

Your technology partner for cost-effective machining

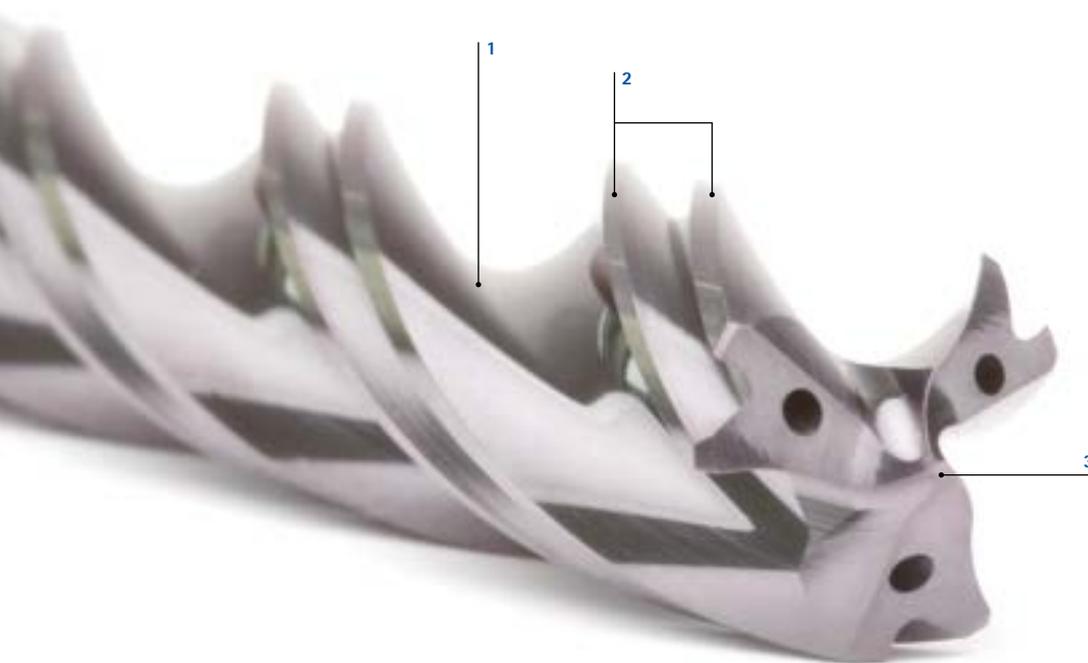
Tritan-Drill - Reamer

Tritan-Drill-Reamer

The most precise solution for drilling and reaming in one machining step

A proven way to manufacture as economically as possible is combining several machining steps in one tool. For example, bores can be drilled and reamed simultaneously with the Tritan-Drill-Reamer from MAPAL. MAPAL has developed the Tritan-Drill-Reamer in order to produce fitting bores even more accurately using just one tool. With six guiding chamfers for excellent guiding properties, precision-ground chip flutes with matching groove shape for good chip removal and a self-centring chisel edge, the new Tritan-Drill-Reamer is impressive all around.

The self-centring chisel edge ensures good positioning accuracy and improved spot drilling behaviour. Three cutting edges guarantee optimal roundness of the fit bore and highest performance. The guiding chamfers produce best-quality surfaces.



1 Finely ground groove profile

- Finely ground chip flutes with adapted groove shape for very good chip removal

2 Six guiding chamfers

- For excellent guiding properties
- For the production of fitting bores with maximum economic efficiency and accuracy with only one tool

3 Innovative centre point

- Self-centring chisel edges for very good positional accuracy and improved spot drilling

Features

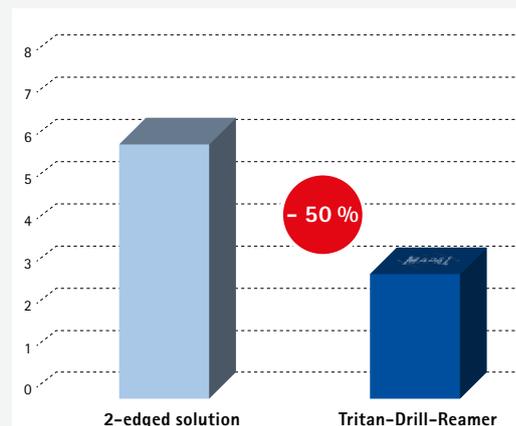
Dimensions:

- Combination of drilling and reaming
- Length versions 3xD and 5xD
- Three cutting edges and six guiding chamfers
- With internal cooling
- Tolerance versions ± 0.003 mm and H7

Configurable diameter

- \varnothing range: 3.800 - 20.005 mm

Processing time [sec.]



