Reaming, countersinking chamfering & de-burring

STOCK

Chip – by Chip – to the Top

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High-performance reamers for every application

SUPER **R-HS**

Maximum performance for all materials

With the SuperR-HS range Stock provides high-performance reamers for virtually any application. The perfect combination of special geometries, tool material and coatings provides optimal results for all reaming operations.

Perfect machining of through holes

The specially developed straight-flute geometry is unique with reamers for through holes:

- extremely high cutting rates also for deep holes
- exceptional coolant delivery due to longitudinal grooves in the shank or radial coolant exits directly at the cutting edge
- trouble-free chip evacuation ahead of the cutting edge
- chips do not return back within the flutes
- the excellent reamed surface remains optimally preserved

Maximum performance in blind holes

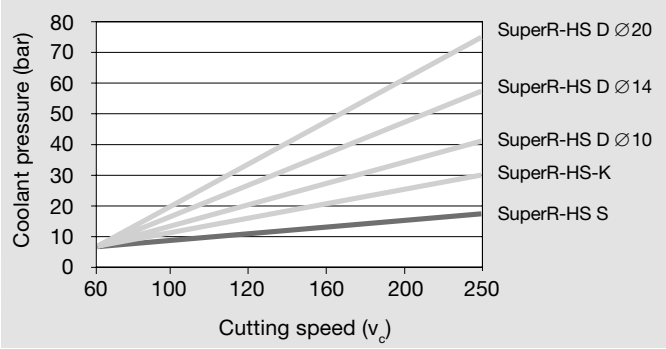
SuperR-HS high-performance reamers for the machining of blind holes are internally cooled with a central coolant duct:

- especially large cross-section ensures the optimal delivery of the coolant to the cutting edge of the tool
- straight-fluted tool geometry ensures the safe evacuation of the optimally formed chips
- excellent cutting rates and optimal surfaces

- For the machining of cast iron or aluminium, Stock provides solid carbide high-performance reamers in the semi-standard range for excellent surfaces.
- For highest requirements in machining steel, carbide or cermet tipped head reamers are available on request.

Please contact us, we will be glad to advise you!

Optimal coolant supply



Guide values for coolant pressure depending on the cutting speed, valid for standard structural dimensions

P	M	K	N	S	H	Type	Cutting direction	Form	Tool material	Surface	Standard	d1/mm	Catalogue no.	Progr. page
Solid carbide high-performance reamers														
														
•	•	○		•	•	SuperR-HS-S	right-hand		**Solid carbide**	AlTiN nano	Company std.	2.000 - 20.000	**72870**	8
														
•	•	○		•	•	SuperR-HS-D	right-hand		**Solid carbide**	AlTiN nano	Company std.	2.000 - 20.000	**72871**	9
														
•	•	○		•	•	SuperR-HS-S	right-hand		**Solid carbide**	AlTiN nano	Company std.	1.970 - 12.030	**72872**	10
														
•	•	○		•	•	SuperR-HS-D	right-hand		**Solid carbide**	AlTiN nano	Company std.	1.970 - 12.030	**72873**	11
														
			•			SuperR-HS-S	right-hand		**Solid carbide**	DLC	Company std.	4.000 - 20.000	**72876**	12
														
			•			SuperR-HS-D	right-hand		**Solid carbide**	DLC	Company std.	4.000 - 20.000	**72877**	13
Solid carbide high-performance head reamers														
														
•	•	○		•	•	SuperR-HS-KS	right-hand		**Solid carbide**	AlTiN nano	Company std.	14.000 - 42.000	**72874**	14
														
•	•	○		•	•	SuperR-HS-KD	right-hand		**Solid carbide**	AlTiN nano	Company std.	14.000 - 42.000	**72875**	15
Shrink fit extensions														
														
										bright	Company std.		**78719**	16

Carbide reamers

Solid carbide high-performance reamers

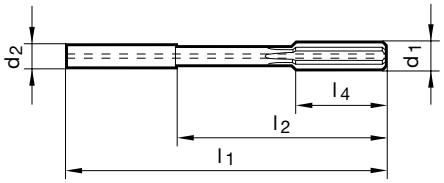
Catalogue no. 72870

SuperR-HS-S | WN | VHM | AlTiN nano | H7 | R | HA | 0°

P	M	K	N	S	H
●	●	○		●	●

Application recommendations page 92

- with axial coolant duct, for reaming blind holes
- for highest cutting rates and exceptional hole quality
- straight flutes, with extremely unequal flute spacing
- straight shank tol. h6 for clamping in hydraulic chucks and shrink fit chucks
- considerable process cost saving potential



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2.500	4.000	50.000	22.000	8.000	4	**2.500**
3.000	4.000	68.000	40.000	12.000	4	**3.000**
3.500	4.000	68.000	40.000	12.000	4	**3.500**
4.000	4.000	68.000	40.000	12.000	4	**4.000**
4.500	6.000	76.000	40.000	12.000	4	**4.500**
5.000	6.000	76.000	40.000	12.000	4	**5.000**
5.500	6.000	76.000	40.000	12.000	4	**5.500**
6.000	6.000	76.000	40.000	12.000	4	**6.000**
6.500	8.000	101.000	65.000	16.000	6	**6.500**
7.000	8.000	101.000	65.000	16.000	6	**7.000**
7.500	8.000	101.000	65.000	16.000	6	**7.500**
8.000	8.000	101.000	65.000	16.000	6	**8.000**
8.500	10.000	101.000	61.000	19.000	6	**8.500**
9.000	10.000	101.000	61.000	19.000	6	**9.000**
9.500	10.000	101.000	61.000	19.000	6	**9.500**
10.000	10.000	101.000	61.000	19.000	6	**10.000**
10.500	12.000	130.000	85.000	19.000	6	**10.500**

d1 mm	d2 h6 mm	l1 mm	l2 mm	l4 mm	Z	**Code no.**
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11.500	12.000	130.000	85.000	19.000	6	**11.500**
12.000	12.000	130.000	85.000	19.000	6	**12.000**
13.000	14.000	130.000	85.000	22.000	6	**13.000**
14.000	14.000	130.000	85.000	22.000	6	**14.000**
15.000	16.000	150.000	102.000	22.000	6	**15.000**
16.000	16.000	150.000	102.000	22.000	6	**16.000**
17.000	18.000	150.000	102.000	25.000	6	**17.000**
18.000	18.000	150.000	102.000	25.000	6	**18.000**
19.000	20.000	150.000	100.000	25.000	6	**19.000**
20.000	20.000	150.000	100.000	25.000	6	**20.000**

Carbide reamers

Solid carbide high-performance reamers

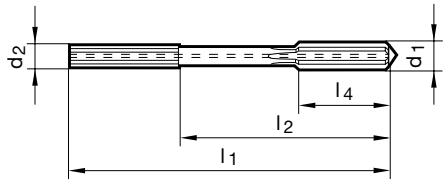
Catalogue no. 72871

SuperR-HS-D | WN | VHM | AlTiN nano | H7 | R | HA | 0°

P	M	K	N	S	H
●	●	○		●	●

Application recommendations page 92

- coolant supply through longitudinal grooves on shank, for reaming through holes
- straight flutes, with extremely unequal flute spacing
- for highest cutting rates and exceptional hole quality
- straight shank tol. h6 for clamping in hydraulic chucks and shrink fit chucks
- considerable process cost saving potential



d1 mm	d2 h6 mm	l1 mm	l2 mm	l4 mm	Z	Code no.
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2.500	4.000	50.000	22.000	8.000	4	**2.500**
3.000	4.000	68.000	40.000	12.000	4	**3.000**
3.500	4.000	68.000	40.000	12.000	4	**3.500**
4.000	4.000	68.000	40.000	12.000	4	**4.000**
4.500	6.000	76.000	40.000	12.000	4	**4.500**
5.000	6.000	76.000	40.000	12.000	4	**5.000**
5.500	6.000	76.000	40.000	12.000	4	**5.500**
6.000	6.000	76.000	40.000	12.000	4	**6.000**
6.500	8.000	101.000	65.000	16.000	6	**6.500**
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7.500	8.000	101.000	65.000	16.000	6	**7.500**
8.000	8.000	101.000	65.000	16.000	6	**8.000**
8.500	10.000	101.000	61.000	19.000	6	**8.500**
9.000	10.000	101.000	61.000	19.000	6	**9.000**
9.500	10.000	101.000	61.000	19.000	6	**9.500**
10.000	10.000	101.000	61.000	19.000	6	**10.000**
10.500	12.000	130.000	85.000	19.000	6	**10.500**

d1 mm	d2 h6 mm	l1 mm	l2 mm	l4 mm	Z	Code no.
11.000	12.000	130.000	85.000	19.000	6	**11.000**
11.500	12.000	130.000	85.000	19.000	6	**11.500**
12.000	12.000	130.000	85.000	19.000	6	**12.000**
13.000	14.000	130.000	85.000	22.000	6	**13.000**
14.000	14.000	130.000	85.000	22.000	6	**14.000**
15.000	16.000	150.000	102.000	22.000	6	**15.000**
16.000	16.000	150.000	102.000	22.000	6	**16.000**
17.000	18.000	150.000	102.000	25.000	6	**17.000**
18.000	18.000	150.000	102.000	25.000	6	**18.000**
19.000	20.000	150.000	100.000	25.000	6	**19.000**
20.000	20.000	150.000	100.000	25.000	6	**20.000**

Carbide reamers

Solid carbide high-performance reamers

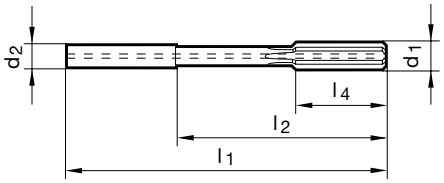
Catalogue no. 72872

SuperR-HS-S | WN | VHM | AlTiN nano | +0,005 | R | HA | 0°

P	M	K	N	S	H
●	●	○		●	●

Application recommendations page 92

- with axial coolant duct, for reaming blind holes
- for highest cutting rates and exceptional hole quality
- straight flutes, with extremely unequal flute spacing
- straight shank tol. h6 for clamping in hydraulic chucks and shrink fit chucks
- considerable process cost saving potential



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1.990	4.000	50.000	22.000	8.000	4	1.990
2.000	4.000	50.000	22.000	8.000	4	2.000
2.010	4.000	50.000	22.000	8.000	4	2.010
2.020	4.000	50.000	22.000	8.000	4	2.020
2.030	4.000	50.000	22.000	8.000	4	2.030
2.970	4.000	68.000	40.000	12.000	4	2.970
2.980	4.000	68.000	40.000	12.000	4	2.980
2.990	4.000	68.000	40.000	12.000	4	2.990
3.000	4.000	68.000	40.000	12.000	4	3.000
3.010	4.000	68.000	40.000	12.000	4	3.010
3.020	4.000	68.000	40.000	12.000	4	3.020
3.030	4.000	68.000	40.000	12.000	4	3.030
3.970	4.000	68.000	40.000	12.000	4	3.970
3.980	4.000	68.000	40.000	12.000	4	3.980
3.990	4.000	68.000	40.000	12.000	4	3.990
4.000	4.000	68.000	40.000	12.000	4	4.000
4.010	4.000	68.000	40.000	12.000	4	4.010
4.020	4.000	68.000	40.000	12.000	4	4.020
4.030	4.000	68.000	40.000	12.000	4	4.030
4.970	6.000	76.000	40.000	12.000	4	4.970
4.980	6.000	76.000	40.000	12.000	4	4.980
4.990	6.000	76.000	40.000	12.000	4	4.990
5.000	6.000	76.000	40.000	12.000	4	5.000
5.010	6.000	76.000	40.000	12.000	4	5.010
5.020	6.000	76.000	40.000	12.000	4	5.020
5.030	6.000	76.000	40.000	12.000	4	5.030
5.970	6.000	76.000	40.000	12.000	4	5.970
5.980	6.000	76.000	40.000	12.000	4	5.980

d1 mm	d2 h6 mm	l1 mm	l2 mm	l4 mm	Z	Code no.
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6.010	6.000	76.000	40.000	12.000	4	6.010
6.020	6.000	76.000	40.000	12.000	4	6.020
6.030	6.000	76.000	40.000	12.000	4	6.030
7.000	8.000	101.000	65.000	16.000	6	7.000
7.970	8.000	101.000	65.000	16.000	6	7.970
7.980	8.000	101.000	65.000	16.000	6	7.980
7.990	8.000	101.000	65.000	16.000	6	7.990
8.000	8.000	101.000	65.000	16.000	6	8.000
8.010	8.000	101.000	65.000	16.000	6	8.010
8.020	8.000	101.000	65.000	16.000	6	8.020
8.030	8.000	101.000	65.000	16.000	6	8.030
9.000	10.000	101.000	61.000	19.000	6	9.000
9.970	10.000	101.000	61.000	19.000	6	9.970
9.980	10.000	101.000	61.000	19.000	6	9.980
9.990	10.000	101.000	61.000	19.000	6	9.990
10.000	10.000	101.000	61.000	19.000	6	10.000
10.010	10.000	101.000	61.000	19.000	6	10.010
10.020	10.000	101.000	61.000	19.000	6	10.020
10.030	10.000	101.000	61.000	19.000	6	10.030
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11.980	12.000	130.000	85.000	19.000	6	11.980
11.990	12.000	130.000	85.000	19.000	6	11.990
12.010	12.000	130.000	85.000	19.000	6	12.010
12.020	12.000	130.000	85.000	19.000	6	12.020
12.030	12.000	130.000	85.000	19.000	6	12.030

Carbide reamers

Solid carbide high-performance reamers

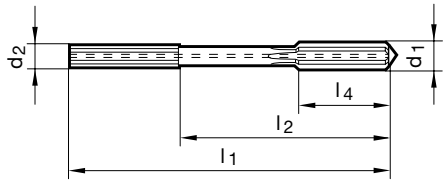
Catalogue no. 72873

SuperR-HS-D | WN | VHM | AlTiN nano | +0,005 | R | HA | 0°

P	M	K	N	S	H
●	●	○		●	●

Application recommendations page 92

- coolant supply through longitudinal grooves on shank, for reaming through holes
- straight flutes, with extremely unequal flute spacing
- for highest cutting rates and exceptional hole quality
- straight shank tol. h6 for clamping in hydraulic chucks and shrink fit chucks
- considerable process cost saving potential



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1.990	4.000	50.000	22.000	8.000	4	**1.990**
2.000	4.000	50.000	22.000	8.000	4	**2.000**
2.010	4.000	50.000	22.000	8.000	4	**2.010**
2.020	4.000	50.000	22.000	8.000	4	**2.020**
2.030	4.000	50.000	22.000	8.000	4	**2.030**
2.970	4.000	68.000	40.000	12.000	4	**2.970**
2.980	4.000	68.000	40.000	12.000	4	**2.980**
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3.010	4.000	68.000	40.000	12.000	4	**3.010**
3.020	4.000	68.000	40.000	12.000	4	**3.020**
3.030	4.000	68.000	40.000	12.000	4	**3.030**
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3.980	4.000	68.000	40.000	12.000	4	**3.980**
3.990	4.000	68.000	40.000	12.000	4	**3.990**
4.000	4.000	68.000	40.000	12.000	4	**4.000**
4.010	4.000	68.000	40.000	12.000	4	**4.010**
4.020	4.000	68.000	40.000	12.000	4	**4.020**
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5.010	6.000	76.000	40.000	12.000	4	**5.010**
5.020	6.000	76.000	40.000	12.000	4	**5.020**
5.030	6.000	76.000	40.000	12.000	4	**5.030**
5.970	6.000	76.000	40.000	12.000	4	**5.970**
5.980	6.000	76.000	40.000	12.000	4	**5.980**

d1 mm	d2 h6 mm	l1 mm	l2 mm	l4 mm	Z	Code no.
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6.000	6.000	76.000	40.000	12.000	4	**6.000**
6.010	6.000	76.000	40.000	12.000	4	**6.010**
6.020	6.000	76.000	40.000	12.000	4	**6.020**
6.030	6.000	76.000	40.000	12.000	4	**6.030**
7.000	8.000	101.000	65.000	16.000	6	**7.000**
7.970	8.000	101.000	65.000	16.000	6	**7.970**
7.980	8.000	101.000	65.000	16.000	6	**7.980**
7.990	8.000	101.000	65.000	16.000	6	**7.990**
8.000	8.000	101.000	65.000	16.000	6	**8.000**
8.010	8.000	101.000	65.000	16.000	6	**8.010**
8.020	8.000	101.000	65.000	16.000	6	**8.020**
8.030	8.000	101.000	65.000	16.000	6	**8.030**
9.000	10.000	101.000	61.000	19.000	6	**9.000**
9.970	10.000	101.000	61.000	19.000	6	**9.970**
9.980	10.000	101.000	61.000	19.000	6	**9.980**
9.990	10.000	101.000	61.000	19.000	6	**9.990**
10.000	10.000	101.000	61.000	19.000	6	**10.000**
10.010	10.000	101.000	61.000	19.000	6	**10.010**
10.020	10.000	101.000	61.000	19.000	6	**10.020**
10.030	10.000	101.000	61.000	19.000	6	**10.030**
11.000	12.000	130.000	85.000	19.000	6	**11.000**
11.970	12.000	130.000	85.000	19.000	6	**11.970**
11.980	12.000	130.000	85.000	19.000	6	**11.980**
11.990	12.000	130.000	85.000	19.000	6	**11.990**
12.010	12.000	130.000	85.000	19.000	6	**12.010**
12.020	12.000	130.000	85.000	19.000	6	**12.020**
12.030	12.000	130.000	85.000	19.000	6	**12.030**

Carbide reamers

Solid carbide high-performance reamers

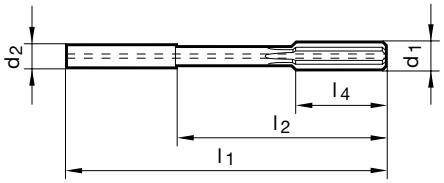
Catalogue no. 72876

SuperR-HS-S | WN | VHM | DLC | H7 | R | HA | 0°

P	M	K	N	S	H
			●		

Application recommendations page 92

- with axial coolant duct, for reaming blind holes
- for highest cutting rates and exceptional hole quality
- straight flutes, with extremely unequal flute spacing
- straight shank tol. h6 for clamping in hydraulic chucks and shrink fit chucks
- considerable process cost saving potential
- the DLC coating prevents the formation of built-up edges, thereby avoiding diameter fluctuations while delivering the best surface quality for the reamed hole



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5.000	6.000	76.000	40.000	12.000	4	**5.000**
6.000	6.000	76.000	40.000	12.000	4	**6.000**
7.000	8.000	101.000	65.000	16.000	6	**7.000**
8.000	8.000	101.000	65.000	16.000	6	**8.000**
10.000	10.000	101.000	61.000	19.000	6	**10.000**

d1 mm	d2 h6 mm	l1 mm	l2 mm	l4 mm	Z	**Code no.**
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14.000	14.000	130.000	85.000	22.000	6	**14.000**
16.000	16.000	150.000	102.000	22.000	6	**16.000**
18.000	18.000	150.000	102.000	25.000	6	**18.000**
20.000	20.000	150.000	100.000	25.000	6	**20.000**

Carbide reamers

Solid carbide high-performance reamers

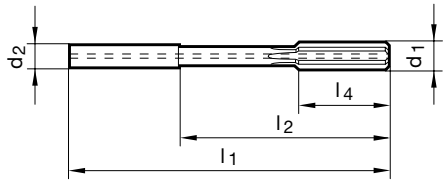
Catalogue no. 72877

SuperR-HS-D | WN | VHM | DLC | H7 | R | HA | 0°

P	M	K	N	S	H
			●		

Application recommendations page 92

- for highest cutting rates and exceptional hole quality
- straight flutes, with extremely unequal flute spacing
- straight shank tol. h6 for clamping in hydraulic chucks and shrink fit chucks
- considerable process cost saving potential
- the DLC coating prevents the formation of built-up edges, thereby avoiding diameter fluctuations while delivering the best surface quality for the reamed hole



d1 mm	d2 h6 mm	l1 mm	l2 mm	l4 mm	Z	**Code no.**
4.000	4.000	68.000	40.000	12.000	4	**4.000**
5.000	6.000	76.000	40.000	12.000	4	**5.000**
6.000	6.000	76.000	40.000	12.000	4	**6.000**
7.000	8.000	101.000	65.000	16.000	6	**7.000**
8.000	8.000	101.000	65.000	16.000	6	**8.000**
10.000	10.000	101.000	61.000	19.000	6	**10.000**

d1 mm	d2 h6 mm	l1 mm	l2 mm	l4 mm	Z	**Code no.**
12.000	12.000	130.000	85.000	19.000	6	**12.000**
14.000	14.000	130.000	85.000	22.000	6	**14.000**
16.000	16.000	150.000	102.000	22.000	6	**16.000**
18.000	18.000	150.000	102.000	25.000	6	**18.000**
20.000	20.000	150.000	100.000	25.000	6	**20.000**

Carbide reamers

Solid carbide high-performance head reamers

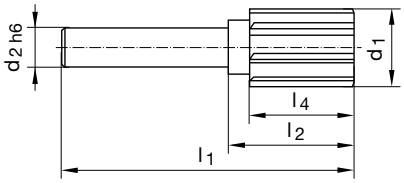
Catalogue no. 72874

SuperR-HS-KS | WN | VHM | AlTiN nano | H7 | R | HA | 0°

P	M	K	N	S	H
●	●	○		●	●

Application recommendations page 92

- for highest cutting rates and exceptional hole quality
- with axial coolant duct, for reaming blind holes
- high reaming depth variance through use of the shrink extension (Cat. No. 78719)
- clamping in hydraulic expansion or shrink fit chucks possible



d1 mm	d2 h6 mm	l1 mm	l2 mm	l4 mm	Z	**Code no.**
14.000	6.000	66.000	30.000	25.000	8	**14.000**
15.000	6.000	66.000	30.000	25.000	8	**15.000**
16.000	8.000	66.000	30.000	25.000	8	**16.000**
18.000	8.000	66.000	30.000	25.000	8	**18.000**
20.000	10.000	70.000	30.000	25.000	8	**20.000**
22.000	10.000	70.000	30.000	25.000	8	**22.000**
24.000	12.000	75.000	30.000	25.000	8	**24.000**
25.000	12.000	75.000	30.000	25.000	8	**25.000**
26.000	12.000	75.000	30.000	25.000	8	**26.000**
28.000	12.000	75.000	30.000	25.000	8	**28.000**
30.000	16.000	78.000	30.000	25.000	8	**30.000**
32.000	16.000	78.000	30.000	25.000	8	**32.000**
34.000	20.000	80.000	30.000	25.000	8	**34.000**
36.000	20.000	80.000	30.000	25.000	8	**36.000**
38.000	20.000	80.000	30.000	25.000	8	**38.000**
40.000	20.000	80.000	30.000	25.000	8	**40.000**
42.000	20.000	80.000	30.000	25.000	8	**42.000**

Carbide reamers

Solid carbide high-performance head reamers

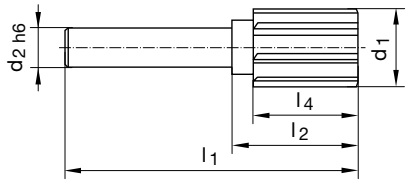
Catalogue no. 72875

SuperR-HS-KD | WN | VHM | AlTiN nano | H7 | R | HA | 0°

P	M	K	N	S	H
●	●	○		●	●

Application recommendations page 92

- for highest cutting rates and exceptional hole quality
- with radial coolant supply and spiral point for optimal chip evacuation in feed direction when machining through holes
- high reaming depth variance through use of the shrink extension (Cat. No. 78719)
- clamping in hydraulic expansion or shrink fit chucks possible



d1 mm	d2 h6 mm	l1 mm	l2 mm	l4 mm	Z	**Code no.**
14.000	6.000	66.000	30.000	25.000	8	**14.000**
15.000	6.000	66.000	30.000	25.000	8	**15.000**
16.000	8.000	66.000	30.000	25.000	8	**16.000**
18.000	8.000	66.000	30.000	25.000	8	**18.000**
20.000	10.000	70.000	30.000	25.000	8	**20.000**
22.000	10.000	70.000	30.000	25.000	8	**22.000**
24.000	12.000	75.000	30.000	25.000	8	**24.000**
25.000	12.000	75.000	30.000	25.000	8	**25.000**
26.000	12.000	75.000	30.000	25.000	8	**26.000**
28.000	12.000	75.000	30.000	25.000	8	**28.000**
30.000	16.000	78.000	30.000	25.000	8	**30.000**
32.000	16.000	78.000	30.000	25.000	8	**32.000**
34.000	20.000	80.000	30.000	25.000	8	**34.000**
36.000	20.000	80.000	30.000	25.000	8	**36.000**
38.000	20.000	80.000	30.000	25.000	8	**38.000**
40.000	20.000	80.000	30.000	25.000	8	**40.000**
42.000	20.000	80.000	30.000	25.000	8	**42.000**

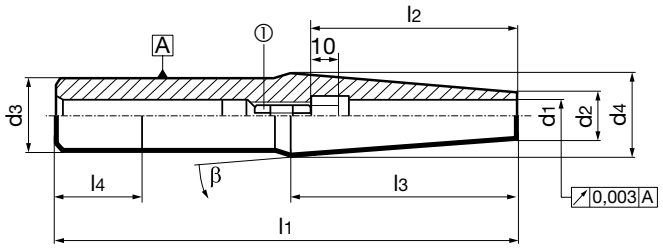
Shrink fit chucks

Shrink fit extensions

Catalogue no. 78719

WN | bright

- for clamping in hydraulic chucks or shrink fit chucks
- suitable for internal cooling
- for carbide tool shanks in tolerance h6 (from d1 14 mm also HSS possible)
- special designs on request
- also suitable for use with cat. no. 72874 and 72875



d1 h6 mm	d2 h6 mm	d3 mm	d4 mm	l1 mm	l2 ± mm	l3 mm	l4 mm	β °	Code no.
3.00	20.00	10.00	20.00	160.00	30.00	71.50	88.50	**4**	**3.120**
3.00	20.00	10.00	20.00	200.00	30.00	71.50	128.50	**4**	**3.220**
4.00	20.00	10.00	20.00	160.00	35.00	71.50	88.50	**4**	**4.120**
4.00	20.00	10.00	20.00	200.00	35.00	71.50	128.50	**4**	**4.220**
5.00	20.00	10.00	20.00	160.00	40.00	71.50	88.50	**4**	**5.120**
5.00	20.00	10.00	20.00	200.00	40.00	71.50	128.50	**4**	**5.220**
6.00	12.00	10.00	12.00	125.00	38.00	19.10	105.90	**3**	**6.012**
6.00	20.00	14.00	20.00	160.00	36.00	42.90	117.10	**4**	**6.120**
6.00	20.00	14.00	20.00	200.00	36.00	42.90	157.10	**4**	**6.220**
6.00	12.00	10.00	12.20	200.00	38.00	153.00	47.00	**3**	**6.312**
8.00	14.00	12.00	14.00	125.00	38.00	19.10	105.90	**3**	**8.014**
8.00	20.00	14.00	20.00	160.00	36.00	42.90	117.10	**4**	**8.120**
8.00	20.00	14.00	20.00	200.00	36.00	42.90	157.10	**4**	**8.220**
8.00	14.00	12.00	14.20	200.00	38.00	153.00	47.00	**3**	**8.314**
10.00	16.00	14.00	16.00	160.00	42.00	19.10	140.90	**3**	**10.116**
10.00	25.00	20.00	25.00	160.00	41.00	35.80	124.20	**4**	**10.125**
10.00	25.00	20.00	25.00	200.00	41.00	35.80	164.20	**4**	**10.225**
10.00	16.00	14.00	16.20	250.00	42.00	200.00	50.00	**3**	**10.316**
12.00	20.00	16.00	20.00	160.00	47.00	38.20	121.80	**3**	**12.120**
12.00	25.00	20.00	25.00	160.00	46.00	35.80	124.20	**4**	**12.125**
12.00	25.00	20.00	25.00	200.00	46.00	35.80	164.20	**4**	**12.225**
12.00	20.00	16.00	20.20	250.00	47.00	198.00	52.00	**3**	**12.320**
14.00	25.00	20.00	29.00	160.00	46.00	74.90	85.10	**4**	**14.125**
14.00	32.00	20.00	32.00	200.00	46.00	85.80	114.20	**4**	**14.232**
16.00	25.00	22.00	33.00	160.00	49.00	82.70	77.30	**4**	**16.125**
16.00	25.00	22.00	25.00	160.00	50.00	28.60	131.40	**3**	**16.225**
16.00	32.00	24.00	32.00	200.00	49.00	57.20	142.80	**4**	**16.232**
16.00	25.00	22.00	25.20	250.00	50.00	192.00	58.00	**3**	**16.325**
18.00	32.00	27.00	32.00	160.00	49.00	35.80	124.20	**4**	**18.132**
18.00	32.00	27.00	32.00	200.00	49.00	35.80	164.20	**4**	**18.232**
20.00	32.00	27.00	32.00	160.00	51.00	35.80	124.20	**4**	**20.132**
20.00	32.00	27.00	32.00	200.00	51.00	35.80	164.20	**4**	**20.232**
20.00	32.00	27.00	32.00	160.00	52.00	47.70	112.30	**3**	**20.332**
20.00	32.00	27.00	32.20	250.00	52.00	188.00	62.00	**3**	**20.432**

