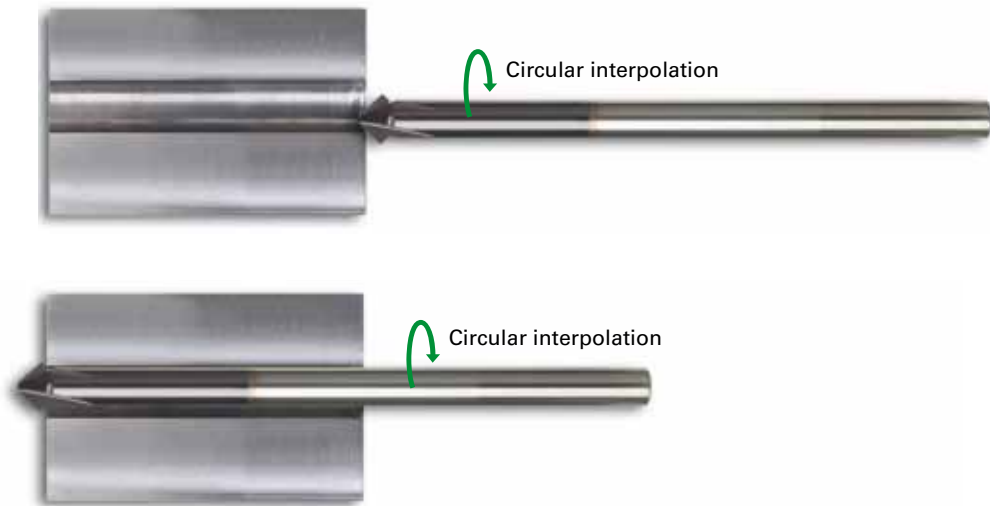
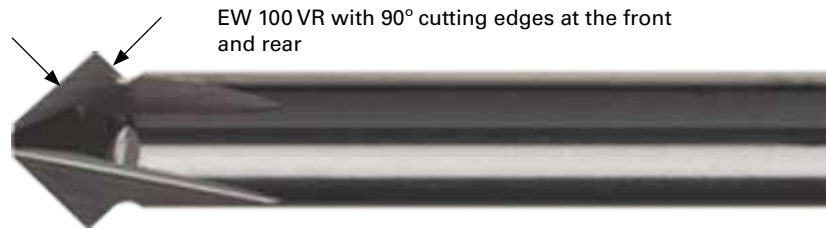
|                                    |                 |        |             |             |        |        |       |      |      |      |                       |                      |
|------------------------------------|-----------------|--------|-------------|-------------|--------|--------|-------|------|------|------|-----------------------|----------------------|
| Order no. = Guhring no. + code no. |                 |        |             |             |        |        |       |      |      |      | <b>Guhring no.</b>    | <b>4101</b>          |
|                                    |                 |        |             |             |        |        |       |      |      |      | <b>Standard</b>       | <b>Guhring std.</b>  |
|                                    |                 |        |             |             |        |        |       |      |      |      | <b>Tool material</b>  | <b>Solid carbide</b> |
|                                    |                 |        |             |             |        |        |       |      |      |      | <b>Carbide grade</b>  | <b>K</b>             |
|                                    |                 |        |             |             |        |        |       |      |      |      | <b>Surface</b>        |                      |
|                                    |                 |        |             |             |        |        |       |      |      |      | <b>Type</b>           | <b>EW 100 G</b>      |
|                                    |                 |        |             |             |        |        |       |      |      |      | <b>Discount group</b> | <b>120</b>           |
|                                    |                 |        |             |             |        |        |       |      |      |      |                       |                      |
|                                    |                 |        |             |             |        |        |       |      |      |      |                       |                      |
|                                    | <b>Code no.</b> | nom. Ø | d1          | for Ø range | d2     | l1     | l2    | l3   | l4   | l9   | h1                    | <b>Availability</b>  |
|                                    | mm              | mm     | mm          | mm          | mm     | mm     | mm    | mm   | mm   | mm   | ●                     |                      |
| 2,000                              | 2.000           | 1.900  | 1.91 - 2.15 | 6.000       | 120.00 | 69.00  | 36.00 | 1.00 | 2.05 | 0.35 | ●                     |                      |
