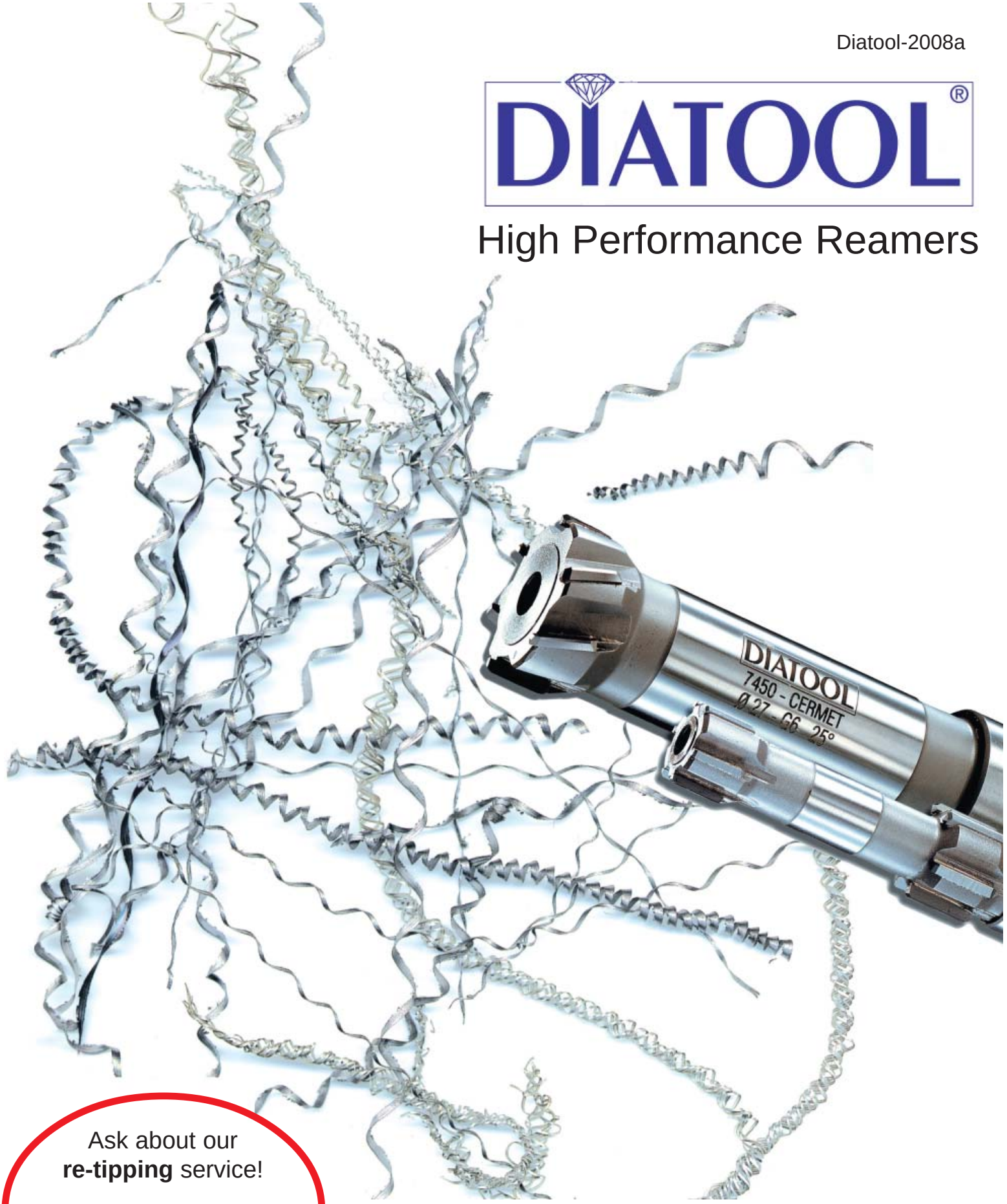
Diatool-2008a

DIATOOL®

High Performance Reamers



Ask about our
re-tipping service!

*** Economical ***
*** Precise ***
*** Fast ***

Exclusively Marketed by:

MONAGHAN & Associates, Incorporated
ATTG ADVANCED TOOLING TECHNOLOGY GROUP

Table of Contents

MONAGHAN & Associates, Incorporated
ATTG ADVANCED TOOLING TECHNOLOGY GROUP

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www.monaghaninc.com

DIATOOL and Monaghan & Associates, Inc.

Your Competent Partners for Reaming Solutions

Partners

Monaghan & Associates, Inc. partnered with DIATOOL Präzisionswerkzeug GmbH of Rheinfelden, Germany in May of 2006 to distribute their reaming products in the United States. Both companies share a deep commitment to customer service. This manifests itself in our fast delivery of both new and reconditioned tools, competitive pricing structure and application support.

