



Your technology partner for cost-effective machining

TRITAN-DRILL-REAMER



Tritan-Drill-Reamer –

The most precise solution for drilling and reaming in a single shot

To be able to achieve the most efficient way of manufacturing, the proven combination machining processes have been incorporated in a single tool. Through this, for example using the Tritan-Drill-Reamer from MAPAL, drilling and reaming processes can be carried out simultaneously. To achieve even more exact fit bores with a single tool MAPAL has developed the Tritan-Drill-Reamer.

With six guiding chamfers for perfect guiding behavior, finely ground chip flutes for excellent chip removal and a self-centering chisel edge the new Tritan-Drill-Reamer impresses in every aspect.

The self-centering chisel edge provides super positioning accuracy and improved entry bore behavior. The three cutting edges assure an optimal circularity of the fit bore and the highest performance. The guiding chamfers produce the best possible surface finish.

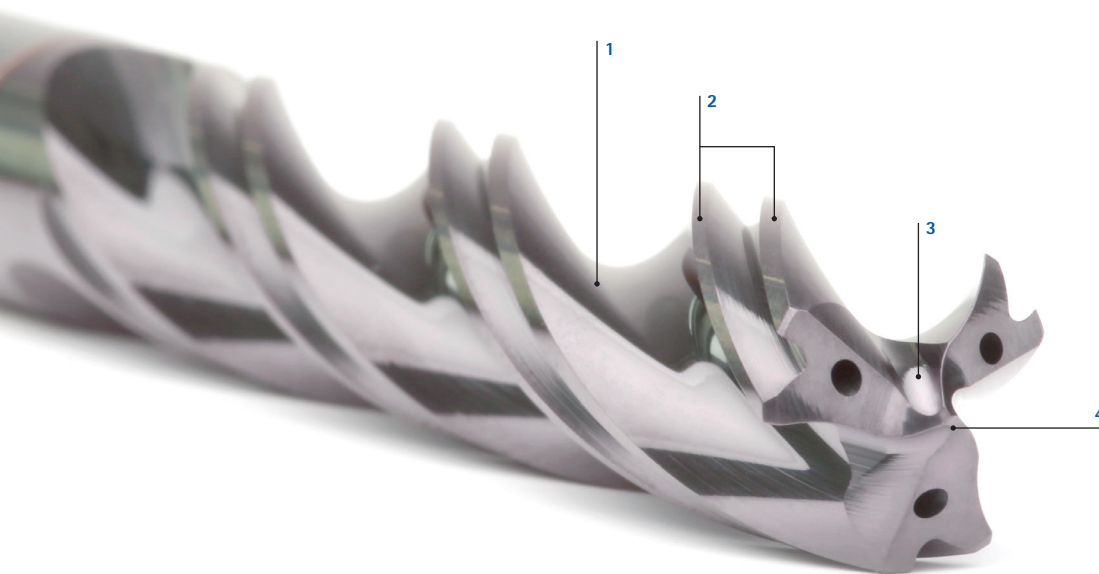
AT A GLANCE

- Combination of drilling and reaming
- Long design 3xD and 5xD
- Three cutting edges and six guiding chamfers
- With internal coolant
- Tolerance range of $\pm 0,003$ mm and H7

ADVANTAGES

- Reduction of main and secondary machining times
- Best performance and μ exact accuracy
- High positioning accuracy
- Optimal circularity

Tool features in detail



1 Finely ground chip flute profile

2 Six guiding chamfers

3 Innovative point thinning

4 Self-centering chisel edge



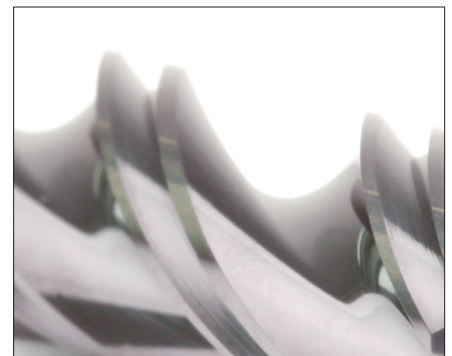
Six guiding chamfers

- For excellent guiding characteristics
- For producing fit bores with the highest economical exactness in a single tool.



