



Standard Programme – Drill Reamer

Drill-Reamer-Pyramid
Drill-Reamer

NEW

CENTERING | DRILLING | REAMING
WITH ONLY ONE TOOL

BECK
MAPAL GROUP

Drill-Reamer-Pyramid

**The new drill reamer with pyramid tip –
centering, drilling and reaming in one shot**

In order to manufacture economically and reduce productive and non-productive times, it is a proven means to combine individual work steps.

For the complete machining of bores in steel or short-chipping materials such as cast iron, BECK presents the new drill reamer with pyra-

mid tip. It combines centering, solid drilling and reaming of the hole in only one shot. In addition to optimum self-centering, the pyramid tip also ensures that the drill reamer can penetrate the component without any problems. Due to the very small chisel edge at a tip angle of 140° , spot drilling is also successful in unstable con-

ditions. The optimally designed cutting edge for reaming produces best surfaces, a new coating enables long tool life.



HIGHLIGHT

The pyramid tip

- Improved material penetration during entry
- Optimum self-centering
- Centering, drilling and reaming with a single tool

AT A GLANCE

- Internal coolant supply
- Centering, drilling and reaming in one work step
- Reduction of productive and non-productive times
- Improved entry behavior during unstable machining situations
- New coating for longer tool life



Drill-Reamer-Pyramid

The new drill reamer with pyramid tip – centering, drilling and reaming in one shot

Drill-Reamer-Pyramid, 5xD - internal coolant supply	4
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Drill-Reamer

The Drill-Reamer combines two operations in one tool: drilling and reaming

With the drill reamers, drilling and reaming operations are performed in a single step. In this way, holes can be machined faster and more efficiently and the main and non-productive times can be significantly reduced. Two drill cutting edges of the coated tool initially carry out the full drilling operation. Four axially slightly offset reaming cutting edges then provide the finish machining and ensure the required surfaces, dimensional accuracy and roundness in reaming quality.

Drill-Reamer, 5xD – internal coolant supply	6
Drill-Reamer, 3xD – internal coolant supply	8
Drill-Reamer, 3xD – external coolant supply	10

Cutting data	
for Drill-Reamer-Pyramid Drill-Reamer	11

Drill-Reamer-Pyramid

Drill Reamer, Preferred series

B093505 (5xD), internal coolant supply, with pyramid tip

Design:

Drill diameter: 3,970 - 16,050 mm
Bore tolerance: $\geq$ IT 7
Cutting material: Solid carbide, special TiAlN-Coating