Products

DIATOOL specializes in expandable, mono-block reamers. These reamers feature an expansion screw for wear compensation (see page 13). DIATOOL reamers also feature unequal flute spacing that allows them to produce very round and cylindrical bores compared to traditional reamers. DIATOOL reamers are 100% interchangeable with the major Swiss and German manufacturers.

The reamers are available with carbide, cermet, and PCD tips. We offer several coatings, including, but not limited to: TiN, TiCN, and TiAlN. The reamers are also available as solid/non-expandable, with internal coolant for through or blind bores, or without internal coolant.

Special reamers are also available from DIATOOL. Examples are:

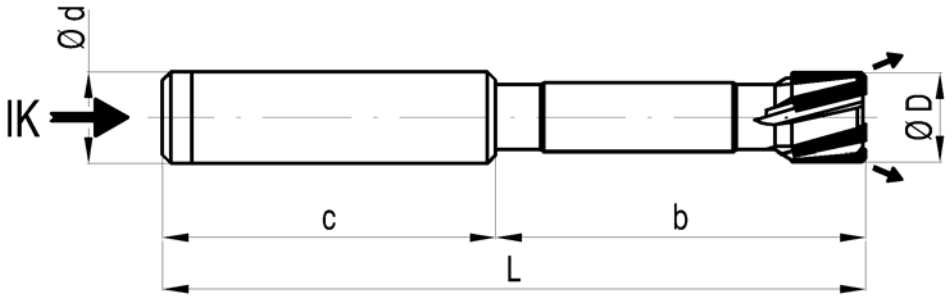
- Step reamers
- Special leads
- Special shanks – HSK, ABS, etc.
- Special work length - longer or shorter than standard

Compensating holders are available to reduce spindle run-out. Floating holders are also available to correct misalignment in turning applications.

Type 3450

DIATOOL®

Expandable reamer, short, with coolant supply
Left hand fluted, for through holes only

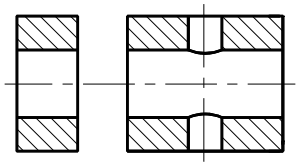


Diameter in mm			Diameter in inches			Length L	Length b	Length c	Ø d	Blades
Ø **D** MIN	to	Ø **D** MAX	Ø **D** MIN	to	Ø **D** MAX	mm	mm	mm	mm (h6)	Z
7,900	to	9,899	0.311	to	0.389	85	40	45	12	4
9,900	to	11,899	0.389	to	0.468	95	50	45	12	4
11,900	to	15,899	0.468	to	0.625	95	50	45	12	6
15,900	to	18,899	0.625	to	0.744	100	50	50	16	6
18,900	to	25,899	0.744	to	1.019	120	60	60	20	6
25,900	to	32,599	1.019	to	1.283	135	75	60	25	6
32,600	to	40,599	1.283	to	1.598	135	75	60	25	8
40,600	to	50,599	1.598	to	1.992	135	75	60	25	8

Possible cutting materials **Carbide**
Cermet
Various coatings (TiN, TiCN, TiAlN, etc.)
PCD

Options:
Reduced shank diameters are possible with surcharge
Clamping flats according to customer specifications with surcharge
Morse taper shanks available
Short delivery times for other dimensions/measurements
Solid (non-expandable) reamer equivalent type 3250
End cutting and special bevel leads available with surcharge

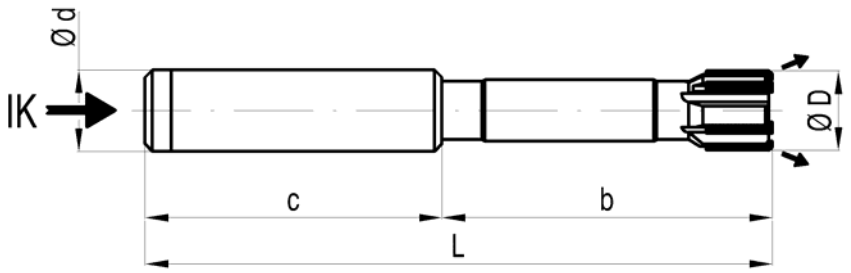
Suitable for the following bore types:



Required Order Information:
Type number
Diameter
Tolerance of bore
Workpiece material