Innovative point thinning

- Self-centering chisel edge for very exact positional accuracy and improved entry bore behavior



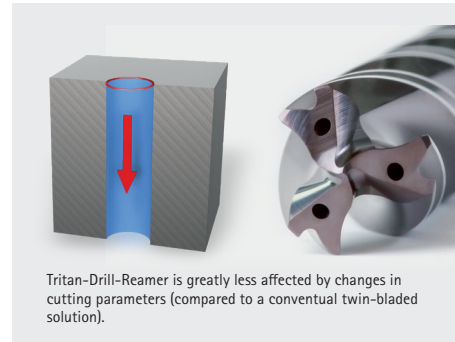
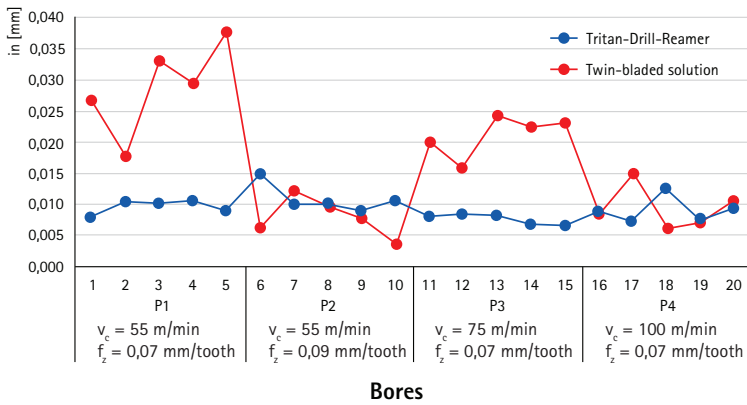
Finely ground chip flute profile

- Finely ground chip flute with matched flute profile for very good chip transport

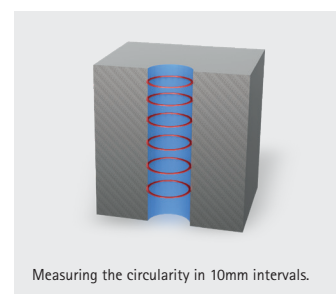
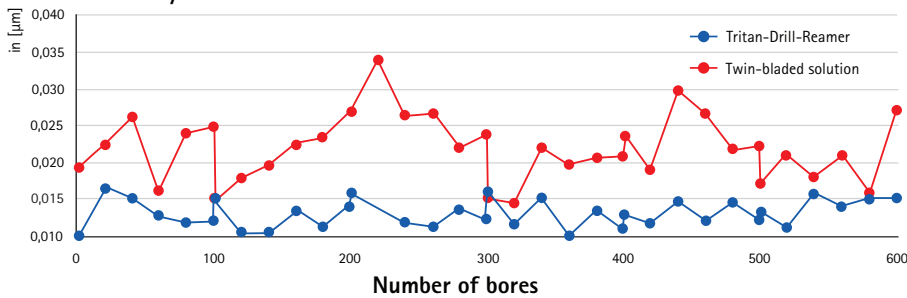


Comparison between the Tritan-Drill-Reamer and a twin-bladed solution

Diameter deviation over the tools entire diameter (42CrMoS4)



Circularity after 600 bores

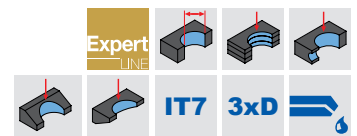
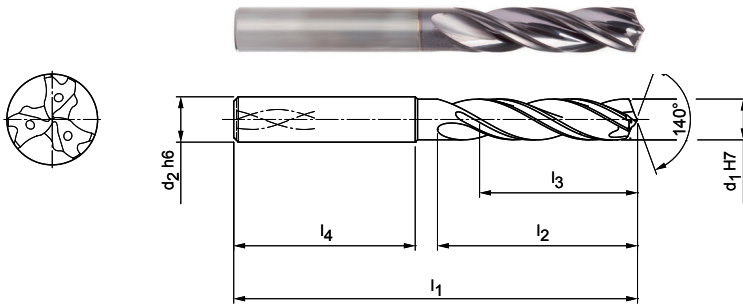


Tritan-Drill-Reamer

Drill Reamer
SCD641 (3xD), H7
internal coolant supply

Design:

Drill diameter: 4,00 – 20,00 mm
Bore tolerance: \geq IT 7
Coating: HP358
Number of cutting edges: 3
Number of guiding chamfers: 6
Tip angle: 140°
Side rake angle: 30°



Dimensions						Shank form HA	
d ₁ H7	d ₂ h6	l ₁	l ₂	l ₃	l ₄	Specification	Order No.
4,00	6	66	24	17	36	SCD641C-0400-3-6-140HA03-HP358	31196337
5,00	6	66	28	20	36	SCD641C-0500-3-6-140HA03-HP358	31196338
6,00	6	66	28	20	36	SCD641C-0600-3-6-140HA03-HP358	31196339
8,00	8	79	41	29	36	SCD641C-0800-3-6-140HA03-HP358	31196560
10,00	10	89	47	35	40	SCD641C-1000-3-6-140HA03-HP358	31196561
12,00	12	102	55	40	45	SCD641C-1200-3-6-140HA03-HP358	31196562
14,00	14	107	60	43	45	SCD641C-1400-3-6-140HA03-HP358	31196563
16,00	16	115	65	45	48	SCD641C-1600-3-6-140HA03-HP358	31196564
18,00	18	123	73	51	48	SCD641C-1800-3-6-140HA03-HP358	31196565
20,00	20	131	79	55	50	SCD641C-2000-3-6-140HA03-HP358	31196566

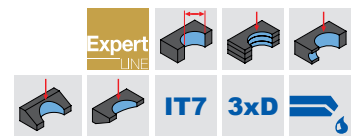
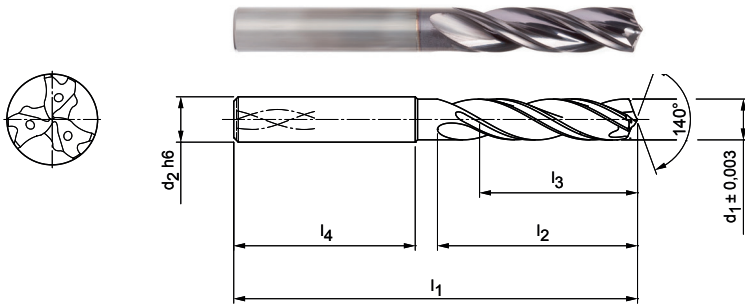
Dimensions in mm.
For fitting holes of tolerance class H7.

Special designs and other coatings on request.

Tritan-Drill-Reamer

Drill Reamer
SCD641 (3xD)
internal coolant supply

Design:
Drill diameter: 3,97 – 20,02 mm
Bore tolerance: \geq IT 7
Coating: HP358
Number of cutting edges: 3
Number of guiding chamfers: 6
Tip angle: 140°
Side rake angle: 30°