Material: 34CrS4

Diameter: 10H7
Drilling depth: 45 mm

2-edged standard solution:

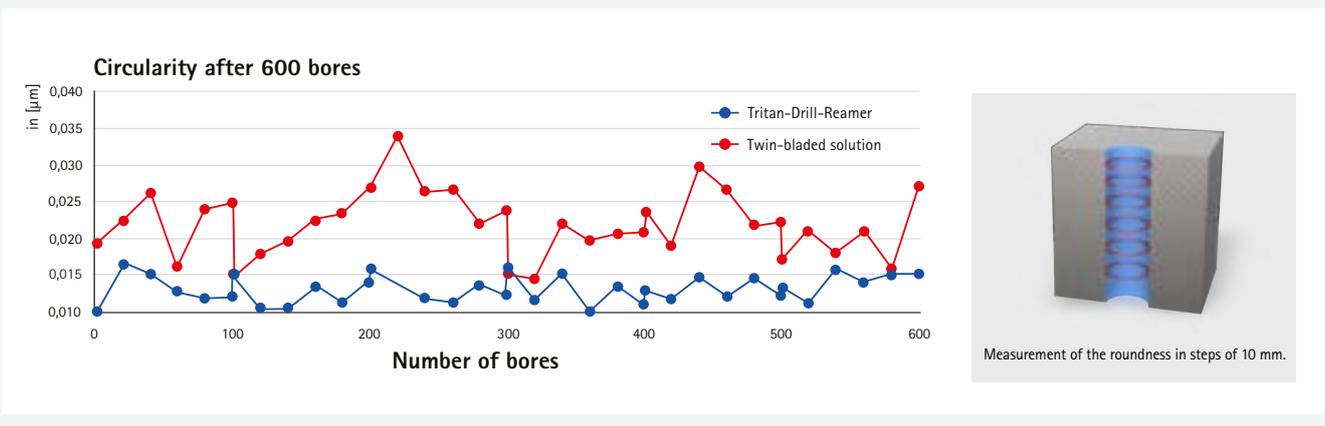
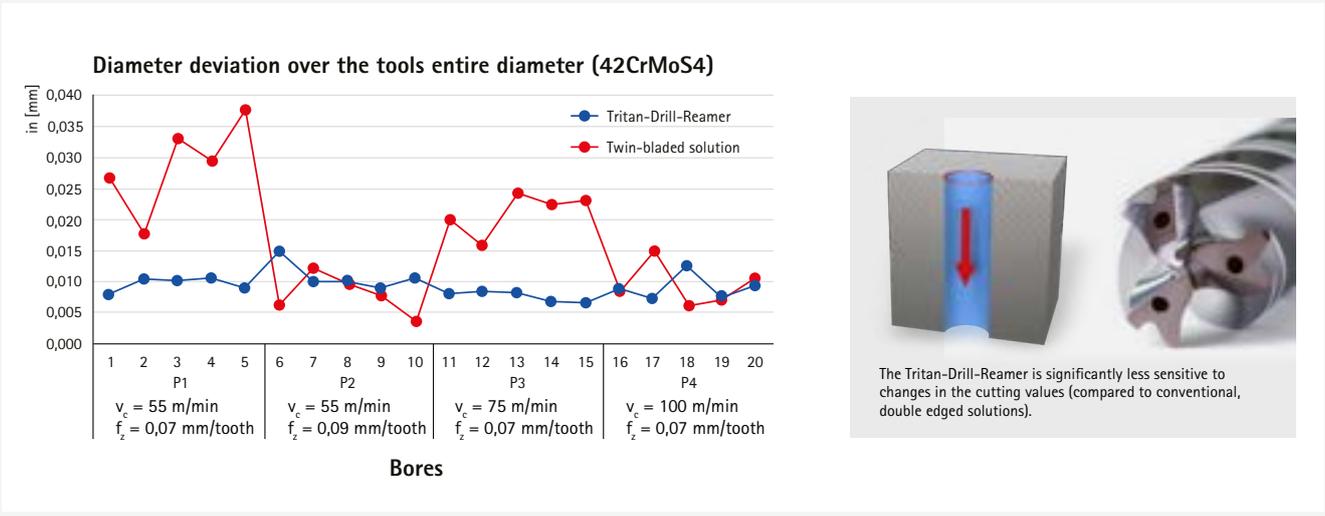
v_c : 70 m/min
 f_{rev} : 0,2 mm/revolution
 n : 2,200 1/min
 v_f : 440 mm/min