Type 3451

Expandable reamer, short, with coolant supply
Straight flute, for through holes

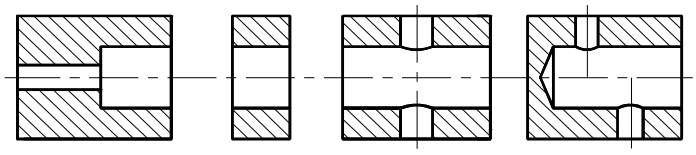


Diameter in mm			Diameter in inches			Length L	Length b	Length c	Ø d	Blades
Ø **D** MIN	to	Ø **D** MAX	Ø **D** MIN	to	Ø **D** MAX	mm	mm	mm	mm (h6)	Z
5,600	to	8,899	0.220	to	0.350	85	40	45	12	4
8,900	to	15,899	0.350	to	0.625	95	50	45	12	6
15,900	to	18,899	0.625	to	0.744	100	50	50	16	6
18,900	to	25,899	0.744	to	1.019	120	60	60	20	6
25,900	to	32,599	1.019	to	1.283	135	75	60	25	6
32,600	to	40,599	1.283	to	1.598	135	75	60	25	8
40,600	to	50,599	1.598	to	1.992	135	75	60	25	8

Possible cutting materials: **Carbide**
Cermet
Various coatings (TiN, TiCN, TiAlN, etc.)
PCD

Options:
Reduced shank diameters are possible with surcharge
Clamping flats according to customer specifications with surcharge
Morse taper shanks available
Short delivery times for other dimensions/measurements
Solid (non-expandable) reamer equivalent type 3251
End cutting and special bevel leads available with surcharge

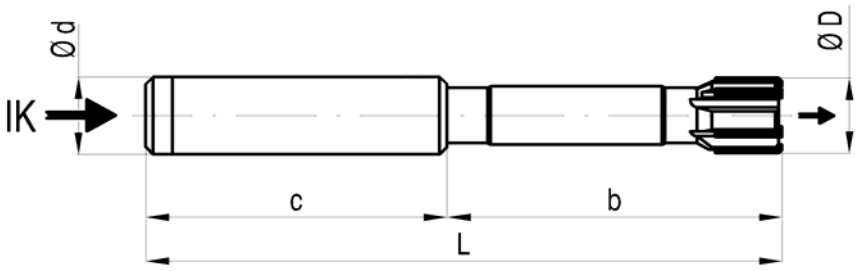
Suitable for the following bore types:



Required Order Information:
Type number
Diameter
Tolerance of bore
Workpiece material

Type 3452

Expandable reamer, short, with coolant supply
Straight flute, for blind holes

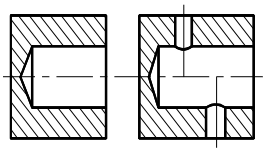


Diameter in mm			Diameter in inches			Length L	Length b	Length c	Ø d	Blades
Ø **D** MIN	to	Ø **D** MAX	Ø **D** MIN	to	Ø **D** MAX	mm	mm	mm	mm (h6)	Z
5,600	to	8,899	0.220	to	0.350	85	40	45	12	4
8,900	to	15,899	0.350	to	0.625	95	50	45	12	6
15,900	to	18,899	0.625	to	0.744	100	50	50	16	6
18,900	to	25,899	0.744	to	1.019	120	60	60	20	6
25,900	to	32,599	1.019	to	1.283	135	75	60	25	6
32,600	to	40,599	1.283	to	1.598	135	75	60	25	8
40,600	to	50,599	1.598	to	1.992	135	75	60	25	8

Possible cutting materials: **Carbide**
Cermet
Various coatings (TiN, TiCN, TiAlN, etc.)
PCD

Options:
Reduced shank diameters are possible with surcharge
Clamping flats according to customer specifications with surcharge
Morse taper shanks available
Short delivery times for other dimensions/measurements
Solid (non-expandable) reamer equivalent type 3252
End cutting and special bevel leads available with surcharge

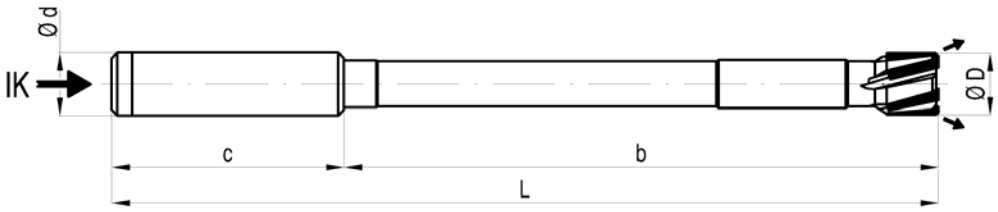
Suitable for the following bore types:



Required Order Information:
Type number
Diameter
Tolerance of bore
Workpiece material

Type 3460

Expandable reamer, long, with coolant supply
Left hand fluted, for through holes only

