



KOMPASS – REAMING
Inch and Metric

KomPass Reaming – BENEFITS for you



As a brand of the KOMET GROUP, DIHART® is known for its precision reaming technology which is sure to take you to the next level.

For the cost-effective finish machining of bores, DIHART® offers a comprehensive tool program of standardized Monomax® monobloc tools, PCD reamers, application-specific multiblade stepped reamers and special tools. DIHART® reamers offer accurate, cost-effective and reliable machining.

Innovative solutions for finish bore machining:

- REAMAX® TS – Modular reaming system
- Reaming with indexable insert technology
- DAH® Compensating holder for accurate concentricity (<math><0.0002\text{''}/0.005\text{ mm}</math>)



REAMAX® TS

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REAMAX®

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Monomax® – Expandable

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Fullmax Solid Carbide Reamer

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Duomax & Cutting Ring

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PCD Reamers

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Special Tools

Insert Reaming Technology
MicroSet System

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DAH® Compensating Holder

Taper shanks · HSK · ABS® · DPS

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Preferred Sizes, Information, Cutting Data
Numerical Index

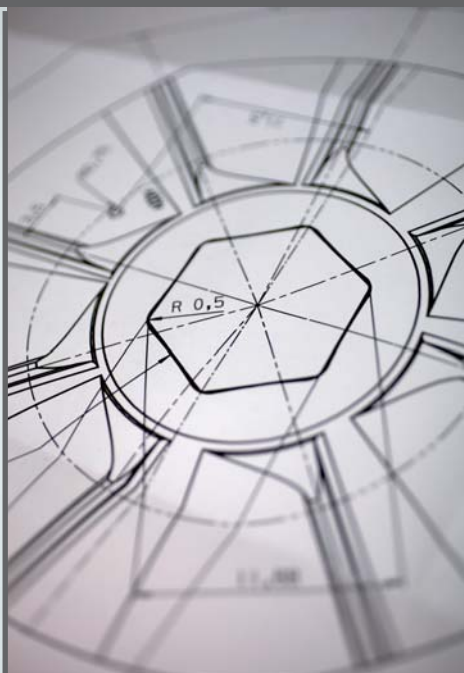
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DIHART® – Innovative Solutions for Precision Finishing of Bores



The KOMET GROUP is a leading global provider of DIHART® reaming tools for the cost-effective, precise machining of bores. Our innovative solutions potential, comprehensive performance range and dedication are the basis for successful partnerships with our customers.

For more than 60 years DIHART® has been synonymous with high-precision reaming. We are successfully meeting the increasing demand for application-specific solutions and standard tools, and have been continuously expanding our solution competency and our innovative edge. Our leading market position is the result of consistently higher quality and continuous development.

The KOMET GROUP also offers the complete range of services internationally. You can find us wherever you manufacture your products with a demand for quality.

The standard tool range and the application-specific special tools guarantee precise, cost-effective and reliable machining.

New product and solution concepts such as the modular high-speed reaming tools REAMAX® TS, set a benchmark especially for standard products. Our knowledge of application-specific solutions offers unique perspectives.

DIHART® is the brand of the KOMET GROUP for precision reaming in new dimensions.



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DIHART® Tool Selection

This selection aid guides you quickly and easily to the tool system that is suitable for your requirements.

Step 1: Diameter and Tolerance Selection – Using your applications bore diameter and tolerance, select an IT class from charts below.

Numerical values for tolerance grades in 0.001 mm

For use with metric dimensions

IT tolerance class												
Nominal dimension range	IT 1	IT 2	IT 3	IT 4	IT 5	IT 6	IT 7	IT 8	IT 9	IT 10	IT 11	IT 12
1 – 3 mm	0.8	1.2	2	3	4	6	10	14	25	40	60	100
> 3 – 6 mm	1	1.5	2.5	4	5	8	12	18	30	48	75	120
> 6 – 10 mm	1	1.5	2.5	4	6	9	15	22	36	58	90	150
> 10 – 18 mm	1.2	2	3	5	8	11	18	27	43	70	110	180
> 18 – 30 mm	1.5	2.5	4	6	9	13	21	33	52	84	130	210
> 30 – 50 mm	1.5	2.5	4	7	11	16	25	39	62	100	160	250
> 50 – 80 mm	2	3	5	8	13	19	30	46	74	120	190	300
> 80 – 120 mm	2.5	4	6	10	15	22	35	54	87	140	220	350
> 120 – 180 mm	3.5	5	8	12	18	25	40	63	100	160	250	400
> 180 – 250 mm	4.5	7	10	14	20	29	46	72	115	185	290	460
> 250 – 315 mm	6	8	12	16	23	32	52	81	130	210	320	520

- Example 1: If your application is Ø 32.5 mm with a total tolerance of 0.020 mm, this will be an IT 6 class.
- Example 2: If your application is Ø 110 mm with a total tolerance of 0.035 mm, this will be an IT 7 class.