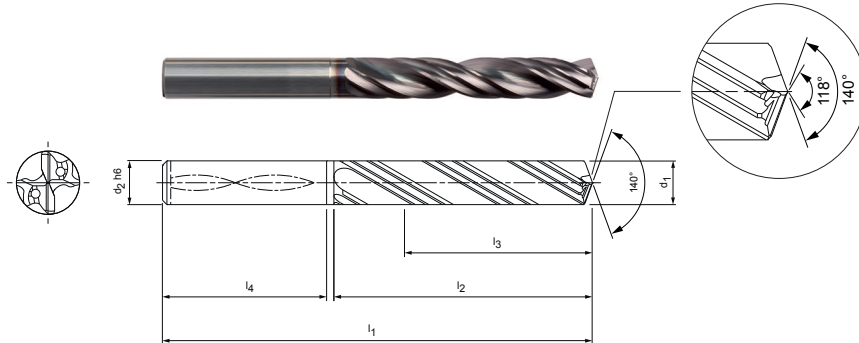
Number of cutting edges: 2

Number of guiding chamfers: 4

Point geometry: Specific geometry with pyramid tip

Point angle: 140°

Helix angle: 30°



Dimensions							Shank form HA	
d ₁	Tolerance	d ₂ h6	l ₁	l ₂	l ₃	l ₄	Specification	Order No.
4,00	H7	6	74	36	29	36	B093505-0400AR H7	31178666
5,00	H7	6	91	53	43	36	B093505-0500AR H7	31178667
5,97	$\pm 0,003$	6	91	53	43	36	B093505-0597AR+3-3	31178564
5,98	$\pm 0,003$	6	91	53	43	36	B093505-0598AR+3-3	31178565
5,99	$\pm 0,003$	6	91	53	43	36	B093505-0599AR+3-3	31178566
6,00	$\pm 0,003$	6	91	53	43	36	B093505-0600AR+3-3	31178567
6,00	H7	6	91	53	43	36	B093505-0600AR H7	31178668
6,01	$\pm 0,003$	6	91	53	43	36	B093505-0601AR+3-3	31178568
6,02	$\pm 0,003$	6	91	53	43	36	B093505-0602AR+3-3	31178569
6,32	$\pm 0,003$	8	91	53	43	36	B093505-0632AR+3-3	31178630
6,33	$\pm 0,003$	8	91	53	43	36	B093505-0633AR+3-3	31178631
6,34	$\pm 0,003$	8	91	53	43	36	B093505-0634AR+3-3	31178632
6,35	$\pm 0,003$	8	91	53	43	36	B093505-0635AR+3-3	31178633
6,36	$\pm 0,003$	8	91	53	43	36	B093505-0636AR+3-3	31178634
6,37	$\pm 0,003$	8	91	53	43	36	B093505-0637AR+3-3	31178635
7,00	H7	8	91	53	43	36	B093505-0700AR H7	31178669
7,97	$\pm 0,003$	8	91	53	43	36	B093505-0797AR+3-3	31178636
7,98	$\pm 0,003$	8	91	53	43	36	B093505-0798AR+3-3	31178637
7,99	$\pm 0,003$	8	91	53	43	36	B093505-0799AR+3-3	31178638
8,00	$\pm 0,003$	8	91	53	43	36	B093505-0800AR+3-3	31178639
8,00	H7	8	91	53	43	36	B093505-0800AR H7	31178670
8,01	$\pm 0,003$	8	91	53	43	36	B093505-0801AR+3-3	31178640
8,02	$\pm 0,003$	8	91	53	43	36	B093505-0802AR+3-3	31178641
9,00	H7	10	103	61	49	40	B093505-0900AR H7	31178671
9,48	$\pm 0,003$	10	103	61	49	40	B093505-0948AR+3-3	31178642
9,49	$\pm 0,003$	10	103	61	49	40	B093505-0949AR+3-3	31178643
9,50	$\pm 0,003$	10	103	61	49	40	B093505-0950AR+3-3	31178644
9,52	$\pm 0,003$	10	103	61	49	40	B093505-0952AR+3-3	31178645
9,53	$\pm 0,003$	10	103	61	49	40	B093505-0953AR+3-3	31178646
9,54	$\pm 0,003$	10	103	61	49	40	B093505-0954AR+3-3	31178647
9,97	$\pm 0,003$	10	103	61	49	40	B093505-0997AR+3-3	31178648
9,98	$\pm 0,003$	10	103	61	49	40	B093505-0998AR+3-3	31178649

Dimensions in mm.

Special editions and other coatings on request.

Drill Reamer, Preferred series | B093505 (5xD), internal coolant supply, with pyramid tip