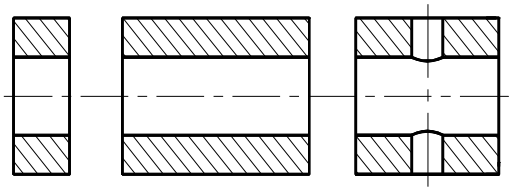


Diameter in mm			Diameter in inches			Length L	Length b	Length c	Ø d	Blades
Ø **D** MIN	to	Ø **D** MAX	Ø **D** MIN	to	Ø **D** MAX	mm	mm	mm	mm (h6)	Z
7,900	to	9,899	0.311	to	0.389	130	85	45	12	4
9,900	to	11,899	0.389	to	0.468	160	115	45	12	4
11,900	to	15,899	0.468	to	0.625	160	115	45	12	6
15,900	to	18,899	0.625	to	0.744	180	130	50	16	6
18,900	to	25,899	0.744	to	1.019	200	140	60	20	6
25,900	to	32,599	1.019	to	1.283	210	150	60	25	6
32,600	to	40,599	1.283	to	1.598	210	150	60	25	8
40,600	to	50,599	1.598	to	1.992	210	150	60	25	8

Possible cutting materials: **Carbide**
Cermet
Various coatings (TiN, TiCN, TiAlN, etc.)
PCD

Options:
Reduced shank diameters are possible with surcharge
Clamping flats according to customer specifications with surcharge
Morse taper shanks available
Short delivery times for other dimensions/measurements
Solid (non-expandable) reamer equivalent type 3260
End cutting and special bevel leads available with surcharge

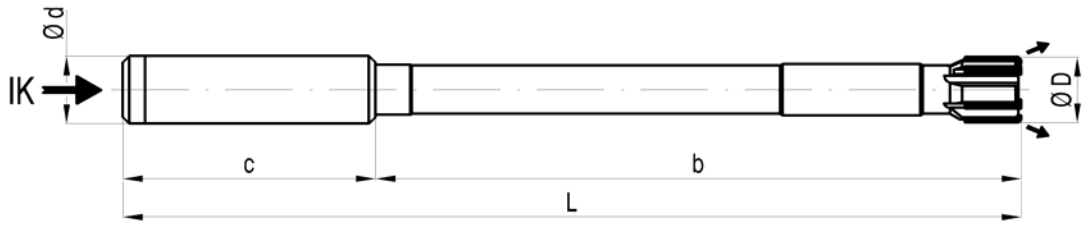
Suitable for the following bore types:



Required Order Information:
Type number
Diameter
Tolerance of bore
Workpiece material

Type 3461

Expandable reamer, long, with coolant supply
Straight fluted, for through holes

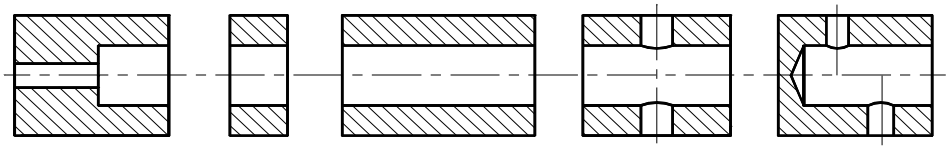


Diameter in mm			Diameter in inches			Length L	Length b	Length c	Ø d	Blades
Ø **D** MIN	to	Ø **D** MAX	Ø **D** MIN	to	Ø **D** MAX	mm	mm	mm	mm (h6)	Z
5,600	to	8,899	0.220	to	0.350	130	85	45	12	4
8,900	to	9,899	0.350	to	0.389	130	85	45	12	6
9,900	to	15,899	0.389	to	0.625	160	115	45	12	6
15,900	to	18,899	0.625	to	0.744	180	130	50	16	6
18,900	to	25,899	0.744	to	1.019	200	140	60	20	6
25,900	to	32,599	1.019	to	1.283	210	150	60	25	6
32,600	to	40,599	1.283	to	1.598	210	150	60	25	8
40,600	to	50,599	1.598	to	1.992	210	150	60	25	8

Possible cutting materials: **Carbide**
Cermet
Various coatings (TiN, TiCN, TiAlN, etc.)
PCD

Options:
Reduced shank diameters are possible with surcharge
Clamping flats according to customer specifications with surcharge
Morse taper shanks available
Short delivery times for other dimensions/measurements
Solid (non-expandable) reamer equivalent type 3261
End cutting and special bevel leads available with surcharge

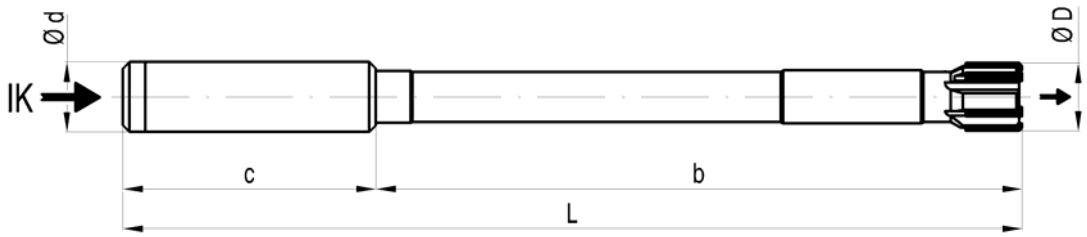
Suitable for the following bore types:



Required Order Information:
Type number
Diameter
Tolerance of bore
Workpiece material

Type 3462

Expandable reamer, long, with coolant supply
Straight fluted, for blind holes

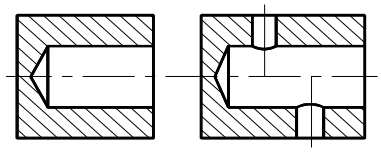


Diameter in mm			Diameter in inches			Length L	Length b	Length c	Ø d	Blades
Ø **D** MIN	to	Ø **D** MAX	Ø **D** MIN	to	Ø **D** MAX	mm	mm	mm	mm (h6)	Z
5,600	to	8,899	0.220	to	0.350	130	85	45	12	4
8,900	to	9,899	0.350	to	0.389	130	85	45	12	6
9,900	to	15,899	0.389	to	0.625	160	115	45	12	6
15,900	to	18,899	0.625	to	0.744	180	130	50	16	6
18,900	to	25,899	0.744	to	1.019	200	140	60	20	6
25,900	to	32,599	1.019	to	1.283	210	150	60	25	6
32,600	to	40,599	1.283	to	1.598	210	150	60	25	8
40,600	to	50,599	1.598	to	1.992	210	150	60	25	8

Possible cutting materials: **Carbide**
Cermet
Various coatings (TiN, TiCN, TiAlN, etc.)
PCD

Options:
Reduced shank diameters are possible with surcharge
Clamping flats according to customer specifications with surcharge
Morse taper shanks available
Short delivery times for other dimensions/measurements
Solid (non-expandable) reamer equivalent type 3262
End cutting and special bevel leads available with surcharge

Suitable for the following bore types:



Required Order Information:
Type number
Diameter
Tolerance of bore
Workpiece material

High Precision Solid Carbide Reamers

K10, uncoated,
TIN or TiAlN coated

45° bevel lead
Straight fluted, right hand cutting

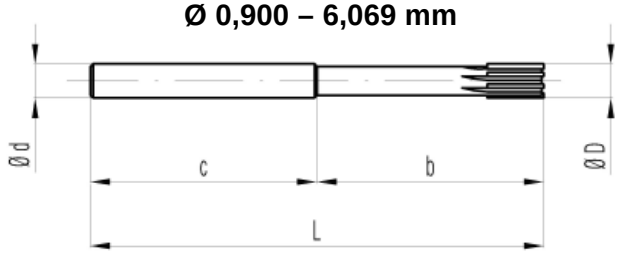
h6 shank for hydraulic or heat shrinking chucks

Without coolant supply for blind- and through holes

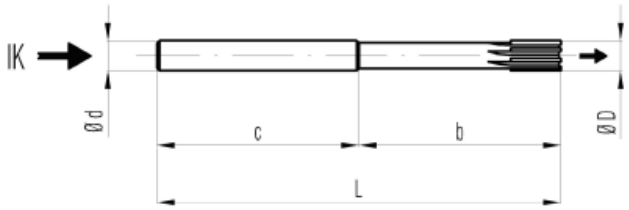
From Ø 3,070 mm with coolant supply for blind hole

(please mention when ordering)

Ø 0,900 – 6,069 mm



Ø 3,070 – 6,069 mm



ØDmm	ØD inches	L Total length	a Head length	b Working length	C Shank length	Ød Shank h6	Z No. of teeth
0.900-1.069	0.035-0.042	48	6	20	28	3	3
1.070-1.569	0.042-0.062	48	6	20	28	3	3
1.570-2.069	0.062-0.081	48	6	20	28	3	3
2.070-2.569	0.081-0.101	48	6	20	28	3	3
2.570-3.069	0.101-0.121	48	6	20	28	3	3
3.070-3.569	0.121-0.141	54	8	26	28	4	4
3.570-4.069	0.141-0.160	54	8	26	28	4	4
4.070-4.569	0.160-0.180	74	12	38	36	6	6
4.570-5.069	0.180-0.200	74	12	38	36	6	6
5.070-5.569	0.200-0.219	74	12	38	36	6	6
5.570-6.069	0.219-0.239	74	12	38	36	6	6

- Four and six bladed reamers have irregular flute spacing.
- Same price for H7, other tolerances or diameters.
- Minimum quantity: 10pcs, each size
- Contact Monaghan Advanced Tooling Technology Group for a quotation.
- Delivery: 4 weeks uncoated
  5-6 weeks coated