Numerical values for tolerance grades in inch






















IT tolerance class												
Nominal dimension range	IT 1	IT 2	IT 3	IT 4	IT 5	IT 6	IT 7	IT 8	IT 9	IT 10	IT 11	IT 12
0.039 – 0.118	0.00003	0.00005	0.00008	0.00012	0.00016	0.00024	0.00039	0.00055	0.00098	0.00158	0.00236	0.00394
> 0.118 – 0.236	0.00004	0.00006	0.00010	0.00016	0.00020	0.00032	0.00047	0.00071	0.00118	0.00189	0.00295	0.00472
> 0.236 – 0.394	0.00004	0.00006	0.00010	0.00016	0.00024	0.00035	0.00059	0.00087	0.00142	0.00228	0.00354	0.00591
> 0.394 – 0.709	0.00005	0.00008	0.00012	0.00020	0.00032	0.00043	0.00071	0.00106	0.00169	0.00276	0.00433	0.00709
> 0.709 – 1.181	0.00006	0.00010	0.00016	0.00024	0.00035	0.00051	0.00083	0.00130	0.00205	0.00331	0.00512	0.00827
> 1.181 – 1.968	0.00006	0.00010	0.00016	0.00028	0.00043	0.00063	0.00098	0.00154	0.00244	0.00394	0.00630	0.00984
> 1.968 – 3.150	0.00008	0.00012	0.00020	0.00032	0.00051	0.00075	0.00118	0.00181	0.00291	0.00472	0.00748	0.01181
> 3.150 – 4.724	0.00010	0.00016	0.00024	0.00039	0.00059	0.00087	0.00138	0.00213	0.00343	0.00551	0.00866	0.01378
> 4.724 – 7.087	0.00014	0.00020	0.00032	0.00047	0.00071	0.00098	0.00158	0.00248	0.00394	0.00630	0.00984	0.01575
> 7.087 – 9.842	0.00018	0.00028	0.00039	0.00055	0.00079	0.00114	0.00181	0.00284	0.00453	0.00728	0.01142	0.01811
> 9.842 – 12.402	0.00024	0.00032	0.00047	0.00063	0.00091	0.00126	0.00205	0.00319	0.00512	0.00827	0.01260	0.02047

- Example 1: If your application is Ø 1.357 inch with a total tolerance of 0.0008 inch, this will be an IT 6 class.
- Example 2: If your application is Ø 4.250 inch with a total tolerance of 0.0015 inch, this will be an IT 7 class.

For rough conversion: 0.0001 inch => 0.0025 mm
0.001 mm => 0.00004 inch







Step 2: Tool Selection – Based on diameter and tolerance required, choose recommended tool series.

- **Example 1:** Diameter 20 H7 to be machined recommends REAMAX® TS System  or Monomax® Expandable 
- **Example 2:** Diameter 1.7500" ± 0.0010" (IT8) to be machined recommends REAMAX® TS System 

Tool series selection based on IT-tolerance						
IT-Tolerance	∅ 0.0551 – 0.2204 in (∅ 1.40 – 5.59 mm)	∅ 0.2205 – 0.4720 in (∅ 5.60 – 11.99 mm)	∅ 0.4721 – 0.7083 in (∅ 12.00 – 17.99 mm)	∅ 0.7084 – 1.5748 in (∅ 18 – 40 mm)	∅ 1.5748 – 2.5591 in (∅ 40 – 65 mm)	∅ 2.5591 – 4.3307 in (∅ 65 – 110 mm)
IT 5 – IT 6	 Fullmax Solid Carbide Reamer	 Monomax® expandable	 Monomax® expandable	  REAMAX®-T Monomax® expandable	 REAMAX® TS	 Duomax Cutting ring
IT 7	 Fullmax Solid Carbide Reamer	 Monomax® expandable	  REAMAX® Monomax® expandable	  REAMAX®-TS Monomax® expandable	 REAMAX® TS	 Duomax Cutting ring
≥ IT 8	 Fullmax Solid Carbide Reamer	 Fullmax Solid Carbide Reamer	 REAMAX®	 REAMAX®	 REAMAX® TS	 Duomax Cutting ring