Dimensions							Shank form HA	
d ₁	Tolerance	d ₂ h6	l ₁	l ₂	l ₃	l ₄	Specification	Order No.
9,99	±0,003	10	103	61	49	40	B093505-0999AR+3-3	31178650
10,00	±0,003	10	103	61	49	40	B093505-1000AR+3-3	31178651
10,00	H7	10	103	61	49	40	B093505-1000AR H7	31178672
10,01	±0,003	10	103	61	49	40	B093505-1001AR+3-3	31178652
10,02	±0,003	10	103	61	49	40	B093505-1002AR+3-3	31178653
11,97	±0,003	12	118	71	56	45	B093505-1197AR+3-3	31178654
11,98	±0,003	12	118	71	56	45	B093505-1198AR+3-3	31178655
11,99	±0,003	12	118	71	56	45	B093505-1199AR+3-3	31178656
12,00	±0,003	12	118	71	56	45	B093505-1200AR+3-3	31178657
12,00	H7	12	118	71	56	45	B093505-1200AR H7	31178673
12,01	±0,003	12	118	71	56	45	B093505-1201AR+3-3	31178658
12,02	±0,003	12	118	71	56	45	B093505-1202AR+3-3	31178659
12,67	±0,003	14	124	77	60	45	B093505-1267AR+3-3	31178660
12,68	±0,003	14	124	77	60	45	B093505-1268AR+3-3	31178661
12,69	±0,003	14	124	77	60	45	B093505-1269AR+3-3	31178662
12,70	±0,003	14	124	77	60	45	B093505-1270AR+3-3	31178663
12,71	±0,003	14	124	77	60	45	B093505-1271AR+3-3	31178664
12,72	±0,003	14	124	77	60	45	B093505-1272AR+3-3	31178665
14,00	H7	14	124	77	60	45	B093505-1400AR H7	31178674
16,00	H7	16	133	83	63	48	B093505-1600AR H7	31178675

Drill-Reamer-Pyramid

Drill Reamer, Configurable series
B093505 (5xD), internal coolant supply, with pyramid tip

Dimensions					
d ₁	d ₂ h6	l ₁	l ₂	l ₃	l ₄
3,970 - 4,800	6	74	36	29	36
4,801 - 5,960	6	91	53	43	36
5,961 - 6,050	6	91	53	43	36
6,051 - 6,999	8	91	53	43	36
7,000 - 8,050	8	91	53	43	36
8,051 - 9,449	10	103	61	49	40
9,450 - 10,050	10	103	61	49	40
10,051 - 12,050	12	118	71	56	45
12,051 - 14,050	14	124	77	60	45
14,051 - 16,050	16	133	83	63	48

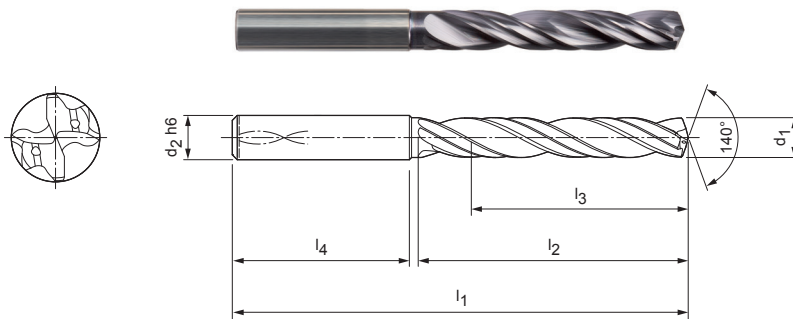
Dimensions in mm.
Special editions and other coatings on request.

Drill-Reamer

Drill Reamer, Preferred series
B093305 (5xD), internal coolant supply

Design:

Drill diameter:	3,970 – 16,050 mm
Bore tolerance:	≥ IT 7
Cutting material:	Solid carbide, special TiAlN-Coating
Number of cutting edges:	2
Number of guiding chamfers:	4
Point geometry:	Specific geometry
Point angle:	140°
Helix angle:	30°