Application data

Material	Strength N/mm²	Reamer Ø (in mm)	Reaming allowance (in mm Ø)	Forward feed (mm/rev)	Cutting speed (in m/min)			Coolant supply
					Carbide	Cermet	Carb. coated	
unalloyed steel	up to 600	up to 10	0,10 - 0,20	0,15 - 0,30	7 - 10	90 - 200	25 - 80	
		10 to 22	0,15 - 0,25	0,25 - 0,50				
		22 to 40	0,20 - 0,40	0,30 - 0,80				
		above 40	0,20 - 0,40	0,60 - 2,00				
	above 600				6 - 8			
alloyed steel	400 - 1000	up to 10	0,10 - 0,20	0,10 - 0,30	4 - 8	30 - 70	15 - 60	
		10 to 22	0,15 - 0,25	0,20 - 0,40				
		22 to 40	0,20 - 0,40	0,30 - 0,60				
		above 40	0,20 - 0,40	0,40 - 2,00				
high-alloyed steel	800 - 1500	up to 10	0,10 - 0,20	0,10 - 0,20	4 - 5	10 - 30	10 - 25	
		10 to 22	0,15 - 0,25	0,15 - 0,40				Emulsion
		22 to 40	0,20 - 0,40	0,30 - 0,50				
		above 40	0,20 - 0,40	0,40 - 1,40				
gray cast iron	up to 220 HB	up to 10	0,10 - 0,20	0,20 - 0,50	8 - 12		100 - 200	
spherodial/spherulitic		10 to 22	0,15 - 0,25	0,30 - 0,60				
graphite iron		22 to 40	0,20 - 0,40	0,50 - 1,20				
pearlitic GGG		above 40	0,20 - 0,40	0,80 - 2,00				
	above 220 HB				6 - 12			
spherodial/spherulitic	300 - 700	up to 10	0,10 - 0,20	0,20 - 0,50	5 - 8	90 - 200		
graphite iron		10 to 22	0,15 - 0,25	0,30 - 0,60				
ferritic GGG		22 to 40	0,20 - 0,40	0,50 - 1,20				
		above 40	0,20 - 0,40	0,80 - 2,00				
copper and copper alloy		up to 10	0,10 - 0,20	0,15 - 0,40	8 - 15		100 - 200	
		10 to 22	0,15 - 0,25	0,20 - 0,60				
		22 to 40	0,20 - 0,40	0,30 - 0,80				
		above 40	0,20 - 0,40	0,60 - 2,00				
brass		up to 10	0,10 - 0,20	0,10 - 0,40	10 - 20		100 - 200	
bronze		10 to 22	0,15 - 0,25	0,25 - 0,60				
		22 to 40	0,20 - 0,40	0,40 - 1,00				
		above 40	0,20 - 0,40	0,60 - 2,00				
aluminium base alloy		up to 10	0,10 - 0,20	0,20 - 0,40	12 - 25		100 - 300	
		10 to 22	0,15 - 0,25	0,30 - 0,60				Emulsion
		22 to 40	0,20 - 0,40	0,40 - 1,00				
		above 40	0,20 - 0,40	0,50 - 2,00				
titanium		up to 10	0,10 - 0,20	0,15 - 0,30	5 - 8			
titanium base alloy		10 to 22	0,15 - 0,25	0,20 - 0,40				
		22 to 40	0,20 - 0,40	0,30 - 0,50				
		up to 40	0,20 - 0,40	0,40 - 1,00				
plastics		up to 10	0,10 - 0,20	0,20 - 0,50	10 - 25			compressed air
		10 to 22	0,15 - 0,25	0,40 - 0,80				
		22 to 40	0,20 - 0,40	0,50 - 1,40				
		above 40	0,20 - 0,40	0,60 - 2,00				

Conversion table:

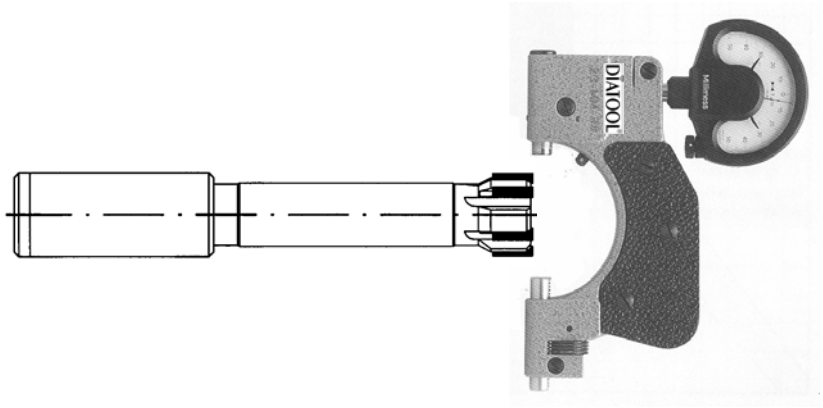
Reamer diameter	mm ÷ 25.4 = inch
Reaming allowance	mm ÷ 25.4 = inch
Forward feed	mm per rev. ÷ 25.4 = inches per rev.
Cutting speed	m per min x 3.28 = feet per minute