Note: For bore tolerance ≤ IT7; Expandable tooling is recommended for wear compensation. Generally, bore tolerances < IT5 should be machined by another process other than reaming

(..) = mm

Standard reamers overview																					
Series	∅ 0.0551 (∅ 1.400)	∅ 0.1575 (∅ 4.000)	∅ 0.2205 (∅ 5.600)	∅ 0.3779 (∅ 9.600)	∅ 0.3999 (∅ 10.159)	∅ 0.4724 (∅ 12.000)	∅ 0.5000 (∅ 12.700)	∅ 0.6929 (∅ 17.600)	∅ 0.7087 (∅ 18.000)	∅ 0.7441 (∅ 18.899)	∅ 0.7913 (∅ 20.100)	∅ 1.0196 (∅ 25.899)	∅ 1.5748 (∅ 40.000)	∅ 1.9685 (∅ 50.000)	∅ 2.3858 (∅ 60.600)	∅ 2.5591 (∅ 65.000)	∅ 4.3543 (∅ 110.599)	∅ 5.4960 (∅ 139.599)	∅ 11.8346 (∅ 300.599)	Tool connection	
 REAMAX® TS																				Cylindrical shank DAH® ABS®	
 REAMAX®																					Cylindrical shank
 Monomax®- expandable																					Cylindrical shank
 Fullmax																					Cylindrical shank
 Duomax / Cutting ring																					Cylindrical shank DAH® ABS®
 PCD reamer																					Cylindrical shank

If you do not find a standard tool in this catalog for your machining needs, we are happy to offer you an application-specific tool.



DIHART® Tool Selection

This selection aid guides you quickly and easily to the tool system that is suitable for your requirements.

Step 3: Tool Recommendation – According to the type of bore and material to be machined, you will be guided to the appropriate tool. The best cutting geometry (ASG) can be seen in the "Tool recommendation" table in each section.

Example:

Material:
non-alloy steel 1010
Bore type: Through bore

Tool recommendation:
DST cutting material
Order No.: 75J.93
Cutting geometry: ASG4000

Recommended cutting data:
Cutting speed:
 $v_C = 330 - 660$ ft/min (100 - 200 m/min)
Feed for $\varnothing 0.7874$ inch ($\varnothing 20.000$ mm)
 $f_z = 0.004 - 0.008$ in/tooth
(0.10 - 0.21 mm/tooth)

DIHART Reamax® TS										
Tool Recommendation										
Material group	Strength Rm (N/mm ²)	Hardness HB	Material	Material example material code/DIN	High-speed machining					
					Order No.	Cutting geometry (ASG)	Cutting material/coating	Order No.	Cutting geometry (ASG)	Cutting material/coating
P 1.0	IA 500		non-alloy steels	S137-2 / 1.0037; 95Mn28 / 1.0715; S44-2 / 1.0044	75J.93	ASG4000	DST	75J.71	ASG4000	TiN
2.0	500-900		non-alloy / low alloy steels	S152-2 / 1.0050, C55 / 1.0525, 16MnCr5 / 1.7131	75J.93	ASG4000	DST	75J.71	ASG4000	TiN
2.1	< 500		lead alloys	95MnPb28 / 1.0718	75J.93	ASG4000	DST	75J.71	ASG4000	TiN

DIHART® Cutting Data																						
Guideline for reaming																						
Material group	Strength Rm (lb/ftin ²)	Hardness HB	Material	Material example ANSI / SAE	Cutting speed v_C ft/min (m/min)																	
					Reamers short / 3xD							Reamers long / 5xD										
P	1.0	IA 72,500	Unalloyed steel	A570.36 1213 A573.81	HIM	DST	TiN	DBG-N	DBF	DJC	DJF	DBC	PCD	HIM	DST	TiN	DBG-N	DBF	DJC	DJF	DBC	
					min-max	min-max	min-max	min-max	min-max	min-max	min-max	min-max	min-max	min-max	min-max	min-max	min-max	min-max	min-max	min-max	min-max	min-max
	2.0	72,500-130,000	Low alloy steel	5120 1055 5115	19-32 (6-10)	330-660 (100-200)	195-460 (60-140)			330-660 (100-200)				19-32 (6-10)	260-525 (80-160)	195-390 (60-120)					260-525 (80-160)	