NC CHUCKING **REAMERS**

Solid carbide NC chucking reamers

P	M	K	N	S	H	Type	Cutting direction	Form	Tool material	Surface	Standard	d1/mm	Catalogue no.	Progr. page
														
•	•	•	•			right-hand	B		**Solid carbide**	bright	Company std.	0.980 - 12.050	**72920**	19
														
•	•	•		•	○	right-hand	B		**Solid carbide**	AlTiN nano	Company std.	0.980 - 12.050	**52920**	21
														
•	•	•	•			right-hand	B		**Solid carbide**	bright	Company std.	3.000 - 12.000	**72930**	23
														
•	•	•		•	○	right-hand	B		**Solid carbide**	AlTiN nano	Company std.	3.000 - 20.000	**52930**	25

NC machine reamers

														
•	•	•	•	○		right-hand	B		**HSS-E**	bright	DIN 212-3	1.000 - 12.030	**72900**	26
														
•	•	•	•	○		right-hand	B		**HSS-E**	bright	DIN 212-3	1.500 - 20.000	**72910**	28

Carbide reamers

Solid carbide NC chucking reamers

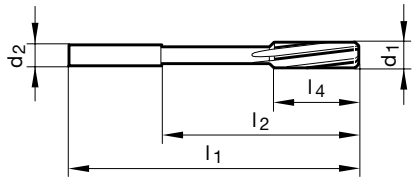
Catalogue no. 72920

WN | B | VHM | bright | +0,004 +0,005 | R | HA | 8°

P	M	K	N	S	H
●	●	●	●		

Application recommendations page 94

- > Ø 3.75 mm with extremely unequal flute spacing
- ≤ Ø 5.50 mm: 0.000/+0.004
- > Ø 5.50 mm: 0.00/+0.005
- straight shank tol. h6 for clamping in hydraulic chucks and shrink fit chucks



d1 mm	d2 h6 mm	l1 mm	l2 mm	l4 mm	Z	Code no.
0.980	4.000	50.000	22.000	6.000	3	**0.980**
0.990	4.000	50.000	22.000	6.000	3	**0.990**
1.000	4.000	50.000	22.000	6.000	3	**1.000**
1.010	4.000	50.000	22.000	6.000	3	**1.010**
1.020	4.000	50.000	22.000	6.000	3	**1.020**
1.030	4.000	50.000	22.000	9.000	3	**1.030**
1.480	4.000	50.000	22.000	9.000	3	**1.480**
1.490	4.000	50.000	22.000	9.000	3	**1.490**
1.500	4.000	50.000	22.000	9.000	3	**1.500**
1.510	4.000	50.000	22.000	9.000	3	**1.510**
1.520	4.000	50.000	22.000	9.000	3	**1.520**
1.530	4.000	50.000	22.000	9.000	3	**1.530**
1.980	4.000	50.000	22.000	12.000	4	**1.980**
1.990	4.000	50.000	22.000	12.000	4	**1.990**
2.000	4.000	50.000	22.000	12.000	4	**2.000**
2.010	4.000	50.000	22.000	12.000	4	**2.010**
2.020	4.000	50.000	22.000	12.000	4	**2.020**
2.030	4.000	50.000	22.000	12.000	4	**2.030**
2.480	4.000	60.000	32.000	16.000	4	**2.480**
2.490	4.000	60.000	32.000	16.000	4	**2.490**
2.500	4.000	60.000	32.000	16.000	4	**2.500**
2.510	4.000	60.000	32.000	16.000	4	**2.510**
2.520	4.000	60.000	32.000	16.000	4	**2.520**
2.530	4.000	60.000	32.000	16.000	4	**2.530**
2.970	4.000	64.000	36.000	17.000	6	**2.970**
2.980	4.000	64.000	36.000	17.000	6	**2.980**
2.990	4.000	64.000	36.000	17.000	6	**2.990**
3.000	4.000	64.000	36.000	17.000	6	**3.000**
3.010	4.000	64.000	36.000	17.000	6	**3.010**
3.020	4.000	64.000	36.000	17.000	6	**3.020**
3.030	4.000	64.000	36.000	17.000	6	**3.030**
3.970	4.000	77.000	45.000	21.000	6	**3.970**
3.980	4.000	77.000	45.000	21.000	6	**3.980**
3.990	4.000	77.000	45.000	21.000	6	**3.990**
4.000	4.000	77.000	45.000	21.000	6	**4.000**
4.010	4.000	77.000	45.000	21.000	6	**4.010**
4.020	4.000	77.000	45.000	21.000	6	**4.020**
4.030	4.000	77.000	45.000	21.000	6	**4.030**
4.970	6.000	93.000	59.000	26.000	6	**4.970**
4.980	6.000	93.000	59.000	26.000	6	**4.980**
4.990	6.000	93.000	59.000	26.000	6	**4.990**
5.000	6.000	93.000	59.000	26.000	6	**5.000**
5.010	6.000	93.000	59.000	26.000	6	**5.010**
5.020	6.000	93.000	59.000	26.000	6	**5.020**
5.030	6.000	93.000	59.000	26.000	6	**5.030**
5.970	6.000	93.000	57.000	26.000	6	**5.970**
5.980	6.000	93.000	57.000	26.000	6	**5.980**
5.990	6.000	93.000	57.000	26.000	6	**5.990**

d1 mm	d2 h6 mm	l1 mm	l2 mm	l4 mm	Z	Code no.
6.000	6.000	93.000	57.000	26.000	6	**6.000**
6.010	6.000	93.000	57.000	26.000	6	**6.010**
6.020	6.000	93.000	57.000	26.000	6	**6.020**
6.030	6.000	93.000	57.000	26.000	6	**6.030**
7.000	8.000	109.000	69.000	31.000	6	**7.000**
7.970	8.000	117.000	75.000	33.000	6	**7.970**
7.980	8.000	117.000	75.000	33.000	6	**7.980**
7.990	8.000	117.000	75.000	33.000	6	**7.990**
8.000	8.000	117.000	75.000	33.000	6	**8.000**
8.010	8.000	117.000	75.000	33.000	6	**8.010**
8.020	8.000	117.000	75.000	33.000	6	**8.020**
8.030	8.000	117.000	75.000	33.000	6	**8.030**
8.040	8.000	117.000	75.000	33.000	6	**8.040**
9.000	10.000	125.000	81.000	36.000	6	**9.000**
9.970	10.000	133.000	87.000	38.000	6	**9.970**
9.980	10.000	133.000	87.000	38.000	6	**9.980**
9.990	10.000	133.000	87.000	38.000	6	**9.990**
10.000	10.000	133.000	87.000	38.000	6	**10.000**
10.010	10.000	133.000	87.000	38.000	6	**10.010**
10.020	10.000	133.000	87.000	38.000	6	**10.020**
10.030	10.000	133.000	87.000	38.000	6	**10.030**
10.040	10.000	133.000	87.000	38.000	6	**10.040**
10.050	10.000	133.000	87.000	38.000	6	**10.050**
11.970	12.000	151.000	105.000	44.000	6	**11.970**
11.980	12.000	151.000	105.000	44.000	6	**11.980**
11.990	12.000	151.000	105.000	44.000	6	**11.990**
12.000	12.000	151.000	105.000	44.000	6	**12.000**
12.010	12.000	151.000	105.000	44.000	6	**12.010**
12.020	12.000	151.000	105.000	44.000	6	**12.020**
12.030	12.000	151.000	105.000	44.000	6	**12.030**
12.040	12.000	151.000	105.000	44.000	6	**12.040**
12.050	12.000	151.000	105.000	44.000	6	**12.050**

Carbide reamers

Solid carbide NC chucking reamers

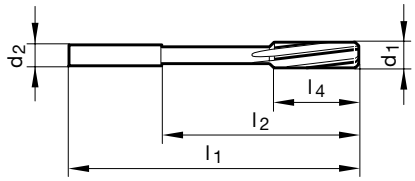
Catalogue no. 52920

WN | B | VHM | AlTiN nano | +0,004 +0,005 | R | HA | 8°

P	M	K	N	S	H
●	●	●		●	○

Application recommendations page 94

- > Ø 3.75 mm with extremely unequal flute spacing
- ≤ Ø 5.50 mm: 0.000/+0.004
- > Ø 5.50 mm: 0.000/+0.005
- straight shank tol. h6 for clamping in hydraulic chucks and shrink fit chucks
- AlTiNnano coating for maximum tool lives and hole surface quality
- for mass production



d1 mm	d2 h6 mm	l1 mm	l2 mm	l4 mm	Z	Code no.
0.980	4.000	50.000	22.000	6.000	3	**0.980**
0.990	4.000	50.000	22.000	6.000	3	**0.990**
1.000	4.000	50.000	22.000	6.000	3	**1.000**
1.010	4.000	50.000	22.000	6.000	3	**1.010**
1.020	4.000	50.000	22.000	6.000	3	**1.020**
1.030	4.000	50.000	22.000	9.000	3	**1.030**
1.480	4.000	50.000	22.000	9.000	3	**1.480**
1.490	4.000	50.000	22.000	9.000	3	**1.490**
1.500	4.000	50.000	22.000	9.000	3	**1.500**
1.510	4.000	50.000	22.000	9.000	3	**1.510**
1.520	4.000	50.000	22.000	9.000	3	**1.520**
1.530	4.000	50.000	22.000	9.000	3	**1.530**
1.980	4.000	50.000	22.000	12.000	4	**1.980**
1.990	4.000	50.000	22.000	12.000	4	**1.990**
2.000	4.000	50.000	22.000	12.000	4	**2.000**
2.010	4.000	50.000	22.000	12.000	4	**2.010**
2.020	4.000	50.000	22.000	12.000	4	**2.020**
2.030	4.000	50.000	22.000	12.000	4	**2.030**
2.480	4.000	60.000	32.000	16.000	4	**2.480**
2.490	4.000	60.000	32.000	16.000	4	**2.490**
2.500	4.000	60.000	32.000	16.000	4	**2.500**
2.510	4.000	60.000	32.000	16.000	4	**2.510**
2.520	4.000	60.000	32.000	16.000	4	**2.520**
2.530	4.000	60.000	32.000	16.000	4	**2.530**
2.970	4.000	64.000	36.000	17.000	6	**2.970**
2.980	4.000	64.000	36.000	17.000	6	**2.980**
2.990	4.000	64.000	36.000	17.000	6	**2.990**
3.000	4.000	64.000	36.000	17.000	6	**3.000**
3.010	4.000	64.000	36.000	17.000	6	**3.010**
3.020	4.000	64.000	36.000	17.000	6	**3.020**
3.030	4.000	64.000	36.000	17.000	6	**3.030**
3.970	4.000	77.000	45.000	21.000	6	**3.970**
3.980	4.000	77.000	45.000	21.000	6	**3.980**
3.990	4.000	77.000	45.000	21.000	6	**3.990**
4.000	4.000	77.000	45.000	21.000	6	**4.000**
4.010	4.000	77.000	45.000	21.000	6	**4.010**
4.020	4.000	77.000	45.000	21.000	6	**4.020**
4.030	4.000	77.000	45.000	21.000	6	**4.030**
4.970	6.000	93.000	59.000	26.000	6	**4.970**
4.980	6.000	93.000	59.000	26.000	6	**4.980**
4.990	6.000	93.000	59.000	26.000	6	**4.990**
5.000	6.000	93.000	59.000	26.000	6	**5.000**
5.010	6.000	93.000	59.000	26.000	6	**5.010**
5.020	6.000	93.000	59.000	26.000	6	**5.020**
5.030	6.000	93.000	59.000	26.000	6	**5.030**
5.970	6.000	93.000	57.000	26.000	6	**5.970**
5.980	6.000	93.000	57.000	26.000	6	**5.980**
5.990	6.000	93.000	57.000	26.000	6	**5.990**

d1 mm	d2 h6 mm	l1 mm	l2 mm	l4 mm	Z	Code no.
6.000	6.000	93.000	57.000	26.000	6	**6.000**
6.010	6.000	93.000	57.000	26.000	6	**6.010**
6.020	6.000	93.000	57.000	26.000	6	**6.020**
6.030	6.000	93.000	57.000	26.000	6	**6.030**
7.000	8.000	109.000	69.000	31.000	6	**7.000**
7.970	8.000	117.000	75.000	33.000	6	**7.970**
7.980	8.000	117.000	75.000	33.000	6	**7.980**
7.990	8.000	117.000	75.000	33.000	6	**7.990**
8.000	8.000	117.000	75.000	33.000	6	**8.000**
8.010	8.000	117.000	75.000	33.000	6	**8.010**
8.020	8.000	117.000	75.000	33.000	6	**8.020**
8.030	8.000	117.000	75.000	33.000	6	**8.030**
8.040	8.000	117.000	75.000	33.000	6	**8.040**
9.000	10.000	125.000	81.000	36.000	6	**9.000**
9.970	10.000	133.000	87.000	38.000	6	**9.970**
9.980	10.000	133.000	87.000	38.000	6	**9.980**
9.990	10.000	133.000	87.000	38.000	6	**9.990**
10.000	10.000	133.000	87.000	38.000	6	**10.000**
10.010	10.000	133.000	87.000	38.000	6	**10.010**
10.020	10.000	133.000	87.000	38.000	6	**10.020**
10.030	10.000	133.000	87.000	38.000	6	**10.030**
10.040	10.000	133.000	87.000	38.000	6	**10.040**
10.050	10.000	133.000	87.000	38.000	6	**10.050**
11.970	12.000	151.000	105.000	44.000	6	**11.970**
11.980	12.000	151.000	105.000	44.000	6	**11.980**
11.990	12.000	151.000	105.000	44.000	6	**11.990**
12.000	12.000	151.000	105.000	44.000	6	**12.000**
12.010	12.000	151.000	105.000	44.000	6	**12.010**
12.020	12.000	151.000	105.000	44.000	6	**12.020**
12.030	12.000	151.000	105.000	44.000	6	**12.030**
12.040	12.000	151.000	105.000	44.000	6	**12.040**
12.050	12.000	151.000	105.000	44.000	6	**12.050**

Carbide reamers

Solid carbide NC chucking reamers

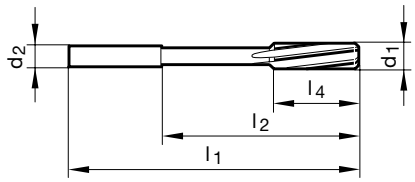
Catalogue no. 72930

WN | B | VHM | bright | H7 | R | HA | 8°

P	M	K	N	S	H
●	●	●	●		

Application recommendations page 94

- > Ø 3.75 mm with extremely unequal flute spacing
- straight shank tol. h6 for clamping in hydraulic chucks and shrink fit chucks



d1 mm	d2 h6 mm	l1 mm	l2 mm	l4 mm	Z	Code no.
3.000	4.000	64.000	36.000	17.000	6	**3.000**
3.100	4.000	68.000	40.000	18.000	6	**3.100**
3.200	4.000	68.000	40.000	18.000	6	**3.200**
3.300	4.000	68.000	40.000	18.000	6	**3.300**
3.400	4.000	74.000	46.000	20.000	6	**3.400**
3.500	4.000	74.000	46.000	20.000	6	**3.500**
3.600	4.000	74.000	46.000	20.000	6	**3.600**
3.700	4.000	74.000	46.000	20.000	6	**3.700**
3.800	4.000	77.000	45.000	21.000	6	**3.800**
3.900	4.000	77.000	45.000	21.000	6	**3.900**
4.000	4.000	77.000	45.000	21.000	6	**4.000**
4.100	6.000	82.000	50.000	23.000	6	**4.100**
4.200	6.000	82.000	50.000	23.000	6	**4.200**
4.300	6.000	82.000	50.000	23.000	6	**4.300**
4.400	6.000	82.000	50.000	23.000	6	**4.400**
4.500	6.000	82.000	50.000	23.000	6	**4.500**
4.600	6.000	82.000	50.000	23.000	6	**4.600**
4.700	6.000	82.000	50.000	23.000	6	**4.700**
4.800	6.000	93.000	59.000	26.000	6	**4.800**
4.900	6.000	93.000	59.000	26.000	6	**4.900**
5.000	6.000	93.000	59.000	26.000	6	**5.000**
5.100	6.000	93.000	59.000	26.000	6	**5.100**
5.200	6.000	93.000	59.000	26.000	6	**5.200**
5.300	6.000	93.000	59.000	26.000	6	**5.300**
5.400	6.000	93.000	57.000	26.000	6	**5.400**
5.500	6.000	93.000	57.000	26.000	6	**5.500**
5.600	6.000	93.000	57.000	26.000	6	**5.600**
5.700	6.000	93.000	57.000	26.000	6	**5.700**
5.800	6.000	93.000	57.000	26.000	6	**5.800**
5.900	6.000	93.000	57.000	26.000	6	**5.900**
6.000	6.000	93.000	57.000	26.000	6	**6.000**
6.100	8.000	101.000	63.000	28.000	6	**6.100**
6.200	8.000	101.000	63.000	28.000	6	**6.200**
6.300	8.000	101.000	63.000	28.000	6	**6.300**
6.400	8.000	101.000	63.000	28.000	6	**6.400**
6.500	8.000	101.000	63.000	28.000	6	**6.500**
6.600	8.000	101.000	63.000	28.000	6	**6.600**
6.700	8.000	101.000	63.000	28.000	6	**6.700**
6.800	8.000	109.000	69.000	31.000	6	**6.800**
6.900	8.000	109.000	69.000	31.000	6	**6.900**
7.000	8.000	109.000	69.000	31.000	6	**7.000**
7.100	8.000	109.000	69.000	31.000	6	**7.100**
7.200	8.000	109.000	69.000	31.000	6	**7.200**
7.300	8.000	109.000	69.000	31.000	6	**7.300**
7.400	8.000	109.000	69.000	31.000	6	**7.400**
7.500	8.000	109.000	69.000	31.000	6	**7.500**
7.600	8.000	109.000	69.000	31.000	6	**7.600**
7.700	8.000	117.000	75.000	33.000	6	**7.700**

d1 mm	d2 h6 mm	l1 mm	l2 mm	l4 mm	Z	Code no.
7.800	8.000	117.000	75.000	33.000	6	**7.800**
7.900	8.000	117.000	75.000	33.000	6	**7.900**
8.000	8.000	117.000	75.000	33.000	6	**8.000**
8.100	10.000	117.000	75.000	33.000	6	**8.100**
8.200	10.000	117.000	75.000	33.000	6	**8.200**
8.300	10.000	117.000	75.000	33.000	6	**8.300**
8.400	10.000	117.000	75.000	33.000	6	**8.400**
8.500	10.000	117.000	75.000	33.000	6	**8.500**
8.600	10.000	117.000	75.000	33.000	6	**8.600**
8.700	10.000	125.000	81.000	36.000	6	**8.700**
8.800	10.000	125.000	81.000	36.000	6	**8.800**
8.900	10.000	125.000	81.000	36.000	6	**8.900**
9.000	10.000	125.000	81.000	36.000	6	**9.000**
9.100	10.000	125.000	81.000	36.000	6	**9.100**
9.200	10.000	125.000	81.000	36.000	6	**9.200**
9.300	10.000	125.000	81.000	36.000	6	**9.300**
9.400	10.000	125.000	81.000	36.000	6	**9.400**
9.500	10.000	125.000	81.000	36.000	6	**9.500**
9.600	10.000	125.000	81.000	36.000	6	**9.600**
9.700	10.000	133.000	87.000	38.000	6	**9.700**
9.800	10.000	133.000	87.000	38.000	6	**9.800**
9.900	10.000	133.000	87.000	38.000	6	**9.900**
10.000	10.000	133.000	87.000	38.000	6	**10.000**
10.100	10.000	133.000	87.000	38.000	6	**10.100**
10.200	10.000	133.000	87.000	38.000	6	**10.200**
10.300	10.000	133.000	87.000	38.000	6	**10.300**
10.400	10.000	133.000	87.000	38.000	6	**10.400**
10.500	10.000	133.000	87.000	38.000	6	**10.500**
10.600	10.000	133.000	87.000	38.000	6	**10.600**
10.700	10.000	142.000	96.000	41.000	6	**10.700**
10.800	10.000	142.000	96.000	41.000	6	**10.800**
10.900	10.000	142.000	96.000	41.000	6	**10.900**
11.000	10.000	142.000	96.000	41.000	6	**11.000**
11.100	10.000	142.000	96.000	41.000	6	**11.100**
11.200	10.000	142.000	96.000	41.000	6	**11.200**
11.300	10.000	142.000	96.000	41.000	6	**11.300**
11.400	10.000	142.000	96.000	41.000	6	**11.400**
11.500	10.000	142.000	96.000	41.000	6	**11.500**
11.600	10.000	142.000	96.000	41.000	6	**11.600**
11.700	10.000	142.000	96.000	41.000	6	**11.700**
11.800	10.000	142.000	96.000	41.000	6	**11.800**
11.900	12.000	151.000	105.000	44.000	6	**11.900**
12.000	12.000	151.000	105.000	44.000	6	**12.000**

Carbide reamers

Solid carbide NC chucking reamers

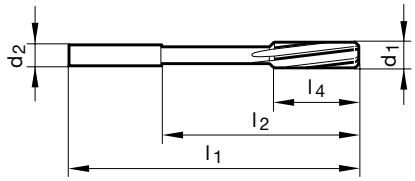
Catalogue no. 52930

WN | B | VHM | AlTiN nano | H7 | R | HA | 8°

P	M	K	N	S	H
●	●	●		●	○

Application recommendations page 94

- > Ø 3.75 mm with extremely unequal flute spacing
- straight shank tol. h6 for clamping in hydraulic chucks and shrink fit chucks
- AlTiNnano coating for maximum tool lives and hole surface quality



d1 mm	d2 h6 mm	l1 mm	l2 mm	l4 mm	Z	Code no.
3.000	4.000	64.000	36.000	17.000	6	**3.000**
3.500	4.000	74.000	46.000	20.000	6	**3.500**
4.000	4.000	77.000	45.000	21.000	6	**4.000**
4.500	6.000	82.000	50.000	23.000	6	**4.500**
5.000	6.000	93.000	59.000	26.000	6	**5.000**
5.500	6.000	93.000	57.000	26.000	6	**5.500**
6.000	6.000	93.000	57.000	26.000	6	**6.000**
6.500	8.000	101.000	63.000	28.000	6	**6.500**
7.000	8.000	109.000	69.000	31.000	6	**7.000**
7.500	8.000	109.000	69.000	31.000	6	**7.500**
8.000	8.000	117.000	75.000	33.000	6	**8.000**
8.500	10.000	117.000	75.000	33.000	6	**8.500**
9.000	10.000	125.000	81.000	36.000	6	**9.000**
9.500	10.000	125.000	81.000	36.000	6	**9.500**
10.000	10.000	133.000	87.000	38.000	6	**10.000**
10.500	10.000	133.000	87.000	38.000	6	**10.500**
11.000	10.000	142.000	96.000	41.000	6	**11.000**
11.500	10.000	142.000	96.000	41.000	6	**11.500**
12.000	12.000	151.000	105.000	44.000	6	**12.000**
13.000	14.000	160.000	114.000	44.000	6	**13.000**
14.000	14.000	160.000	110.000	47.000	6	**14.000**
15.000	16.000	170.000	120.000	50.000	6	**15.000**
16.000	16.000	170.000	120.000	52.000	6	**16.000**
17.000	18.000	182.000	130.000	52.000	6	**17.000**
18.000	18.000	182.000	130.000	52.000	6	**18.000**
19.000	20.000	195.000	137.000	52.000	6	**19.000**
20.000	20.000	195.000	137.000	52.000	6	**20.000**