| 2,250                              | 2.250           | 2.100  | 2.16 - 2.40 | 6.000       | 120.00 | 69.00  | 36.00 | 1.50 | 2.60 | 0.40 | ●                     |                      |
| 2,500                              | 2.500           | 2.400  | 2.41 - 2.70 | 6.000       | 120.00 | 69.00  | 36.00 | 1.50 | 2.90 | 0.40 | ●                     |                      |
| 2,750                              | 2.750           | 2.600  | 2.71 - 2.90 | 6.000       | 130.00 | 79.00  | 36.00 | 1.50 | 2.95 | 0.45 | ●                     |                      |
| 3,000                              | 3.000           | 2.900  | 2.91 - 3.25 | 6.000       | 130.00 | 79.00  | 36.00 | 2.00 | 3.65 | 0.45 | ●                     |                      |
| 3,500                              | 3.500           | 3.200  | 3.26 - 3.60 | 10.000      | 135.00 | 80.00  | 40.00 | 2.00 | 3.80 | 0.60 | ●                     |                      |
| 4,000                              | 4.000           | 3.600  | 3.61 - 4.25 | 10.000      | 135.00 | 80.00  | 40.00 | 2.00 | 4.10 | 0.70 | ●                     |                      |
| 4,500                              | 4.500           | 4.200  | 4.26 - 4.75 | 10.000      | 135.00 | 80.00  | 40.00 | 2.50 | 4.60 | 0.70 | ●                     |                      |
| 5,000                              | 5.000           | 4.700  | 4.76 - 5.30 | 10.000      | 145.00 | 80.00  | 40.00 | 2.50 | 4.85 | 0.75 | ●                     |                      |
| 5,500                              | 5.500           | 5.200  | 5.31 - 5.80 | 10.000      | 145.00 | 90.00  | 40.00 | 2.50 | 4.85 | 0.75 | ●                     |                      |
| 6,000                              | 6.000           | 5.600  | 5.81 - 6.20 | 10.000      | 155.00 | 90.00  | 40.00 | 3.00 | 5.80 | 0.80 | ●                     |                      |
| 6,500                              | 6.500           | 6.000  | 6.21 - 6.70 | 16.000      | 165.00 | 102.00 | 48.00 | 3.00 | 5.90 | 0.90 | ●                     |                      |
| 7,000                              | 7.000           | 6.500  | 6.71 - 7.10 | 16.000      | 165.00 | 102.00 | 48.00 | 3.00 | 5.85 | 0.85 | ●                     |                      |
| 7,500                              | 7.500           | 6.900  | 7.11 - 7.60 | 16.000      | 165.00 | 102.00 | 48.00 | 3.50 | 6.95 | 0.95 | ●                     |                      |
| 8,000                              | 8.000           | 7.300  | 7.61 - 8.05 | 16.000      | 165.00 | 102.00 | 48.00 | 3.50 | 7.00 | 1.00 | ●                     |                      |