Tritan-Drill-Reamer

v_c : 70 m/min
 f_{rev} : 0,39 mm/revolution
 n : 2,200 1/min
 v_f : 858 mm/min



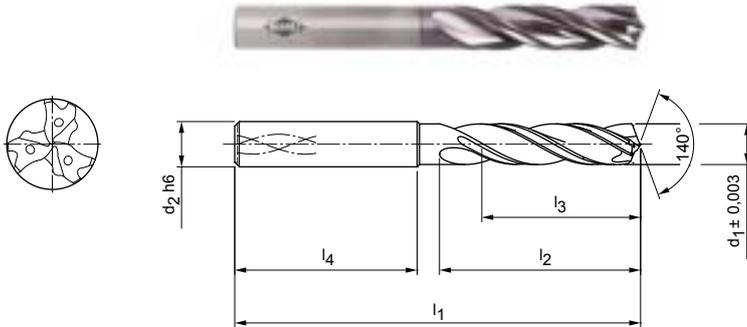
Comparison Tritan-Drill-Reamer and double edged solution



Tritan-Drill-Reamer

Drill reamer
SDR301G (3xD), internal coolant supply

Design:
 Drill diameter: 3.800 – 20.050 mm
 Bore tolerance: \geq IT 7
 Cutting material: HP358
 Number of cutting edges: 3
 Number of guiding chamfers: 6
 Tip angle: 140°
 Side rake angle: 30°



Stocked preferred series in ± 0.003

| Dimensions | | | | | | Shank form HA | |
|-----------------|----------|-------|-------|-------|-------|-------------------------------|-----------|
| $d_1 \pm 0.003$ | $d_2 h6$ | l_1 | l_2 | l_3 | l_4 | Specification | Order no. |
| 3,990 | 6 | 66 | 24 | 17 | 36 | SDR301G-3.990+3-3-HA03-HP358 | 31196569 |
| 4,000 | 6 | 66 | 24 | 17 | 36 | SDR301G-4.000+3-3-HA03-HP358 | 31196570 |
| 4,010 | 6 | 66 | 24 | 17 | 36 | SDR301G-4.010+3-3-HA03-HP358 | 31196571 |
| 4,990 | 6 | 66 | 28 | 20 | 36 | SDR301G-4.990+3-3-HA03-HP358 | 31196575 |
| 5,000 | 6 | 66 | 28 | 20 | 36 | SDR301G-5.000+3-3-HA03-HP358 | 31196576 |
| 5,010 | 6 | 66 | 28 | 20 | 36 | SDR301G-5.010+3-3-HA03-HP358 | 31196577 |
| 5,020 | 6 | 66 | 28 | 20 | 36 | SDR301G-5.020+3-3-HA03-HP358 | 31196578 |
| 5,990 | 6 | 66 | 28 | 20 | 36 | SDR301G-5.990+3-3-HA03-HP358 | 31196581 |
| 6,000 | 6 | 66 | 28 | 20 | 36 | SDR301G-6.000+3-3-HA03-HP358 | 31196582 |
| 6,010 | 6 | 66 | 28 | 20 | 36 | SDR301G-6.010+3-3-HA03-HP358 | 31196583 |
| 7,990 | 8 | 79 | 41 | 29 | 36 | SDR301G-7.990+3-3-HA03-HP358 | 31196587 |
| 8,000 | 8 | 79 | 41 | 29 | 36 | SDR301G-8.000+3-3-HA03-HP358 | 31196588 |
| 8,010 | 8 | 79 | 41 | 29 | 36 | SDR301G-8.010+3-3-HA03-HP358 | 31196589 |
| 9,990 | 10 | 89 | 47 | 35 | 40 | SDR301G-9.990+3-3-HA03-HP358 | 31196593 |
| 10,000 | 10 | 89 | 47 | 35 | 40 | SDR301G-10.000+3-3-HA03-HP358 | 31196594 |
| 10,010 | 10 | 89 | 47 | 35 | 40 | SDR301G-10.010+3-3-HA03-HP358 | 31196595 |
| 10,020 | 10 | 89 | 47 | 35 | 40 | SDR301G-10.020+3-3-HA03-HP358 | 31196596 |
| 11,990 | 12 | 102 | 55 | 40 | 45 | SDR301G-11.990+3-3-HA03-HP358 | 31196599 |
| 12,000 | 12 | 102 | 55 | 40 | 45 | SDR301G-12.000+3-3-HA03-HP358 | 31196600 |
| 12,010 | 12 | 102 | 55 | 40 | 45 | SDR301G-12.010+3-3-HA03-HP358 | 31196601 |
| 13,990 | 14 | 107 | 60 | 43 | 45 | SDR301G-13.990+3-3-HA03-HP358 | 31196605 |
| 14,000 | 14 | 107 | 60 | 43 | 45 | SDR301G-14.000+3-3-HA03-HP358 | 31196606 |
| 14,010 | 14 | 107 | 60 | 43 | 45 | SDR301G-14.010+3-3-HA03-HP358 | 31196607 |
| 15,990 | 16 | 115 | 65 | 45 | 48 | SDR301G-15.990+3-3-HA03-HP358 | 31196611 |
| 16,000 | 16 | 115 | 65 | 45 | 48 | SDR301G-16.000+3-3-HA03-HP358 | 31196612 |
| 16,010 | 16 | 115 | 65 | 45 | 48 | SDR301G-16.010+3-3-HA03-HP358 | 31196613 |