Dimensions							Shank form HA	
d ₁	Tolerance	d ₂ h6	l ₁	l ₂	l ₃	l ₄	Specification	Order No.
4,00	H7	6	74	36	29	36	B093305-0400AE H7	30134903
5,00	H7	6	91	53	43	36	B093305-0500AE H7	30157641
5,97	±0,003	6	91	53	43	36	B093305-0597AE+3-3	30120150
5,98	±0,003	6	91	53	43	36	B093305-0598AE+3-3	30120151
5,99	±0,003	6	91	53	43	36	B093305-0599AE+3-3	30089316
6,00	±0,003	6	91	53	43	36	B093305-0600AE+3-3	30120152
6,00	H7	6	91	53	43	36	B093305-0600AE H7	30060348
6,01	±0,003	6	91	53	43	36	B093305-0601AE+3-3	30120153
6,02	±0,003	6	91	53	43	36	B093305-0602AE+3-3	30120154
6,32	±0,003	8	91	53	43	36	B093305-0632AE+3-3	30221676
6,33	±0,003	8	91	53	43	36	B093305-0633AE+3-3	30221674
6,34	±0,003	8	91	53	43	36	B093305-0634AE+3-3	30221673
6,35	±0,003	8	91	53	43	36	B093305-0635AE+3-3	30221672
6,36	±0,003	8	91	53	43	36	B093305-0636AE+3-3	30221671
6,37	±0,003	8	91	53	43	36	B093305-0637AE+3-3	30221670
7,00	H7	8	91	53	43	36	B093305-0700AE H7	30076515
7,97	±0,003	8	91	53	43	36	B093305-0797AE+3-3	30120190
7,98	±0,003	8	91	53	43	36	B093305-0798AE+3-3	30120191
7,99	±0,003	8	91	53	43	36	B093305-0799AE+3-3	30120192
8,00	±0,003	8	91	53	43	36	B093305-0800AE+3-3	30099663
8,00	H7	8	91	53	43	36	B093305-0800AE H7	30072738
8,01	±0,003	8	91	53	43	36	B093305-0801AE+3-3	30120194
8,02	±0,003	8	91	53	43	36	B093305-0802AE+3-3	30120195
9,00	H7	10	103	61	49	40	B093305-0900AE H7	30076516
9,48	±0,003	10	103	61	49	40	B093305-0948AE+3-3	30221668
9,49	±0,003	10	103	61	49	40	B093305-0949AE+3-3	30221667
9,5	±0,003	10	103	61	49	40	B093305-0950AE+3-3	30120223
9,52	±0,003	10	103	61	49	40	B093305-0952AE+3-3	30221664
9,53	±0,003	10	103	61	49	40	B093305-0953AE+3-3	30221665
9,54	±0,003	10	103	61	49	40	B093305-0954AE+3-3	30221666
9,97	±0,003	10	103	61	49	40	B093305-0997AE+3-3	30082992
9,98	±0,003	10	103	61	49	40	B093305-0998AE+3-3	30120231

Dimensions in mm.

Special editions and other coatings on request.

Drill Reamer, Preferred series | B093305 (5xD), internal coolant supply

Dimensions							Shank form HA	
d ₁	Tolerance	d ₂ h6	l ₁	l ₂	l ₃	l ₄	Specification	Order No.
9,99	±0,003	10	103	61	49	40	B093305-0999AE+3-3	30089317
10,00	±0,003	10	103	61	49	40	B093305-1000AE+3-3	30120232
10,00	H7	10	103	61	49	40	B093305-1000AE H7	30072099
10,01	±0,003	10	103	61	49	40	B093305-1001AE+3-3	30120233
10,02	±0,003	10	103	61	49	40	B093305-1002AE+3-3	30120234
11,97	±0,003	12	118	71	56	45	B093305-1197AE+3-3	30120270
11,98	±0,003	12	118	71	56	45	B093305-1198AE+3-3	30120271
11,99	±0,003	12	118	71	56	45	B093305-1199AE+3-3	30089318
12,00	±0,003	12	118	71	56	45	B093305-1200AE+3-3	30120272
12,00	H7	12	118	71	56	45	B093305-1200AE H7	30060349
12,01	±0,003	12	118	71	56	45	B093305-1201AE+3-3	30120273
12,02	±0,003	12	118	71	56	45	B093305-1202AE+3-3	30120274
12,67	±0,003	14	124	77	60	45	B093305-1267AE+3-3	30221658
12,68	±0,003	14	124	77	60	45	B093305-1268AE+3-3	30221657
12,69	±0,003	14	124	77	60	45	B093305-1269AE+3-3	30221656
12,7	±0,003	14	124	77	60	45	B093305-1270AE+3-3	30101086
12,71	±0,003	14	124	77	60	45	B093305-1271AE+3-3	30221654
12,72	±0,003	14	124	77	60	45	B093305-1272AE+3-3	30221655
14,00	H7	14	124	77	60	45	B093305-1400AE H7	30060350
16,00	H7	16	133	83	63	48	B093305-1600AE H7	30060351