Feed f_z in/tooth (mm/tooth)			
straight fluted G03, ASG11, ASG1101		straight fluted ASG4000, ASG09B, ASG1	
$\varnothing 0.984 - 1.968$ ($\varnothing 25 - 50$)	$> \varnothing 1.968$ ($> \varnothing 50$)	$< \varnothing 0.472$ ($< \varnothing 12$)	$\varnothing 0.472 - 0.984$ ($\varnothing 12 - 25$)
min-max	min-max	min-max	min-max
0.003-0.007 (0.09-0.20)	0.004-0.010 (0.10-0.25)	0.003-0.005 (0.07-0.14)	0.004-0.008 (0.10-0.21)
0.003-0.007 (0.09-0.20)	0.004-0.010 (0.10-0.25)	0.003-0.005 (0.07-0.14)	0.004-0.008 (0.10-0.21)

Complete cutting data can be found on page 100-101.

Reaming Bearing Case with DIHART® Cutting Ring

The task:

Finish machining operation for bearing case in class 25 cast iron.

Parameters:

Diameter: Ø 4.331" (Ø 110 mm) H6
 Hole Length: 1.968 inch (50 mm)
 Surface Finish: Ra 0.4
 Pre-machined: Ø 4.315 inch (Ø 109.6 mm)

Machining Data:

Cutting Material: TIN
 Geometry: ASG3000
 Surface Finish: Ra 0.4
 Run-out: 0.003

Cutting data:

$v_c = 246$ SFM (75 m/min);
 $v_f = 787$ ft/min (240 m/min)
 $n = 200$ rpm
 $f = 0.047$ in/rev (1.2 mm/rev)



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Reaming Cylinder Liner with REAMAX® TS

The task:

Finish machining operation for cylinder liner in 34CrAlNi7V (nitride steel).
 Previously getting 23 ft of tool life.

Parameters:

Diameter: Ø 0.9843 (Ø 25 mm) H7
 Hole Length: 0.9843 inch (25 mm)
 Surface Finish: Rz 1.6

Machining Data:

Cutting Material: HM/TIN
 Geometry: ASG4000
 Surface Finish: <Rz 1.6
 Tool Life: 63 ft (19.2 m)

Cutting data:

$v_c = 164$ SFM (50 m/min);
 $v_f = 1443$ ft/min (440 m/min)
 $n = 630$ rpm
 $f = 0.004$ in/rev (0.11 mm/rev)



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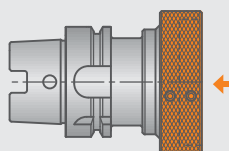


DIHART® Program Summary Adapters

DAH® Compensating Holder

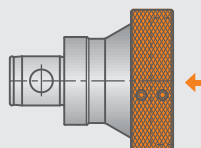
HSK adapter DIN 69893 A

▶ 80



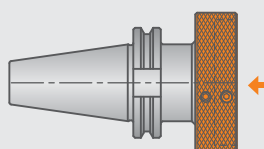
ABS® adapter

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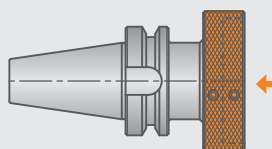
taper shank DIN 69871 AD/B

▶ 81



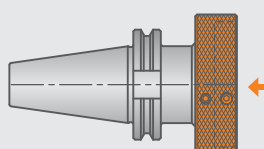
taper shank JIS B 6339 AD/B

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CAT / MS taper

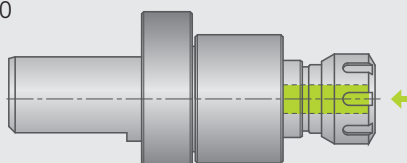
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DPS Floating Holder

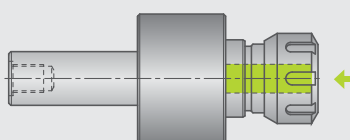
VDI connection DIN 69880

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cylindrical shank similar to DIN 1835