Tritan-Drill-Reamer | Drill reamer SDR301G (3xD), internal coolant supply

Configurable features



Diameter:
Diameter in increments of
0.001 mm freely selectable

**Specification:**

SDR301G-[diameter]+3-3-HA03-HP358

Example:

SDR301G-4.001+3-3-HA03-HP358

Tool diameter $d_1 = 4.001$ mm

Dimensions of configurable series

| d_1 min. | d_1 max. | d_2 h6 | l_1 | l_2 | l_3 | l_4 |
|------------|------------|----------|-------|-------|-------|-------|
| 3,800 | 4,700 | 6 | 66 | 24 | 17 | 36 |
| 4,701 | 6,050 | 6 | 66 | 28 | 20 | 36 |
| 6,051 | 8,050 | 8 | 79 | 41 | 29 | 36 |
| 8,051 | 10,050 | 10 | 89 | 47 | 35 | 40 |
| 10,051 | 12,050 | 12 | 102 | 55 | 40 | 45 |
| 12,970 | 14,050 | 14 | 107 | 60 | 43 | 45 |
| 14,970 | 16,050 | 16 | 115 | 65 | 45 | 48 |
| 16,800 | 18,050 | 18 | 123 | 73 | 51 | 48 |
| 18,700 | 20,050 | 20 | 131 | 79 | 55 | 50 |

Dimensions in mm.

For tolerance class fit bores up to max. IT7, with sufficient machine stability and cooling.

For help in calculating the optimum nominal diameter for different fitting bores, please refer to the information field at page 10.

For cutting data recommendations, see page 10.

Special designs and other coatings available upon request.

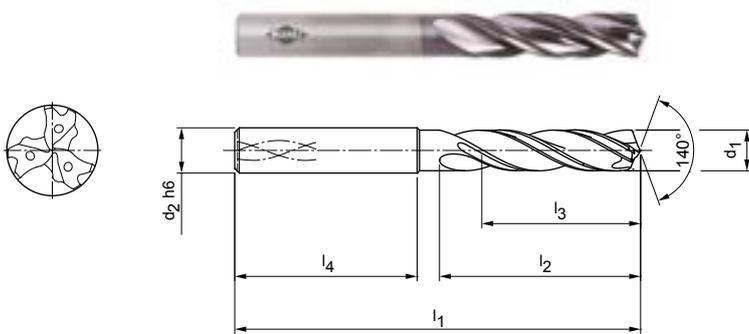
Tritan-Drill-Reamer

Drill reamer

SDR301 (3xD), internal coolant supply

Design:

| | |
|-----------------------------|-------------------|
| Drill diameter: | 4.000 – 16.000 mm |
| Bore tolerance: | ≥ IT 7 |
| Cutting material: | HP358 |
| Number of cutting edges: | 3 |
| Number of guiding chamfers: | 6 |
| Tip angle: | 140° |
| Side rake angle: | 30° |