Drill-Reamer

Drill Reamer, Configurable series
B093305 (5xD), internal coolant supply

Dimensions					
d ₁	d ₂ h6	l ₁	l ₂	l ₃	l ₄
3,970 - 4,800	6	74	36	29	36
4,801 - 5,960	6	91	53	43	36
5,961 - 6,050	6	91	53	43	36
6,051 - 6,999	8	91	53	43	36
7,000 - 8,050	8	91	53	43	36
8,051 - 9,449	10	103	61	49	40
9,450 - 10,050	10	103	61	49	40
10,051 - 12,050	12	118	71	56	45
12,051 - 14,050	14	124	77	60	45
14,051 - 16,050	16	133	83	63	48

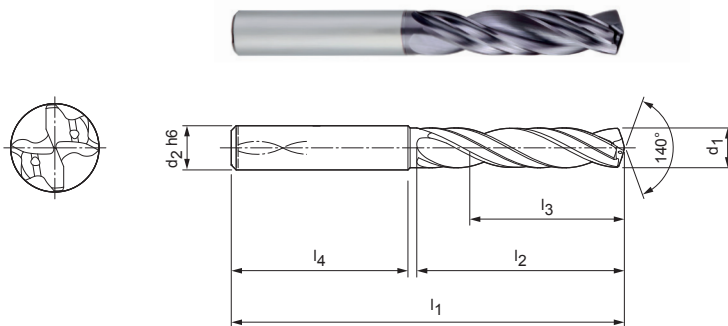
Dimensions in mm.
Special editions and other coatings on request.

Drill-Reamer

Drill Reamer, Preferred series
B093303 (3xD), internal coolant supply

Design:

Drill diameter:	3,970 – 16,050 mm
Bore tolerance:	≥ IT 7
Cutting material:	Solid carbide, special TiAlN-Coating
Number of cutting edges:	2
Number of guiding chamfers:	4
Point geometry:	Specific geometry
Point angle:	140°
Helix angle:	30°