○ bright   
 ◐ steam tempered   
 ● nitrided   
 A TiAlN   
 C TiCN   
 S TiN   
 P AlCrN   
 M MolyGlide

## EW 100 VR front/back de-burrer

Guhring's solid carbide EW 100 VR front/back de-burrer with TiAlN-coating as a standard tool enables de-burring as well as chamfering of hole entry and exit with a 90° angle. EW 100 VR possesses a milling head with a

front and back cutting region. To de-burr or chamfer the tool performs a circular milling movement along the hole edge or contour.



### Cutting parameters for front/back de-burrer

| Material group                  | Tens. strength Hard-<br>MPa (N/mm <sup>2</sup> ) ness | v <sub>c</sub><br>(m/min) | Feed col.<br>no. |
|---------------------------------|---|---------------------------|------------------|
| Steels                          | < 850   | 120 - 200                 | 71               |
|                                 | 850-1200  | 100 - 180                 | 71               |
|                                 | > 1200  | 80 - 140                  | 71               |
| Hardened steels                 | < 54 HRC  | 60 - 120                  | 71               |
|                                 | 54-60 HRC   | 40 - 80                   | 71               |
| Stainless/acid-resistant steels | < 850   | 80 - 120                  | 71               |
| Nickel-based alloys             | < 1300  | 30 - 60                   | 71               |
| Ti-alloys                       | < 1300  | 50 - 100                  | 71               |
| Cast materials                  | < 240 HB30  | 120 - 180                 | 72               |
|                                 | > 240 HB30  | 100 - 160                 | 72               |
| Al wrought alloys < 3% Si       |   | 150 - 250                 | 72               |
| Al cast alloys > 3% Si          |   | 100 - 200                 | 72               |
| Magnesium alloys                |   | 150 - 250                 | 72               |
| Non-ferrous alloys              | < 850   | 30 - 200                  | 72               |

### Feed column no. (mm/rev)

| Ø      | 71    | 72    |
|--------|-------|-------|
| ≤ 3.00 | 0.060 | 0.080 |
| 4.00   | 0.100 | 0.125 |
| 5.00   | 0.100 | 0.125 |
| 6.30   | 0.125 | 0.160 |
| 8.00   | 0.160 | 0.200 |
| 10.00  | 0.200 | 0.250 |
| 12.50  | 0.200 | 0.250 |

### Important:

Please note that the cutting parameters are recommendations. They can be adjusted up or down.





## Solid carbide de-burring spiral EW 100 S

For internal de-burring of cross-holes 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) | $v_c$ m/min | $f_u$ (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

With shank to DIN 6535 HA or extra length shank for extremely deep holes



Solutions for extremely deep holes

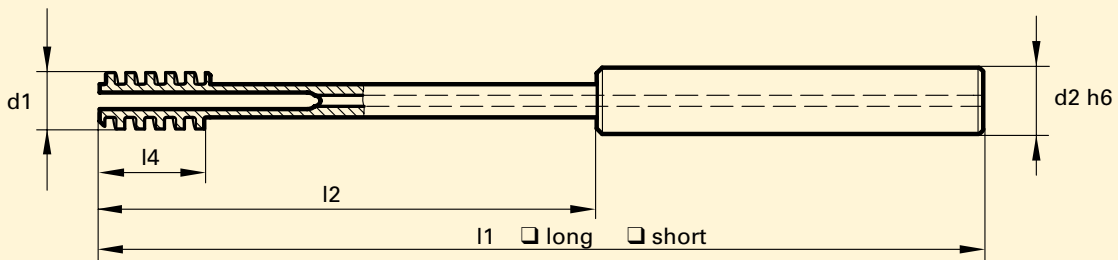
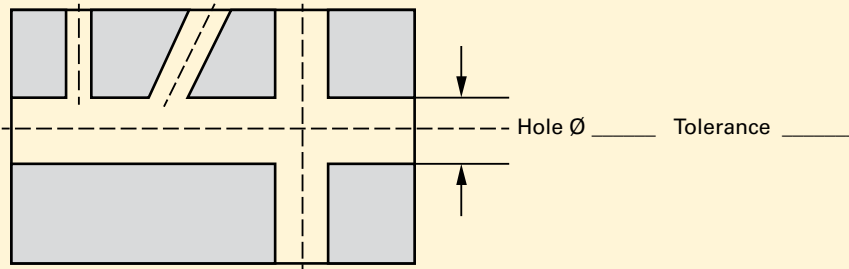
|  |    |                  |     |                  |    |                |   |
|--|----|------------------|-----|------------------|----|----------------|---|
| <p><b>Standard</b></p> <p><b>Tool material</b></p> <p><b>Carbide grade</b></p> <p><b>Surface</b></p> <p><b>Type</b></p> <p><b>Discount group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