Stocked preferred series in H7

| Dimensions | | | | | | Shank form HA | |
|-------------------|-------------------|----------------|----------------|----------------|----------------|----------------------------|-----------|
| d ₁ H7 | d ₂ h6 | l ₁ | l ₂ | l ₃ | l ₄ | Specification | Order no. |
| 4,000 | 6 | 66 | 24 | 17 | 36 | SDR301-4.000H7-HA03-HP358 | 31196337 |
| 5,000 | 6 | 66 | 28 | 20 | 36 | SDR301-5.000H7-HA03-HP358 | 31196338 |
| 6,000 | 6 | 66 | 28 | 20 | 36 | SDR301-6.000H7-HA03-HP358 | 31196339 |
| 8,000 | 8 | 79 | 41 | 29 | 36 | SDR301-8.000H7-HA03-HP358 | 31196560 |
| 10,000 | 10 | 89 | 47 | 35 | 40 | SDR301-10.000H7-HA03-HP358 | 31196561 |
| 12,000 | 12 | 102 | 55 | 40 | 45 | SDR301-12.000H7-HA03-HP358 | 31196562 |
| 14,000 | 14 | 107 | 60 | 43 | 45 | SDR301-14.000H7-HA03-HP358 | 31196563 |
| 16,000 | 16 | 115 | 65 | 45 | 48 | SDR301-16.000H7-HA03-HP358 | 31196564 |

Dimensions in mm.

For tolerance class fit bores of H7, with sufficient machine stability and cooling.

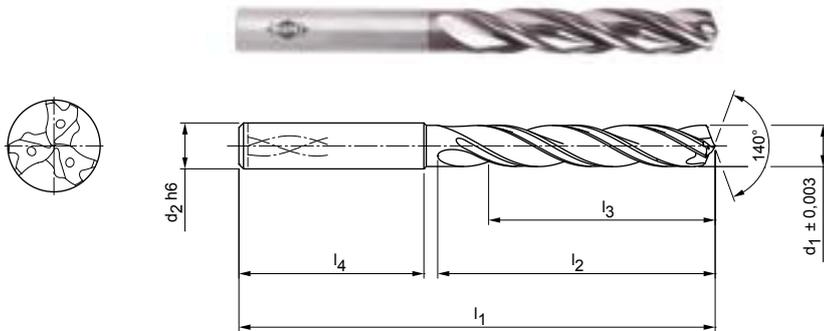
For cutting data recommendations, see page 10.

Special designs and other coatings available upon request.

Tritan-Drill-Reamer

Drill reamer
SDR301G (5xD), internal coolant supply

Design:
 Drill diameter: 3.800 – 20.050 mm
 Bore tolerance: $\geq IT 7$
 Cutting material: HP358
 Number of cutting edges: 3
 Number of guiding chamfers: 6
 Tip angle: 140°
 Side rake angle: 30°