Dimensions							Shank form HA	
d ₁	Tolerance	d ₂ h6	l ₁	l ₂	l ₃	l ₄	Specification	Order No.
4,00	H7	6	66	24	17	36	B093303-0400AE H7	30115438
5,00	H7	6	79	34	24	36	B093303-0500AE H7	30095401
5,97	±0,003	6	79	34	24	36	B093303-0597AE+3-3	30120040
5,98	±0,003	6	79	34	24	36	B093303-0598AE+3-3	30120041
5,99	±0,003	6	79	34	24	36	B093303-0599AE+3-3	30120042
6,00	±0,003	6	79	34	24	36	B093303-0600AE+3-3	30119701
6,00	H7	6	79	34	24	36	B093303-0600AE H7	30072761
6,01	±0,003	6	79	34	24	36	B093303-0601AE+3-3	30119702
6,02	±0,003	6	79	34	24	36	B093303-0602AE+3-3	30119703
6,32	±0,003	8	79	34	24	36	B093303-0632AE+3-3	30078773
6,33	±0,003	8	79	34	24	36	B093303-0633AE+3-3	30221632
6,34	±0,003	8	79	34	24	36	B093303-0634AE+3-3	30221633
6,35	±0,003	8	79	34	24	36	B093303-0635AE+3-3	30221634
6,36	±0,003	8	79	34	24	36	B093303-0636AE+3-3	30221635
6,37	±0,003	8	79	34	24	36	B093303-0637AE+3-3	30221636
7,00	H7	8	79	34	24	36	B093303-0700AE H7	30076509
7,97	±0,003	8	79	34	24	36	B093303-0797AE+3-3	30084334
7,98	±0,003	8	79	34	24	36	B093303-0798AE+3-3	30119739
7,99	±0,003	8	79	34	24	36	B093303-0799AE+3-3	30093430
8,00	±0,003	8	79	34	24	36	B093303-0800AE+3-3	30095195
8,00	H7	8	79	34	24	36	B093303-0800AE H7	30072737
8,01	±0,003	8	79	34	24	36	B093303-0801AE+3-3	30119740
8,02	±0,003	8	79	34	24	36	B093303-0802AE+3-3	30119741
9,00	H7	10	89	47	35	40	B093303-0900AE H7	30076510
9,48	±0,003	10	89	47	35	40	B093303-0948AE+3-3	30221640
9,49	±0,003	10	89	47	35	40	B093303-0949AE+3-3	30221638
9,5	±0,003	10	89	47	35	40	B093303-0950AE+3-3	30119771
9,52	±0,003	10	89	47	35	40	B093303-0952AE+3-3	30221641
9,53	±0,003	10	89	47	35	40	B093303-0953AE+3-3	30221642
9,54	±0,003	10	89	47	35	40	B093303-0954AE+3-3	30221643
9,97	±0,003	10	89	47	35	40	B093303-0997AE+3-3	30119778
9,98	±0,003	10	89	47	35	40	B093303-0998AE+3-3	30119779
9,99	±0,003	10	89	47	35	40	B093303-0999AE+3-3	30119780
10,00	±0,003	10	89	47	35	40	B093303-1000AE+3-3	30119781

Dimensions in mm.

Special editions and other coatings on request.

Drill Reamer, Preferred series | B093303 (3xD), internal coolant supply

Dimensions							Shank form HA	
d ₁	Tolerance	d ₂ h6	l ₁	l ₂	l ₃	l ₄	Specification	Order No.
10,00	H7	10	89	47	35	40	B093303-1000AE H7	30072858
10,01	±0,003	10	89	47	35	40	B093303-1001AE+3-3	30119782
10,02	±0,003	10	89	47	35	40	B093303-1002AE+3-3	30119783
11,97	±0,003	12	102	55	40	45	B093303-1197AE+3-3	30119829
11,98	±0,003	12	102	55	40	45	B093303-1198AE+3-3	30119830
11,99	±0,003	12	102	55	40	45	B093303-1199AE+3-3	30119831
12,00	±0,003	12	102	55	40	45	B093303-1200AE+3-3	30119832
12,00	H7	12	102	55	40	45	B093303-1200AE H7	30072857
12,01	±0,003	12	102	55	40	45	B093303-1201AE+3-3	30073018
12,02	±0,003	12	102	55	40	45	B093303-1202AE+3-3	30089695
12,67	±0,003	14	107	60	43	45	B093303-1267AE+3-3	30221647
12,68	±0,003	14	107	60	43	45	B093303-1268AE+3-3	30221646
12,69	±0,003	14	107	60	43	45	B093303-1269AE+3-3	30221645
12,70	±0,003	14	107	60	43	45	B093303-1270AE+3-3	30119842
12,71	±0,003	14	107	60	43	45	B093303-1271AE+3-3	30221650
12,72	±0,003	14	107	60	43	45	B093303-1272AE+3-3	30221652
14,00	H7	14	107	60	43	45	B093303-1400AE H7	30060346
16,00	H7	16	115	65	45	48	B093303-1600AE H7	30060347

Drill-Reamer

Drill Reamer, Preferred series
B093303 (3xD), internal coolant supply

Dimensions					
d ₁	d ₂ h6	l ₁	l ₂	l ₃	l ₄
3,970 - 4,800	6	66	24	17	36
4,801 - 5,960	6	79	34	24	36
5,961 - 6,050	6	79	34	24	36
6,051 - 6,999	8	79	34	24	36
7,000 - 8,050	8	79	34	24	36
8,051 - 9,449	10	89	47	35	40
9,450 - 10,050	10	89	47	35	40
10,051 - 12,050	12	102	55	40	45
12,051 - 14,050	14	107	60	43	45
14,051 - 16,050	16	115	65	45	48

Dimensions in mm.
Special editions and other coatings on request.