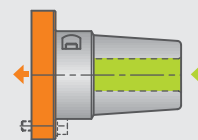
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DAH® Hydraulic chuck

For cylindrical shank tooling

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Reducer sleeve

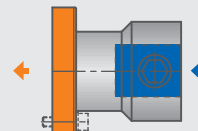
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DAH® Adapter

For ABS® connection tooling

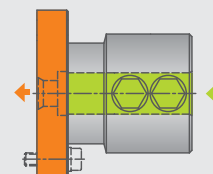
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DAH® Cylindrical Shank Bushing

For cylindrical shank tooling

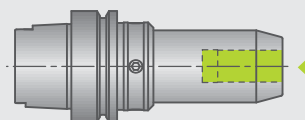
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DAH® 50 HS Compensating Holder

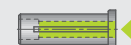
HSK adapter DIN 69893 A

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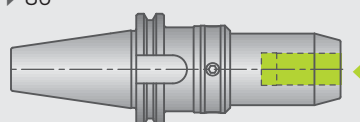
Reducer sleeve

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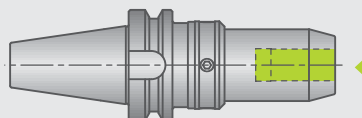
taper shank DIN 69871 AD

▶ 86



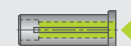
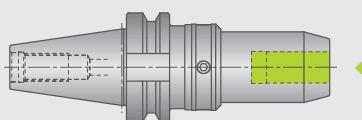
taper shank JIS B 6339 AD

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taper shank CAT 40

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Reaming Tools

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 cylindrical connection

 DAH® connection

 ABS® connection

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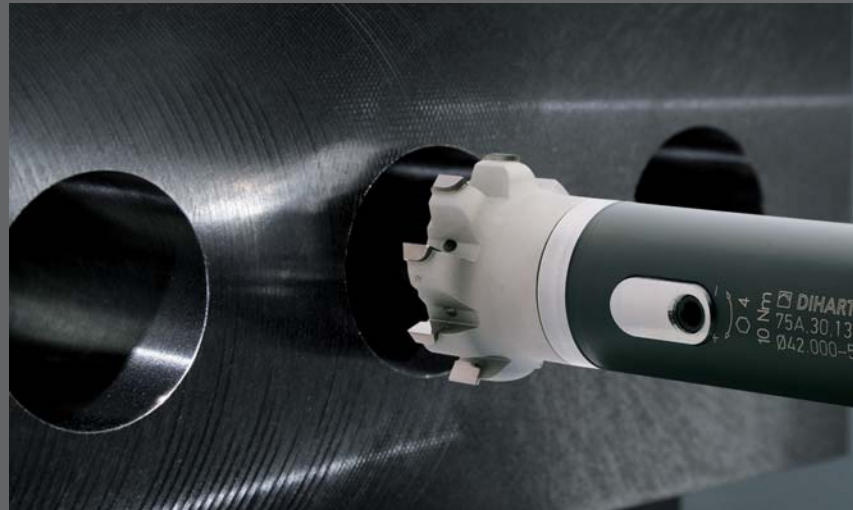


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Modular Reaming System

The flexible and cost effective DIHART REAMAX® TS offers a precise clamping system with a standard connection for all DIHART REAMAX® TS reaming heads, offering flexibility and cost-effectiveness thanks to fast and high-precision tool changing.

DIHART REAMAX® TS offer system modularity due to a versatile and clearly structured range of reaming heads which can handle all common diameter ranges and machining requirements. Tool costs and holder inventory are thereby reduced to a minimum.

BENEFITS for you:

- High-precision manufacturing for guaranteed quality
- Modular tool system for the highest flexibility
- Compensation for wear through simple adjustment
- Integrated run-out adjustment for short lengths
- Can be adjusted for extremely small hole tolerances

Application:

- All current materials
- Through and blind holes
- Small bore tolerances
- Up to 5 × D
- High speed – up to 985 ft/min (300 m/min)
- High feed – up to 0.094 in/rev (2.4 mm/rev)

A connection for maximum production reliability

This high-precision connection guarantees safer transfer of the torque that occurs during reaming and provides the concentricity required for precision machining. DIHART REAMAX® TS is designed for high speed machining.