Stocked preferred series in ± 0.003

| Dimensions | | | | | | Shank form HA | |
|-----------------|----------|-------|-------|-------|-------|-------------------------------|-----------|
| $d_1 \pm 0.003$ | $d_2 h6$ | l_1 | l_2 | l_3 | l_4 | Specification | Order no. |
| 3,990 | 6 | 74 | 36 | 29 | 36 | SDR301G-3.990+3-3-HA05-HP358 | 31196639 |
| 4,000 | 6 | 74 | 36 | 29 | 36 | SDR301G-4.000+3-3-HA05-HP358 | 31196640 |
| 4,010 | 6 | 74 | 36 | 29 | 36 | SDR301G-4.010+3-3-HA05-HP358 | 31196641 |
| 4,020 | 6 | 74 | 36 | 29 | 36 | SDR301G-4.020+3-3-HA05-HP358 | 31196642 |
| 4,990 | 6 | 82 | 44 | 35 | 36 | SDR301G-4.990+3-3-HA05-HP358 | 31196645 |
| 5,000 | 6 | 82 | 44 | 35 | 36 | SDR301G-5.000+3-3-HA05-HP358 | 31196646 |
| 5,010 | 6 | 82 | 44 | 35 | 36 | SDR301G-5.010+3-3-HA05-HP358 | 31196647 |
| 5,990 | 6 | 82 | 44 | 35 | 36 | SDR301G-5.990+3-3-HA05-HP358 | 31196651 |
| 6,000 | 6 | 82 | 44 | 35 | 36 | SDR301G-6.000+3-3-HA05-HP358 | 31196652 |
| 6,010 | 6 | 82 | 44 | 35 | 36 | SDR301G-6.010+3-3-HA05-HP358 | 31196653 |
| 7,990 | 8 | 91 | 53 | 43 | 36 | SDR301G-7.990+3-3-HA05-HP358 | 31196658 |
| 8,000 | 8 | 91 | 53 | 43 | 36 | SDR301G-8.000+3-3-HA05-HP358 | 31196659 |
| 8,010 | 8 | 91 | 53 | 43 | 36 | SDR301G-8.010+3-3-HA05-HP358 | 31196660 |
| 8,020 | 8 | 91 | 53 | 43 | 36 | SDR301G-8.020+3-3-HA05-HP358 | 31196661 |
| 9,990 | 10 | 103 | 61 | 49 | 40 | SDR301G-9.990+3-3-HA05-HP358 | 31196664 |
| 10,000 | 10 | 103 | 61 | 49 | 40 | SDR301G-10.000+3-3-HA05-HP358 | 31196665 |
| 10,010 | 10 | 103 | 61 | 49 | 40 | SDR301G-10.010+3-3-HA05-HP358 | 31196666 |
| 11,990 | 12 | 118 | 71 | 59 | 45 | SDR301G-11.990+3-3-HA05-HP358 | 31196670 |
| 12,000 | 12 | 118 | 71 | 59 | 45 | SDR301G-12.000+3-3-HA05-HP358 | 31196671 |
| 12,010 | 12 | 118 | 71 | 59 | 45 | SDR301G-12.010+3-3-HA05-HP358 | 31196672 |
| 13,990 | 14 | 124 | 77 | 60 | 45 | SDR301G-13.990+3-3-HA05-HP358 | 31196676 |
| 14,000 | 14 | 124 | 77 | 60 | 45 | SDR301G-14.000+3-3-HA05-HP358 | 31196677 |
| 14,010 | 14 | 124 | 77 | 60 | 45 | SDR301G-14.010+3-3-HA05-HP358 | 31196678 |
| 15,990 | 16 | 133 | 83 | 63 | 48 | SDR301G-15.990+3-3-HA05-HP358 | 31196682 |
| 16,000 | 16 | 133 | 83 | 63 | 48 | SDR301G-16.000+3-3-HA05-HP358 | 31196683 |
| 16,010 | 16 | 133 | 83 | 63 | 48 | SDR301G-16.010+3-3-HA05-HP358 | 31196684 |

Continued on next page.

Tritan-Drill-Reamer | Drill reamer SDR301G (5xD), internal coolant supply

Configurable features



Diameter:
Diameter in increments of
0.001 mm freely selectable

**Specification:**

SDR301G-[diameter]+3-3-HA05-HP358

Example:

SDR301G-04001+3-3-HA05-HP358

Tool diameter $d_1 = 4.001$ mm

Dimensions of configurable series

| d_1 min. | d_1 max. | d_2 h6 | l_1 | l_2 | l_3 | l_4 |
|------------|------------|----------|-------|-------|-------|-------|
| 3,800 | 4,700 | 6 | 74 | 36 | 29 | 36 |
| 4,701 | 6,050 | 6 | 82 | 44 | 35 | 36 |
| 6,051 | 8,050 | 8 | 91 | 53 | 43 | 36 |
| 8,051 | 10,050 | 10 | 103 | 61 | 49 | 40 |
| 10,051 | 12,050 | 12 | 118 | 71 | 56 | 45 |
| 12,970 | 14,050 | 14 | 124 | 77 | 60 | 45 |
| 14,970 | 16,050 | 16 | 133 | 83 | 63 | 48 |
| 16,800 | 18,050 | 18 | 143 | 93 | 71 | 48 |
| 18,700 | 20,050 | 20 | 153 | 101 | 77 | 50 |

Dimensions in mm.

For tolerance class fit bores up to max. IT7, with sufficient machine stability and cooling.

For help in calculating the optimum nominal diameter for different fitting bores, please refer to the information field at page 10.

For cutting data recommendations, see page 10.

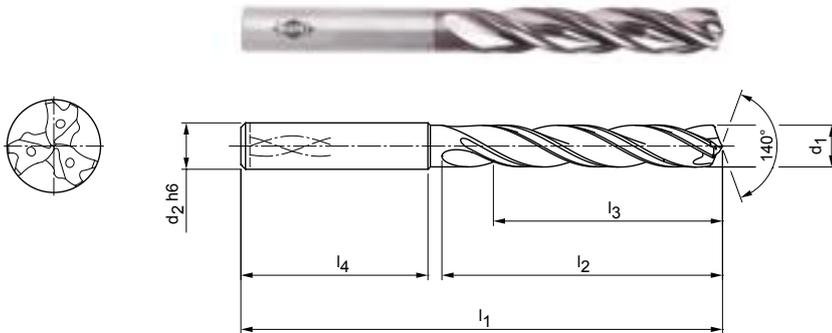
Special designs and other coatings available upon request.