High speed steel reamers

NC machine reamers

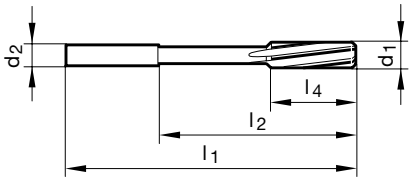
Catalogue no. 72900

DIN 212-3 | B | HSS-E | bright | +0,004 +0,005 | R | HA | 7°

P	M	K	N	S	H
●	●	●	●	○	

Application recommendations page 94

- > Ø 3.75 mm with internal centres on both ends
- ≤ Ø 3.75 mm with external centres on both ends
- ≤ Ø 5.50 mm: 0.000/+0.004
- > Ø 5.50 mm: 0.00/+0.005
- straight shank tol. h6 for clamping in hydraulic chucks and shrink fit chucks
- for tensile strengths up to a max. 1000 N/mm²



d1 mm	d2 h6 mm	l1 mm	l2 mm	l4 mm	Z	Code no.
1.000	1.000	34.000	15.000	5.500	3	**1.000**
1.010	1.000	34.000	15.000	5.500	3	**1.010**
1.020	1.000	34.000	15.000	5.500	3	**1.020**
1.030	1.000	34.000	15.000	5.500	3	**1.030**
1.500	2.000	40.000	18.000	8.000	3	**1.500**
1.510	2.000	43.000	20.000	9.000	3	**1.510**
1.520	2.000	43.000	20.000	9.000	3	**1.520**
1.530	2.000	43.000	20.000	9.000	3	**1.530**
1.970	2.000	49.000	24.000	11.000	4	**1.970**
1.980	2.000	49.000	24.000	11.000	4	**1.980**
1.990	2.000	49.000	24.000	11.000	4	**1.990**
2.000	2.000	49.000	24.000	11.000	4	**2.000**
2.010	2.000	49.000	24.000	11.000	4	**2.010**
2.020	2.000	49.000	24.000	11.000	4	**2.020**
2.030	2.000	49.000	24.000	11.000	4	**2.030**
2.470	3.000	57.000	29.000	14.000	4	**2.470**
2.480	3.000	57.000	29.000	14.000	4	**2.480**
2.490	3.000	57.000	29.000	14.000	4	**2.490**
2.500	3.000	57.000	29.000	14.000	4	**2.500**
2.510	3.000	57.000	29.000	14.000	4	**2.510**
2.520	3.000	57.000	29.000	14.000	4	**2.520**
2.530	3.000	57.000	29.000	14.000	4	**2.530**
2.970	3.000	61.000	33.000	15.000	6	**2.970**
2.980	3.000	61.000	33.000	15.000	6	**2.980**
2.990	3.000	61.000	33.000	15.000	6	**2.990**
3.000	3.000	61.000	33.000	15.000	6	**3.000**
3.010	4.000	65.000	37.000	16.000	6	**3.010**
3.020	4.000	65.000	37.000	16.000	6	**3.020**
3.030	4.000	65.000	37.000	16.000	6	**3.030**
3.970	4.000	75.000	47.000	19.000	6	**3.970**
3.980	4.000	75.000	47.000	19.000	6	**3.980**
3.990	4.000	75.000	47.000	19.000	6	**3.990**
4.000	4.000	75.000	47.000	19.000	6	**4.000**
4.010	4.000	75.000	47.000	19.000	6	**4.010**
4.020	4.000	75.000	47.000	19.000	6	**4.020**
4.030	4.000	75.000	47.000	19.000	6	**4.030**
4.970	5.000	86.000	58.000	23.000	6	**4.970**
4.980	5.000	86.000	58.000	23.000	6	**4.980**
4.990	5.000	86.000	58.000	23.000	6	**4.990**
5.000	5.000	86.000	58.000	23.000	6	**5.000**
5.010	5.000	86.000	58.000	23.000	6	**5.010**
5.020	5.000	86.000	58.000	23.000	6	**5.020**
5.030	5.000	86.000	58.000	23.000	6	**5.030**
5.970	6.000	93.000	57.000	26.000	6	**5.970**
5.980	6.000	93.000	57.000	26.000	6	**5.980**
5.990	6.000	93.000	57.000	26.000	6	**5.990**
6.000	6.000	93.000	57.000	26.000	6	**6.000**
6.010	6.000	101.000	65.000	28.000	6	**6.010**

d1 mm	d2 h6 mm	l1 mm	l2 mm	l4 mm	Z	Code no.
6.020	6.000	101.000	65.000	28.000	6	**6.020**
6.030	6.000	101.000	65.000	28.000	6	**6.030**
7.970	8.000	117.000	81.000	33.000	6	**7.970**
7.980	8.000	117.000	81.000	33.000	6	**7.980**
7.990	8.000	117.000	81.000	33.000	6	**7.990**
8.000	8.000	117.000	81.000	33.000	6	**8.000**
8.010	8.000	117.000	81.000	33.000	6	**8.010**
8.020	8.000	117.000	81.000	33.000	6	**8.020**
8.030	8.000	117.000	81.000	33.000	6	**8.030**
9.000	10.000	125.000	85.000	36.000	6	**9.000**
9.010	10.000	125.000	85.000	36.000	6	**9.010**
9.020	10.000	125.000	85.000	36.000	6	**9.020**
9.030	10.000	125.000	85.000	36.000	6	**9.030**
9.970	10.000	133.000	93.000	38.000	6	**9.970**
9.980	10.000	133.000	93.000	38.000	6	**9.980**
9.990	10.000	133.000	93.000	38.000	6	**9.990**
10.000	10.000	133.000	93.000	38.000	6	**10.000**
10.010	10.000	133.000	93.000	38.000	6	**10.010**
10.020	10.000	133.000	93.000	38.000	6	**10.020**
10.030	10.000	133.000	93.000	38.000	6	**10.030**
11.970	10.000	151.000	111.000	44.000	6	**11.970**
11.980	10.000	151.000	111.000	44.000	6	**11.980**
11.990	10.000	151.000	111.000	44.000	6	**11.990**
12.000	10.000	151.000	111.000	44.000	6	**12.000**
12.010	10.000	151.000	111.000	44.000	6	**12.010**
12.020	10.000	151.000	111.000	44.000	6	**12.020**
12.030	10.000	151.000	111.000	44.000	6	**12.030**

High speed steel reamers

NC machine reamers

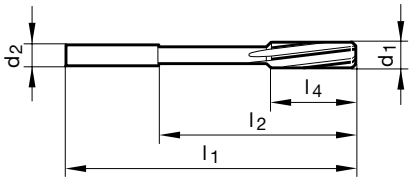
Catalogue no. 72910

DIN 212-3 | B | HSS-E | bright | H7 | R | HA | 7°

P	M	K	N	S	H
●	●	●	●	○	

Application recommendations page 94

- ≤ Ø 3.75 mm with external centres on both ends
- > Ø 3.75 mm with internal centres on both ends
- straight shank tol. h6 for clamping in hydraulic chucks and shrink fit chucks
- for tensile strengths up to a max. 1000 N/mm²

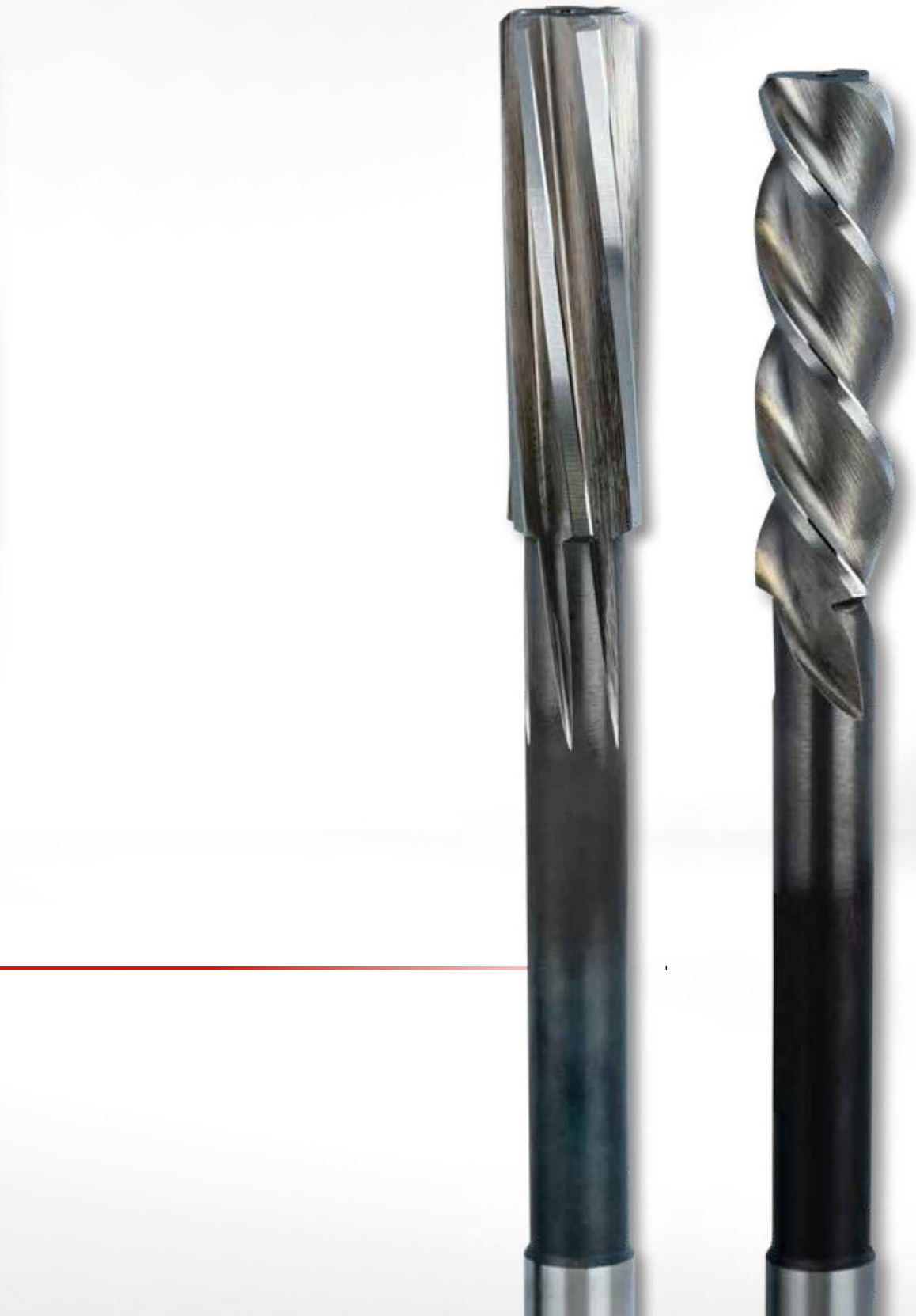


d1 mm	d2 h6 mm	l1 mm	l2 mm	l4 mm	Z	Code no.
1.500	2.000	40.000	18.000	8.000	3	**1.500**
1.600	2.000	43.000	20.000	9.000	3	**1.600**
1.700	2.000	43.000	20.000	9.000	3	**1.700**
1.800	2.000	46.000	22.000	10.000	4	**1.800**
1.900	2.000	46.000	22.000	10.000	4	**1.900**
2.000	2.000	49.000	24.000	11.000	4	**2.000**
2.100	2.000	49.000	24.000	11.000	4	**2.100**
2.200	3.000	53.000	25.000	12.000	4	**2.200**
2.300	3.000	53.000	25.000	12.000	4	**2.300**
2.400	3.000	57.000	29.000	14.000	4	**2.400**
2.500	3.000	57.000	29.000	14.000	4	**2.500**
2.600	3.000	57.000	29.000	14.000	4	**2.600**
2.700	3.000	61.000	33.000	15.000	6	**2.700**
2.800	3.000	61.000	33.000	15.000	6	**2.800**
2.900	3.000	61.000	33.000	15.000	6	**2.900**
3.000	3.000	61.000	33.000	15.000	6	**3.000**
3.100	4.000	65.000	37.000	16.000	6	**3.100**
3.200	4.000	65.000	37.000	16.000	6	**3.200**
3.300	4.000	65.000	37.000	16.000	6	**3.300**
3.400	4.000	70.000	42.000	18.000	6	**3.400**
3.500	4.000	70.000	42.000	18.000	6	**3.500**
3.600	4.000	70.000	42.000	18.000	6	**3.600**
3.700	4.000	70.000	42.000	18.000	6	**3.700**
3.800	4.000	75.000	47.000	19.000	6	**3.800**
3.900	4.000	75.000	47.000	19.000	6	**3.900**
4.000	4.000	75.000	47.000	19.000	6	**4.000**
4.100	4.000	75.000	47.000	19.000	6	**4.100**
4.200	4.000	75.000	47.000	19.000	6	**4.200**
4.300	5.000	80.000	52.000	21.000	6	**4.300**
4.400	5.000	80.000	52.000	21.000	6	**4.400**
4.500	5.000	80.000	52.000	21.000	6	**4.500**
4.600	5.000	80.000	52.000	21.000	6	**4.600**
4.700	5.000	80.000	52.000	21.000	6	**4.700**
4.800	5.000	86.000	58.000	23.000	6	**4.800**
4.900	5.000	86.000	58.000	23.000	6	**4.900**
5.000	5.000	86.000	58.000	23.000	6	**5.000**
5.100	5.000	86.000	58.000	23.000	6	**5.100**
5.200	5.000	86.000	58.000	23.000	6	**5.200**
5.300	5.000	86.000	58.000	23.000	6	**5.300**
5.400	6.000	93.000	57.000	26.000	6	**5.400**
5.500	6.000	93.000	57.000	26.000	6	**5.500**
5.600	6.000	93.000	57.000	26.000	6	**5.600**
5.700	6.000	93.000	57.000	26.000	6	**5.700**
5.800	6.000	93.000	57.000	26.000	6	**5.800**
5.900	6.000	93.000	57.000	26.000	6	**5.900**
6.000	6.000	93.000	57.000	26.000	6	**6.000**
6.100	6.000	101.000	65.000	28.000	6	**6.100**
6.200	6.000	101.000	65.000	28.000	6	**6.200**

d1 mm	d2 h6 mm	l1 mm	l2 mm	l4 mm	Z	Code no.
6.300	6.000	101.000	65.000	28.000	6	**6.300**
6.400	6.000	101.000	65.000	28.000	6	**6.400**
6.500	6.000	101.000	65.000	28.000	6	**6.500**
6.600	6.000	101.000	65.000	28.000	6	**6.600**
6.700	6.000	101.000	65.000	28.000	6	**6.700**
6.800	8.000	109.000	73.000	31.000	6	**6.800**
6.900	8.000	109.000	73.000	31.000	6	**6.900**
7.000	8.000	109.000	73.000	31.000	6	**7.000**
7.100	8.000	109.000	73.000	31.000	6	**7.100**
7.200	8.000	109.000	73.000	31.000	6	**7.200**
7.300	8.000	109.000	73.000	31.000	6	**7.300**
7.400	8.000	109.000	73.000	31.000	6	**7.400**
7.500	8.000	109.000	73.000	31.000	6	**7.500**
7.600	8.000	117.000	81.000	33.000	6	**7.600**
7.700	8.000	117.000	81.000	33.000	6	**7.700**
7.800	8.000	117.000	81.000	33.000	6	**7.800**
7.900	8.000	117.000	81.000	33.000	6	**7.900**
8.000	8.000	117.000	81.000	33.000	6	**8.000**
8.100	8.000	117.000	81.000	33.000	6	**8.100**
8.200	8.000	117.000	81.000	33.000	6	**8.200**
8.300	8.000	117.000	81.000	33.000	6	**8.300**
8.400	8.000	117.000	81.000	33.000	6	**8.400**
8.500	8.000	117.000	81.000	33.000	6	**8.500**
8.600	10.000	125.000	85.000	36.000	6	**8.600**
8.700	10.000	125.000	85.000	36.000	6	**8.700**
8.800	10.000	125.000	85.000	36.000	6	**8.800**
8.900	10.000	125.000	85.000	36.000	6	**8.900**
9.000	10.000	125.000	85.000	36.000	6	**9.000**
9.100	10.000	125.000	85.000	36.000	6	**9.100**
9.200	10.000	125.000	85.000	36.000	6	**9.200**
9.300	10.000	125.000	85.000	36.000	6	**9.300**
9.400	10.000	125.000	85.000	36.000	6	**9.400**
9.500	10.000	125.000	85.000	36.000	6	**9.500**
9.600	10.000	133.000	93.000	38.000	6	**9.600**
9.700	10.000	133.000	93.000	38.000	6	**9.700**
9.800	10.000	133.000	93.000	38.000	6	**9.800**
9.900	10.000	133.000	93.000	38.000	6	**9.900**
10.000	10.000	133.000	93.000	38.000	6	**10.000**
11.000	10.000	142.000	102.000	41.000	6	**11.000**
12.000	10.000	151.000	111.000	44.000	6	**12.000**
13.000	10.000	151.000	111.000	44.000	6	**13.000**
14.000	14.000	160.000	115.000	47.000	8	**14.000**
15.000	14.000	162.000	117.000	50.000	8	**15.000**
16.000	14.000	170.000	125.000	52.000	8	**16.000**
17.000	14.000	175.000	130.000	54.000	8	**17.000**
18.000	14.000	182.000	137.000	56.000	8	**18.000**
19.000	16.000	189.000	141.000	58.000	8	**19.000**
20.000	16.000	195.000	147.000	60.000	8	**20.000**

- Carbide brazed chucking reamers and high speed steel reamers
- Quick helix reamers and taper reamers
- Hand reamers

CONVENTIONAL **REAMERS**



SELECTION AND APPLICATION

Reaming improves the quality of the hole. The change in diameter is minimal. A hallmark feature is that the reamer guides itself into the hole and cuts even without a spot drilling aid.

Forms of reamers

Reamers consist of a shank, neck, guide and chamfer lead. A distinction is made between hand reamers, machine reamers, NC reamers and taper reamers.

Hand reamers

Hand reamers have a particularly long chamfer lead. Helix can be used for through-holes if the chips can be removed downwards. The number of cutting edges is usually even (4–18 depending on diameter). Adjustable hand reamers can be used for variable tolerance fields.

Machine reamers

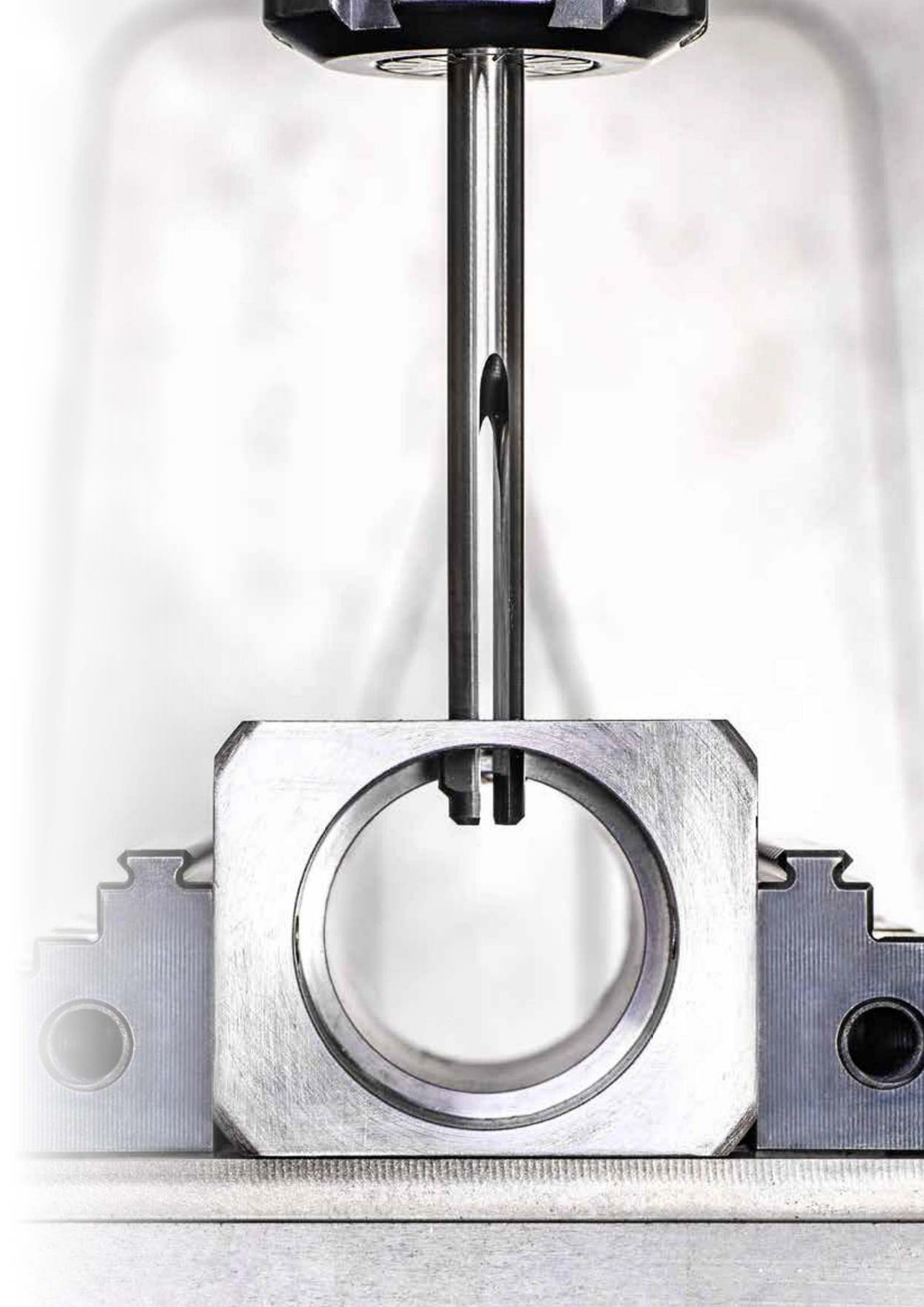
They have a shorter chamfer lead than hand reamers. They guide themselves into the hole through the guide chamfer. The cutting edges can be straight or with a left-hand helix, but can also have a fast helix. The ***left-hand helix*** produces a better surface finish, but can only be used to a limited extent in blind holes. ***Quick helix reamers*** are suitable for higher feed rates, especially in soft materials.

NC machine reamers

They have a straight shank diameter for standardised tool holders. Hydraulic chucks, HG and Centro P chucks are particularly suitable for this purpose. In order to achieve maximum concentric accuracy and process reliability when producing fits. If the pitch is unequal, the cutting edges are exactly opposite each other in pairs. This makes the hole completely round and free of chatter marks. The circular bevel on the cutting part smooths the hole and guides the reamer.

Taper reamers

In taper reamers, the main cutting edges extend over the entire cone.
Side cutting edges are not present in the original sense. The tools can be straight or helical. Quick helix reamers are suitable for producing rough shapes. To allow chips to flow out better, the reamer should be retracted more often. Due to the higher quality surface finish of the hole, a straight-fluted reamer is more suitable for final machining.



P	M	K	N	S	H	Type	Cutting direction	Form	Tool material	Surface	Standard	d1/mm	Catalogue no.	Progr. page
Carbide brazed chucking reamers														
														
●	●	●	●		○		right-hand	A	**Carbide**	bright	~DIN 8050	5.000 - 20.000	**72868**	36
														
●	●	●	●		○		right-hand	B	**Solid carbide**	bright	~DIN 8050	5.000 - 20.000	**72867**	37
														
●	●	●	●		○		right-hand	A	**Carbide**	bright	~DIN 8093	1.200 - 16.000	**72880**	38
														
●	●	●	●		○		right-hand	B	**Carbide**	bright	~DIN 8093	1.000 - 16.000	**72881**	39
														
●	●	●	●		○		right-hand	A	**Carbide**	bright	~DIN 8051	9.000 - 30.000	**72860**	40
														
●	●	●	●		○		right-hand	B	**Carbide**	bright	~DIN 8051	6.000 - 32.000	**72859**	41
Chucking reamers														
														
●	○	●	●	○			right-hand	B	**HSS-E**	bright	DIN 212-2	0.980 - 12.000	**72654**	42
														
●	○	●	●	○			right-hand	A	**HSS-E**	bright	DIN 212-2	2.200 - 20.000	**72640**	45
														
●	○	●	●	○			right-hand	B	**HSS-E**	bright	DIN 212-2	4.000 - 20.000	**72650**	46
														
●	○	●	●	○			right-hand	A	**HSS-E**	bright	DIN 208	8.000 - 37.000	**72660**	47
														
●	○	●	●	○			right-hand	B	**HSS-E**	bright	DIN 208	5.000 - 50.000	**72670**	48
Quick helix reamers														
														
●			●				right-hand	C	**HSS-E**	bright	DIN 212-2	4.000 - 13.000	**72690**	49

P	M	K	N	S	H	Type	Cutting direction	Form	Tool material	Surface	Standard	d1/mm	Catalogue no.	Progr. page
Bridge reamers														
														
●	○	●	●			right-hand			**HSS**	nitrided	DIN 311	9.500 - 37.000	**72680**	50
Machine taper reamers														
														
●		●	●			right-hand			**HSS-E**	bright	DIN 2179	2.000 - 12.000	**72741**	51
Hand reamers														
														
●		●	●			right-hand		A	**HSS**	bright	DIN 206	2.500 - 28.000	**72600**	52
														
●		●	●			right-hand		B	**HSS**	bright	DIN 206	2.000 - 35.000	**72610**	53

Carbide reamers

Carbide brazed chucking reamers

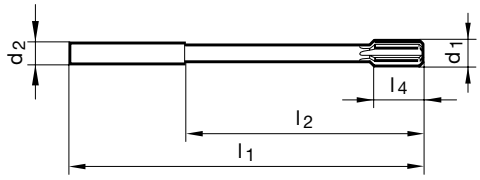
Catalogue no. 72868

~DIN 8050 | A | HM | bright | H7 | R | Cyl | 0°

P	M	K	N	S	H
●	●	●	●		○

Application recommendations page 94

- > Ø 9.50 mm: carbide inserts
- ≤ Ø 9.50 mm: solid carbide
- ≤ Ø 9.50 mm with external centres on both ends
- > Ø 9.50 mm with internal centres on both ends
- for tensile strengths up to a max. 1400 N/mm² / 44 HRC



d1 mm	d2 h6 mm	l1 mm	l2 mm	l4 mm	Z	**Code no.**
5.000	5.000	86.000	52.000	12.000	6	**5.000**
6.000	5.600	93.000	57.000	12.000	6	**6.000**
7.000	7.100	109.000	69.000	16.000	6	**7.000**
8.000	8.000	117.000	75.000	16.000	6	**8.000**
9.000	9.000	125.000	81.000	19.000	6	**9.000**
10.000	10.000	133.000	87.000	12.000	6	**10.000**
11.000	10.000	142.000	96.000	12.000	6	**11.000**
12.000	10.000	151.000	105.000	12.000	6	**12.000**
14.000	12.000	160.000	110.000	16.000	6	**14.000**
15.000	12.000	162.000	112.000	16.000	6	**15.000**
16.000	12.000	170.000	120.000	19.000	6	**16.000**
20.000	16.000	195.000	137.000	19.000	6	**20.000**

Carbide reamers

Carbide brazed chucking reamers

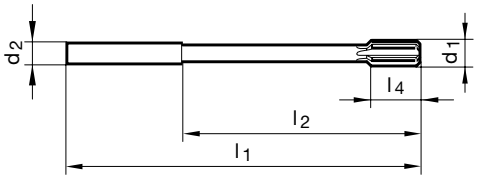
Catalogue no. 72867

~DIN 8050 | B | VHM | bright | H7 | R | Cyl | 7° A

P	M	K	N	S	H
●	●	●	●		○

Application recommendations page 94

- > Ø 9.50 mm: carbide inserts
- ≤ Ø 9.50 mm: solid carbide
- ≤ Ø 9.50 mm with external centres on both ends
- > Ø 9.50 mm with internal centres on both ends
- for tensile strengths up to a max. 1400 N/mm² / 44 HRC
- only for through holes



d1 mm	d2 h6 mm	l1 mm	l2 mm	l4 mm	Z	**Code no.**
5.000	5.000	86.000	52.000	12.000	6	**5.000**
6.000	5.600	93.000	57.000	12.000	6	**6.000**
7.000	7.100	109.000	69.000	16.000	6	**7.000**
8.000	8.000	117.000	75.000	16.000	6	**8.000**
9.000	9.000	125.000	81.000	19.000	6	**9.000**
10.000	10.000	133.000	87.000	12.000	6	**10.000**
11.000	10.000	142.000	96.000	12.000	6	**11.000**
12.000	10.000	151.000	105.000	12.000	6	**12.000**
13.000	10.000	151.000	105.000	12.000	6	**13.000**
14.000	12.000	160.000	110.000	16.000	6	**14.000**
15.000	12.000	162.000	112.000	16.000	6	**15.000**
16.000	12.000	170.000	120.000	19.000	6	**16.000**
18.000	14.000	182.000	130.000	19.000	6	**18.000**
20.000	16.000	195.000	137.000	19.000	6	**20.000**

Carbide reamers

Carbide brazed chucking reamers

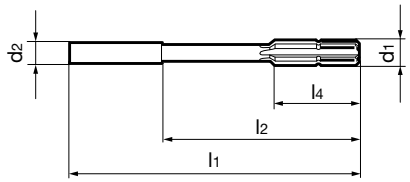
Catalogue no. 72880

~DIN 8093 | A | HM | bright | H7 | R | Cyl | 0° A

P	M	K	N	S	H
●	●	●	●		○

Application recommendations page 94

- ≥ Ø 3.0 mm with extrem unequal flute spacing
- ≤ Ø 9.50 mm: solid carbide
- > Ø 9.50 mm: carbide inserts
- ≤ Ø 9.50 mm with external centres on both ends
- > Ø 9.50 mm with internal centres on both ends
- shank Ø < 10.0 mm tolerance h9, shank Ø ≥ 10,0 mm tolerance h6
- for tensile strengths up to a max. 1400 N/mm² / 44 HRC



d1 mm	d2 h6 mm	l1 mm	l2 mm	l4 mm	Z	Code no.
1.200	1.200	38.000	16.500	7.500	3	**1.200**
1.500	1.500	40.000	18.000	8.000	3	**1.500**
1.600	1.600	43.000	20.000	9.000	3	**1.600**
2.000	2.000	49.000	24.000	11.000	4	**2.000**
2.500	2.500	57.000	29.000	14.000	4	**2.500**
3.000	3.000	61.000	33.000	15.000	6	**3.000**
4.000	4.000	75.000	43.000	19.000	6	**4.000**
4.500	4.500	80.000	47.000	21.000	6	**4.500**
5.000	5.000	86.000	52.000	23.000	6	**5.000**
6.000	5.600	93.000	57.000	26.000	6	**6.000**
7.000	7.100	109.000	69.000	31.000	6	**7.000**
8.000	8.000	117.000	75.000	33.000	6	**8.000**
9.000	9.000	125.000	81.000	36.000	6	**9.000**
10.000	10.000	133.000	87.000	38.000	6	**10.000**
11.000	10.000	142.000	96.000	41.000	6	**11.000**
12.000	10.000	151.000	105.000	44.000	6	**12.000**
13.000	10.000	151.000	105.000	44.000	6	**13.000**
14.000	12.000	160.000	110.000	47.000	6	**14.000**
16.000	12.000	170.000	120.000	52.000	6	**16.000**