Cutting material and coating

We recommend the following cutting materials and coatings when reaming with our tools:

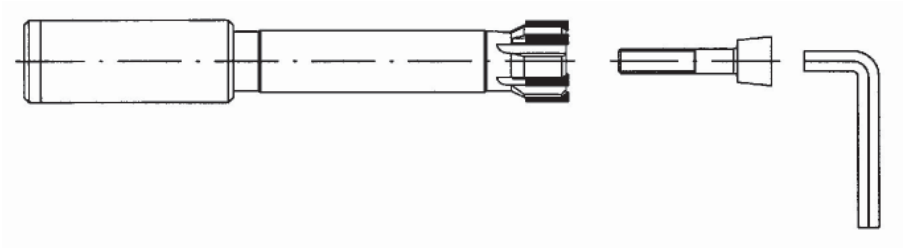
Work piece material	Batch size	Recommended	Options
Low carbon and low alloy steels	Small batches	Cermet uncoated	Carbide uncoated
	High volume batches	Cermet uncoated	Carbide TiAlN coated Cermet TiAlN coated
High alloy steel, stainless steel, heat resisting steels	Small batches	Carbide TIN coated	Carbide uncoated
	High volume batches		
Grey cast iron and alloyed grey cast iron	Small batches	Carbide TiAlN coated	Carbide TIN coated Carbide uncoated
	High volume batches		
Nodular iron ferritic/pearlitic GGG40 – GGG55, GTW35 – GTW55 GTS35 – GTS55	Small batches	Cermet uncoated	Carbide uncoated Carbide TiAlN coated
	High volume batches	Cermet uncoated	Carbide TiAlN coated Cermet TiAlN coated
Nodular iron ferritic/pearlitic Nodular iron pearlitic/malleable GGG60 – GGG80, GTW65, GTS65 GTS70	Small batches	Cermet uncoated	Carbide uncoated
	High volume batches	Cermet uncoated	Cermet TiAlN coated Carbide TiAlN coated
Copper, copper alloys, brass, bronze	Small batches	Carbide uncoated	
	High volume batches	Cermet uncoated	Carbide uncoated
Aluminum, alu-casting alloys, magnesium	Small batches	Carbide uncoated	
	High volume batches	PCD	Carbide uncoated

Expansion instructions



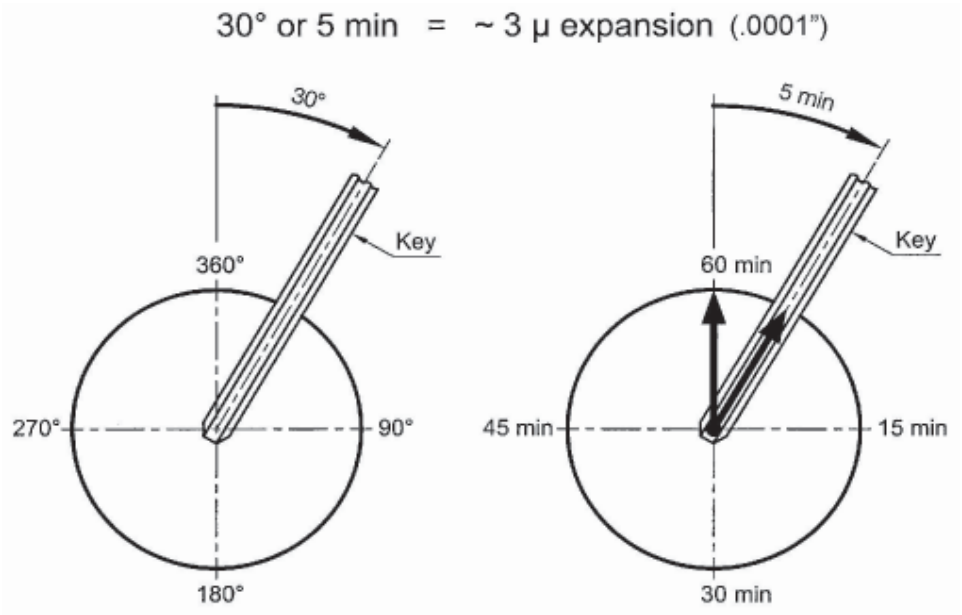
Measurement:

The diameter of the reamer can be checked with any commercially available micrometer.
The two blades to be measured are 180° opposite and marked with a dot.
The reamer must be measured up front because of the back-taper.
Be careful not to damage the bevel-lead edge.