Tritan-Drill-Reamer

Drill reamer
SDR301 (5xD), internal coolant supply

Design:

Drill diameter: 4.000 – 20.000 mm
Bore tolerance: \geq IT 7
Cutting material: HP358
Number of cutting edges: 3
Number of guiding chamfers: 6
Tip angle: 140°
Side rake angle: 30°



Stocked preferred series in H7

| Dimensions | | | | | | Shank form HA | |
|------------|----------|-------|-------|-------|-------|----------------------------|-----------|
| d_1 H7 | d_2 h6 | l_1 | l_2 | l_3 | l_4 | Specification | Order no. |
| 4,000 | 6 | 74 | 36 | 29 | 36 | SDR301-4.000H7-HA05-HP358 | 31196627 |
| 5,000 | 6 | 82 | 44 | 35 | 36 | SDR301-5.000H7-HA05-HP358 | 31196628 |
| 6,000 | 6 | 82 | 44 | 35 | 36 | SDR301-6.000H7-HA05-HP358 | 31196629 |
| 8,000 | 8 | 91 | 53 | 43 | 36 | SDR301-8.000H7-HA05-HP358 | 31196630 |
| 10,000 | 10 | 103 | 61 | 49 | 40 | SDR301-10.000H7-HA05-HP358 | 31196631 |
| 12,000 | 12 | 118 | 71 | 56 | 45 | SDR301-12.000H7-HA05-HP358 | 31196632 |
| 14,000 | 14 | 124 | 77 | 60 | 45 | SDR301-14.000H7-HA05-HP358 | 31196633 |
| 16,000 | 16 | 133 | 83 | 63 | 48 | SDR301-16.000H7-HA05-HP358 | 31196634 |
| 18,000 | 18 | 143 | 93 | 71 | 48 | SDR301-18.000H7-HA05-HP358 | 31196635 |
| 20,000 | 20 | 153 | 101 | 77 | 50 | SDR301-20.000H7-HA05-HP358 | 31196636 |

Dimensions in mm.

For tolerance class fit bores of H7, with sufficient machine stability and cooling.

For cutting data recommendations, see page 10.

Special designs and other coatings available upon request.

