

**Garant**
**GARANT Diabolo solid carbide torus cutter R1 0.1, TiAlN, Ø DC × L1:  
1,5X20mm**

**Order data**

|              |               |
|--------------|---------------|
| Order number | 206156 1,5X20 |
| GTIN         | 4045197934277 |
| Item class   | 11X           |

**Description**
**Version:**
**GARANT Diabolo:**

Special geometry, coating and carbide **for hard machining in the high-performance field.**  
Suitable even for machining **electrolytic copper.**

Double-relief ground with 2 chamfers hollow ground for high-precision hard machining.

**Recess angle  $\alpha = 16^\circ$ .**

Tolerances:

- **Corner radius:  $R_1 = \pm 0.0025$  mm.**
- **Neck Ø:  $D_1 = 0 / -0.01$  mm.**

**Note:**

At greater tool overhang lengths, use a reduced value for  $a_p$ !

Values for:

side milling:  $a_p = 0.1 \times D \times a_{p,corr}$

copying:  $a_p = 0.05 \times D \times a_{p,corr}$

**To calculate the feed rate  $v_f$  please use the actual speed of the machine (the maximum possible speed)! e.g:  $v_f = 18000 \text{ [rpm]} \times f_z \text{ [mm/Z]} \times z$**

**Technical description**

|                                               |                   |
|-----------------------------------------------|-------------------|
| Overall length L                              | 60 mm             |
| Shank Ø $D_s$                                 | 4 mm              |
| Corner radius $R_1$                           | 0.1 mm            |
| Shank                                         | DIN 6535 HA to h5 |
| Feed $f_z$ for copy milling in steel < 65 HRC | 0.015 mm          |

|                                               |                                  |
|-----------------------------------------------|----------------------------------|
| Overhang length $L_1$ incl. recess            | 20 mm                            |
| Feed $f_z$ for side milling in steel < 65 HRC | 0.015 mm                         |
| No. of teeth Z                                | 2                                |
| Flute length $L_c$                            | 1.5 mm                           |
| Helix angle                                   | 30 degrees                       |
| Cutting edge $\varnothing D_c$                | 1.5 mm                           |
| Correction factor $a_{p\text{ corr}}$         | 0.35                             |
| Recess $\varnothing D_1$                      | 1.44 mm                          |
| Series                                        | Diabolo                          |
| Coating                                       | TiAlN                            |
| Tool material                                 | Solid carbide                    |
| Standard                                      | Manufacturer's standard          |
| Type                                          | H                                |
| Tolerance nominal $\varnothing$               | 0 / -0.005                       |
| Direction of infeed                           | horizontal, oblique and vertical |
| Cutting width $a_e$ for milling operation     | 0.05×D for copy milling          |
| Cutting width $a_e$ for milling operation     | 0.05×D for copy milling          |
| Through-coolant                               | no                               |
| Colour ring                                   | red                              |
| Type of product                               | Torus cutter                     |

## User data

|                                | Suitability                               | $V_c$     | ISO code |
|--------------------------------|-------------------------------------------|-----------|----------|
| Steel < 750 N/mm <sup>2</sup>  | suitable only under restricted conditions | 200 m/min | P        |
| Steel < 900 N/mm <sup>2</sup>  | suitable only under restricted conditions | 200 m/min | P        |
| Steel < 1100 N/mm <sup>2</sup> | suitable                                  | 190 m/min | P        |
| Steel < 1400 N/mm <sup>2</sup> | suitable                                  | 170 m/min | P        |

|                              |                                           |           |   |
|------------------------------|-------------------------------------------|-----------|---|
| Steel < 50 HRC               | suitable                                  | 120 m/min | H |
| Steel < 55 HRC               | suitable                                  | 100 m/min | H |
| Steel < 60 HRC               | suitable                                  | 72 m/min  | H |
| Steel < 65 HRC               | suitable                                  | 55 m/min  | H |
| Steel < 67 HRC               | suitable                                  | 50 m/min  | H |
| Steel < 70 HRC               | suitable                                  | 45 m/min  | H |
| INOX < 900 N/mm <sup>2</sup> | suitable                                  | 90 m/min  | M |
| INOX > 900 N/mm <sup>2</sup> | suitable                                  | 80 m/min  | M |
| CuZn                         | suitable                                  | 140 m/min | N |
| wet maximum                  | suitable only under restricted conditions |           |   |
| wet minimum                  | suitable only under restricted conditions |           |   |
| dry                          | suitable                                  |           |   |
| Air                          | suitable                                  |           |   |