Dimensions						Shank form HA	
$d_1 \pm 0,003$	d_2 h6	l_1	l_2	l_3	l_4	Specification	Order No.
3,97	6	66	24	17	36	SCD641-0397-3-6-140HA03-HP358	31196567
3,98	6	66	24	17	36	SCD641-0398-3-6-140HA03-HP358	31196568
3,99	6	66	24	17	36	SCD641-0399-3-6-140HA03-HP358	31196569
4,00	6	66	24	17	36	SCD641-0400-3-6-140HA03-HP358	31196570
4,01	6	66	24	17	36	SCD641-0401-3-6-140HA03-HP358	31196571
4,02	6	66	24	17	36	SCD641-0402-3-6-140HA03-HP358	31196572
4,97	6	66	28	20	36	SCD641-0497-3-6-140HA03-HP358	31196573
4,98	6	66	28	20	36	SCD641-0498-3-6-140HA03-HP358	31196574
4,99	6	66	28	20	36	SCD641-0499-3-6-140HA03-HP358	31196575
5,00	6	66	28	20	36	SCD641-0500-3-6-140HA03-HP358	31196576
5,01	6	66	28	20	36	SCD641-0501-3-6-140HA03-HP358	31196577
5,02	6	66	28	20	36	SCD641-0502-3-6-140HA03-HP358	31196578
5,97	6	66	28	20	36	SCD641-0597-3-6-140HA03-HP358	31196579
5,98	6	66	28	20	36	SCD641-0598-3-6-140HA03-HP358	31196580
5,99	6	66	28	20	36	SCD641-0599-3-6-140HA03-HP358	31196581
6,00	6	66	28	20	36	SCD641-0600-3-6-140HA03-HP358	31196582
6,01	6	66	28	20	36	SCD641-0601-3-6-140HA03-HP358	31196583
6,02	6	66	28	20	36	SCD641-0602-3-6-140HA03-HP358	31196584
7,97	8	79	41	29	36	SCD641-0797-3-6-140HA03-HP358	31196585
7,98	8	79	41	29	36	SCD641-0798-3-6-140HA03-HP358	31196586
7,99	8	79	41	29	36	SCD641-0799-3-6-140HA03-HP358	31196587
8,00	8	79	41	29	36	SCD641-0800-3-6-140HA03-HP358	31196588
8,01	8	79	41	29	36	SCD641-0801-3-6-140HA03-HP358	31196589
8,02	8	79	41	29	36	SCD641-0802-3-6-140HA03-HP358	31196590
9,97	10	89	47	35	40	SCD641-0997-3-6-140HA03-HP358	31196591
9,98	10	89	47	35	40	SCD641-0998-3-6-140HA03-HP358	31196592
9,99	10	89	47	35	40	SCD641-0999-3-6-140HA03-HP358	31196593
10,00	10	89	47	35	40	SCD641-1000-3-6-140HA03-HP358	31196594
10,01	10	89	47	35	40	SCD641-1001-3-6-140HA03-HP358	31196595
10,02	10	89	47	35	40	SCD641-1002-3-6-140HA03-HP358	31196596
11,97	12	102	55	40	45	SCD641-1197-3-6-140HA03-HP358	31196597
11,98	12	102	55	40	45	SCD641-1198-3-6-140HA03-HP358	31196598
11,99	12	102	55	40	45	SCD641-1199-3-6-140HA03-HP358	31196599
12,00	12	102	55	40	45	SCD641-1200-3-6-140HA03-HP358	31196600
12,01	12	102	55	40	45	SCD641-1201-3-6-140HA03-HP358	31196601
12,02	12	102	55	40	45	SCD641-1202-3-6-140HA03-HP358	31196602

Tritan-Drill-Reamer | Drill Reamer SCD641 (3xD), internal coolant supply

Dimensions						Shank form HA	
$d_1 \pm 0,003$	$d_2 h6$	l_1	l_2	l_3	l_4	Specification	Order No.
13,97	14	107	60	43	45	SCD641-1397-3-6-140HA03-HP358	31196603
13,98	14	107	60	43	45	SCD641-1398-3-6-140HA03-HP358	31196604
13,99	14	107	60	43	45	SCD641-1399-3-6-140HA03-HP358	31196605
14,00	14	107	60	43	45	SCD641-1400-3-6-140HA03-HP358	31196606
14,01	14	107	60	43	45	SCD641-1401-3-6-140HA03-HP358	31196607
14,02	14	107	60	43	45	SCD641-1402-3-6-140HA03-HP358	31196608
15,97	16	115	65	45	48	SCD641-1597-3-6-140HA03-HP358	31196609
15,98	16	115	65	45	48	SCD641-1598-3-6-140HA03-HP358	31196610
15,99	16	115	65	45	48	SCD641-1599-3-6-140HA03-HP358	31196611
16,00	16	115	65	45	48	SCD641-1600-3-6-140HA03-HP358	31196612
16,01	16	115	65	45	48	SCD641-1601-3-6-140HA03-HP358	31196613
16,02	16	115	65	45	48	SCD641-1602-3-6-140HA03-HP358	31196614
17,97	18	123	73	51	48	SCD641-1797-3-6-140HA03-HP358	31196615
17,98	18	123	73	51	48	SCD641-1798-3-6-140HA03-HP358	31196616
17,99	18	123	73	51	48	SCD641-1799-3-6-140HA03-HP358	31196617
18,00	18	123	73	51	48	SCD641-1800-3-6-140HA03-HP358	31196618
18,01	18	123	73	51	48	SCD641-1801-3-6-140HA03-HP358	31196619
18,02	18	123	73	51	48	SCD641-1802-3-6-140HA03-HP358	31196620
19,97	20	131	79	55	50	SCD641-1997-3-6-140HA03-HP358	31196621
19,98	20	131	79	55	50	SCD641-1998-3-6-140HA03-HP358	31196622
19,99	20	131	79	55	50	SCD641-1999-3-6-140HA03-HP358	31196623
20,00	20	131	79	55	50	SCD641-2000-3-6-140HA03-HP358	31196624
20,01	20	131	79	55	50	SCD641-2001-3-6-140HA03-HP358	31196625
20,02	20	131	79	55	50	SCD641-2002-3-6-140HA03-HP358	31196626