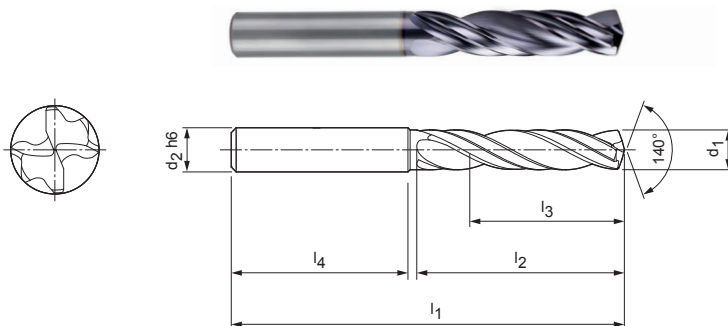
Drill-Reamer

Drill Reamer, Preferred series

B093301 (3xD), external coolant supply

Design:

Drill diameter:	3,970 – 16,050 mm
Bore tolerance:	≥ IT 7
Cutting material:	Solid carbide, special TiAlN-Coating
Number of cutting edges:	2
Number of guiding chamfers:	4
Point geometry:	Specific geometry
Point angle:	140°
Helix angle:	30°



Dimensions							Shank form HA	
d ₁	Tolerance	d ₂ h6	l ₁	l ₂	l ₃	l ₄	Specification	Order No.
5,97	±0,003	6	79	34	24	36	B093301-0597AE+3-3	30179014
5,98	±0,003	6	79	34	24	36	B093301-0598AE+3-3	30211380
5,99	±0,003	6	79	34	24	36	B093301-0599AE+3-3	30184711
6,00	±0,003	6	79	34	24	36	B093301-0600AE+3-3	30099666
6,01	±0,003	6	79	34	24	36	B093301-0601AE+3-3	30158303
6,02	±0,003	6	79	34	24	36	B093301-0602AE+3-3	30219852
7,97	±0,003	8	79	34	24	36	B093301-0797AE+3-3	30218108
7,98	±0,003	8	79	34	24	36	B093301-0798AE+3-3	30218109
7,99	±0,003	8	79	34	24	36	B093301-0799AE+3-3	30078182
8,00	±0,003	8	79	34	24	36	B093301-0800AE+3-3	30175468
8,01	±0,003	8	79	34	24	36	B093301-0801AE+3-3	30209762
8,02	±0,003	8	79	34	24	36	B093301-0802AE+3-3	30096454
9,97	±0,003	10	89	47	35	40	B093301-0997AE+3-3	30218110
9,98	±0,003	10	89	47	35	40	B093301-0998AE+3-3	30174736
9,99	±0,003	10	89	47	35	40	B093301-0999AE+3-3	30175469
10,00	±0,003	10	89	47	35	40	B093301-1000AE+3-3	30099665
10,01	±0,003	10	89	47	35	40	B093301-1001AE+3-3	30218111
10,02	±0,003	10	89	47	35	40	B093301-1002AE+3-3	30218112
11,97	±0,003	12	102	55	40	45	B093301-1197AE+3-3	30218113
11,98	±0,003	12	102	55	40	45	B093301-1198AE+3-3	30151652
11,99	±0,003	12	102	55	40	45	B093301-1199AE+3-3	30176856
12,00	±0,003	12	102	55	40	45	B093301-1200AE+3-3	30099664
12,01	±0,003	12	102	55	40	45	B093301-1201AE+3-3	30214889
12,02	±0,003	12	102	55	40	45	B093301-1202AE+3-3	30182014

Dimensions in mm.