Expansion:

The conical screw has to be turned carefully clockwise with the key until the required diameter is reached. About 30° or 5 minutes from a clock represent an expansion of about 3 microns.
This manipulation is meant to be for wear compensation only.



Troubleshooting

DIATOOL®

Problem	Cause	Corrective action
1. Bore oversized	a) Reamer is not running true in the machine	a) Use a DIATOOL compensation holder
	b) Alignment is not precise, reamer cuts at the back end	b) Correct the alignment, use compensation holder or event. floating holder
	c) Built-up edges	c) Use another coolant, reduce the cutting speed
	d) Coolant is inappropriate	d) Use another coolant
	e) Reamer is too big	e) Use a smaller reamer
2. Tapered Bore	a) Inaccurrate alignment	a) Correct the alignment, use compensation holder or event. floating holder
	b) Misalignement between headstock and tailstock	b) Correct the tailstock, use compensation holder or event. floating holder
3. Lipped bore	a) Misalignment Blades press at start.	a) Correct the alignment, use compensation holder or event. floating holder
	b) Reamer cuts at the back end	b) Correct the tailstock, use compensation holder or event. floating holder
4. Bore diameter to small	a) Reamer is too small	a) Use larger or reworked reamer
	b) Reamer is blunt	b) Have the reamer reworked
	c) Coolant is inappropriate	c) Use another coolant
	d) Reaming allowance is too small	d) Select the reaming allowance from the table (application data)
	e) Cutting speed is to low	e) Select cutting speed from the table (application data)
5. Bore is not true, shows chatter marks	a) Fault of concentricity or alignment of the reamer in the machine	a) Correct the true running/alignment of the reamer, use compensation holder
	b) Asymmetrical cutting of the reamer	b) Countersink the bore
	c) Deformation through clamping of the workpiece	c) Correct the fixation of the workpiece
6. Quality of the surface is unsatisfactory	a) Cutting edges are blunt or notched	a) Have the reamer reworked
	b) Bevel is uneven	b) Have the bevel reground
	c) Reamer does not run true	c) Adjust the reamer with a DIATOOL compensation holder
	d) Wrong machining data	d) Correct machining data refering to table (application data)
	e) None or unsufficant coolant supply, chips are jammed	e) Increase coolant pressure, use reamer with internal coolant supply
7. Reamer is jamming	a) Conical/taper form of the reamer is too small by wearout or loosening of the cone screw	a) Have the reamer reworked
	b) Circular land too wide	b) Relief angle to be reground
	c) Drop of the edge was not removed	c) Face has to be reground, resp. reamer has to be reworked
	d) Coolant is inappropriate	d) Use another coolant
8. Grooves in the bore "feed marks"	a) Reamer does not run true in the machine	a) Use a DIATOOL compensation holder possibly the reamer has to be reworked
	b) Masterial built-up on cutting edges	b) Reduce cutting speed

Application Data Sheet

DIATOOL®

Company Date

Customer contact

1. Material to be machined

Standard designation

Heat treatment

Tensile strength

2. Bore

Ø and tolerance

Ø of the premachining

Method of premachining

Length of bore

Through hole ☐ Blind hole ☐

Bottom also to be machined? yes ☐ no ☐

Discontinuous hole yes ☐ no ☐

if yes, length of interruption

Surface finish Ra / Rt / Rz

Circular error permitted

Cylindricity to be obtained

Other quality requirements

3. Tool fitting

Morse taper

Cylindrical shank

Other tool shanks

Machining horizontal ☐ vertical ☐

Tool fixed ☐ rotating ☐

4. Coolant and coolant supply

Brand and style

Concentration

Coolant supply through the tool yes ☐ no ☐

Coolant pressure available bar

5. Machine

Brand and style

F = (mm/rev) fixed ☐ variable ☐

S = (m/min) fixed ☐ variable ☐

True running accuracy of the spindle

6. Volume of production

Number of holes per year

Batch volume

7. Workpiece / workpiece clamping

Please enclose a drawing of the workpiece or make a sketch here

Please complete this form and return to:

Fax: 937.259.9241
Email: sales@monaghaninc.com
Phone: 800.732.4565

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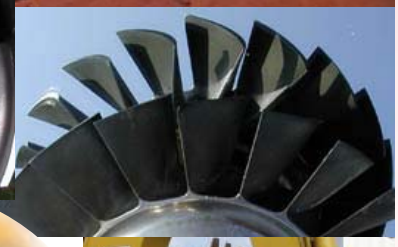

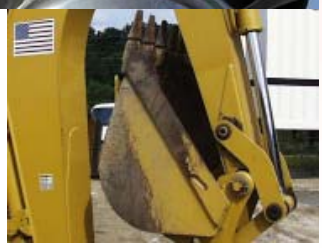

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