Carbide reamers

Carbide brazed chucking reamers

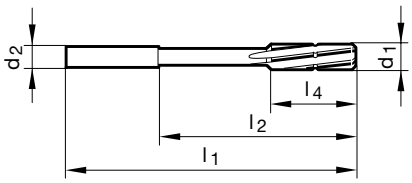
Catalogue no. 72881

~DIN 8093 | B | HM | bright | H7 | R | Cyl | 7°

P	M	K	N	S	H
●	●	●	●		○

Application recommendations page 94

- ≥ Ø 3.0 mm with extrem unequal flute spacing
- ≤ Ø 9.50 mm: solid carbide
- > Ø 9.50 mm: carbide inserts
- ≤ Ø 9.50 mm with external centres on both ends
- > Ø 9.50 mm with internal centres on both ends
- shank Ø < 10.0 mm tolerance h9, shank Ø ≥ 10,0 mm tolerance h6
- for tensile strengths up to a max. 1400 N/mm² / 44 HRC
- only for through holes



d1 mm	d2 h6 mm	l1 mm	l2 mm	l4 mm	Z	Code no.
1.000	1.000	34.000	15.000	5.500	3	**1.000**
1.200	1.200	38.000	16.500	7.500	3	**1.200**
1.500	1.500	40.000	18.000	8.000	3	**1.500**
2.000	2.000	49.000	24.000	11.000	4	**2.000**
2.500	2.500	57.000	29.000	14.000	4	**2.500**
3.000	3.000	61.000	33.000	15.000	6	**3.000**
3.200	3.200	65.000	37.000	16.000	6	**3.200**
3.500	3.500	70.000	42.000	18.000	6	**3.500**
4.000	4.000	75.000	43.000	19.000	6	**4.000**
4.500	4.500	80.000	47.000	21.000	6	**4.500**
5.000	5.000	86.000	52.000	23.000	6	**5.000**
6.000	5.600	93.000	57.000	26.000	6	**6.000**
7.000	7.100	109.000	69.000	31.000	6	**7.000**
8.000	8.000	117.000	75.000	33.000	6	**8.000**
9.000	9.000	125.000	81.000	36.000	6	**9.000**
10.000	10.000	133.000	87.000	38.000	6	**10.000**
11.000	10.000	142.000	96.000	41.000	6	**11.000**
12.000	10.000	151.000	105.000	44.000	6	**12.000**
13.000	10.000	151.000	105.000	44.000	6	**13.000**
14.000	12.000	160.000	110.000	47.000	6	**14.000**
16.000	12.000	170.000	120.000	52.000	6	**16.000**

Carbide reamers

Carbide brazed chucking reamers

Catalogue no. 72860

~DIN 8051 | A | HM | bright | H7 | R | MK | 0°

P	M	K	N	S	H
●	●	●	●		○

Application recommendations page 94

- ≤ Ø 9.50 mm: solid carbide
- > Ø 9.50 mm: carbide inserts
- ≤ Ø 9.50 mm with external centre on cutting end
- internal centre on shank end
- > Ø 9.50 mm with internal centres on both ends
- for tensile strengths up to a max. 1400 N/mm² / 44 HRC

d1 mm	S	l1 mm	l2 mm	l4 mm	Z	Code no.
9.000	MK-1	162.000	100.000	19.000	6	**9.000**
10.000	MK-1	168.000	106.000	12.000	6	**10.000**
11.000	MK-1	175.000	113.000	12.000	6	**11.000**
12.000	MK-1	182.000	120.000	12.000	6	**12.000**
13.000	MK-1	182.000	120.000	12.000	6	**13.000**
14.000	MK-1	189.000	127.000	16.000	6	**14.000**
15.000	MK-2	204.000	129.000	16.000	6	**15.000**
16.000	MK-2	210.000	135.000	19.000	6	**16.000**
17.000	MK-2	214.000	139.000	19.000	6	**17.000**
18.000	MK-2	219.000	144.000	19.000	6	**18.000**
20.000	MK-2	228.000	153.000	19.000	6	**20.000**
22.000	MK-2	237.000	162.000	22.000	6	**22.000**
24.000	MK-3	268.000	174.000	22.000	6	**24.000**
25.000	MK-3	268.000	174.000	22.000	6	**25.000**
28.000	MK-3	277.000	183.000	25.000	6	**28.000**
30.000	MK-3	281.000	187.000	25.000	6	**30.000**

Carbide reamers

Carbide brazed chucking reamers

Catalogue no. 72859

~DIN 8051 | B | HM | bright | H7 | R | MK | 7° A

P	M	K	N	S	H
●	●	●	●		○

Application recommendations page 94

- ≤ Ø 9.50 mm: solid carbide
- > Ø 9.50 mm: carbide inserts
- ≤ Ø 9.50 mm with external centre on cutting end
- internal centre on shank end
- > Ø 9.50 mm with internal centres on both ends
- for tensile strengths up to a max. 1400 N/mm² / 44 HRC

d1 mm	S	l1 mm	l2 mm	l4 mm	Z	Code no.
6.000	MK-1	138.000	76.000	12.000	6	**6.000**
8.000	MK-1	156.000	94.000	16.000	6	**8.000**
10.000	MK-1	168.000	106.000	12.000	6	**10.000**
11.000	MK-1	175.000	113.000	12.000	6	**11.000**
12.000	MK-1	182.000	120.000	12.000	6	**12.000**
13.000	MK-1	182.000	120.000	12.000	6	**13.000**
14.000	MK-1	189.000	127.000	16.000	6	**14.000**
15.000	MK-2	204.000	129.000	16.000	6	**15.000**
16.000	MK-2	210.000	135.000	19.000	6	**16.000**
17.000	MK-2	214.000	139.000	19.000	6	**17.000**
18.000	MK-2	219.000	144.000	19.000	6	**18.000**
20.000	MK-2	228.000	153.000	19.000	6	**20.000**
21.000	MK-2	232.000	157.000	22.000	6	**21.000**
22.000	MK-2	237.000	162.000	22.000	6	**22.000**
23.000	MK-2	241.000	166.000	22.000	6	**23.000**
24.000	MK-3	268.000	174.000	22.000	8	**24.000**
25.000	MK-3	268.000	174.000	22.000	8	**25.000**
26.000	MK-3	273.000	179.000	22.000	8	**26.000**
27.000	MK-3	277.000	183.000	25.000	8	**27.000**
30.000	MK-3	281.000	187.000	25.000	8	**30.000**
32.000	MK-4	317.000	199.500	25.000	8	**32.000**

High speed steel reamers

Chucking reamers

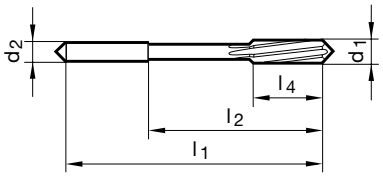
Catalogue no. 72654

DIN 212-2 | B | HSS-E | bright | +0,004 +0,005 | R | Cyl | 7°

P	M	K	N	S	H
●	○	●	●	○	

Application recommendations page 96

- for series production on machines
- with short chamfer lead, ≤ Ø 3.75 mm: 15°, > Ø 3.75 mm: 45°
- Ø in increments of 0.01 mm
- ≤ Ø 3.75 mm with external centres on both ends
- > Ø 3.75 mm with internal centres on both ends
- manufacturing tolerance:
- Ø 0.95 - 5.50 mm: 0.00/+0.004
- Ø 5.51 - 12.05 mm: 0.00/+0.005
- for tensile strengths up to a max. 1000 N/mm²



d1 mm	d2 h6 mm	l1 mm	l2 mm	l4 mm	Z	Code no.
0.980	1.000	34.000	15.000	5.500	3	**0.980**
0.990	1.000	34.000	15.000	5.500	3	**0.990**
1.000	1.000	34.000	15.000	5.500	3	**1.000**
1.010	1.000	34.000	15.000	5.500	3	**1.010**
1.020	1.000	34.000	15.000	5.500	3	**1.020**
1.050	1.000	34.000	15.000	5.500	3	**1.050**
1.100	1.100	36.000	15.500	6.500	3	**1.100**
1.200	1.200	38.000	16.500	7.500	3	**1.200**
1.250	1.200	38.000	16.500	7.500	3	**1.250**
1.300	1.200	38.000	16.500	7.500	3	**1.300**
1.400	1.400	40.000	18.000	8.000	3	**1.400**
1.480	1.500	40.000	18.000	8.000	3	**1.480**
1.490	1.500	40.000	18.000	8.000	3	**1.490**
1.500	1.500	40.000	18.000	8.000	3	**1.500**
1.510	1.600	43.000	20.000	9.000	3	**1.510**
1.520	1.600	43.000	20.000	9.000	3	**1.520**
1.550	1.600	43.000	20.000	9.000	3	**1.550**
1.600	1.600	43.000	20.000	9.000	3	**1.600**
1.700	1.600	43.000	20.000	9.000	3	**1.700**
1.800	1.800	46.000	22.000	10.000	4	**1.800**
1.980	2.000	49.000	24.000	11.000	4	**1.980**
1.990	2.000	49.000	24.000	11.000	4	**1.990**
2.000	2.000	49.000	24.000	11.000	4	**2.000**
2.010	2.000	49.000	24.000	11.000	4	**2.010**
2.030	2.000	49.000	24.000	11.000	4	**2.030**
2.050	2.000	49.000	24.000	11.000	4	**2.050**
2.100	2.000	49.000	24.000	11.000	4	**2.100**
2.200	2.200	53.000	25.000	12.000	4	**2.200**
2.300	2.200	53.000	25.000	12.000	4	**2.300**
2.350	2.200	53.000	25.000	12.000	4	**2.350**
2.400	2.500	57.000	29.000	14.000	4	**2.400**
2.500	2.500	57.000	29.000	14.000	4	**2.500**
2.550	2.500	57.000	29.000	14.000	4	**2.550**
2.600	2.500	57.000	29.000	14.000	4	**2.600**
2.700	2.800	61.000	33.000	15.000	6	**2.700**
2.750	2.800	61.000	33.000	15.000	6	**2.750**
2.800	2.800	61.000	33.000	15.000	6	**2.800**
2.900	3.000	61.000	33.000	15.000	6	**2.900**
2.980	3.000	61.000	33.000	15.000	6	**2.980**
2.990	3.000	61.000	33.000	15.000	6	**2.990**
3.000	3.000	61.000	33.000	15.000	6	**3.000**
3.010	3.200	65.000	37.000	16.000	6	**3.010**
3.020	3.200	65.000	37.000	16.000	6	**3.020**
3.030	3.200	65.000	37.000	16.000	6	**3.030**
3.050	3.200	65.000	37.000	16.000	6	**3.050**
3.100	3.200	65.000	37.000	16.000	6	**3.100**
3.200	3.200	65.000	37.000	16.000	6	**3.200**
3.250	3.200	65.000	37.000	16.000	6	**3.250**

d1 mm	d2 h6 mm	l1 mm	l2 mm	l4 mm	Z	Code no.
3.300	3.200	65.000	37.000	16.000	6	**3.300**
3.400	3.500	70.000	42.000	18.000	6	**3.400**
3.500	3.500	70.000	42.000	18.000	6	**3.500**
3.600	3.500	70.000	42.000	18.000	6	**3.600**
3.700	3.500	70.000	42.000	18.000	6	**3.700**
3.800	4.000	75.000	47.000	19.000	6	**3.800**
3.900	4.000	75.000	47.000	19.000	6	**3.900**
3.950	4.000	75.000	47.000	19.000	6	**3.950**
3.970	4.000	75.000	47.000	19.000	6	**3.970**
3.980	4.000	75.000	47.000	19.000	6	**3.980**
3.990	4.000	75.000	47.000	19.000	6	**3.990**
4.000	4.000	75.000	47.000	19.000	6	**4.000**
4.010	4.000	75.000	47.000	19.000	6	**4.010**
4.020	4.000	75.000	47.000	19.000	6	**4.020**
4.030	4.000	75.000	47.000	19.000	6	**4.030**
4.040	4.000	75.000	47.000	19.000	6	**4.040**
4.050	4.000	75.000	47.000	19.000	6	**4.050**
4.100	4.000	75.000	47.000	19.000	6	**4.100**
4.200	4.000	75.000	47.000	19.000	6	**4.200**
4.500	4.500	80.000	52.000	21.000	6	**4.500**
4.800	5.000	86.000	58.000	23.000	6	**4.800**
4.980	5.000	86.000	58.000	23.000	6	**4.980**
4.990	5.000	86.000	58.000	23.000	6	**4.990**
5.000	5.000	86.000	58.000	23.000	6	**5.000**
5.010	5.000	86.000	58.000	23.000	6	**5.010**
5.020	5.000	86.000	58.000	23.000	6	**5.020**
5.030	5.000	86.000	58.000	23.000	6	**5.030**
5.050	5.000	86.000	58.000	23.000	6	**5.050**
5.100	5.000	86.000	58.000	23.000	6	**5.100**
5.200	5.000	86.000	58.000	23.000	6	**5.200**
5.500	5.600	93.000	57.000	26.000	6	**5.500**
5.800	5.600	93.000	57.000	26.000	6	**5.800**
5.980	5.600	93.000	57.000	26.000	6	**5.980**
5.990	5.600	93.000	57.000	26.000	6	**5.990**
6.000	5.600	93.000	57.000	26.000	6	**6.000**
6.010	6.300	101.000	65.000	28.000	6	**6.010**
6.020	6.300	101.000	65.000	28.000	6	**6.020**
6.050	6.300	101.000	65.000	28.000	6	**6.050**
6.100	6.300	101.000	65.000	28.000	6	**6.100**
6.200	6.300	101.000	65.000	28.000	6	**6.200**
6.350	6.300	101.000	65.000	28.000	6	**6.350**
6.500	6.300	101.000	65.000	28.000	6	**6.500**
7.000	7.100	109.000	73.000	31.000	6	**7.000**
7.010	7.100	109.000	73.000	31.000	6	**7.010**
7.020	7.100	109.000	73.000	31.000	6	**7.020**
7.100	7.100	109.000	73.000	31.000	6	**7.100**
7.500	7.100	109.000	73.000	31.000	6	**7.500**
7.980	8.000	117.000	81.000	33.000	6	**7.980**
8.000	8.000	117.000	81.000	33.000	6	**8.000**
8.010	8.000	117.000	81.000	33.000	6	**8.010**
8.020	8.000	117.000	81.000	33.000	6	**8.020**
8.030	8.000	117.000	81.000	33.000	6	**8.030**
8.050	8.000	117.000	81.000	33.000	6	**8.050**
8.100	8.000	117.000	81.000	33.000	6	**8.100**
8.200	8.000	117.000	81.000	33.000	6	**8.200**
8.500	8.000	117.000	81.000	33.000	6	**8.500**
8.900	9.000	125.000	85.000	36.000	6	**8.900**
9.000	9.000	125.000	85.000	36.000	6	**9.000**
9.010	9.000	125.000	85.000	36.000	6	**9.010**
9.020	9.000	125.000	85.000	36.000	6	**9.020**
9.500	9.000	125.000	85.000	36.000	6	**9.500**
9.980	10.000	133.000	93.000	38.000	6	**9.980**
10.000	10.000	133.000	93.000	38.000	6	**10.000**
10.010	10.000	133.000	93.000	38.000	6	**10.010**
10.020	10.000	133.000	93.000	38.000	6	**10.020**
10.030	10.000	133.000	93.000	38.000	6	**10.030**
10.050	10.000	133.000	93.000	38.000	6	**10.050**
10.100	10.000	133.000	93.000	38.000	6	**10.100**
10.200	10.000	133.000	93.000	38.000	6	**10.200**
10.300	10.000	133.000	93.000	38.000	6	**10.300**
10.500	10.000	133.000	93.000	38.000	6	**10.500**
11.000	10.000	142.000	102.000	41.000	6	**11.000**

d1 **mm**	d2 h6 mm	l1 mm	l2 mm	l4 mm	Z	**Code no.**
11.010	10.000	142.000	102.000	41.000	6	**11.010**
11.020	10.000	142.000	102.000	41.000	6	**11.020**
11.500	10.000	142.000	102.000	41.000	6	**11.500**
12.000	10.000	151.000	111.000	44.000	6	**12.000**

High speed steel reamers

Chucking reamers

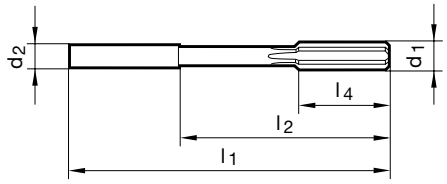
Catalogue no. 72640

DIN 212-2 | A | HSS-E | bright | H7 | R | Cyl | 0°

P	M	K	N	S	H
●	○	●	●	○	

Application recommendations page 96

- ≤ Ø 3.75 mm with external centres on both ends
- > Ø 3.75 mm with internal centres on both ends
- for tensile strengths up to a max. 1000 N/mm²



d1 mm	d2 h6 mm	l1 mm	l2 mm	l4 mm	Z	Code no.
2.200	2.200	53.000	25.000	12.000	4	**2.200**
3.500	3.500	70.000	42.000	18.000	6	**3.500**
4.000	4.000	75.000	47.000	19.000	6	**4.000**
4.500	4.500	80.000	52.000	21.000	6	**4.500**
5.000	5.000	86.000	58.000	23.000	6	**5.000**
6.000	5.600	93.000	57.000	26.000	6	**6.000**
7.000	7.100	109.000	73.000	31.000	6	**7.000**
8.000	8.000	117.000	81.000	33.000	6	**8.000**
9.000	9.000	125.000	85.000	36.000	6	**9.000**
10.000	10.000	133.000	93.000	38.000	6	**10.000**
11.000	10.000	142.000	102.000	41.000	6	**11.000**
12.000	10.000	151.000	111.000	44.000	6	**12.000**
13.000	10.000	151.000	111.000	44.000	6	**13.000**
14.000	12.500	160.000	115.000	47.000	6	**14.000**
15.000	12.500	162.000	117.000	50.000	6	**15.000**
16.000	12.500	170.000	125.000	52.000	6	**16.000**
17.000	14.000	175.000	130.000	54.000	6	**17.000**
19.000	16.000	189.000	141.000	58.000	6	**19.000**
20.000	16.000	195.000	147.000	60.000	6	**20.000**

High speed steel reamers

Chucking reamers

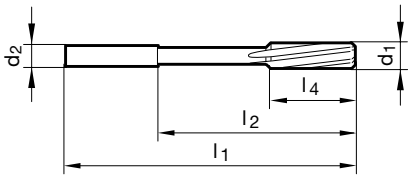
Catalogue no. 72650

DIN 212-2 | B | HSS-E | bright | H7 | R | Cyl | 7°

P	M	K	N	S	H
●	○	●	●	○	

Application recommendations page 96

- > Ø 3.75 mm with internal centres on both ends
- ≤ Ø 3.75 mm with external centres on both ends
- for tensile strengths up to a max. 1000 N/mm²
- only for through holes



d1 mm	d2 h6 mm	l1 mm	l2 mm	l4 mm	Z	**Code no.**
4.000	4.000	75.000	47.000	19.000	6	**4.000**
4.500	4.500	80.000	52.000	21.000	6	**4.500**
5.000	5.000	86.000	58.000	23.000	6	**5.000**
5.500	5.600	93.000	57.000	26.000	6	**5.500**
6.000	5.600	93.000	57.000	26.000	6	**6.000**
6.500	6.300	101.000	65.000	28.000	6	**6.500**
7.000	7.100	109.000	73.000	31.000	6	**7.000**
8.000	8.000	117.000	81.000	33.000	6	**8.000**
9.000	9.000	125.000	85.000	36.000	6	**9.000**
10.000	10.000	133.000	93.000	38.000	6	**10.000**
11.000	10.000	142.000	102.000	41.000	6	**11.000**
12.000	10.000	151.000	111.000	44.000	6	**12.000**
13.000	10.000	151.000	111.000	44.000	6	**13.000**
14.000	12.500	160.000	115.000	47.000	6	**14.000**
15.000	12.500	162.000	117.000	50.000	6	**15.000**
16.000	12.500	170.000	125.000	52.000	6	**16.000**
17.000	14.000	175.000	130.000	54.000	6	**17.000**
18.000	14.000	182.000	137.000	56.000	6	**18.000**
20.000	16.000	195.000	147.000	60.000	6	**20.000**

High speed steel reamers

Chucking reamers

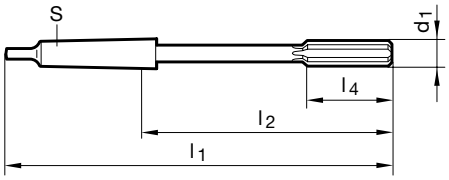
Catalogue no. 72660

DIN 208 | A | HSS-E | bright | H7 | R | MK | 0°

P	M	K	N	S	H
●	○	●	●	○	

Application recommendations page 96

- Ø 3.00 mm with external centre on cutting end, with internal centre on shank end
- ≤ Ø 4.00 mm to company standard
- > Ø 3.00 mm with internal centres on both ends
- for tensile strengths up to a max. 1000 N/mm²



d1 mm	S	l1 mm	l2 mm	l4 mm	Z	Code no.
8.000	MK-1	156.000	94.000	33.000	6	**8.000**
9.000	MK-1	162.000	100.000	36.000	6	**9.000**
10.000	MK-1	168.000	106.000	38.000	6	**10.000**
11.000	MK-1	175.000	113.000	41.000	6	**11.000**
12.000	MK-1	182.000	120.000	44.000	6	**12.000**
13.000	MK-1	182.000	120.000	44.000	6	**13.000**
14.000	MK-1	189.000	127.000	47.000	8	**14.000**
15.000	MK-2	204.000	129.000	50.000	8	**15.000**
16.000	MK-2	210.000	135.000	52.000	8	**16.000**
17.000	MK-2	214.000	139.000	54.000	8	**17.000**
18.000	MK-2	219.000	144.000	56.000	8	**18.000**
19.000	MK-2	223.000	148.000	58.000	8	**19.000**
20.000	MK-2	228.000	153.000	60.000	8	**20.000**
21.000	MK-2	232.000	157.000	62.000	8	**21.000**
22.000	MK-2	237.000	162.000	64.000	8	**22.000**
23.000	MK-2	241.000	166.000	66.000	8	**23.000**
24.000	MK-3	268.000	174.000	68.000	8	**24.000**
25.000	MK-3	268.000	174.000	68.000	8	**25.000**
26.000	MK-3	273.000	179.000	70.000	8	**26.000**
28.000	MK-3	277.000	183.000	71.000	10	**28.000**
30.000	MK-3	281.000	187.000	73.000	10	**30.000**
32.000	MK-4	317.000	199.500	77.000	10	**32.000**
35.000	MK-4	321.000	203.500	78.000	10	**35.000**
37.000	MK-4	325.000	207.500	79.000	10	**37.000**

High speed steel reamers

Chucking reamers

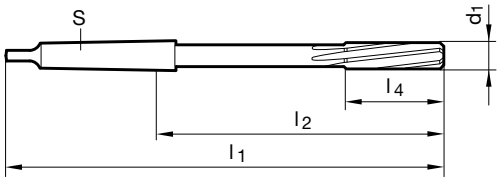
Catalogue no. 72670

DIN 208 | B | HSS-E | bright | H7 | R | MK | 7°

P	M	K	N	S	H
●	○	●	●	○	

Application recommendations page 96

- ≤ Ø 4.00 mm to company standard
- > Ø 3.00 mm with internal centres on both ends
- Ø 3.00 mm with external centre on cutting end, with internal centre on shank end
- for tensile strengths up to a max. 1000 N/mm²
- only for through holes



d1 mm	S	l1 mm	l2 mm	l4 mm	Z	Code no.
5.000	MK-1	133.000	71.000	23.000	6	**5.000**
6.000	MK-1	138.000	76.000	26.000	6	**6.000**
7.000	MK-1	150.000	88.000	31.000	6	**7.000**
8.000	MK-1	156.000	94.000	33.000	6	**8.000**
9.000	MK-1	162.000	100.000	36.000	6	**9.000**
10.000	MK-1	168.000	106.000	38.000	6	**10.000**
11.000	MK-1	175.000	113.000	41.000	6	**11.000**
12.000	MK-1	182.000	120.000	44.000	6	**12.000**
13.000	MK-1	182.000	120.000	44.000	6	**13.000**
14.000	MK-1	189.000	127.000	47.000	8	**14.000**
15.000	MK-2	204.000	129.000	50.000	8	**15.000**
16.000	MK-2	210.000	135.000	52.000	8	**16.000**
17.000	MK-2	214.000	139.000	54.000	8	**17.000**
18.000	MK-2	219.000	144.000	56.000	8	**18.000**
19.000	MK-2	223.000	148.000	58.000	8	**19.000**
20.000	MK-2	228.000	153.000	60.000	8	**20.000**
21.000	MK-2	232.000	157.000	62.000	8	**21.000**
22.000	MK-2	237.000	162.000	64.000	8	**22.000**
23.000	MK-2	241.000	166.000	66.000	8	**23.000**
24.000	MK-3	268.000	174.000	68.000	8	**24.000**
25.000	MK-3	268.000	174.000	68.000	8	**25.000**
26.000	MK-3	273.000	179.000	70.000	8	**26.000**
27.000	MK-3	277.000	183.000	71.000	10	**27.000**
28.000	MK-3	277.000	183.000	71.000	10	**28.000**
29.000	MK-3	281.000	187.000	73.000	10	**29.000**
30.000	MK-3	281.000	187.000	73.000	10	**30.000**
31.000	MK-3	285.000	191.000	75.000	10	**31.000**
32.000	MK-4	317.000	199.500	77.000	10	**32.000**
33.000	MK-4	317.000	199.500	77.000	10	**33.000**
34.000	MK-4	321.000	203.500	78.000	10	**34.000**
35.000	MK-4	321.000	203.500	78.000	10	**35.000**
40.000	MK-4	329.000	211.500	81.000	10	**40.000**
44.000	MK-4	336.000	218.500	83.000	12	**44.000**
45.000	MK-4	336.000	218.500	83.000	12	**45.000**
50.000	MK-4	344.000	226.500	86.000	12	**50.000**