Dimensions in mm.

For fitting bores of tolerance classes up to max. IT7.

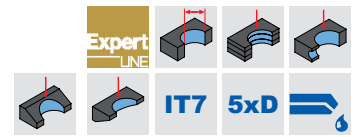
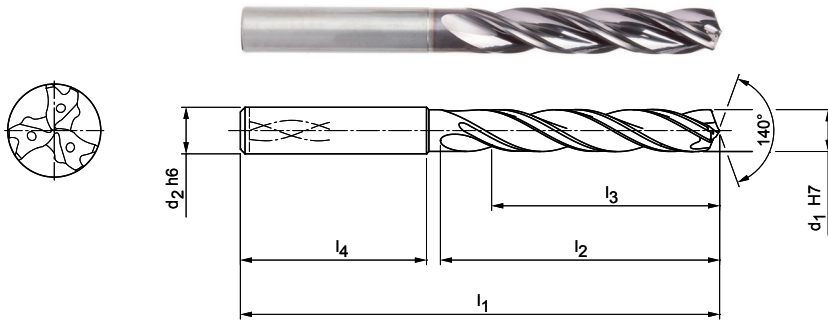
Please refer to the information field on page 10 for help in calculating the optimum nominal diameter for the fitting hole you require.

Special designs and other coatings on request.

Tritan-Drill-Reamer

Drill Reamer
SCD641 (5xD), H7
internal coolant supply

Design:
 Drill diameter: 4,00 – 20,00 mm
 Bore tolerance: \geq IT 7
 Coating: HP358
 Number of cutting edges: 3
 Number of guiding chamfers: 6
 Tip angle: 140°
 Side rake angle: 30°



Dimensions						Shank form HA	
d ₁ H7	d ₂ h6	l ₁	l ₂	l ₃	l ₄	Specification	Order No.
4,00	6	74	36	29	36	SCD641C-0400-3-6-140HA05-HP358	31196627
5,00	6	82	44	35	36	SCD641C-0500-3-6-140HA05-HP358	31196628
6,00	6	82	44	35	36	SCD641C-0600-3-6-140HA05-HP358	31196629
8,00	8	91	53	43	36	SCD641C-0800-3-6-140HA05-HP358	31196630
10,00	10	103	61	49	40	SCD641C-1000-3-6-140HA05-HP358	31196631
12,00	12	118	71	56	45	SCD641C-1200-3-6-140HA05-HP358	31196632
14,00	14	124	77	60	45	SCD641C-1400-3-6-140HA05-HP358	31196633
16,00	16	133	83	63	48	SCD641C-1600-3-6-140HA05-HP358	31196634
18,00	18	143	93	71	48	SCD641C-1800-3-6-140HA05-HP358	31196635
20,00	20	153	101	77	50	SCD641C-2000-3-6-140HA05-HP358	31196636

Dimensions in mm.
For fitting holes of tolerance class H7.

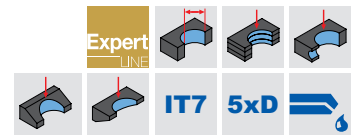
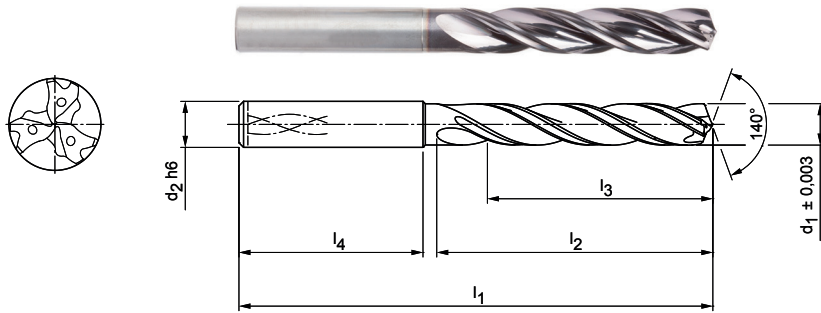
Special designs and other coatings on request.