# Solid carbide de-burring spiral EW 100 S semistandard

**Fax Inquiry / Order**  
**simply photo-copy, complete and fax...**

Inquiry       Order       Repeat order, no. of initial order

Number required: \_\_\_\_\_ items



The production  $\varnothing$  d1 of the de-burring spiral is determined by the hole  $\varnothing$  of the component. Shank  $\varnothing$  and lengths are dependent on the production  $\varnothing$  and the table below.

| Dimensions<br>d1<br>from ... to<br>1/100 increments | l4 | Length<br>long version |     | Length<br>short version |    | Shank<br>d2 h6 |
|---|----|------------------------|-----|-------------------------|----|----------------|
|   |    | l1                     | l2  | l1                      | l2 |                |
| mm  | mm | mm                     | mm  | mm                      | mm | mm             |
| 3.00 - 4.10   | 12 | 68.00                  | 40  |                         |    | 4.00           |
| 4.11 - 6.10   | 12 | 76.00                  | 40  |                         |    | 6.00           |
| 6.11 - 8.10   | 16 | 101.00                 | 65  | 76.00                   | 40 | 8.00           |
| 8.11 - 10.10  | 19 | 101.00                 | 61  | 76.00                   | 36 | 10.00          |
| 10.11 - 12.10                                       | 19 | 130.00                 | 85  | 80.00                   | 35 | 12.00          |
| 12.11 - 14.10                                       | 22 | 130.00                 | 85  | 80.00                   | 35 | 14.00          |
| 14.11 - 16.10                                       | 22 | 150.00                 | 102 | 90.00                   | 42 | 16.00          |

Company: \_\_\_\_\_

Company stamp: \_\_\_\_\_

Telephone/fax: \_\_\_\_\_

Contact: \_\_\_\_\_

Signature: \_\_\_\_\_

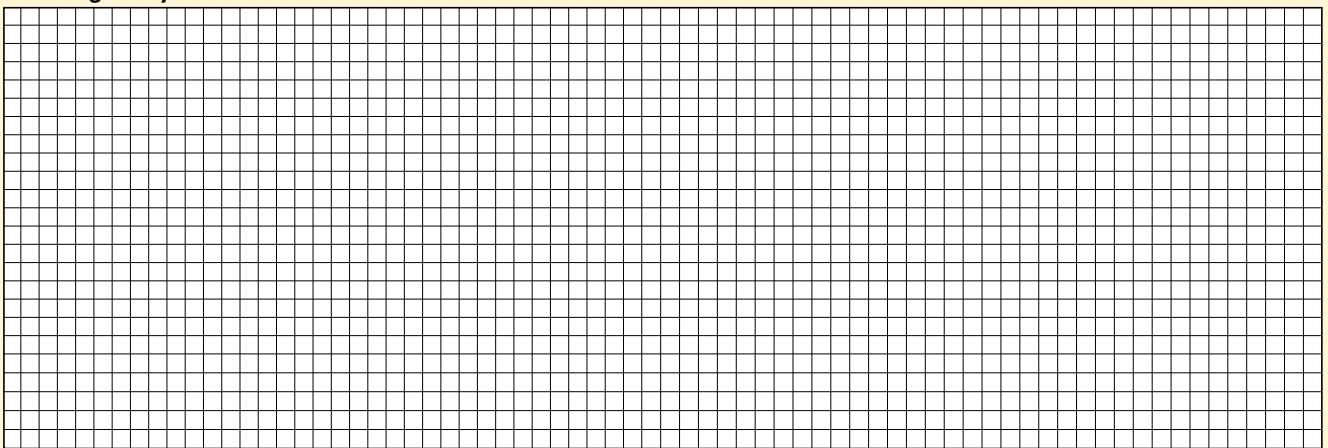
# Special solutions

**Fax Inquiry / Order**  
**simply photo-copy, complete and fax...**

Inquiry       Order       Repeat order, no. of initial order

- |                                   |                                    |   |
|-----------------------------------|------------------------------------|---|
| <input type="checkbox"/> EW 100 G | <input type="checkbox"/> EW 100 VR | <input type="checkbox"/> EW 100 S   |
| <input type="checkbox"/> EW 100 L | <input type="checkbox"/> EW 100 F  | <input type="checkbox"/> Please recommend the optimal tool for the operation described below. |