Special editions and other coatings on request.

Drill-Reamer

Drill Reamer, Configurable series

B093301 (3xD), external coolant supply

Dimensions					
d ₁	d ₂ h6	l ₁	l ₂	l ₃	l ₄
3,970 - 4,800	6	66	24	17	36
4,801 - 5,960	6	79	34	24	36
5,961 - 6,050	6	79	34	24	36
6,051 - 6,999	8	79	34	24	36
7,000 - 8,050	8	79	34	24	36
8,051 - 9,449	10	89	47	35	40
9,450 - 10,050	10	89	47	35	40
10,051 - 12,050	12	102	55	40	45
12,051 - 14,050	14	107	60	43	45
14,051 - 16,050	16	115	65	45	48

Dimensions in mm.

Special editions and other coatings on request.

Cutting data for Drill-Reamer-Pyramid | Drill-Reamer

Cutting speed v_c [m/min], feed f [mm/rev]

Drill-Reamer-Pyramid 5xD with IC | B093505

Drill-Reamer 5xD mit IK | B093305 – Drill-Reamer 3xD with IC | B093303 – Drill-Reamer 3xD without IC | B093301

ZG*		Material	Strength/ Hardness [N/mm ²] [HRC]	v_c [m/min]		Feed f [mm/U] for drill diameter					
				Internal coolant	External coolant	3,0	4,5	6,5	9,5	14,0	20,0
P	P1	P1.1 Structural, free-cutting, case hardened and heat-treated steel, non-alloyed	< 700	80	70	0,11	0,13	0,14	0,15	0,17	0,19
		P1.2 Structural, free-cutting, case hardened and heat-treated steel, non-alloyed	< 1.200	70	60	0,14	0,16	0,17	0,19	0,21	0,23
	P2	P2.1 Nitratred, case hardened and heat-treated steel, alloyed	< 900	80	70	0,13	0,15	0,16	0,18	0,20	0,22
		P2.2 Nitratred, case hardened and heat-treated steel, alloyed	< 1.400	55	50	0,11	0,12	0,13	0,15	0,16	0,18
	P3	P3.1 Tool, roller bearing, spring and high speed steel**	< 800	60	50	0,12	0,13	0,15	0,16	0,18	0,20
		P3.2 Tool, roller bearing, spring and high speed steel**	< 1.000	50	45	0,10	0,11	0,12	0,14	0,15	0,16
		P3.3 Tool, roller bearing, spring and high speed steel**	< 1.500	50	35	0,10	0,11	0,12	0,14	0,15	0,16
	P4	P4.1 Stainless steel, ferritic and martensitic		50	35	0,08	0,09	0,10	0,11	0,12	0,13
	P5	P5.1 Cast steel		80	70	0,13	0,15	0,16	0,18	0,20	0,22
	P6	P6.1 Stainless cast steel, ferritic and martensitic		50	35	0,08	0,09	0,10	0,11	0,12	0,13
K	K1	K1.1 Cast iron with lamellar graphite (grey cast iron), EN-GJL	< 300	95	70	0,17	0,19	0,22	0,25	0,27	0,30
		K2.1 Cast iron with spheroidal graphite, EN-GJS	< 500	130	80	0,16	0,19	0,20	0,23	0,26	0,28
	K2	K2.2 Cast iron with spheroidal graphite, EN-GJS	≤ 800	80	60	0,14	0,16	0,18	0,20	0,22	0,24
		K2.3 Cast iron with spheroidal graphite, EN-GJS	> 800								
	K3	K3.1 Cast iron with vermicular graphite, EN-GJV; Malleable cast iron, GJM	< 500	70	65	0,16	0,17	0,19	0,22	0,24	0,26
		K3.2 Cast iron with vermicular graphite, EN-GJV; Malleable cast iron, GJM	> 500	65	55	0,13	0,14	0,16	0,17	0,19	0,21

The recommended values are reference values.

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

* BECK machining groups

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

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