Multi-flute tools

Wear compensating for small tolerances and able to machine bore tolerances as small as IT4, all DIHART REAMAX® TS multi-flute tools are adjustable. Maximum repeatable accuracy is achieved without pre-setting

- Longer tool life
- Maximum performance
- Extremely tight bore tolerances
- Less machine down time

Internal coolant system

The coolant is supplied through the tool with flute or blind hole coolant styles.



DIHART REAMAX® TS Page

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Reaming Head

Ø 0.7087 – 2.5591 inch (Ø 18.000 – 65.000 mm) 16

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7



8



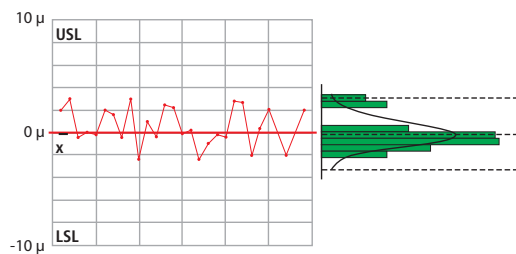
9



Minimal setting time


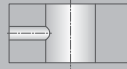
The radial clamping system allows the replaceable heads to be changed without removing the holder from the adaptor, reducing the setting time considerably.

DIHART REAMAX® TS provides maximum production reliability for the smallest tolerances.



DIHART REAMAX® TS

Tool Recommendation

Material group	Strength Rm (lbf/in ²)	Hardness HB	Material	Material example AISI / SAE	High-speed machining					
										
					Order No.	Cutting geometry (ASG)	Cutting material/coating	Order No.	Cutting geometry (ASG)	Cutting material/coating
P	1.0	≤ 72,500	non-alloy steels	1010 1144 1213	75J.93	ASG4000	DST	75J.71	ASG4000	TiN
	2.0	72,500 - 130,000	non-alloy / low alloy steels	1055 5115 5120	75J.93	ASG4000	DST	75J.71	ASG4000	TiN
	2.1	< 72,500	lead alloys	12L14	75J.93	ASG4000	DST	75J.71	ASG4000	TiN
	3.0	> 130,000	non alloy / low alloy steels: heat resistant structural, heat treated, nitride and tools steels	1064 4140	75J.93	ASG4000	DST	75J.71	ASG3000	TiN
	4.0	> 130,000	high alloy steels	H13 H21	75J.71	ASG0106	TiN	75J.71	ASG0106	TiN
	4.1		HSS	M10 T4						
S	5.0		250 special alloys: Inconel, Hastelloy, Nimonic, stc.	Inconel® 718 Nimonic® 80A						
	5.1	58,000	titanium, titanium alloys	Ti-6Al-4V						
M	6.0	≤ 87,000	stainless steels	304L 316	75J.47	ASG0106	DBF	75J.47	ASG0106	DBF
	6.1	< 130,000	stainless steels	630	75J.47	ASG0106	DBF	75J.47	ASG0106	DBF
	7.0	> 130,000	stainless / fireproof steels	403 420	75J.47	ASG0106	DBF	75J.47	ASG0106	DBF
K	8.0		180 gray cast iron	Class 25 G3000	75J.37	ASG3000	DBG-N	75J.37	ASG3000	DBG-N
	8.1		250 alloy gray cast iron	A436 Type 2	75J.37	ASG3000	DBG-N	75J.37	ASG3000	DBG-N
	9.0	≤ 87,000	130 ductile cast iron, ferritic	60-40-18 D4512	75J.93	ASG3000	DST	75J.47	ASG3000	DBF
	9.1		230 ductile cast iron, ferritic / perlitic	80-55-06 D5506	75J.93	ASG3000	DST	75J.47	ASG3000	DBF
	10.0	> 87,000	250 spheroidal graphite cast iron, perlitic malleable iron	100-70-03 07003	75J.93	ASG3000	DST	75J.47	ASG3000	DBF
	10.1		200 alloyed spheroidal graphite cast iron	A43D2	75J.37	ASG3000	DBG-N	75J.37	ASG3000	DBG-N
10.2		300 vermicular cast iron		75J.37	ASG3000	DBG-N	75J.37	ASG3000	DBG-N	
N	12.0		90 copper alloy, brass, lead-alloy bronze, lead bronze: good cut	316	75J.93	ASG3000	DST	75J.71	ASG3000	TiN
	12.1		100 copper alloy, brass, bronze: average cut		75J.71	ASG3000	TiN	75J.71	ASG3000	TiN
	13.0		60 wrought aluminum alloys	6151 7075	75J.17	ASG0706	DBC	75J.17	ASG0706	
	13.1		75 cast aluminum alloy: Si-content < 10% magnesium alloy	380 A356.0	75J.17	ASG0706	DBC	75J.17	ASG0706	
	14.0		100 cast aluminum alloy: Si-content > 10%	383 A413.0	75J.17	ASG0706	DBC	75J.17	ASG0706	
H	15.0	203,000	hardened steels < 45 HRC		75J.37	ASG0106	DBG-N			
	16.0	261,000	hardened steels > 45 HRC, ≤ 55 HRC		75J.37	ASG0106	DBG-N			