High speed steel reamers

Quick helix reamers

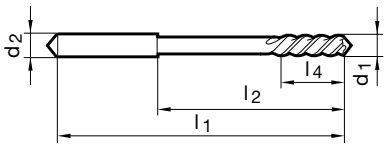
Catalogue no. 72690

DIN 212-2 | C | HSS-E | bright | H7 | R | Cyl | 45° A

P	M	K	N	S	H
●			●		

Application recommendations page 96

- with tapered chamfer lead, appr. 1/6 of the cutting edge length
- the special geometry of the tool requires an increase the reaming oversize of the hole by 50 to 100%
- > Ø 3.75 mm with internal centres on both ends
- the feed rate should be 50% higher than with all other reamers
- for tensile strengths up to a max. 1000 N/mm²



d1 mm	d2 h6 mm	l1 mm	l2 mm	l4 mm	Z	Code no.
4.000	4.000	75.000	47.000	19.000	3	**4.000**
4.500	4.500	80.000	52.000	21.000	3	**4.500**
5.000	5.000	86.000	58.000	23.000	3	**5.000**
5.500	5.600	93.000	57.000	26.000	3	**5.500**
6.000	5.600	93.000	57.000	26.000	3	**6.000**
7.000	7.100	109.000	73.000	31.000	3	**7.000**
8.000	8.000	117.000	81.000	33.000	3	**8.000**
9.000	9.000	125.000	85.000	36.000	3	**9.000**
10.000	10.000	133.000	93.000	38.000	3	**10.000**
12.000	10.000	151.000	111.000	44.000	3	**12.000**
13.000	10.000	151.000	111.000	44.000	3	**13.000**

High speed steel reamers

Bridge reamers

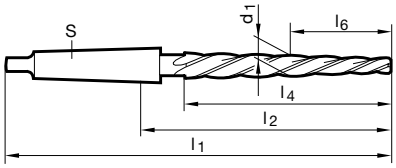
Catalogue no. 72680

DIN 311 | HSS | ni-trided | R | MK | 25°

P	M	K	N	S	H
●	○	●	●		

Application recommendations page 96

- with long, tapered chamfer lead 1:10
- corrects the hole offset of stacked sheet metal parts to the required hole -Ø (i. e. to riveting or screwing together)
- manufacturing tolerance k11
- with internal centres on both ends
- steel fabrication, boiler and tank construction, shipbuilding
- tool with high metal removal rate
- also for slow running hand drilling machines
- for tensile strengths up to a max. 1000 N/mm²



d1 mm	S	l1 mm	l2 mm	l4 mm	l6 mm	Z	Code no.
9.500	MK-1	166.000	104.000	90.000	27.000	4	**9.500**
10.000	MK-1	171.000	109.000	95.000	30.000	4	**10.000**
11.000	MK-1	176.000	114.000	100.000	33.000	4	**11.000**
12.000	MK-2	199.000	124.000	105.000	39.000	4	**12.000**
13.000	MK-2	199.000	124.000	105.000	39.000	4	**13.000**
14.000	MK-2	209.000	134.000	115.000	42.000	5	**14.000**
15.000	MK-2	219.000	144.000	125.000	45.000	5	**15.000**
16.000	MK-2	229.000	154.000	135.000	48.000	5	**16.000**
17.000	MK-3	251.000	157.000	135.000	51.000	5	**17.000**
18.000	MK-3	261.000	167.000	145.000	58.000	5	**18.000**
19.000	MK-3	261.000	167.000	145.000	58.000	5	**19.000**
20.000	MK-3	271.000	177.000	155.000	62.000	5	**20.000**
21.000	MK-3	271.000	177.000	155.000	62.000	5	**21.000**
22.000	MK-3	281.000	187.000	165.000	66.000	5	**22.000**
23.000	MK-3	281.000	187.000	165.000	66.000	5	**23.000**
24.000	MK-3	296.000	202.000	180.000	72.000	5	**24.000**
25.000	MK-3	296.000	202.000	180.000	72.000	5	**25.000**
26.000	MK-3	296.000	202.000	180.000	72.000	5	**26.000**
27.000	MK-3	311.000	217.000	195.000	78.000	5	**27.000**
28.000	MK-3	311.000	217.000	195.000	78.000	5	**28.000**
30.000	MK-3	311.000	217.000	195.000	78.000	5	**30.000**
31.000	MK-3	326.000	232.000	210.000	84.000	5	**31.000**
32.000	MK-4	354.000	236.500	210.000	84.000	5	**32.000**
33.000	MK-4	354.000	236.500	210.000	84.000	5	**33.000**
34.000	MK-4	364.000	246.500	220.000	88.000	5	**34.000**
36.000	MK-4	364.000	246.500	220.000	88.000	5	**36.000**
37.000	MK-4	364.000	246.500	220.000	88.000	5	**37.000**

High speed steel reamers

Machine taper reamers

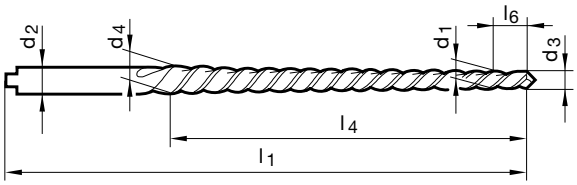
Catalogue no. 72741

DIN 2179 | HSS-E | bright | R | Cyl | 45°

P	M	K	N	S	H
●		●	●		

Application recommendations page 96

- for small batch productions and repairs
- with taper 1:50 for the reaming of holes to suit taper pins to DIN 1, 258, 7977 and 7978
- > Ø 4.00 mm with internal centres on both ends
- ≤ Ø 4.00 mm with external centres on both ends
- pre-drilling: cylindrical
- with tang to DIN 1809
- for tensile strengths up to a max. 1000 N/mm²



d1 mm	d2 mm	d3 mm	d4 mm	l1 mm	l4 mm	l6 mm	Z	**Code no.**
2.000	3.150	1.900	2.860	86.000	48.000	5.000	3	**2.000**
2.500	3.150	2.400	3.360	86.000	48.000	5.000	3	**2.500**
3.000	4.000	2.900	4.060	100.000	58.000	5.000	3	**3.000**
4.000	5.000	3.900	5.260	112.000	68.000	5.000	3	**4.000**
5.000	6.300	4.900	6.360	122.000	73.000	5.000	3	**5.000**
6.000	8.000	5.900	8.000	160.000	105.000	5.000	3	**6.000**
6.500	8.500	6.400	8.780	188.000	119.000	5.000	3	**6.500**
8.000	10.000	7.900	10.800	207.000	145.000	5.000	3	**8.000**
10.000	12.500	9.900	13.400	245.000	175.000	5.000	3	**10.000**
12.000	16.000	11.860	16.000	290.000	210.000	7.000	3	**12.000**

High speed steel reamers

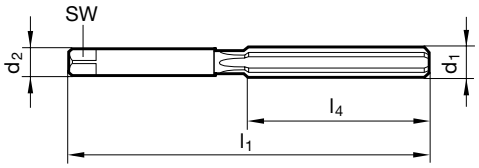
Hand reamers

Catalogue no. 72600

DIN 206 | A | HSS | bright | H7 | R | Cyl | 0°

P	M	K	N	S	H
●		●	●		

- for small batch productions and repairs
- long taper lead, approx. 1/3 of cutting length tapered
- not suitable for blind holes due to chamfer lead length
- with square to DIN 10
- ≤ Ø 3.75 mm with external centres on both ends
- > Ø 3.75 mm with internal centres on both ends
- for tensile strengths up to a max. 900 N/mm²



d1 mm	d2 mm	l1 mm	l4 mm	SW mm	Z	Code no.
2.500	2.500	58.000	29.000	2.100	4	**2.500**
3.000	3.000	62.000	31.000	2.400	6	**3.000**
3.500	3.500	71.000	35.000	2.700	6	**3.500**
4.000	4.000	76.000	38.000	3.000	6	**4.000**
4.500	4.500	81.000	41.000	3.400	6	**4.500**
5.000	5.000	87.000	44.000	3.800	6	**5.000**
5.500	5.500	93.000	47.000	4.300	6	**5.500**
6.000	6.000	93.000	47.000	4.900	6	**6.000**
8.000	8.000	115.000	58.000	6.200	6	**8.000**
9.000	9.000	124.000	62.000	7.000	6	**9.000**
10.000	10.000	133.000	66.000	8.000	6	**10.000**
11.000	11.000	142.000	71.000	9.000	6	**11.000**
12.000	12.000	152.000	76.000	9.000	6	**12.000**
13.000	13.000	152.000	76.000	10.000	6	**13.000**
16.000	16.000	175.000	87.000	12.000	8	**16.000**
17.000	17.000	175.000	87.000	13.000	8	**17.000**
19.000	19.000	188.000	93.000	14.500	8	**19.000**
20.000	20.000	201.000	100.000	16.000	8	**20.000**
24.000	24.000	231.000	115.000	18.000	8	**24.000**
25.000	25.000	231.000	115.000	20.000	8	**25.000**
28.000	28.000	247.000	124.000	22.000	10	**28.000**

High speed steel reamers

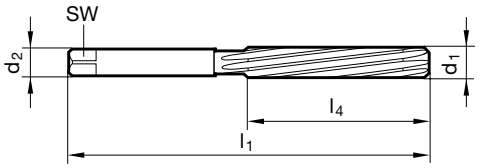
Hand reamers

Catalogue no. 72610

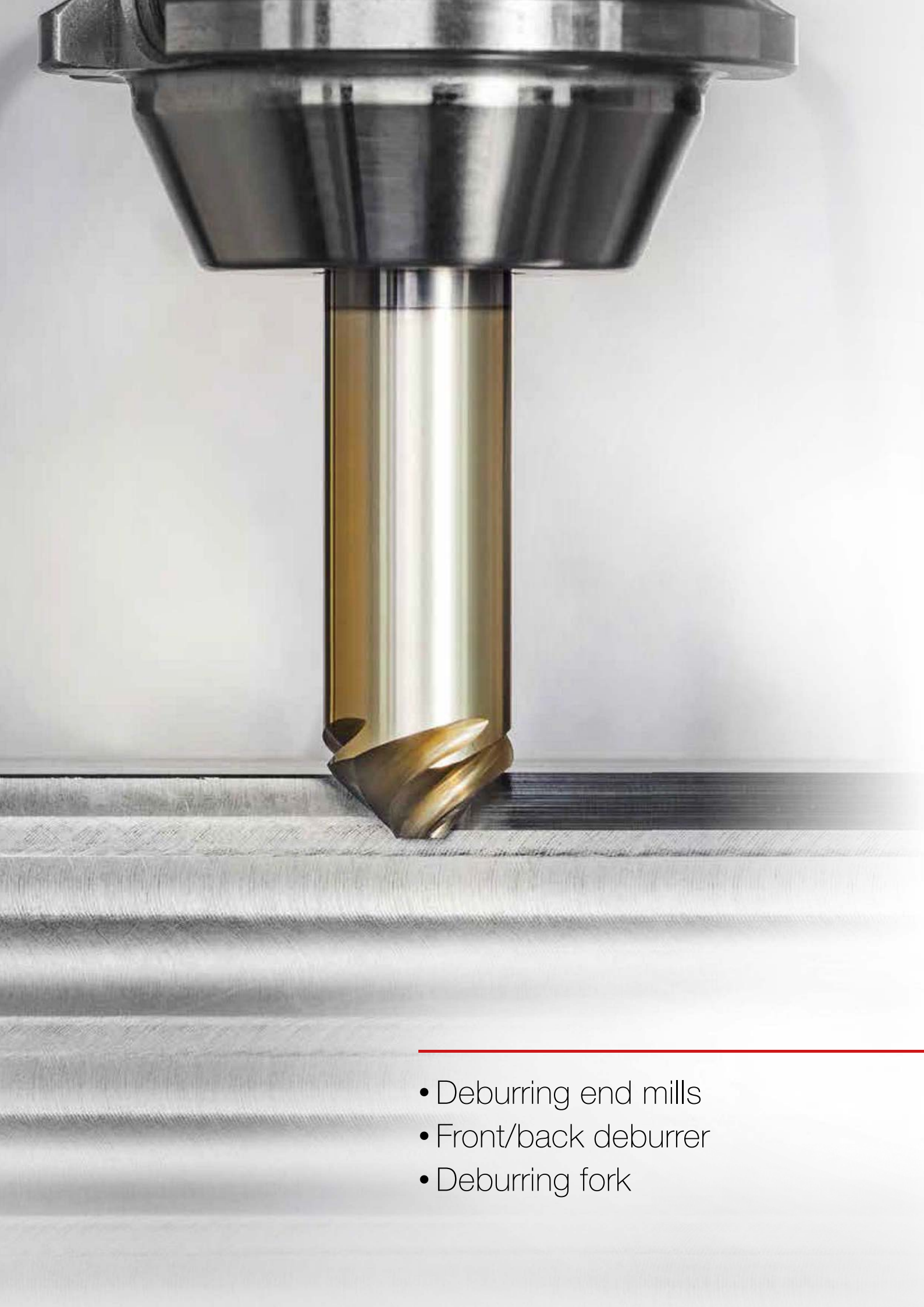
DIN 206 | B | HSS | bright | H7 | R | Cyl | 7°

P	M	K	N	S	H
●		●	●		

- for small batch productions and repairs
- long taper lead, approx. 1/3 of cutting length tapered
- for interrupted hole e.g. split workpieces, hole interruptions, intersecting holes and similar
- with square to DIN 10
- ≤ Ø 3.75 mm with external centres on both ends
- > Ø 3.75 mm with internal centres on both ends
- for tensile strengths up to a max. 900 N/mm²



d1 mm	d2 mm	l1 mm	l4 mm	SW mm	Z	Code no.
2.000	2.000	50.000	25.000	1.600	4	**2.000**
2.500	2.500	58.000	29.000	2.100	4	**2.500**
2.800	2.800	62.000	31.000	2.100	6	**2.800**
3.000	3.000	62.000	31.000	2.400	6	**3.000**
3.500	3.500	71.000	35.000	2.700	6	**3.500**
4.000	4.000	76.000	38.000	3.000	6	**4.000**
4.500	4.500	81.000	41.000	3.400	6	**4.500**
5.000	5.000	87.000	44.000	3.800	6	**5.000**
6.000	6.000	93.000	47.000	4.900	6	**6.000**
7.000	7.000	107.000	54.000	5.500	6	**7.000**
8.000	8.000	115.000	58.000	6.200	6	**8.000**
9.000	9.000	124.000	62.000	7.000	6	**9.000**
10.000	10.000	133.000	66.000	8.000	6	**10.000**
12.000	12.000	152.000	76.000	9.000	6	**12.000**
13.000	13.000	152.000	76.000	10.000	6	**13.000**
14.000	14.000	163.000	81.000	11.000	8	**14.000**
15.000	15.000	163.000	81.000	12.000	8	**15.000**
16.000	16.000	175.000	87.000	12.000	8	**16.000**
17.000	17.000	175.000	87.000	13.000	8	**17.000**
18.000	18.000	188.000	93.000	14.500	8	**18.000**
19.000	19.000	188.000	93.000	14.500	8	**19.000**
20.000	20.000	201.000	100.000	16.000	8	**20.000**
22.000	22.000	215.000	107.000	18.000	8	**22.000**
25.000	25.000	231.000	115.000	20.000	8	**25.000**
26.000	26.000	231.000	115.000	20.000	8	**26.000**
28.000	28.000	247.000	124.000	22.000	10	**28.000**
30.000	30.000	247.000	124.000	24.000	10	**30.000**
32.000	32.000	265.000	133.000	24.000	10	**32.000**
34.000	34.000	284.000	142.000	26.000	10	**34.000**
35.000	35.000	284.000	142.000	29.000	10	**35.000**



- Deburring end mills
- Front/back deburrer
- Deburring fork

DEBURRING AND **CHAMFERING TOOLS**

P	M	K	N	S	H	Type	Cutting direction	Form	Tool material	Surface	Standard	d1/mm	Catalogue no.	Progr. page

Deburring end mills 60°

•	•	•	•	•		SuperAF-60	right-hand		**Solid carbide**	AlTiN	Company std.	4.000 - 12.000	**53393**	57

•	•	•	•	•		SuperAF-60	right-hand		**Solid carbide**	AlTiN	Company std.	6.000 - 12.000	**53394**	58

Deburring end mills 90°

•	•	•	•	•		SuperAF-90	right-hand		**Solid carbide**	AlTiN	Company std.	4.000 - 12.000	**53395**	59

•	•	•	•	•		SuperAF-90	right-hand		**Solid carbide**	AlTiN	Company std.	4.000 - 12.000	**53396**	60

•	•	•	•	•	○	SuperAF-90	right-hand		**Solid carbide**	TiAlZrN	Company std.	6.000 - 20.000	**53399**	61

Deburring end mills 90°, spiral-fluted

•	•	○	•	•		Super AFX-90	right-hand		**Solid carbide**	TiAlZrN	Company std.	6.000 - 20.000	**63399**	63

Deburring end mills 120°

•	•	•	•	•		Super-AF-120	right-hand		**Solid carbide**	AlTiN	Company std.	4.000 - 12.000	**53397**	64

•	•	•	•	•		Super-AF-120	right-hand		**Solid carbide**	AlTiN	Company std.	6.000 - 12.000	**53398**	65

Front/back deburrer 90°

•	•	•	•	•		SuperAD-90	right-hand		**Solid carbide**	AlTiN nano	Company std.	3.000 - 12.000	**52365**	66

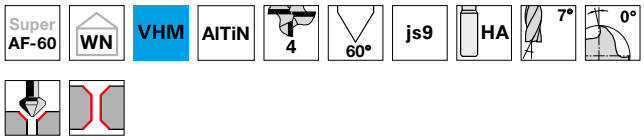
Deburring forks

•	•		○			SuperE-U	right-hand		**Solid carbide**	bright	Company std.	2.000 - 8.000	**52360**	67

Deburring and chamfering tools

Deburring end mills 60°

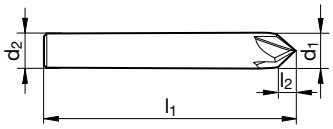
Catalogue no. 53393



P	M	K	N	S	H
•	•	•	•	•	

Application recommendations page 100

- deburring- and chamfering-mill to machine workpiece edges with a 60° angle

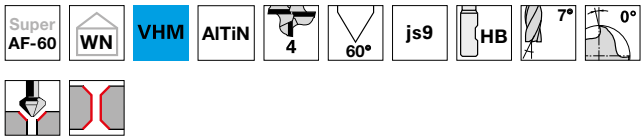


d1 js9 mm	d2 h6 mm	l1 mm	l2 mm	Z	Code no.
4.000	4.000	50.000	3.500	4	**4.000**
6.000	6.000	57.000	5.200	4	**6.000**
8.000	8.000	63.000	7.000	4	**8.000**
10.000	10.000	72.000	8.700	4	**10.000**
12.000	12.000	83.000	10.400	4	**12.000**

Deburring and chamfering tools

Deburring end mills 60°

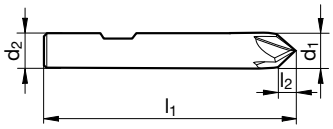
Catalogue no. 53394



P	M	K	N	S	H
•	•	•	•	•	

Application recommendations page 100

- deburring- and chamfering-mill to machine workpiece edges with a 60° angle

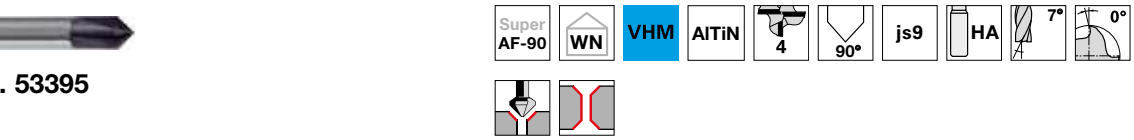


d1 js9 mm	d2 h6 mm	l1 mm	l2 mm	Z	Code no.
6.000	6.000	57.000	5.200	4	**6.000**
8.000	8.000	63.000	7.000	4	**8.000**
10.000	10.000	72.000	8.700	4	**10.000**
12.000	12.000	83.000	10.400	4	**12.000**

Deburring and chamfering tools

Deburring end mills 90°

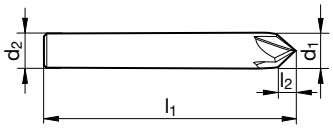
Catalogue no. 53395



P	M	K	N	S	H
•	•	•	•	•	

Application recommendations page 100

- deburring- and chamfering-mill to machine workpiece edges with a 90° angle

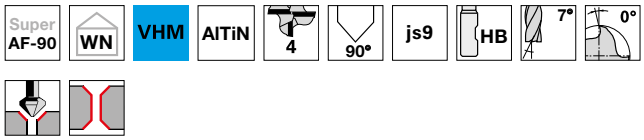


d1 js9 mm	d2 h6 mm	l1 mm	l2 mm	Z	Code no.
4.000	4.000	50.000	2.000	4	**4.000**
6.000	6.000	57.000	3.000	4	**6.000**
8.000	8.000	63.000	4.000	4	**8.000**
10.000	10.000	72.000	5.000	4	**10.000**
12.000	12.000	83.000	6.000	4	**12.000**

Deburring and chamfering tools

Deburring end mills 90°

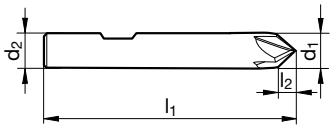
Catalogue no. 53396



P	M	K	N	S	H
●	●	●	●	●	

Application recommendations page 100

- deburring- and chamfering-mill to machine workpiece edges with a 90° angle
- ≥ Ø 6.0 mm with clamping surface shank form HB



d1 js9 mm	d2 h6 mm	l1 mm	l2 mm	Z	**Code no.**
4.000	4.000	50.000	2.000	4	**4.000**
6.000	6.000	57.000	3.000	4	**6.000**
8.000	8.000	63.000	4.000	4	**8.000**
10.000	10.000	72.000	5.000	4	**10.000**
12.000	12.000	83.000	6.000	4	**12.000**

Deburring and chamfering tools

Deburring end mills 90°

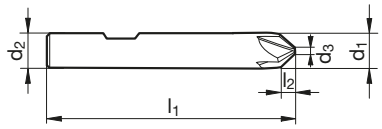
Catalogue no. 53399

Super AF-90 | WN | VHM | TiAlZrN | 6 | 90° | js9 | HB | 7° | 0°

P	M	K	N	S	H
●	●	●	●	●	○

Application recommendations page 100

- deburring- and chamfering-mill to machine workpiece edges with a 90° angle
- highest feed rates and improved surface finish thanks to z = 6
- also available as kit 322 044 176
- HA shank on request



d1 js9 mm	d2 h6 mm	d3 mm	l1 mm	l2 mm	Z	**Code no.**
6.000	6.000	1.500	57.000	2.250	6	**6.000**
8.000	8.000	2.000	63.000	3.000	6	**8.000**
10.000	10.000	3.000	72.000	3.500	6	**10.000**
12.000	12.000	3.000	83.000	4.500	6	**12.000**
16.000	16.000	4.000	92.000	6.000	6	**16.000**
20.000	20.000	6.000	92.000	7.000	6	**20.000**

Deburring end mills 90°, sets

Catalogue no. 322 044 176

Super AF-90 | WN | VHM | TiAlZrN | 6 | 90° | js9 | HB | 7° | 0°

P	M	K	N	S	H
●	●	●	●	●	○

Application recommendations page 100

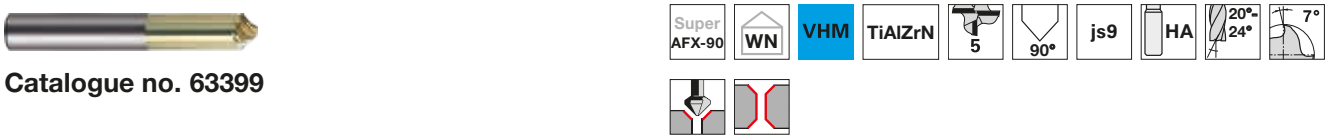
- deburring- and chamfering-mill to machine workpiece edges with a 90° angle
- highest feed rates and improved surface finish thanks to z = 6
- consisting of catalogue no.53399

Ø-range mm	Pieces/set
6/8/10/12	4

Deburring and chamfering tools

Deburring end mills 90°, spiral-fluted

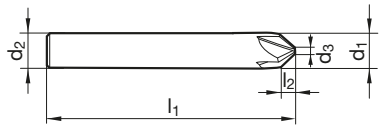
Catalogue no. 63399



P	M	K	N	S	H
●	●	○	●	●	

Application recommendations page 100

- use of the full cutting edge length through face cut, machining up to the component base
- positive rake angle and 5 different helix angles for smooth cutting and better surfaces on large chamfers
- HB surface clamping available on request

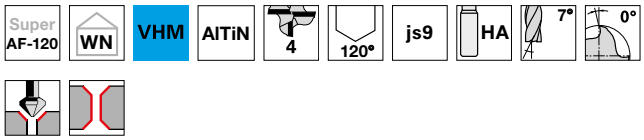


d1 js9 mm	d2 h6 mm	d3 mm	l1 mm	l2 mm	Z	**Code no.**
6.000	6.000	1.500	57.000	2.250	5	**6.000**
8.000	8.000	2.000	63.000	3.000	5	**8.000**
10.000	10.000	2.500	72.000	3.750	5	**10.000**
12.000	12.000	3.000	83.000	4.500	5	**12.000**
16.000	16.000	4.000	92.000	6.000	5	**16.000**
20.000	20.000	5.000	104.000	7.500	5	**20.000**

Deburring and chamfering tools

Deburring end mills 120°

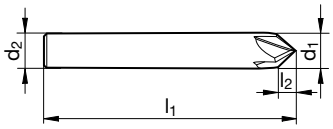
Catalogue no. 53397



P	M	K	N	S	H
•	•	•	•	•	

Application recommendations page 100

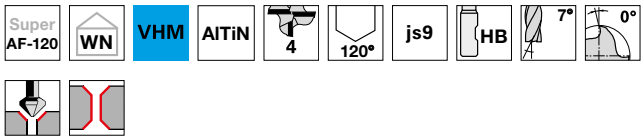
- deburring- and chamfering-mill to machine workpiece edges with a 120° angle



d1 js9 mm	d2 h6 mm	l1 mm	l2 mm	Z	Code no.
4.000	4.000	50.000	1.200	4	**4.000**
6.000	6.000	57.000	1.800	4	**6.000**
8.000	8.000	63.000	2.400	4	**8.000**
10.000	10.000	72.000	2.900	4	**10.000**
12.000	12.000	83.000	3.500	4	**12.000**

Deburring end mills 120°

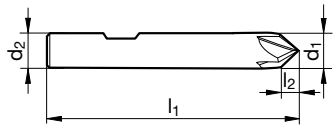
Catalogue no. 53398



P	M	K	N	S	H
•	•	•	•	•	

Application recommendations page 100

- deburring- and chamfering-mill to machine workpiece edges with a 120° angle



d1 js9 mm	d2 h6 mm	l1 mm	l2 mm	Z	Code no.
6.000	6.000	57.000	1.800	4	**6.000**
8.000	8.000	63.000	2.400	4	**8.000**
10.000	10.000	72.000	2.900	4	**10.000**
12.000	12.000	83.000	3.500	4	**12.000**

Deburring and chamfering tools

Front/back deburrer 90°

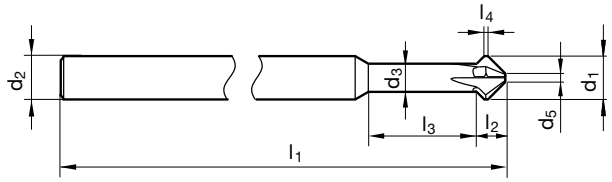
Catalogue no. 52365

Super AD-90 | WN | VHM | AlTiN nano | R | Cyl | 0°

P	M	K	N	S	H
●	●	●	●	●	

Application recommendations page 100

- de-burring and chamfer tool for the machining of workpiece edges with a 90° chamfer angle
- for clamping in hydraulic and shrink fit chucks
- with shank to DIN 6535



d1 mm	d2 h6 mm	d3 mm	d5 mm	l1 mm	l1 mm	l3 mm	l4 mm	Z	**Code no.**
3.000	4.000	2.200	0.600	75.000	2.10	11.400	0.500	4	**3.000**
4.000	4.000	2.900	0.800	75.000	2.70	15.000	0.500	4	**4.000**
5.000	5.000	3.900	1.000	75.000	3.00	18.000	0.500	4	**5.000**
6.000	6.000	3.900	1.200	100.000	3.90	18.200	0.500	4	**6.000**
8.000	6.000	6.000	1.600	100.000	4.70	55.000	0.500	4	**8.000**
10.000	6.000	6.000	2.000	100.000	6.50	55.000	0.500	4	**10.000**
12.000	6.000	6.000	2.400	100.000	8.30	55.500	0.500	4	**12.000**