Tritan-Drill-Reamer

Drill Reamer
SCD641 (5xD)
internal coolant supply

Design:

Drill diameter: 3,97 – 20,02 mm
Bore tolerance: \geq IT 7
Coating: HP358
Number of cutting edges: 3
Number of guiding chamfers: 6
Tip angle: 140°
Side rake angle: 30°



Dimensions						Shank form HA	
$d_1 \pm 0,003$	$d_2 h6$	l_1	l_2	l_3	l_4	Specification	Order No.
3,97	6	74	36	29	36	SCD641-0397-3-6-140HA05-HP358	31196637
3,98	6	74	36	29	36	SCD641-0398-3-6-140HA05-HP358	31196638
3,99	6	74	36	29	36	SCD641-0399-3-6-140HA05-HP358	31196639
4,00	6	74	36	29	36	SCD641-0400-3-6-140HA05-HP358	31196640
4,01	6	74	36	29	36	SCD641-0401-3-6-140HA05-HP358	31196641
4,02	6	74	36	29	36	SCD641-0402-3-6-140HA05-HP358	31196642
4,97	6	82	44	35	36	SCD641-0497-3-6-140HA05-HP358	31196643
4,98	6	82	44	35	36	SCD641-0498-3-6-140HA05-HP358	31196644
4,99	6	82	44	35	36	SCD641-0499-3-6-140HA05-HP358	31196645
5,00	6	82	44	35	36	SCD641-0500-3-6-140HA05-HP358	31196646
5,01	6	82	44	35	36	SCD641-0501-3-6-140HA05-HP358	31196647
5,02	6	82	44	35	36	SCD641-0502-3-6-140HA05-HP358	31196648
5,97	6	82	44	35	36	SCD641-0597-3-6-140HA05-HP358	31196649
5,98	6	82	44	35	36	SCD641-0598-3-6-140HA05-HP358	31196650
5,99	6	82	44	35	36	SCD641-0599-3-6-140HA05-HP358	31196651
6,00	6	82	44	35	36	SCD641-0600-3-6-140HA05-HP358	31196652
6,01	6	82	44	35	36	SCD641-0601-3-6-140HA05-HP358	31196653
6,02	6	82	44	35	36	SCD641-0602-3-6-140HA05-HP358	31196654
7,97	8	91	53	43	36	SCD641-0797-3-6-140HA05-HP358	31196656
7,98	8	91	53	43	36	SCD641-0798-3-6-140HA05-HP358	31196657
7,99	8	91	53	43	36	SCD641-0799-3-6-140HA05-HP358	31196658
8,00	8	91	53	43	36	SCD641-0800-3-6-140HA05-HP358	31196659
8,01	8	91	53	43	36	SCD641-0801-3-6-140HA05-HP358	31196660
8,02	8	91	53	43	36	SCD641-0802-3-6-140HA05-HP358	31196661
9,97	10	103	61	49	40	SCD641-0997-3-6-140HA05-HP358	31196662
9,98	10	103	61	49	40	SCD641-0998-3-6-140HA05-HP358	31196663
9,99	10	103	61	49	40	SCD641-0999-3-6-140HA05-HP358	31196664
10,00	10	103	61	49	40	SCD641-1000-3-6-140HA05-HP358	31196665
10,01	10	103	61	49	40	SCD641-1001-3-6-140HA05-HP358	31196666
10,02	10	103	61	49	40	SCD641-1002-3-6-140HA05-HP358	31196667
11,97	12	118	71	56	45	SCD641-1197-3-6-140HA05-HP358	31196668
11,98	12	118	71	56	45	SCD641-1198-3-6-140HA05-HP358	31196669
11,99	12	118	71	56	45	SCD641-1199-3-6-140HA05-HP358	31196670
12,00	12	118	71	56	45	SCD641-1200-3-6-140HA05-HP358	31196671
12,01	12	118	71	56	45	SCD641-1201-3-6-140HA05-HP358	31196672
12,02	12	118	71	56	45	SCD641-1202-3-6-140HA05-HP358	31196673