**Drawing of lay-out**



**Machining:**      De-burring       Entry       Exit       Cross-hole

                         Milling       Entry, angle \_\_\_\_\_°       Exit, angle \_\_\_\_\_°

**Workpiece:**      Hole Ø: \_\_\_\_\_mm      Hole depth: \_\_\_\_\_mm

                         Cross-hole:       no       yes, to \_\_\_\_\_mm

                         Material/designation: \_\_\_\_\_

**Maschine type:**       Machining centre       Turning centre       others: \_\_\_\_\_

**Shank:**       HA       HE       others: \_\_\_\_\_

**Coolant:**       internal       external

Oil       Soluble oil       MQL

                         Pressure: \_\_\_\_\_bar      Quantity: \_\_\_\_\_l/min

**Company:**      \_\_\_\_\_      **Company stamp:**

**Telephone/fax:**      \_\_\_\_\_

**Contact:**      \_\_\_\_\_      **Signature:** \_\_\_\_\_

# GUHRING

## Guhring oHG

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Fax: +49 74 31 17-2 79  
www.guehring.de

## OUR PRODUCT RANGE:

### 1. DRILLING TOOLS IN HIGH SPEED STEEL AND CARBIDE

Twist drills  
Ratio drills  
Micro-precision drills  
Oil feed drills  
Subland drills  
Centre drills  
Core drills  
Gun drills  
Drilling systems with interchangeable inserts

### 2. THREAD CUTTING TOOLS IN HIGH SPEED STEEL AND CARBIDE

Machine taps and fluteless taps  
Oil feed taps and oil feed fluteless taps  
Hand taps  
Thread milling cutters  
Dies

### 3. MILLING CUTTERS IN HIGH SPEED STEEL AND CARBIDE

Ratio end mills  
Slot drills  
End mills  
Radius profile cutters  
Hard profile cutters  
Diesinking cutters

### 4. REAMING TOOLS IN HIGH SPEED STEEL AND CARBIDE

NC machine chucking reamers  
Machine and machine chucking reamers  
Taper pin reamers  
Hand reamers

### 5. COUNTERSINKING TOOLS IN HIGH SPEED STEEL AND CARBIDE

Countersinks, counterbores and spot facers  
Short counterbores, back spot facers  
De-burring tools

### 6. CUTTING TOOLS IN ULTRA-HARD MATERIALS

Face milling cutter PF 1000  
Cermet and ceramic tools  
PCD- and PCB-tipped tools

### 7. COATED TOOLS

A-tools, TiAlN-coated  
SuperA-tools, AlTiN-coated  
C-tools, TiCN-coated  
F-tools, FIRE-coated (allround)  
P-tools, AlCrNN-coated  
S-tools, TiN-coated (allround)  
M-tools, MolyGlide-coated

### 8. MODULAR TOOLING SYSTEMS

#### TOOLING SYSTEM GM 300

Tool holders, clamping systems and accessories to ISO 12164, DIN 69893 and DIN 69871 for transfer lines, machining and turning centres

#### FLEXIBLE TOOLING SYSTEM GE 100

a tooling system for the combined machining operations facing, chamfering, boring, centering etc.

#### ISO INDEXABLE INSERTS, SHORT CLAMPING HOLDERS AND KV 400 CARTRIDGES

### 9. Special Tools

to sketch or drawing, the more complex, the better

### 10. CARBIDES FOR PRECISION CUTTING TOOLS

### 11. CARBIDE SPECIAL PARTS FOR THE FORMING, MACHINING AND WEAR PROTECTION INDUSTRY

Cold heading dies, ribbed rolls, dies, mandrels, drawing dies, gear cutters, etc.

### 12. TOOL RESTORATION SERVICE

Re-grinding, re-coating, tool management

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