Deburring and chamfering tools

Deburring forks

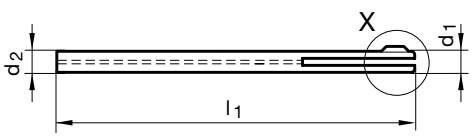
Catalogue no. 52360

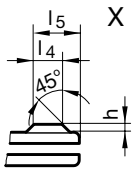
SuperE-U | WN | VHM | bright | R | Cyl

P	M	K	N	S	H
●	●		○		

Application recommendations page 100

- this tool is designed for deburring the hole-entry and -exit as well as cross holes
- with shank to DIN 6535
- for holding in collet chucks
- with internal cooling
- for universal application

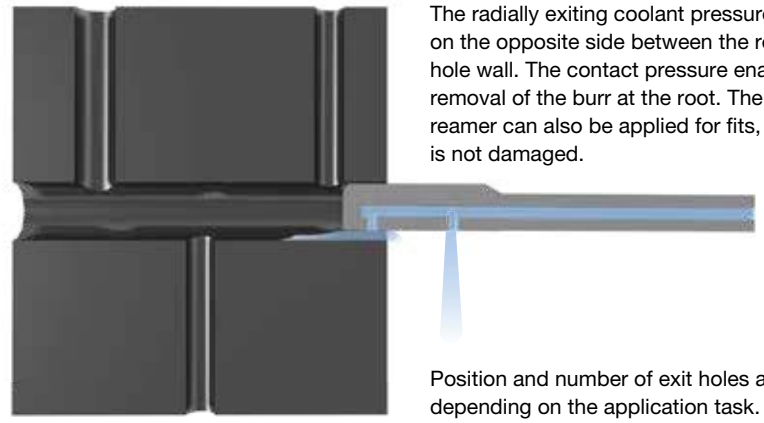




Code no.	Ø-range mm	d1 mm	d2 mm	l1 mm	l4 mm	l5 mm	h mm
2.000	**1,91 -2,15**	1.900	1.900	80.000	1.000	2.050	0.350
2.250	**2,16 -2,40**	2.100	2.100	80.000	1.500	2.600	0.400
2.500	**2,41 -2,70**	2.400	2.400	80.000	1.500	2.900	0.400
2.750	**2.71 -2.90**	2.600	2.600	90.000	1.500	2.950	0.450
3.000	**2,91 -3,25**	2.900	2.900	90.000	2.000	3.650	0.450
3.500	**3,26 -3,60**	3.200	3.200	90.000	2.000	3.800	0.600
4.000	**3,61 -4,25**	3.600	3.600	90.000	2.000	4.100	0.700
4.500	**4,26 -4,75**	4.200	4.200	90.000	2.500	4.600	0.700
5.000	**4,76 -5,30**	4.700	4.700	100.000	2.500	4.850	0.750
5.500	**5,31 -5,80**	5.200	5.200	100.000	2.500	4.850	0.750
6.000	**5,81 -6,20**	5.600	5.600	110.000	3.000	5.800	0.800
6.500	**6,21 -6,70**	6.000	6.000	110.000	3.000	5.900	0.900
7.000	**6,71 -7,10**	6.500	6.500	110.000	3.000	5.850	0.850
7.500	**7,11 -7,60**	6.900	6.900	110.000	3.500	6.950	0.950
8.000	**7,61 -8,05**	7.300	7.300	110.000	3.500	7.000	1.000

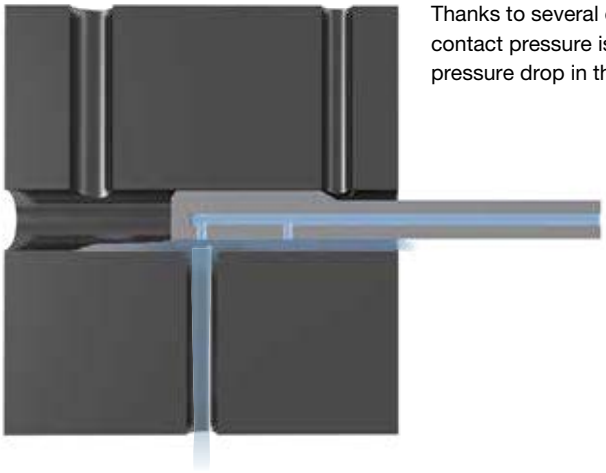
De-burr cross holes with the de-burring reamer SuperE-R

When de-burring with conventional reamers the burr between tool and hole wall is only folded over. The machining process suffers. In contrast to conventional reamers with the new de-burring reamer SuperE-R the burr is process reliably cut.
Get in touch, we will be happy to help!



The radially exiting coolant pressure closes the gap on the opposite side between the reamer and the hole wall. The contact pressure enables a clean removal of the burr at the root. The de-burring reamer can also be applied for fits, as the hole wall is not damaged.

Position and number of exit holes are adapted depending on the application task.



Thanks to several coolant exit holes a permanent contact pressure is ensured. This prevents a pressure drop in the cross hole area.

SuperE-R

the surface finish quality of the reamed hole is retained

short process times, as rapid movement is possible outside the cross hole

flexible diameter range

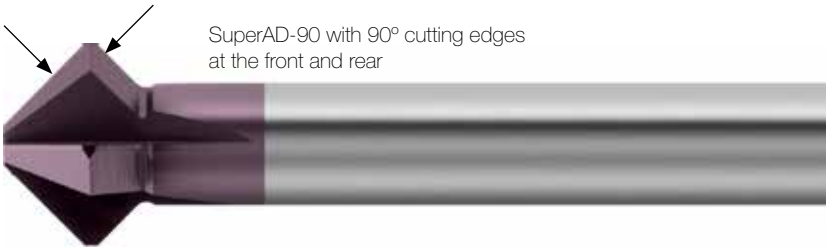
Functional area

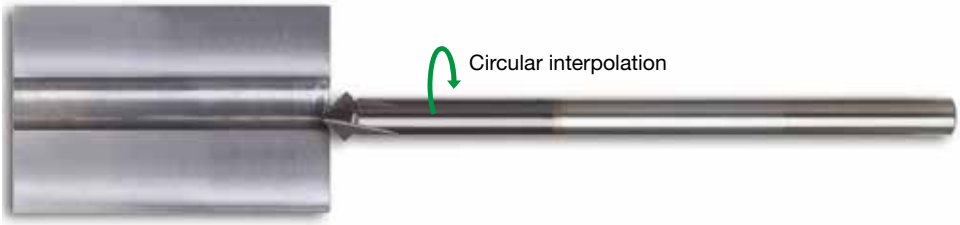
	Hole diameter	
Ø d1 (mm)	from Ø [mm]	up to Ø [mm]
2.97	2.99	3.04
3.97	3.99	4.04
4.97	4.99	5.04
5.97	5.99	6.04
7.97	7.99	8.04
9.97	9.99	10.04
11.97	11.99	12.04

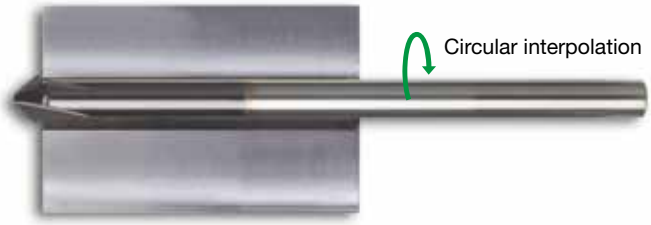
Front/back deburrer SuperAD-90

Back deburring for the first time

The Stock solid carbide SuperAD-90 front/back deburrer with AlTiN nano-coating as a standard tool enables deburring as well as chamfering of hole entry and exit with a 90° angle. SuperAD-90 possesses a milling head with a front and back cutting region. To deburr or chamfer the tool performs a circular milling movement along the hole edge or contour.







Cutting parameters for front/back deburrer SuperAD-90

Material group	Tens. strength MPa (N/mm²)	Hardness	v_c (m/min)	Feed col. 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

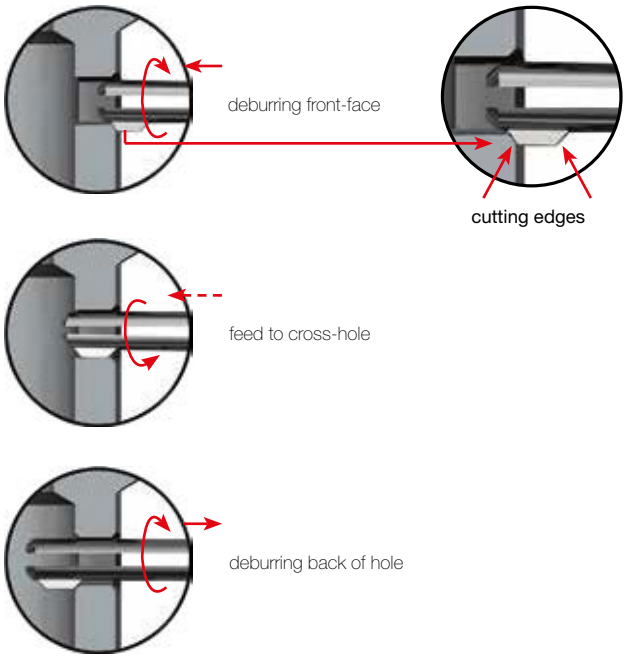
Important:
Please note that the cutting parameters are recommendations.
They can be adjusted up or down.

Deburring fork SuperE-U

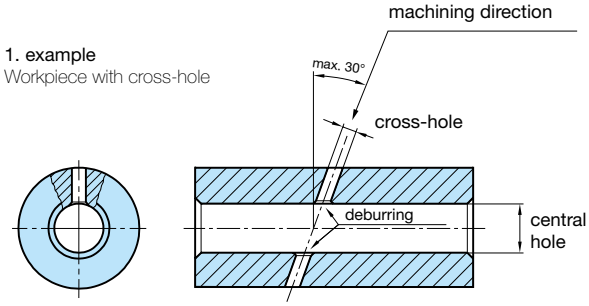
Advantages

- cost-efficient, because the standard tool offers considerable cost-savings in comparison with special tooling.
- universal for tooling, milling, turning and robotic applications. In addition, the diameter bridging of 0.25 mm makes it possible to apply the deburring fork in large tolerance holes. Valuable set-up time and set-up costs are eliminated!
- increased productivity, because the deburring fork deburrs automatically with one set-up. Expensive and extensive manual operations are no longer required..

Operation

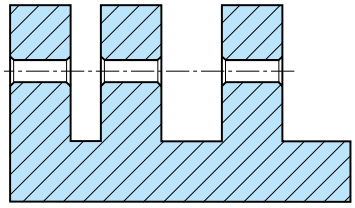


Application examples



Please note when machining workpieces with cross holes:
- the diameter of cross hole must be maximal 35% of the central hole
- the diameter of cross hole must be 40% larger than the cutting length l_4

2. example
Workpiece with multi-interrupted cut



Step by step:

The automatically internal and external deburring with deburring fork SuperE-U is an easy and cost saving alternative to common, extensive manual operations. Just one tool is required for all machining steps.

Universal application:

The new ex-stock deburring fork machines workpieces with one cross-hole as well as workpieces with multi-interrupted cut and produces high quality deburred faces and ends of the hole.

Diameter range (mm)	v_c m/min	fu (mm)
< Ø 4	8 - 10	0.1 - 0.2
Ø 4 - < Ø 6	10 - 14	0.1 - 0.2
6 - Ø 8	14 - 20	0.1 - 0.2

Important:

Please note, that the cutting parameters are recommendations. They can be adapted to higher and lower cutting parameters.

- Countersinks V-NX
- Conventional countersinks and counterbores

COUNTERSINKING TOOLS

P	M	K	N	S	H	Type	Cutting direction	Form	Tool material	Surface	Standard	d1/mm	Catalogue no.	Progr. page

Countersinks 90° V-NX

●	●	●	○	○		V-NX	right-hand	C	**HSCO**	AlTiN	DIN 335	6.300 - 40.000	**52348**	76

●	●	●	○	○		V-NX	right-hand	C	**HSCO**	AlTiN	DIN 335	6.300 - 40.000	**52350**	77

90° Countersink sets V-NX

●	●	●	○	○		V-NX	right-hand	C	**HSCO**	AlTiN	DIN 335	6.300 - 20.500	**52398**	78

●	●	●	○	○		V-NX	right-hand	C	**HSCO**	AlTiN	DIN 335	6.300 - 20.500	**52399**	79

60° Countersinks

●	●	●	●	○			right-hand	C	**HSS**	TiN	DIN 334	6.300 - 25.000	**62327**	81

●	○	●	●	●			right-hand	C	**HSS**	bright	DIN 334	6.300 - 25.000	**72326**	80

90° Countersinks

●	○	●	●	●			right-hand	A	**HSS**	steam tempered	DIN 335	8.000 - 20.000	**72345**	85

●	○	●	○	●			right-hand	C	**HSS**	TiN	DIN 335	4.300 - 31.000	**62347**	83

P	M	K	N	S	H	Type	Cutting direction	Form	Tool material	Surface	Standard	d1/mm	Catalogue no.	Progr. page

90° Countersinks

●	○	●	●	●			right-hand	C	**HSS**	bright	DIN 335	4.300 - 31.000	**72346**	82

●	○	●	●	●			right-hand	D	**HSS**	bright	DIN 335	15.000 - 80.000	**72356**	84

90° Countersink sets

●	○	●	○	○			right-hand	C	**HSS**	TiN	DIN 335	6.300 - 20.500	**62399**	87

●	○	●	●	○			right-hand	C	**HSS**	bright	DIN 335	6.300 - 20.500	**72399**	86

Counterbores with fixed pilots for fine tolerances

●	○	●	●	○			right-hand		**HSS**	bright	DIN 373	6.000 - 20.000	**72304**	88

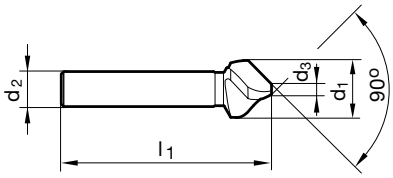
Counterbores with fixed pilots for medium tolerances

●	○	●	●	○			right-hand		**HSS**	bright	DIN 373	6.000 - 18.000	**72305**	89

Countersinks HSS-Co

Countersinks 90° V-NX

Catalogue no. 52348



V-NX | DIN 335 | C | HSCO | Al-TiN | 90° | R | Cyl

P	M	K	N	S	H
●	●	●	○	○	

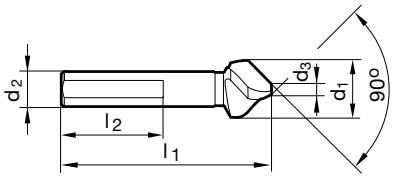
- 3 different convex cutting edges
- low-vibration cutting processes
- for round and chatter-free countersinking
- considerably lower feed force required
- for universal application

d1 mm	d2 mm	d3 mm	l1 mm	Z	Code no.
6.300	5.000	1.500	45.000	3	**6.300**
8.000	6.000	2.000	50.000	3	**8.000**
8.300	6.000	2.000	50.000	3	**8.300**
10.000	6.000	2.500	50.000	3	**10.000**
10.400	6.000	2.500	50.000	3	**10.400**
11.500	8.000	2.800	56.000	3	**11.500**
12.400	8.000	2.800	56.000	3	**12.400**
15.000	10.000	3.200	60.000	3	**15.000**
16.500	10.000	3.200	60.000	3	**16.500**
19.000	10.000	3.500	63.000	3	**19.000**
20.500	10.000	3.500	63.000	3	**20.500**
23.000	10.000	3.800	67.000	3	**23.000**
25.000	10.000	3.800	67.000	3	**25.000**
31.000	12.000	4.200	71.000	3	**31.000**
40.000	12.000	10.000	75.000	3	**40.000**

Countersinks HSS-Co

Countersinks 90° V-NX

Catalogue no. 52350



V-NX	DIN 335	C	HSCO	Al-TiN	90°	R	3

P	M	K	N	S	H
●	●	●	○	○	

- 3-flats on shank prevent slipping in the chuck
- 3 different convex cutting edges
- perfect for hand drills
- low-vibration cutting processes
- for round and chatter-free countersinking
- considerably lower feed force required
- for universal application

d1 mm	d2 mm	d3 mm	l1 mm	l2 mm	Z	**Code no.**
6.300	5.000	1.500	45.000	30.000	3	**6.300**
8.000	6.000	2.000	50.000	30.000	3	**8.000**
8.300	6.000	2.000	50.000	30.000	3	**8.300**
10.000	6.000	2.500	50.000	30.000	3	**10.000**
10.400	6.000	2.500	50.000	30.000	3	**10.400**
11.500	8.000	2.800	56.000	30.000	3	**11.500**
12.400	8.000	2.800	56.000	30.000	3	**12.400**
15.000	10.000	3.200	60.000	30.000	3	**15.000**
16.500	10.000	3.200	60.000	30.000	3	**16.500**
19.000	10.000	3.500	63.000	30.000	3	**19.000**
20.500	10.000	3.500	63.000	30.000	3	**20.500**
23.000	10.000	3.800	67.000	30.000	3	**23.000**
25.000	10.000	3.800	67.000	30.000	3	**25.000**
31.000	12.000	4.200	71.000	30.000	3	**31.000**
40.000	12.000	10.000	75.000	30.000	3	**40.000**

Countersinks HSS-Co

90° Countersink sets V-NX

V-NX | DIN 335 | C | HSCO | Al-TiN | 90° | R | Cyl

P	M	K	N	S	H
●	●	●	○	○	

- consisting of catalogue no. 52348
- 3 different convex cutting edges
- low-vibration cutting processes
- for round and chatter-free countersinking
- considerably lower feed force required
- for universal application

Catalogue no. 52398

Code no.	Ø-range mm	Pieces/set
1.000	**6.3/8.3/10.4/12.4/16.5/20.5**	6

Countersinks HSS-Co

90° Countersink sets V-NX

V-NX | DIN 335 | C | HSCO | Al-TiN | 90° | R | 3

P	M	K	N	S	H
●	●	●	○	○	

- consisting of catalogue no. 52350
- 3-flats on shank prevent slipping in the chuck
- 3 different convex cutting edges
- perfect for hand drills
- low-vibration cutting processes
- for round and chatter-free countersinking
- considerably lower feed force required
- for universal application

Catalogue no. 52399

Code no.	Ø-range mm	Pieces/set
1.000	6.3/8.3/10.4/12.4/16.5/20.5	6

Countersinks HSS

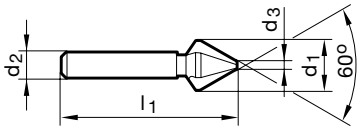
60° Countersinks

Catalogue no. 72326

DIN 334 | C | HSS | bright | 60° | R | Cyl

P	M	K	N	S	H
●	○	●	●	●	

- universal de-burring and countersinking tool i. e. for tapping size holes
- radial relieved
- 3-fluted



d1 mm	d2 mm	d3 mm	l1 mm	Z	Code no.
6.300	5.000	1.600	45.000	3	**6.300**
8.000	6.000	2.000	50.000	3	**8.000**
12.500	8.000	3.200	56.000	3	**12.500**
16.000	10.000	4.000	63.000	3	**16.000**
20.000	10.000	5.000	67.000	3	**20.000**
25.000	10.000	6.300	71.000	3	**25.000**

Countersinks HSS

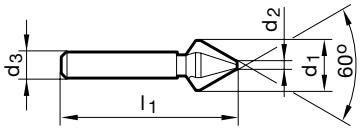
60° Countersinks

Catalogue no. 62327

DIN 334 | C | HSS | TiN | 60° | R | Cyl

P	M	K	N	S	H
●	●	●	●	○	

- universal de-burring and countersinking tool i. e. for tapping size holes
- radial relieved
- 3-fluted



d1 **mm**	d2 mm	d3 mm	l1 mm	Z	**Code no.**
6.300	5.000	1.600	45.000	3	**6.300**
8.000	6.000	2.000	50.000	3	**8.000**
12.500	8.000	3.200	56.000	3	**12.500**
25.000	10.000	6.300	71.000	3	**25.000**

Countersinks HSS

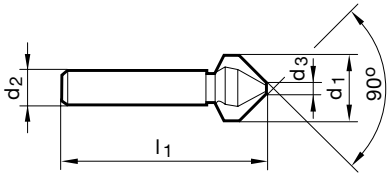
90° Countersinks

Catalogue no. 72346

DIN 335 | C | HSS | bright | 90° | R | Cyl

P	M	K	N	S	H
●	○	●	●	●	

- universal de-burring and countersinking tool i. e. for tapping size holes
- radial relieved
- 3-fluted



d1 mm	d2 mm	d3 mm	l1 mm	Z	Code no.
4.300	4.000	1.300	40.000	3	**4.300**
5.000	4.000	1.500	40.000	3	**5.000**
5.300	4.000	1.500	40.000	3	**5.300**
5.800	5.000	1.500	45.000	3	**5.800**
6.000	5.000	1.500	45.000	3	**6.000**
6.300	5.000	1.500	45.000	3	**6.300**
7.000	6.000	1.800	50.000	3	**7.000**
7.300	6.000	1.800	50.000	3	**7.300**
8.000	6.000	2.000	50.000	3	**8.000**
8.300	6.000	2.000	50.000	3	**8.300**
9.400	6.000	2.200	50.000	3	**9.400**
10.000	6.000	2.500	50.000	3	**10.000**
10.400	6.000	2.500	50.000	3	**10.400**
11.500	8.000	2.800	56.000	3	**11.500**
12.400	8.000	2.800	56.000	3	**12.400**
13.400	8.000	2.900	56.000	3	**13.400**
15.000	10.000	3.200	60.000	3	**15.000**
16.500	10.000	3.200	60.000	3	**16.500**
19.000	10.000	3.500	63.000	3	**19.000**
20.500	10.000	3.500	63.000	3	**20.500**
23.000	10.000	3.800	67.000	3	**23.000**
25.000	10.000	3.800	67.000	3	**25.000**
26.000	10.000	3.800	67.000	3	**26.000**
28.000	12.000	4.000	71.000	3	**28.000**
30.000	12.000	4.200	71.000	3	**30.000**
31.000	12.000	4.200	71.000	3	**31.000**

Countersinks HSS

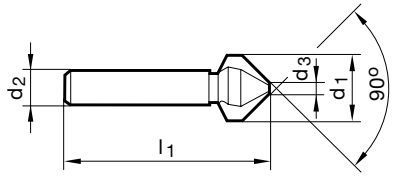
90° Countersinks

Catalogue no. 62347

DIN 335 | C | HSS | TiN | 90° | R | Cyl

P	M	K	N	S	H
●	○	●	○	●	

- universal de-burring and countersinking tool i. e. for tapping size holes
- radial relieved
- 3-fluted



d1 mm	d2 mm	d3 mm	l1 mm	Z	Code no.
4.300	4.000	1.300	40.000	3	**4.300**
5.000	4.000	1.500	40.000	3	**5.000**
6.000	5.000	1.500	45.000	3	**6.000**
6.300	5.000	1.500	45.000	3	**6.300**
7.300	6.000	1.800	50.000	3	**7.300**
8.000	6.000	2.000	50.000	3	**8.000**
8.300	6.000	2.000	50.000	3	**8.300**
9.400	6.000	2.200	50.000	3	**9.400**
10.000	6.000	2.500	50.000	3	**10.000**
10.400	6.000	2.500	50.000	3	**10.400**
11.500	8.000	2.800	56.000	3	**11.500**
12.400	8.000	2.800	56.000	3	**12.400**
13.400	8.000	2.900	56.000	3	**13.400**
15.000	10.000	3.200	60.000	3	**15.000**
16.500	10.000	3.200	60.000	3	**16.500**
19.000	10.000	3.500	63.000	3	**19.000**
20.500	10.000	3.500	63.000	3	**20.500**
25.000	10.000	3.800	67.000	3	**25.000**
30.000	12.000	4.200	71.000	3	**30.000**
31.000	12.000	4.200	71.000	3	**31.000**

Countersinks HSS

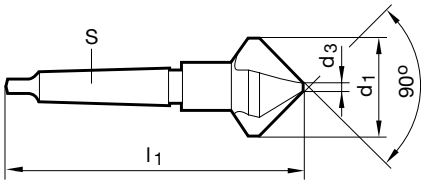
90° Countersinks

Catalogue no. 72356

DIN 335 | D | HSS | bright | 90° | R | MK

P	M	K	N	S	H
●	○	●	●	●	

- universal de-burring and countersinking tool i. e. for tapping size holes
- radial relieved
- 3-fluted



d1 mm	S	d3 mm	l1 mm	Z	Code no.
15.000	MK-1	3.200	85.000	3	**15.000**
16.500	MK-1	3.200	85.000	3	**16.500**
19.000	MK-2	3.500	100.000	3	**19.000**
20.500	MK-2	3.500	100.000	3	**20.500**
23.000	MK-2	3.800	106.000	3	**23.000**
25.000	MK-2	3.800	106.000	3	**25.000**
26.000	MK-2	3.800	106.000	3	**26.000**
30.000	MK-2	4.200	112.000	3	**30.000**
31.000	MK-2	4.200	112.000	3	**31.000**
34.000	MK-2	4.500	118.000	3	**34.000**
37.000	MK-2	4.800	118.000	3	**37.000**
40.000	MK-3	10.000	140.000	3	**40.000**
50.000	MK-3	14.000	150.000	3	**50.000**
63.000	MK-4	16.000	180.000	3	**63.000**
80.000	MK-4	22.000	190.000	3	**80.000**

Countersinks HSS

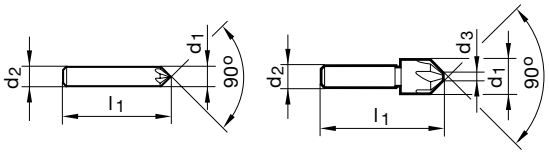
90° Countersinks

Catalogue no. 72345

DIN 335 | A | HSS | steam tempered | 90° | R | Cyl

P	M	K	N	S	H
●	○	●	●	●	

- straight-fluted
- multi-fluted



d1 mm	d2 mm	d3 mm	l1 mm	Z	Code no.
8.000	8.000		48.000	5	**8.000**
12.500	8.000	2.000	48.000	5	**12.500**
16.000	10.000	3.200	56.000	7	**16.000**
20.000	10.000	5.000	60.000	7	**20.000**

Countersinks HSS

90° Countersink sets

DIN 335 | C | HSS | bright | 90° | R | Cyl

P	M	K	N	S	H
●	○	●	●	○	

- set in case, consisting of catalogue no. 72346 Ø: 6.30 mm, 8.30 mm, 10.40 mm, 12.40 mm, 16.50 mm, 20.50 mm
- universal de-burring and countersinking tool i. e. for tapping size holes
- radial relieved
- 3-fluted

Catalogue no. 72399

Code no.	Ø-range mm	Pieces/set
8.000	**6.30-20.50**	6

Countersinks HSS

90° Countersink sets

DIN 335 | C | HSS | TiN | 90° | R | Cyl

P	M	K	N	S	H
●	○	●	○	○	

- set in case, consisting of catalogue no. 62347 Ø: 6.30 mm, 8.30 mm, 10.40 mm, 12.40 mm, 16.50 mm, 20.50 mm
- universal de-burring and countersinking tool i. e. for tapping size holes
- radial relieved
- 3-fluted

Catalogue no. 62399

Code no.	Ø-range mm	Pieces/set
8.000	**6.30-20.50**	6

Countersinks HSS

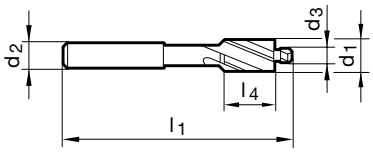
Counterbores with fixed pilots for fine tolerances

Catalogue no. 72304

DIN 373 | HSS | bright | R | Cyl

P	M	K	N	S	H
●	○	●	●	○	

- with fixed pilot
- right hand spiral flutes



d1 **mm**	d2 mm	d3 mm	l1 mm	l4 mm	G	Z	**Code no.**
6.000	5.000	3.200	71.000	14.000	M 3	3	**6.000**
8.000	5.000	4.300	71.000	14.000	M 4	3	**8.000**
10.000	8.000	5.300	80.000	18.000	M 5	3	**10.000**
11.000	8.000	6.400	80.000	18.000	M 6	3	**11.000**
15.000	12.500	8.400	100.000	22.000	M 8	3	**15.000**
18.000	12.500	10.500	100.000	22.000	M10	3	**18.000**
20.000	12.500	13.000	100.000	22.000	M12	3	**20.000**

Countersinks HSS

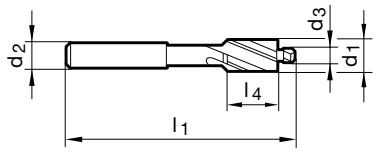
Counterbores with fixed pilots for medium tolerances

Catalogue no. 72305

DIN 373 | HSS | bright | R | Cyl

P	M	K	N	S	H
●	○	●	●	○	

- with fixed pilot
- right hand spiral flutes
- for countersinks to DIN 974, part 1



d1 **mm**	d2 mm	d3 mm	l1 mm	l6 mm	d1	Z	**Code no.**
6.000	5.000	3.400	71.000	14.000	M 3	3	**6.000**
6.500	5.000	3.900	71.000	14.000	M 3.5	3	**6.500**
8.000	5.000	4.500	71.000	14.000	M 4	3	**8.000**
10.000	8.000	5.500	80.000	18.000	M 5	3	**10.000**
11.000	8.000	6.600	80.000	18.000	M 6	3	**11.000**
15.000	12.500	9.000	100.000	22.000	M 8	3	**15.000**
18.000	12.500	11.000	100.000	22.000	M10	3	**18.000**

APPLICATION **RECOMMENDATIONS**

Application recommendations for reamers

Feed column no.