Tritan-Drill-Reamer | Drill Reamer SCD641 (5xD), internal coolant supply

Dimensions						Shank form HA	
$d_1 \pm 0,003$	$d_2 h6$	l_1	l_2	l_3	l_4	Specification	Order No.
13,97	14	124	77	60	45	SCD641-1397-3-6-140HA05-HP358	31196674
13,98	14	124	77	60	45	SCD641-1398-3-6-140HA05-HP358	31196675
13,99	14	124	77	60	45	SCD641-1399-3-6-140HA05-HP358	31196676
14,00	14	124	77	60	45	SCD641-1400-3-6-140HA05-HP358	31196677
14,01	14	124	77	60	45	SCD641-1401-3-6-140HA05-HP358	31196678
14,02	14	124	77	60	45	SCD641-1402-3-6-140HA05-HP358	31196679
15,97	16	133	83	63	48	SCD641-1597-3-6-140HA05-HP358	31196680
15,98	16	133	83	63	48	SCD641-1598-3-6-140HA05-HP358	31196681
15,99	16	133	83	63	48	SCD641-1599-3-6-140HA05-HP358	31196682
16,00	16	133	83	63	48	SCD641-1600-3-6-140HA05-HP358	31196683
16,01	16	133	83	63	48	SCD641-1601-3-6-140HA05-HP358	31196684
16,02	16	133	83	63	48	SCD641-1602-3-6-140HA05-HP358	31196685
17,97	18	143	93	71	48	SCD641-1797-3-6-140HA05-HP358	31196686
17,98	18	143	93	71	48	SCD641-1798-3-6-140HA05-HP358	31196687
17,99	18	143	93	71	48	SCD641-1799-3-6-140HA05-HP358	31196688
18,00	18	143	93	71	48	SCD641-1800-3-6-140HA05-HP358	31196689
18,01	18	143	93	71	48	SCD641-1801-3-6-140HA05-HP358	31196690
18,02	18	143	93	71	48	SCD641-1802-3-6-140HA05-HP358	31196691
19,97	20	153	101	77	50	SCD641-1997-3-6-140HA05-HP358	31196692
19,98	20	153	101	77	50	SCD641-1998-3-6-140HA05-HP358	31196693
19,99	20	153	101	77	50	SCD641-1999-3-6-140HA05-HP358	31196694
20,00	20	153	101	77	50	SCD641-2000-3-6-140HA05-HP358	31196695
20,01	20	153	101	77	50	SCD641-2001-3-6-140HA05-HP358	31196696
20,02	20	153	101	77	50	SCD641-2002-3-6-140HA05-HP358	31196697

Dimensions in mm.

For fitting bores of tolerance classes up to max. IT7.

Please refer to the information field on page 10 for help in calculating the optimum nominal diameter for the fitting hole you require.

Special designs and other coatings on request.

Cutting Data for Drill Reamers

Feed and cutting speed

Tritan-Drill-Reamer | SCD64

MZG*	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	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

CALCULATION EXAMPLE

Please be aware that, the results achieved can be influenced by taking into account additional machining parameters such as the machining center and the clamping of the tool.

Formula to calculate the optimal nominal tool diameter:

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

Example:

- Fit bore: \varnothing 10 F7
- Largest bore dimension G_{OB} : 10,028 mm
- Smallest bore dimension G_{UB} : 10,013 mm

$$\rightarrow (10,028 \text{ mm} + 10,013 \text{ mm}) / 2 = 10,021 \text{ mm} = \text{Selected tool dimension } 10,02 \text{ mm}$$

* MAPAL machining groups

** If the alloying elements Cr, Mo, Ni, V, W, are in total > 8 %, then select the next higher MAPAL machining group.

The recommended values are reference values.

The optimum data for the respective processing case may vary slightly.

■ perfectly suitable □ conditionally suitable

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 clamping catalogue.



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