Cutting data recommendations for drill reamer

Feed and cutting speed

Tritan-Drill-Reamer | SDR301

| MMG* | Material | Strength/ Hardness [N/mm ²] [HRC] | Cutting speed v_c [m/min] | | | | Feed f [mm] at drill diameter | | | | | | |
|------|----------|--|--------------------------------|---------------------|-----|-----|------------------------------------|------|------|-------|-------|-------|------|
| | | | Internal coolant | External coolant | MQL | Air | 4,00 | 5,50 | 7,50 | 10,50 | 14,50 | 20,00 | |
| P | P1.1 | Structural, free-cutting, case hardened and heat-treated | < 700 | 70 | 65 | 65 | | 0,17 | 0,22 | 0,27 | 0,34 | 0,41 | 0,47 |
| | P1.2 | Structural, free-cutting, case hardened and heat-treated | < 1.200 | 65 | 55 | 55 | | 0,22 | 0,27 | 0,34 | 0,42 | 0,51 | 0,59 |
| | P2.1 | Nitrated, case hardened and heat-treated steel, alloyed | < 900 | 70 | 60 | 60 | | 0,20 | 0,26 | 0,32 | 0,40 | 0,48 | 0,56 |
| | P2.2 | Nitrated, case hardened and heat-treated steel, alloyed | < 1.400 | 50 | 40 | 40 | | 0,17 | 0,21 | 0,26 | 0,32 | 0,38 | 0,44 |
| | P3.1 | Tool, roller bearing, spring and high speed steel** | < 800 | 55 | 45 | 45 | | 0,18 | 0,23 | 0,29 | 0,36 | 0,43 | 0,50 |
| | P3.2 | Tool, roller bearing, spring and high speed steel** | < 1.000 | 40 | 40 | 40 | | 0,15 | 0,19 | 0,24 | 0,30 | 0,36 | 0,41 |
| | P3.3 | Tool, roller bearing, spring and high speed steel** | < 1.500 | 40 | 30 | 35 | | 0,13 | 0,16 | 0,19 | 0,23 | 0,28 | 0,32 |
| | P5.1 | Cast steel | | 70 | 60 | 60 | | 0,20 | 0,26 | 0,32 | 0,40 | 0,48 | 0,56 |
| K | K1.1 | Cast iron with lamellar graphite (grey cast iron), EN-GJL | < 300 | 100 | 70 | 70 | 70 | 0,25 | 0,33 | 0,42 | 0,55 | 0,67 | 0,79 |
| | K2.1 | Cast iron with spheroidal graphite, EN-GJS | < 500 | 135 | 85 | 100 | 100 | 0,24 | 0,32 | 0,40 | 0,51 | 0,62 | 0,72 |
| | K2.2 | Cast iron with spheroidal graphite, EN-GJS | ≤ 800 | 85 | 65 | 65 | | 0,22 | 0,28 | 0,35 | 0,44 | 0,54 | 0,62 |
| | K2.3 | Cast iron with spheroidal graphite, EN-GJS | > 800 | 50 | 35 | 45 | | 0,11 | 0,13 | 0,16 | 0,20 | 0,24 | 0,28 |
| | K3.1 | Cast iron with vermicular graphite, EN-GJV; Malleable cast | < 500 | 75 | 70 | 70 | | 0,23 | 0,30 | 0,38 | 0,47 | 0,58 | 0,67 |
| | K3.2 | Cast iron with vermicular graphite, EN-GJV; Malleable cast | > 500 | 70 | 60 | 60 | | 0,20 | 0,25 | 0,31 | 0,38 | 0,46 | 0,53 |

Example calculation

Please note that the result may be influenced by additional parameters such as the machine tool or tool clamping.

Formula for calculating the optimum nominal tool diameter:

$$(G_{OB} + G_{UB}) / 2$$

Example:

- Fitting bore: \varnothing 10 F7
- Maximum bore dimension G_{OB} : 10.028 mm
- Minimum bore dimension G_{UB} : 10.013 mm

$$\rightarrow (10.028 \text{ mm} + 10.013 \text{ mm}) / 2 = 10.021 \text{ mm} = \text{selection of tool nominal diameter } 10.021 \text{ mm}$$

* MAPAL machining groups

** If the alloy parts Cr, Mo, Ni, V, W in total > 8% then select the next highest MAPAL machining group.

The specified cutting values are guide values.

The optimum data for the respective machining task should be determined during the test or machining.

Best bore results with a combination of Tritan-Drill-Reamer and the new hydraulic clamping chuck Hydro DReaM Chuck 4.5°

The newly developed hydraulic clamping system permits high machining parameters through the excellent stability and accuracy. It minimalises self-generated vibrations, through this the tool being clamped is not subjected to micro vibrations. This also leads to a reduction spindle strain of up to 5 percent, providing significantly longer tool life and assures optimal surface finish values.

The through MAPAL specially developed polishing process, that provides a brilliant surface finish resulting in the chuck being more resistant to dirt and corrosion. Operators can clamp the tool in the chuck with reduced force. „Foolproof-Handling“ provides this, as well as the simply self-explanatory handling of the chuck.

Especially by the Hydro DReaM Chuck 4,5° this means significant time savings compared to other clamping systems.

ADVANTAGES

- Corrosion resistant clamping chuck
- Self-explanatory and simple handling- Foolproofing
- Greatest possible stability with an optimal use of resources



To obtain the optimal bore quality MAPAL suggests using the Tritan-Drill-Reamer in combination with the new hydraulic clamping chuck Hydro DReaM Chuck 4.5°.

Further clamping chucks can be found in the MAPAL catalogue "CLAMPING".



Discover tool and service solutions now that give you a lead:

BORE MACHINING

REAMING | FINE BORING

DRILLING FROM SOLID | BORING | COUNTERSINKING

MILLING

CLAMPING

TURNING

ACTUATING

SETTING | MEASURING | DISPENSING

SERVICES

Mat. no. 10168356 | V1.0.0
TRITAN-EN-PC-01-007-0824-VVA Printed in Austria. Technical data subject to change without notice.
© MAPAL Dr. Kress KG | Reprinting, in whole or in part, only with the approval of the publisher.

FOLLOW US