Tool-Ø mm	Code letter E	F	G	H	I	J	K
3.15	0.080	0.100	0.125	0.300	0.500	0.800	1.000
4.00	0.100	0.125	0.160	0.300	0.500	1.000	1.200
5.00	0.100	0.125	0.160	0.400	0.600	1.000	1.400
6.30	0.125	0.160	0.200	0.400	0.700	1.200	1.600
8.00	0.160	0.200	0.250	0.600	1.000	1.800	2.400
10.00	0.200	0.250	0.315	0.600	1.200	1.800	2.400
12.50	0.200	0.250	0.315	0.800	1.200	2.000	2.500
16.00	0.250	0.315	0.400	0.800	1.400	2.200	2.600
20.00	0.315	0.400	0.500	0.800	1.400	2.200	2.600

Feed f (mm/rpm)

Tools with feed column no. in bold are preferred choices for listed material group.

Diameter	**Pre-hole allowance of undersizes (recommended values)**
< 6 mm	0.1 - 0.2 mm
< 10 mm	0.2 mm
< 16 mm	0.2 - 0.3 mm
< 25 mm	0.3 - 0.4 mm
> 25 mm	0.4 mm

Lubricants:

cutting oil, highly activated, surface active lubricant with effective additives which chemically react and result in a special adhesive and abrasion reducing lubricant film.

soluble oil (emulsion)

without lubricant

air only

Material group	Materials examples, **new designations** (old designation in brackets) Figures in bold = material no. to DIN EN	Tensile strength MPa (N/mm²)	Hardness	Coolant
General purpose steels	**1.0035** S185(St33),**1.0486** P275N(StE285),**1.0345** P235GH(H1),**1.0425** P265GH(H2)	≤500		■
	1.0050 E295 (St50-2), **1.0070** E360 (St70-2), **1.8937** P500NH (WStE500)	>500-850		■
Free-cutting steels	**1.0718** 11SMnPb30 (9SMnPb28), **1.0736** 11SMn37 (9SMn36)	≤850		■
	1.0727 46S20 (45S20), **1.0728** (60S20), **1.0757** 46SPb20 (45SPb20)	850-1000		■
Unalloyed tempering steels	**1.0402** C22, **1.1178** C30E (Ck30)	≤ 700		■
	1.0503 C45, **1.1191** C45E (Ck45)	700-850		■
	1.0601 C60, **1.1221** C60E (Ck60)	850-1000		■
Alloyed tempering steels	**1.5131** 50MnSi4, **1.7003** 38Cr2, **1.7030** 28Cr4	850-≤1000		■
	1.5710 36NiCr6, **1.7035** 41Cr4, **1.7225** 42CrMo4	1000-1200		■
Unalloyed case hardened steels	**1.0301** (C10), **1.1121** C10E (Ck10)	≤750		■
Alloyed case hardened steels	**1.7043** 38Cr4	850-≤1000		■ ■
	1.5752 15NiCr13 (15NiCr13), **1.7131** 16MnCr5, **1.7264** 20CrMo5	1000-1200		■ ■
Nitriding steels	**1.8504** 34CrAl6	≥850-≤1000		■
	1.8519 31CrMoV9, **1.8550** 34CrAlNi7	>1000-1200		■ ■
Tool steels	**1.1750** C75W, **1.2067** 102Cr6, **1.2307** 29CrMoV9	≤850		■
	1.2080 X210Cr12, **1.2083** X42Cr13, **1.2419** 105WCr6, **1.2767** X45NiCrMo4	>850-1000		■ ■
High speed steels	**1.3243** S 6-5-2-5, **1.3343** S 6-5-2, **1.3344** S 6-5-3	≥650-1000		■
Spring steels	**1.5026** 55Si7, **1.7176** 55Cr3, **1.8159** 51CrV4 (51CrV4)		≤330 HB	■ ■
Hardened steels	–		≤40-48 HRC	■
			>48-60 HRC	■
Stainless steels, sulphured	**1.4005** X12CrS13, **1.4104** X14CrMoS17, **1.4105** X6CrMoS17, **1.4305** X8CrNiS18-9	≤850		■
austenitic	**1.4301** X5CrNi18-10 (V2A), **1.4541** X6CrNiTi18-10, **1.4571** X6CrNiMoTi 17-12-2 (V4A)	≤850		■
martensitic	**1.4057** X20CrNi 17 2 (X17CrNi16-2), **1.4122** X39CrMo17-1, **1.4521** X2CrMoTi18-2	≤850		■
Cast iron	**0.6010** EN-GJL-100(GG10), **0.6020** EN-GJL-200(GG20)	850-≤1000		■ □
	0.6025 EN-GJL-250(GG25), **0.6035** EN-GJL-350(GG35)	1000-1200		■ □
Spheroidal graphite iron and	**0.7050** EN-GJS-500-7(GGG50), **0.8035** EN-GJMW-350-4(GTW35)		≤240 HB	■
malleable cast iron	**0.7070** EN-GJS-700-2(GGG70), **0.8170** EN-GJMB-700-2(GTS70)		<300 HB	■
Chilled cast iron	–		≤350 HB	■
New Cast iron GGV	**EN-GJV250** (GGV25), **EN-GJV350** (GGV35)			■ □
	EN-GJV400 (GGV40), **EN-GJV500** (GGV50), SiMo6			■ □
New Cast iron ADI	**EN-GJS-800-8** (ADI800), **EN-GJS-1000-5** (ADI1000)	800-1000		■ □
	EN-GJS-1200-2 (ADI1200), **EN-GJS-1400-1** (ADI1400)	1200-1400		■ □
Special alloys	Nimonic, Inconel, Monel, Hastelloy	≤1200		■
Ti and Ti-alloys	**3.7024** Ti99,5, **3.7114** TiAl5Sn2,5, **3.7124** TiCu2	≤850		■
	3.7154 TiAl6Zr5, **3.7165** TiAl6V4, **3.7184** TiAl4Mo4Sn2,5, - TiAl8Mo1V1	>850-1200		■
Aluminium and Al-alloys	**3.0255** Al99,5, **3.2315** AlMgSi1, **3.3515** AlMg1	≤400		■
Al wrought alloys	**3.0615** AlMgSiPb, **3.1325** AlCuMg1, **3.3245** AlMg3Si, **3.4365** AlZnMgCu1,5	≤450		■
Al cast alloys ≤ 10 % Si	**3.2131** G-AlSi5Cu1, **3.2153** G-AlSi7Cu3, **3.2573** G-AlSi9	≤600		■
> 10 % Si	**3.2581** G-AlSi12, **3.2583** G-AlSi12Cu, - G-AlSi12CuNiMg	≤600		■
Magnesium alloys	**3.5200** MgMn2, **3.5812.05** G-MgAl8Zn1, **3.5612.05** G-MgAl6Zn1	≤450		!
Copper, low alloyed	**2.0070** SE-Cu, **2.1020** CuSn6, **2.1096** G-CuSn5ZnPb	≤400		■ ■
Brass, short-chipping	**2.0380** CuZn39Pb2, **2.0401** CuZn39Pb3, **2.0410** CuZn43Pb2	≤600		■ ■
long-chipping	**2.0250** CuZn20, **2.0280** CuZn33, **2.0332** CuZn37Pb0,5	≤600		■ ■
Bronze, short-chipping	**2.1090** CuSn7ZnPb, **2.1170** CuPb5Sn5, **2.1176** CuPb10Sn	≤600		■ ■
	2.0790 CuNi18Zn19Pb	>600-850		■
Bronze, long-chipping	**2.0916** CuAl5, **2.0960** CuAl9Mn, **2.1050** CuSn10	≤850		■
	2.0980 CuAl11Ni, **2.1247** CuBe2	>850-1000		■
Duroplastics	Epoxy resin, Resopal, Pertinax, Moltopren		–	□
Thermoplastics	Plexiglass, Hostalen, Novodur, Makralon		–	■ □
Kevlar	Kevlar		–	□
Glass/carbon-concentr. plastics	GFK/CFK		–	□

SuperR-HS Reamers / SuperR-HS solid carbide head reamers

	SuperR-HS Reamers						SuperR-HS solid carbide head reamers	
Catalog no.	72870	72871	72872	72873	72876	72877	72874	72875
Tool material	Carbide		Carbide		Carbide		Carbide	
Surface finish	AlTiN nano		AlTiN nano		DLC		AlTiN nano	
DIN	Stock	Stock	Stock	Stock	Stock	Stock	Stock	Stock
Type	HS-S	HS-D	HS-S	HS-D	HS-S	HS-D	HS-KS	HS-KD
Page	8	9	10	11	12	13	14	15


vc m/min	Feed column no.		vc m/min	Feed column no.		vc m/min	Feed column no.		vc m/min	Feed column no.	
185	I-J	I-J	185	I-J	I-J				185	I-J	I-J
185	I-J	I-J	185	I-J	I-J				185	I-J	I-J
185	I-J	I-J	185	I-J	I-J				185	I-J	I-J
185	I-J	I-J	185	I-J	I-J				185	I-J	I-J
185	I-J	I-J	185	I-J	I-J				185	I-J	I-J
185	I-J	I-J	185	I-J	I-J				185	I-J	I-J
185	I-J	I-J	185	I-J	I-J				185	I-J	I-J
185	I-J	I-J	185	I-J	I-J				185	I-J	I-J
185	I-J	I-J	185	I-J	I-J				185	I-J	I-J
185	I-J	I-J	185	I-J	I-J				185	I-J	I-J
185	I-J	I-J	185	I-J	I-J				185	I-J	I-J
185	I-J	I-J	185	I-J	I-J				185	I-J	I-J
185	I-J	I-J	185	I-J	I-J				185	I-J	I-J
185	I-J	I-J	185	I-J	I-J				185	I-J	I-J
185	I-J	I-J	185	I-J	I-J				185	I-J	I-J
185	I-J	I-J	185	I-J	I-J				185	I-J	I-J
90	I-J	I-J	90	I-J	I-J				90	I-J	I-J
45	G-H	G-H	45	G-H	G-H				45	G-H	G-H
50	G-H	G-H	50	G-H	G-H				50	G-H	G-H
45	G-H	G-H	45	G-H	G-H				45	G-H	G-H
90	H-I	H-I	90	H-I	H-I				90	H-I	H-I
60	H-I	H-I	60	H-I	H-I				60	H-I	H-I
90	H-I	H-I	90	H-I	H-I				90	H-I	H-I
100	I-J	I-J	100	I-J	I-J				100	I-J	I-J
100	I-J	I-J	100	I-J	I-J				100	I-J	I-J
185	I-J	I-J	185	I-J	I-J				185	I-J	I-J
90	I-J	I-J	90	I-J	I-J				90	I-J	I-J
40	H-I	H-I	40	H-I	H-I				40	H-I	H-I
80	I-J	I-J	80	I-J	I-J				80	I-J	I-J
80	I-J	I-J	80	I-J	I-J				80	I-J	I-J
80	I-J	I-J	80	I-J	I-J				80	I-J	I-J
80	I-J	I-J	80	I-J	I-J				80	I-J	I-J
50	G-H	G-H	50	G-H	G-H				50	G-H	G-H
60	H-I	H-I	60	H-I	H-I				60	H-I	H-I
60	H-I	H-I	60	H-I	H-I				60	H-I	H-I
						250	J - K	J - K			
						250	J - K	J - K			
						250	J - K	J - K			
						250	J - K	J - K			
120	I-J	I-J	120	I-J	I-J				120	I-J	I-J
175	I-J	I-J	175	I-J	I-J				175	I-J	I-J
175	I-J	I-J	175	I-J	I-J				175	I-J	I-J
175	I-J	I-J	175	I-J	I-J				175	I-J	I-J
140	I-J	I-J	140	I-J	I-J				140	I-J	I-J
140	I-J	I-J	140	I-J	I-J				140	I-J	I-J
80	E	E	80	E	E				80	E	E
80	E	E	80	E	E				80	E	E

Technical section

Application recommendations for reamers

Feed column no.

Tool-Ø mm / Feed f (mm/rpm)

Code letter	E	F	G	H	I	J	K
3.15	0.080	0.100	0.125	0.300	0.500	0.800	1.000
4.00	0.100	0.125	0.160	0.300	0.500	1.000	1.200
5.00	0.100	0.125	0.160	0.400	0.600	1.000	1.400
6.30	0.125	0.160	0.200	0.400	0.700	1.200	1.600
8.00	0.160	0.200	0.250	0.600	1.000	1.800	2.400
10.00	0.200	0.250	0.315	0.600	1.200	1.800	2.400
12.50	0.200	0.250	0.315	0.800	1.200	2.000	2.500
16.00	0.250	0.315	0.400	0.800	1.400	2.200	2.600
20.00	0.315	0.400	0.500	0.800	1.400	2.200	2.600

Tools with feed column no. in bold are preferred choices for listed material group.

Diameter	**Pre-hole allowance of undersizes (recommended values)**
< 6 mm	0.1 - 0.2 mm
< 10 mm	0.2 mm
< 16 mm	0.2 - 0.3 mm
< 25 mm	0.3 - 0.4 mm
> 25 mm	0.4 mm

Lubricants:

cutting oil, highly activated, surface active lubricant with effective additives which chemically react and result in a special adhesive and abrasion reducing lubricant film.

soluble oil (emulsion) ■

without lubricant □

air only [!]

Material group	Materials examples, **new designations** (old designation in brackets) Figures in bold = material no. to DIN EN	Tensile strength MPa (N/mm²)	Hardness	Coolant
General purpose steels	**1.0035** S185(St33),**1.0486** P275N(StE285),**1.0345** P235GH(H1),**1.0425** P265GH(H2)	≤500		■
	1.0050 E295 (St50-2), **1.0070** E360 (St70-2), **1.8937** P500NH (WStE500)	>500-850		■
Free-cutting steels	**1.0718** 11SMnPb30 (9SMnPb28), **1.0736** 11SMn37 (9SMn36)	≤850		■
	1.0727 46S20 (45S20), **1.0728** (60S20), **1.0757** 46SPb20 (45SPb20)	850-1000		■
Unalloyed tempering steels	**1.0402** C22, **1.1178** C30E (Ck30)	≤ 700		■
	1.0503 C45, **1.1191** C45E (Ck45)	700-850		■
	1.0601 C60, **1.1221** C60E (Ck60)	850-1000		■
Alloyed tempering steels	**1.5131** 50MnSi4, **1.7003** 38Cr2, **1.7030** 28Cr4	850-≤1000		■
	1.5710 36NiCr6, **1.7035** 41Cr4, **1.7225** 42CrMo4	1000-1200		■
Unalloyed case hardened steels	**1.0301** (C10), **1.1121** C10E (Ck10)	≤750		■
Alloyed case hardened steels	**1.7043** 38Cr4	850-≤1000		■ ■
	1.5752 15NiCr13 (15NiCr13), **1.7131** 16MnCr5, **1.7264** 20CrMo5	1000-1200		■ ■
Nitriding steels	**1.8504** 34CrAl6	≥850-≤1000		■
	1.8519 31CrMoV9, **1.8550** 34CrAlNi7	>1000-1200		■ ■
Tool steels	**1.1750** C75W, **1.2067** 102Cr6, **1.2307** 29CrMoV9	≤850		■
	1.2080 X210Cr12, **1.2083** X42Cr13, **1.2419** 105WCr6, **1.2767** X45NiCrMo4	>850-1000		■ ■
High speed steels	**1.3243** S 6-5-2-5, **1.3343** S 6-5-2, **1.3344** S 6-5-3	≥650-1000		■
Spring steels	**1.5026** 55Si7, **1.7176** 55Cr3, **1.8159** 51CrV4 (51CrV4)		≤330 HB	■ ■
Hardened steels	–		≤40-48 HRC	■
			>48-60 HRC	■
Stainless steels, sulphured	**1.4005** X12CrS13, **1.4104** X14CrMoS17, **1.4105** X6CrMoS17, **1.4305** X8CrNiS18-9	≤850		■
austenitic	**1.4301** X5CrNi18-10 (V2A), **1.4541** X6CrNiTi18-10, **1.4571** X6CrNiMoTi 17-12-2 (V4A)	≤850		■
martensitic	**1.4057** X20CrNi 17 2 (X17CrNi16-2), **1.4122** X39CrMo17-1, **1.4521** X2CrMoTi18-2	≤850		■
Cast iron	**0.6010** EN-GJL-100(GG10), **0.6020** EN-GJL-200(GG20)	850-≤1000		■ □
	0.6025 EN-GJL-250(GG25), **0.6035** EN-GJL-350(GG35)	1000-1200		■ □
Spheroidal graphite iron and	**0.7050** EN-GJS-500-7(GGG50), **0.8035** EN-GJMW-350-4(GTW35)		≤240 HB	■
malleable cast iron	**0.7070** EN-GJS-700-2(GGG70), **0.8170** EN-GJMB-700-2(GTS70)		<300 HB	■
Chilled cast iron	–		≤350 HB	■
New Cast iron GGV	**EN-GJV250** (GGV25), **EN-GJV350** (GGV35)			■ □
	EN-GJV400 (GGV40), **EN-GJV500** (GGV50), SiMo6			■ □
New Cast iron ADI	**EN-GJS-800-8** (ADI800), **EN-GJS-1000-5** (ADI1000)	800-1000		■ □
	EN-GJS-1200-2 (ADI1200), **EN-GJS-1400-1** (ADI1400)	1200-1400		■ □
Special alloys	Nimonic, Inconel, Monel, Hastelloy	≤1200		■
Ti and Ti-alloys	**3.7024** Ti99,5, **3.7114** TiAl5Sn2,5, **3.7124** TiCu2	≤850		■
	3.7154 TiAl6Zr5, **3.7165** TiAl6V4, **3.7184** TiAl4Mo4Sn2,5, - TiAl8Mo1V1	>850-1200		■
Aluminium and Al-alloys	**3.0255** Al99,5, **3.2315** AlMgSi1, **3.3515** AlMg1	≤400		■
Al wrought alloys	**3.0615** AlMgSiPb, **3.1325** AlCuMg1, **3.3245** AlMg3Si, **3.4365** AlZnMgCu1,5	≤450		■
Al cast alloys ≤ 10 % Si	**3.2131** G-AlSi5Cu1, **3.2153** G-AlSi7Cu3, **3.2573** G-AlSi9	≤600		■
> 10 % Si	**3.2581** G-AlSi12, **3.2583** G-AlSi12Cu, - G-AlSi12CuNiMg	≤600		■
Magnesium alloys	**3.5200** MgMn2, **3.5812.05** G-MgAl8Zn1, **3.5612.05** G-MgAl6Zn1	≤450		[!]
Copper, low alloyed	**2.0070** SE-Cu, **2.1020** CuSn6, **2.1096** G-CuSn5ZnPb	≤400		■ ■
Brass, short-chipping	**2.0380** CuZn39Pb2, **2.0401** CuZn39Pb3, **2.0410** CuZn43Pb2	≤600		■ ■
long-chipping	**2.0250** CuZn20, **2.0280** CuZn33, **2.0332** CuZn37Pb0,5	≤600		■ ■
Bronze, short-chipping	**2.1090** CuSn7ZnPb, **2.1170** CuPb5Sn5, **2.1176** CuPb10Sn	≤600		■ ■
	2.0790 CuNi18Zn19Pb	>600-850		■
Bronze, long-chipping	**2.0916** CuAl5, **2.0960** CuAl9Mn, **2.1050** CuSn10	≤850		■
	2.0980 CuAl11Ni, **2.1247** CuBe2	>850-1000		■
Duroplastics	Epoxy resin, Resopal, Pertinax, Moltopren		–	□
Thermoplastics	Plexiglass, Hostalen, Novodur, Makralon		–	■ □
Kevlar	Kevlar		–	□
Glass/carbon-concentr. plastics	GFK/CFK		–	□

NC reamers

Catalog no.	72920	72930
Tool material	Carbide	
Surface finish	bright	bright
DIN	Stock	Stock
Form	B	B
Page	19	23

52920	52930
Carbide	
AlTiN nano	AlTiN nano
Stock	Stock
B	B
21	25

Machine reamers

72868	72867	72860	72859	72880	72881
Carbide	Carbide	Carbide	Carbide	Carbide	Carbide
bright	bright	bright	bright	bright	bright
8050	8050	8051	8051	8093	8093
A	B	A	B	A	B
36	37	40	41	38	39

v_c m/min	Feed column no.	
18	F	F
16	F	F
18	F	F
16	F	F
18	E	E
16	F	F
14	E	E
14	E	E
12	E	E
18	E	E
14	E	E
12	E	E
14	E	E
12	E	E
12	E	E
10	E	E
10	E	E
8	E	E
6	E	E
6	E	E
20	E	E
18	E	E
20	E	E
18	E	E
16	E	E
16	E	E
10	E	E
10	E	E
30	G	G
30	G	G
40	F	F
30	F	F
25	F	F
25	F	F
35	F	F
30	F	F
35	F	F
30	F	F
30	F	F
25	F	F
20	G	G
20	G	G

v_c m/min	Feed column no.	
20	G	G
18	G	G
20	G	G
18	G	G
20	F	F
18	F	F
15	F	F
15	F	F
13	E	E
20	G	G
15	F	F
13	F	F
15	E	E
13	E	E
13	E	E
11	E	E
11	E	E
11	E	E
9	E	E
7	E	E
7	E	E
22	G	G
20	G	G
22	G	G
20	G	G
4	E	E
16	E	E
16	E	E
7	E	E
11	E	E
11	E	E
28	G	G
28	G	G
39	G	G
33	G	G
39	G	G
33	G	G
33	G	G
28	G	G
22	G	G
22	G	G

v_c m/min	Feed column no.					
18	F	F	F	F	F	F
16	F	F	F	F	F	F
18	F	F	F	F	F	F
16	F	F	F	F	F	F
18	E	E	E	E	E	E
16	F	F	F	F	F	F
14	E	E	E	E	E	E
14	E	E	E	E	E	E
12	E	E	E	E	E	E
18	E	E	E	E	E	E
14	E	E	E	E	E	E
12	E	E	E	E	E	E
14	E	E	E	E	E	E
12	E	E	E	E	E	E
12	E	E	E	E	E	E
10	E	E	E	E	E	E
10	E	E	E	E	E	E
8	E	E	E	E	E	E
6	E	E	E	E	E	E
6	E	E	E	E	E	E
20	E	E	E	E	E	E
18	E	E	E	E	E	E
20	E	E	E	E	E	E
18	E	E	E	E	E	E
16	E	E	E	E	E	E
16	E	E	E	E	E	E
10	E	E	E	E	E	E
10	E	E	E	E	E	E
30	G	G	G	G	G	G
30	G	G	G	G	G	G
40	F	F	F	F	F	F
30	F	F	F	F	F	F
25	F	F	F	F	F	F
25	F	F	F	F	F	F
35	F	F	F	F	F	F
30	F	F	F	F	F	F
35	F	F	F	F	F	F
30	F	F	F	F	F	F
30	F	F	F	F	F	F
25	F	F	F	F	F	F
20	G	G	G	G	G	G
20	G	G	G	G	G	G

Application recommendations for reamers

Feed column no.

Tool-Ø mm	Code letter E	F	G	H	I	J	K
3.15	0.080	0.100	0.125	0.300	0.500	0.800	1.000
4.00	0.100	0.125	0.160	0.300	0.500	1.000	1.200
5.00	0.100	0.125	0.160	0.400	0.600	1.000	1.400
6.30	0.125	0.160	0.200	0.400	0.700	1.200	1.600
8.00	0.160	0.200	0.250	0.600	1.000	1.800	2.400
10.00	0.200	0.250	0.315	0.600	1.200	1.800	2.400
12.50	0.200	0.250	0.315	0.800	1.200	2.000	2.500
16.00	0.250	0.315	0.400	0.800	1.400	2.200	2.600
20.00	0.315	0.400	0.500	0.800	1.400	2.200	2.600

Feed f (mm/rpm)

Tools with feed column no. in bold are preferred choices for listed material group.

Diameter	**Pre-hole allowance of undersizes (recommended values)**
< 6 mm	0.1 - 0.2 mm
< 10 mm	0.2 mm
< 16 mm	0.2 - 0.3 mm
< 25 mm	0.3 - 0.4 mm
> 25 mm	0.4 mm

Lubricants:

cutting oil, highly activated, surface active lubricant with effective additives which chemically react and result in a special adhesive and abrasion reducing lubricant film. ■

soluble oil (emulsion) ■

without lubricant □

air only [!]

Material group	Materials examples, **new designations** (old designation in brackets) Figures in bold = material no. to DIN EN	Tensile strength MPa (N/mm²)	Hardness	Coolant
General purpose steels	**1.0035** S185(St33),**1.0486** P275N(StE285),**1.0345** P235GH(H1),**1.0425** P265GH(H2)	≤500		■
	1.0050 E295 (St50-2), **1.0070** E360 (St70-2), **1.8937** P500NH (WStE500)	>500-850		■
Free-cutting steels	**1.0718** 11SMnPb30 (9SMnPb28), **1.0736** 11SMn37 (9SMn36)	≤850		■
	1.0727 46S20 (45S20), **1.0728** (60S20), **1.0757** 46SPb20 (45SPb20)	850-1000		■
Unalloyed tempering steels	**1.0402** C22, **1.1178** C30E (Ck30)	≤ 700		■
	1.0503 C45, **1.1191** C45E (Ck45)	700-850		■
	1.0601 C60, **1.1221** C60E (Ck60)	850-1000		■
Alloyed tempering steels	**1.5131** 50MnSi4, **1.7003** 38Cr2, **1.7030** 28Cr4	850-≤1000		■
	1.5710 36NiCr6, **1.7035** 41Cr4, **1.7225** 42CrMo4	1000-1200		■
Unalloyed case hardened steels	**1.0301** (C10), **1.1121** C10E (Ck10)	≤750		■
Alloyed case hardened steels	**1.7043** 38Cr4	850-≤1000		■ ■
	1.5752 15NiCr13 (15NiCr13), **1.7131** 16MnCr5, **1.7264** 20CrMo5	1000-1200		■ ■
Nitriding steels	**1.8504** 34CrAl6	≥850-≤1000		■
	1.8519 31CrMoV9, **1.8550** 34CrAlNi7	>1000-1200		■ ■
Tool steels	**1.1750** C75W, **1.2067** 102Cr6, **1.2307** 29CrMoV9	≤850		■
	1.2080 X210Cr12, **1.2083** X42Cr13, **1.2419** 105WCr6, **1.2767** X45NiCrMo4	>850-1000		■ ■
High speed steels	**1.3243** S 6-5-2-5, **1.3343** S 6-5-2, **1.3344** S 6-5-3	≥650-1000		■
Spring steels	**1.5026** 55Si7, **1.7176** 55Cr3, **1.8159** 51CrV4 (51CrV4)		≤330 HB	■ ■
Hardened steels	–		≤40-48 HRC	■
			>48-60 HRC	■
Stainless steels, sulphured	**1.4005** X12CrS13, **1.4104** X14CrMoS17, **1.4105** X6CrMoS17, **1.4305** X8CrNiS18-9	≤850		■
austenitic	**1.4301** X5CrNi18-10 (V2A), **1.4541** X6CrNiTi18-10, **1.4571** X6CrNiMoTi 17-12-2 (V4A)	≤850		■
martensitic	**1.4057** X20CrNi 17 2 (X17CrNi16-2), **1.4122** X39CrMo17-1, **1.4521** X2CrMoTi18-2	≤850		■
Cast iron	**0.6010** EN-GJL-100(GG10), **0.6020** EN-GJL-200(GG20)	850-≤1000		■ □
	0.6025 EN-GJL-250(GG25), **0.6035** EN-GJL-350(GG35)	1000-1200		■ □
Spheroidal graphite iron and	**0.7050** EN-GJS-500-7(GGG50), **0.8035** EN-GJMW-350-4(GTW35)		≤240 HB	■
malleable cast iron	**0.7070** EN-GJS-700-2(GGG70), **0.8170** EN-GJMB-700-2(GTS70)		<300 HB	■
Chilled cast iron	–		≤350 HB	■
New Cast iron GGV	**EN-GJV250** (GGV25), **EN-GJV350** (GGV35)			■ □
	EN-GJV400 (GGV40), **EN-GJV500** (GGV50), SiMo6			■ □
New Cast iron ADI	**EN-GJS-800-8** (ADI800), **EN-GJS-1000-5** (ADI1000)	800-1000		■ □
	EN-GJS-1200-2 (ADI1200), **EN-GJS-1400-1** (ADI1400)	1200-1400		■ □
Special alloys	Nimonic, Inconel, Monel, Hastelloy	≤1200		■
Ti and Ti-alloys	**3.7024** Ti99,5, **3.7114** TiAl5Sn2,5, **3.7124** TiCu2	≤850		■
	3.7154 TiAl6Zr5, **3.7165** TiAl6V4, **3.7184** TiAl4Mo4Sn2,5, - TiAl8Mo1V1	>850-1200		■
Aluminium and Al-alloys	**3.0255** Al99,5, **3.2315** AlMgSi1, **3.3515** AlMg1	≤400		■
Al wrought alloys	**3.0615** AlMgSiPb, **3.1325** AlCuMg1, **3.3245** AlMg3Si, **3.4365** AlZnMgCu1,5	≤450		■
Al cast alloys ≤ 10 % Si	**3.2131** G-AlSi5Cu1, **3.2153** G-AlSi7Cu3, **3.2573** G-AlSi9	≤600		■
> 10 % Si	**3.2581** G-AlSi12, **3.2583** G-AlSi12Cu, - G-AlSi12CuNiMg	≤600		■
Magnesium alloys	**3.5200** MgMn2, **3.5812.05** G-MgAl8Zn1, **3.5612.05** G-MgAl6Zn1	≤450		[!]
Copper, low alloyed	**2.0070** SE-Cu, **2.1020** CuSn6, **2.1096** G-CuSn5ZnPb	≤400		■ ■
Brass, short-chipping	**2.0380** CuZn39Pb2, **2.0401** CuZn39Pb3, **2.0410** CuZn43Pb2	≤600		■ ■
long-chipping	**2.0250** CuZn20, **2.0280** CuZn33, **2.0332** CuZn37Pb0,5	≤600		■ ■
Bronze, short-chipping	**2.1090** CuSn7ZnPb, **2.1170** CuPb5Sn5, **2.1176** CuPb10Sn	≤600		■ ■
	2.0790 CuNi18Zn19Pb	>600-850		■
Bronze, long-chipping	**2.0916** CuAl5, **2.0960** CuAl9Mn, **2.1050** CuSn10	≤850		■
	2.0980 CuAl11Ni, **2.1247** CuBe2	>850-1000		■
Duroplastics	Epoxy resin, Resopal, Pertinax, Moltopren		–	□
Thermoplastics	Plexiglass, Hostalen, Novodur, Makralon		–	■ □
Kevlar	Kevlar		–	□
Glass/carbon-concentr. plastics	GFK/CFK		–	□

	Bridge Reamers	NC Chucking Reamers		Taper Pin Reamers	Chucking Reamers				Quick Helix Reamers
Catalog no.	72680	72900	72910	72741	72640	72654	72650	72660	72670	72690
Tool material	HSS	HSS-E		HSS-E	HSS-E					HSS-E
Surface finish	nitrided	bright	bright	bright	bright	bright	bright	bright	bright	bright
DIN	311	Stock	Stock	2179	212	212	212	208	208	212
Form		B	B		A	B	B	A	B	C
Page	50	26	28	51	45	42	46	47	48	49

v_c m/min	Feed col. no.	v_c m/min	Feed col. no.		v_c m/min	Feed col. no.					v_c m/min	Feed col. no.
14	F	16	F	F	8	F	16	F	F	F	F	16	G
		12	F	F			12	F	F	F	F	12	G
12	F	12	F	F	8	F	12	F	F	F	F	12	G
10	F	10	E	E	8	F	10	E	E	E	E		
		14	F	F			14	F	F	F	F	14	G
10	E	12	E	E	8	E	12	E	E	E	E	12	G
8	E	10	E	E	8	E	10	E	E	E	E		
		10	E	E			10	E	E	E	E		
6	E	8	E	E	8	E	8	E	E	E	E	16	G
12	F	16	F	F	8	E	16	F	F	F	F		
		10	E	E			10	E	E	E	E		
6	E	8	E	E	6	E	8	E	E	E	E		
8	E	10	E	E	6	E	10	E	E	E	E		
		8	E	E			8	E	E	E	E	10	G
12	E	14	F	F	6	E	14	F	F	F	F		
8	E	10	E	E	6	E	10	E	E	E	E		
		10	E	E			10	E	E	E	E		
5	E	6	F	F	6	E	6	F	F	F	F	F	
		6	F	F			6	F	F	F	F	F	
4	E	4	F	F	6	E	4	F	F	F	F	F	
12	E	14	E	E	6	E	14	E	E	E	E	E	
		12	E	E			12	E	E	E	E	E	
12	E	12	E	E	6	E	12	E	E	E	E	E	
10	E	10	E	E	6	E	10	E	E	E	E	E	
		8	E	E			8	E	E	E	E	E	
		8	E	E			8	E	E	E	E	E	
4	E	6	E	E	6	E	6	E	E	E	E	E	5	E
3	E	4	E	E	6	E	4	E	E	E	E	E		
		18	G	G			18	G	G	G	G	G	22	G
18	G	18	G	G	8	G	18	G	G	G	G	G	22	G
18	G	20	F	F	8	G	20	F	F	F	F	F	20	G
		18	F	F			18	F	F	F	F	F		
18	G	20	F	F	8	G	20	F	F	F	F	F	16	G
16	F	18	F	F	8	F	18	F	F	F	F	F		
		18	F	F			18	F	F	F	F	F		
16	F	16	F	F	8	F	16	F	F	F	F	F	18	G
20	E	20	F	F	8	F	20	F	F	F	F	F		
		18	F	F			18	F	F	F	F	F		
16	F	18	F	F	8	F	18	F	F	F	F	F		
14	F	14	F	F	8	F	14	F	F	F	F	F		
		12	G	G			12	G	G	G	G	G	12	G
10	F	14	G	G	8	F	14	G	G	G	G	G	14	G

Countersink V-NX

Application recommendations

Feed column no.

Tool-Ø mm	Code letter E	F	G	H	I	J
2.00	0.03	0.04	0.06	0.08	0.10	0.13
2.50	0.03	0.05	0.07	0.10	0.13	0.16
3.15	0.03	0.05	0.08	0.11	0.15	0.20
4.00	0.04	0.06	0.09	0.13	0.17	0.22
5.00	0.04	0.07	0.10	0.14	0.18	0.23
6.30	0.04	0.07	0.12	0.15	0.19	0.24
8.00	0.05	0.08	0.13	0.16	0.20	0.25
10.00	0.06	0.09	0.14	0.17	0.22	0.26
12.50	0.06	0.10	0.15	0.19	0.23	0.28
16.00	0.07	0.11	0.17	0.21	0.26	0.31
20.00	0.08	0.13	0.18	0.23	0.28	0.33
25.00	0.09	0.15	0.21	0.26	0.30	0.38
31.50	0.12	0.17	0.24	0.30	0.36	0.42
40.00	0.14	0.21	0.28	0.34	0.40	0.46

Feed f (mm/rpm)

Tools with feed column no. in bold are preferred choices for listed material group.

Lubricants:

cutting oil, highly activated, surface active lubricant with effective additives which chemically react and result in a special adhesive and abrasion reducing lubricant film. ■

soluble oil (emulsion) ■

without lubricant □

air only ⊡

Material group	Materials examples, **new designations** (old designation in brackets) Figures in bold = material no. to DIN EN	Tensile strength MPa (N/mm²)	Hardness	Coolant
General purpose steels	**1.0035** S185(St33),**1.0486** P275N(StE285),**1.0345** P235GH(H1),**1.0425** P265GH(H2)	≤500		■
	1.0050 E295 (St50-2), **1.0070** E360 (St70-2), **1.8937** P500NH (WStE500)	>500-850		■
Free-cutting steels	**1.0718** 11SMnPb30 (9SMnPb28), **1.0736** 11SMn37 (9SMn36)	≤850		■
	1.0727 46S20 (45S20), **1.0728** (60S20), **1.0757** 46SPb20 (45SPb20)	850-1000		■
Unalloyed tempering steels	**1.0402** C22, **1.1178** C30E (Ck30)	≤ 700		■
	1.0503 C45, **1.1191** C45E (Ck45)	700-850		■
	1.0601 C60, **1.1221** C60E (Ck60)	850-1000		■
Alloyed tempering steels	**1.5131** 50MnSi4, **1.7003** 38Cr2, **1.7030** 28Cr4	850-≤1000		■
	1.5710 36NiCr6, **1.7035** 41Cr4, **1.7225** 42CrMo4	1000-1200		■
Unalloyed case hardened steels	**1.0301** (C10), **1.1121** C10E (Ck10)	≤750		■
Alloyed case hardened steels	**1.7043** 38Cr4	850-≤1000		■ ■
	1.5752 15NiCr13 (15NiCr13), **1.7131** 16MnCr5, **1.7264** 20CrMo5	1000-1200		■ ■
Nitriding steels	**1.8504** 34CrAl6	≥850-≤1000		■
	1.8519 31CrMoV9, **1.8550** 34CrAlNi7	>1000-1200		■ ■
Tool steels	**1.1750** C75W, **1.2067** 102Cr6, **1.2307** 29CrMoV9	≤850		■
	1.2080 X210Cr12, **1.2083** X42Cr13, **1.2419** 105WCr6, **1.2767** X45NiCrMo4	>850-1000		■ ■
High speed steels	**1.3243** S 6-5-2-5, **1.3343** S 6-5-2, **1.3344** S 6-5-3	≥650-1000		■
Spring steels	**1.5026** 55Si7, **1.7176** 55Cr3, **1.8159** 51CrV4 (51CrV4)		≤330 HB	■ ■
Hardened steels	–		≤40-48 HRC	■
			>48-60 HRC	■
Stainless steels, sulphured	**1.4005** X12CrS13, **1.4104** X14CrMoS17, **1.4105** X6CrMoS17, **1.4305** X8CrNiS18-9	≤850		■
austenitic	**1.4301** X5CrNi18-10 (V2A), **1.4541** X6CrNiTi18-10, **1.4571** X6CrNiMoTi 17-12-2 (V4A)	≤850		■
martensitic	**1.4057** X20CrNi 17 2 (X17CrNi16-2), **1.4122** X39CrMo17-1, **1.4521** X2CrMoTi18-2	≤850		■
Cast iron	**0.6010** EN-GJL-100(GG10), **0.6020** EN-GJL-200(GG20)	850-≤1000		■ □
	0.6025 EN-GJL-250(GG25), **0.6035** EN-GJL-350(GG35)	1000-1200		■ □
Spheroidal graphite iron and	**0.7050** EN-GJS-500-7(GGG50), **0.8035** EN-GJMW-350-4(GTW35)		≤240 HB	■
malleable cast iron	**0.7070** EN-GJS-700-2(GGG70), **0.8170** EN-GJMB-700-2(GTS70)		<300 HB	■
Chilled cast iron	–		≤350 HB	■
New Cast iron GGV	**EN-GJV250** (GGV25), **EN-GJV350** (GGV35)			■ □
	EN-GJV400 (GGV40), **EN-GJV500** (GGV50), SiMo6			■ □
New Cast iron ADI	**EN-GJS-800-8** (ADI800), **EN-GJS-1000-5** (ADI1000)	800-1000		■ □
	EN-GJS-1200-2 (ADI1200), **EN-GJS-1400-1** (ADI1400)	1200-1400		■ □
Special alloys	Nimonic, Inconel, Monel, Hastelloy	≤1200		■
Ti and Ti-alloys	**3.7024** Ti99,5, **3.7114** TiAl5Sn2,5, **3.7124** TiCu2	≤850		■
	3.7154 TiAl6Zr5, **3.7165** TiAl6V4, **3.7184** TiAl4Mo4Sn2,5, - TiAl8Mo1V1	>850-1200		■
Aluminium and Al-alloys	**3.0255** Al99,5, **3.2315** AlMgSi1, **3.3515** AlMg1	≤400		■
Al wrought alloys	**3.0615** AlMgSiPb, **3.1325** AlCuMg1, **3.3245** AlMg3Si, **3.4365** AlZnMgCu1,5	≤450		■
Al cast alloys ≤ 10 % Si	**3.2131** G-AlSi5Cu1, **3.2153** G-AlSi7Cu3, **3.2573** G-AlSi9	≤600		■
> 10 % Si	**3.2581** G-AlSi12, **3.2583** G-AlSi12Cu, - G-AlSi12CuNiMg	≤600		■
Magnesium alloys	**3.5200** MgMn2, **3.5812.05** G-MgAl8Zn1, **3.5612.05** G-MgAl6Zn1	≤450		⊡
Copper, low alloyed	**2.0070** SE-Cu, **2.1020** CuSn6, **2.1096** G-CuSn5ZnPb	≤400		■ ■
Brass, short-chipping	**2.0380** CuZn39Pb2, **2.0401** CuZn39Pb3, **2.0410** CuZn43Pb2	≤600		■ ■
long-chipping	**2.0250** CuZn20, **2.0280** CuZn33, **2.0332** CuZn37Pb0,5	≤600		■ ■
Bronze, short-chipping	**2.1090** CuSn7ZnPb, **2.1170** CuPb5Sn5, **2.1176** CuPb10Sn	≤600		■ ■
	2.0790 CuNi18Zn19Pb	>600-850		■
Bronze, long-chipping	**2.0916** CuAl5, **2.0960** CuAl9Mn, **2.1050** CuSn10	≤850		■
	2.0980 CuAl11Ni, **2.1247** CuBe2	>850-1000		■
Duroplastics	Epoxy resin, Resopal, Pertinax, Moltopren		–	□
Thermoplastics	Plexiglass, Hostalen, Novodur, Makralon		–	■ □
Kevlar	Kevlar		–	□
Glass/carbon-concentr. plastics	GFK/CFK		–	□

Catalogue no.	52348	52350	52398	52399
Tool material	HSS-Co	HSS-Co	HSS-Co	HSS-Co
Surface finish	AlTiN	AlTiN	AlTiN	AlTiN
DIN	335	335	335	335
Countersink angle	90°	90°	90°	90°
Shank form	cylindrical	3-surface	cylindrical	3-surface
Page	76	77	78	79

v_c m/min	Feed column no.	v_c m/min	Feed column no.	v_c m/min	Feed column no.	v_c m/min	Feed column no.
41	G	41	G	41	G	41	G
39	F	39	F	39	F	39	F
41	G	41	G	41	G	41	G
39	F	39	F	39	F	39	F
41	G	41	G	41	G	41	G
39	G	39	G	39	G	39	G
25	F	25	F	25	F	25	F
19	G	19	G	19	G	19	G
15	F	15	F	15	F	15	F
32	G	32	G	32	G	32	G
19	G	19	G	19	G	19	G
13	F	13	F	13	F	13	F
19	F	19	F	19	F	19	F
15	E	15	E	15	E	15	E
22	F	22	F	22	F	22	F
19	E	19	E	19	E	19	E
19	E	19	E	19	E	19	E
13	E	13	E	13	E	13	E
20	F	20	F	20	F	20	F
15	E	15	E	15	E	15	E
18	E	18	E	18	E	18	E
32	G	32	G	32	G	32	G
20	G	20	G	20	G	20	G
28	G	28	G	28	G	28	G
25	G	25	G	25	G	25	G
10	E	10	E	10	E	10	E
28	G	28	G	28	G	28	G
18	G	18	G	18	G	18	G
10	E	10	E	10	E	10	E
19	F	19	F	19	F	19	F
13	E	13	E	13	E	13	E
101	H	114	H	101	H	114	H
89	H	89	H	89	H	89	H
51	G	51	G	51	G	51	G
39	G	39	G	39	G	39	G
127	H	127	H	127	H	127	H
76	H	76	H	76	H	76	H
101	H	101	H	101	H	101	H
64	H	64	H	64	H	64	H
39	H	39	H	39	H	39	H
33	H	33	H	33	H	33	H
31	H	31	H	31	H	31	H
25	H	25	H	25	H	25	H
39	H	39	H	39	H	39	H
51	H	51	H	51	H	51	H

Chamfering milling cutters / front/back deburrer

Chamfering max. a_p / a_e 0,25xD 

Chamfering

Material	Hardness	a_p max.	a_e max.	v_c	f_z with nom. Ø						
					3	6	8	10	12	16	20
P	≤ 850 N/mm²	0.25xD	0.25xD	192	0.018	0.036	0.048	0.060	0.080	0.100	0.130
	≥ 850 N/mm²	0.25xD	0.25xD	140	0.016	0.032	0.042	0.060	0.070	0.090	0.120
M	≤ 750 N/mm²	0.25xD	0.25xD	120	0.013	0.025	0.034	0.050	0.050	0.070	0.090
	≥ 750 N/mm²	0.25xD	0.25xD	80	0.009	0.019	0.025	0.040	0.040	0.060	0.070
K	≤ 240 HB	0.25xD	0.25xD	170	0.017	0.033	0.044	0.060	0.070	0.090	0.120
	≥ 240 HB	0.25xD	0.25xD	150	0.014	0.028	0.037	0.050	0.060	0.080	0.100
N	≥ 7 % Si	0.25xD	0.25xD	250	0.023	0.047	0.062	0.080	0.100	0.130	0.170
H	≤ 55 HRC	0.25xD	0.25xD	50	0.010	0.020	0.026	0.040	0.050	0.060	0.070
S	Ti-based	0.25xD	0.25xD	50	0.010	0.020	0.027	0.036	0.043	0.060	0.070
	Ni-based	0.25xD	0.25xD	40	0.005	0.011	0.014	0.022	0.026	0.030	0.040

Deburring max. a_p / a_e 0,05xD 

Deburring

Material	Hardness	a_p max.	a_e max.	v_c	f_z with nom. Ø						
					3	6	8	10	12	16	20
P	≤ 850 N/mm²	0.05xD	0.05xD	250	0.030	0.060	0.080	0.110	0.130	0.170	0.210
	≥ 850 N/mm²	0.05xD	0.05xD	180	0.026	0.053	0.070	0.100	0.120	0.160	0.200
M	≤ 750 N/mm²	0.05xD	0.05xD	160	0.021	0.042	0.056	0.080	0.090	0.120	0.150
	≥ 750 N/mm²	0.05xD	0.05xD	100	0.016	0.032	0.042	0.060	0.070	0.100	0.120
K	≤ 240 HB	0.05xD	0.05xD	230	0.028	0.056	0.074	0.100	0.120	0.160	0.200
	≥ 240 HB	0.05xD	0.05xD	190	0.023	0.047	0.062	0.080	0.100	0.130	0.170
N	≥ 7 % Si	0.05xD	0.05xD	330	0.039	0.078	0.104	0.140	0.170	0.220	0.280
H	≤ 55 HRC	0.05xD	0.05xD	70	0.017	0.033	0.044	0.060	0.070	0.100	0.120
S	Ti-based	0.05xD	0.05xD	80	0.009	0.018	0.025	0.033	0.040	0.050	0.070
	Ni-based	0.05xD	0.05xD	50	0.004	0.008	0.011	0.017	0.021	0.029	0.039

Chamfering milling cutters with radial relieved geometry for chamfering and deburring:

- especially smooth cutting operation
- regrindable
- universal application in most materials
- long tool life thanks to wear-resistant coating and ultra-tough carbide
- calculate cutting speed from effective diameter

Catalogue no.	Page	Standard	Surface	Description	Tool material	Type
52348	76	DIN 335	AlTiN	Countersinks 90° V-NX	HSCO	V-NX
52350	77	DIN 335	AlTiN	Countersinks 90° V-NX	HSCO	V-NX
52360	67	Company std.	bright	Deburring forks	Solid carbide	SuperE-U
52365	66	Company std.	AlTiN nano	Front/back deburrer 90°	Solid carbide	SuperAD-90
52398	78	DIN 335	AlTiN	90° Countersink sets V-NX	HSCO	V-NX
52399	79	DIN 335	AlTiN	90° Countersink sets V-NX	HSCO	V-NX
52920	21	Company std.	AlTiN nano	Solid carbide NC chucking reamers	Solid carbide	
52930	25	Company std.	AlTiN nano	Solid carbide NC chucking reamers	Solid carbide	
53393	57	Company std.	AlTiN	Deburring end mills 60°	Solid carbide	SuperAF-60
53394	58	Company std.	AlTiN	Deburring end mills 60°	Solid carbide	SuperAF-60
53395	59	Company std.	AlTiN	Deburring end mills 90°	Solid carbide	SuperAF-90
53396	60	Company std.	AlTiN	Deburring end mills 90°	Solid carbide	SuperAF-90
53397	64	Company std.	AlTiN	Deburring end mills 120°	Solid carbide	SuperAF-120
53398	65	Company std.	AlTiN	Deburring end mills 120°	Solid carbide	SuperAF-120
53399	61	Company std.	TiAlZrN	Deburring end mills 90°	Solid carbide	SuperAF-90
62327	81	DIN 334	TiN	60° Countersinks	HSS	
62347	83	DIN 335	TiN	90° Countersinks	HSS	
62399	87	DIN 335	TiN	90° Countersink sets	HSS	
63399	63	Company std.	TiAlZrN	Deburring end mills 90°, spiral-fluted	Solid carbide	Super AFX-90
72304	88	DIN 373	bright	Counterbores with fixed pilots for fine tolerances	HSS	
72305	89	DIN 373	bright	Counterbores with fixed pilots for medium tolerances	HSS	
72326	80	DIN 334	bright	60° Countersinks	HSS	
72345	85	DIN 335	steam tempered	90° Countersinks	HSS	
72346	82	DIN 335	bright	90° Countersinks	HSS	
72356	84	DIN 335	bright	90° Countersinks	HSS	
72399	86	DIN 335	bright	90° Countersink sets	HSS	
72600	52	DIN 206	bright	Hand reamers	HSS	
72610	53	DIN 206	bright	Hand reamers	HSS	
72640	45	DIN 212-2	bright	Chucking reamers	HSS-E	
72650	46	DIN 212-2	bright	Chucking reamers	HSS-E	
72654	42	DIN 212-2	bright	Chucking reamers	HSS-E	
72660	47	DIN 208	bright	Chucking reamers	HSS-E	
72670	48	DIN 208	bright	Chucking reamers	HSS-E	
72680	50	DIN 311	nitrided	Bridge reamers	HSS	
72690	49	DIN 212-2	bright	Quick helix reamers	HSS-E	
72741	51	DIN 2179	bright	Machine taper reamers	HSS-E	
72859	41	~DIN 8051	bright	Carbide brazed chucking reamers	Carbide	
72860	40	~DIN 8051	bright	Carbide brazed chucking reamers	Carbide	
72867	37	~DIN 8050	bright	Carbide brazed chucking reamers	Solid carbide	
72868	36	~DIN 8050	bright	Carbide brazed chucking reamers	Carbide	
72870	8	Company std.	AlTiN nano	Solid carbide high-performance reamers	Solid carbide	SuperR-HS-S
72871	9	Company std.	AlTiN nano	Solid carbide high-performance reamers	Solid carbide	SuperR-HS-D
72872	10	Company std.	AlTiN nano	Solid carbide high-performance reamers	Solid carbide	SuperR-HS-S
72873	11	Company std.	AlTiN nano	Solid carbide high-performance reamers	Solid carbide	SuperR-HS-D
72874	14	Company std.	AlTiN nano	Solid carbide high-performance head reamers	Solid carbide	SuperR-HS-KS
72875	15	Company std.	AlTiN nano	Solid carbide high-performance head reamers	Solid carbide	SuperR-HS-KD
72876	12	Company std.	DLC	Solid carbide high-performance reamers	Solid carbide	SuperR-HS-S
72877	13	Company std.	DLC	Solid carbide high-performance reamers	Solid carbide	SuperR-HS-D
72880	38	~DIN 8093	bright	Carbide brazed chucking reamers	Carbide	
72881	39	~DIN 8093	bright	Carbide brazed chucking reamers	Carbide	
72900	26	DIN 212-3	bright	NC machine reamers	HSS-E	
72910	28	DIN 212-3	bright	NC machine reamers	HSS-E	
72920	19	Company std.	bright	Solid carbide NC chucking reamers	Solid carbide	
72930	23	Company std.	bright	Solid carbide NC chucking reamers	Solid carbide	
78719	16	Company std.	bright	Shrink fit extensions		

Notes

Notes

Reaming, countersinking chamfering & de-burring

Our programme

Products

Twist Drills
Taps
Milling Cutters
Reamers
Countersinks & -bores
Chamfering Tools
Special HSS and Carbide Tools
(to your specifications or our solutions)
Tool holders

Services

Regrinding and Recoating
Coating removal
Carbide recycling
Intelligent Tool Depot Systems
Technical assistance

Your local contact:

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