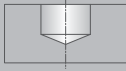
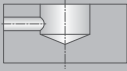
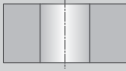
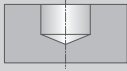
For inquiries concerning tools for materials without a recommendation, please contact us.

Patent applied for inside and outside Germany (REAMAX®)

DIHART REAMAX® TS


Tool Recommendation



	High-speed machining						Conventional machining					
												
	Order No.	Cutting geometry (ASG)	Cutting material/coating	Order No.	Cutting geometry (ASG)	Cutting material/coating	Order No.	Cutting geometry (ASG)	Cutting material	Order No.	Cutting geometry (ASG)	Cutting material
	75H.93	ASG3000	DST	75H.71	ASG3000	TiN	75J.21	ASG3000	HM	75H.21	ASG3000	HM
	75H.93	ASG3000	DST	75H.71	ASG3000	TiN	75J.21	ASG02	HM	75H.21	ASG02	HM
	75H.93	ASG3000	DST	75H.71	ASG3000	TiN	75J.21	ASG3000	HM	75H.21	ASG3000	HM
	75H.93	ASG3000	DST	75H.71	ASG3000	TiN	75J.21	ASG3000	HM	75H.21	ASG3000	HM
	75H.71	ASG0106	TiN	75H.71	ASG0106	TiN	75J.21	ASG0106	HM	75H.21	ASG0106	HM
							75J.21	ASG03	HM	75H.21	ASG03	HM
	75H.47	ASG0106	DBF	75H.47	ASG0106	DBF	75J.21	ASG0106	HM	75H.21	ASG0106	HM
	75H.47	ASG0106	DBF	75H.47	ASG0106	DBF	75J.21	ASG0106	HM	75H.21	ASG0106	HM
	75H.47	ASG0106	DBF	75H.47	ASG0106	DBF	75J.21	ASG0106	HM	75H.21	ASG0106	HM
	75H.37	ASG3000	DBG-N	75H.37	ASG3000	DBG-N	75J.21	ASG3000	HM	75H.21	ASG3000	HM
	75H.37	ASG3000	DBG-N	75H.37	ASG3000	DBG-N	75J.21	ASG3000	HM	75H.21	ASG3000	HM
	75H.93	ASG3000	DST	75H.47	ASG3000	DBF	75J.21	ASG02	HM	75H.21	ASG02	HM
	75H.93	ASG3000	DST	75H.47	ASG3000	DBF	75J.21	ASG3000	HM	75H.21	ASG3000	HM
	75H.93	ASG3000	DST	75H.47	ASG3000	DBF	75J.21	ASG3000	HM	75H.21	ASG3000	HM
	75H.37	ASG3000	DBG-N	75H.37	ASG3000	DBG-N	75J.21	ASG3000	HM	75H.21	ASG3000	HM
	75H.37	ASG3000	DBG-N	75H.37	ASG3000	DBG-N	75J.21	ASG3000	HM	75H.21	ASG3000	HM
	75H.93	ASG3000	DST	75H.71	ASG3000	TiN	75J.21	ASG0106	HM	75H.21	ASG0106	HM
	75H.71	ASG3000	TiN	75H.71	ASG3000	TiN	75J.21	ASG0106	HM	75H.21	ASG0106	HM
	75H.17	ASG0706	DBC	75H.17	ASG0706	DBC	75J.21	ASG02	HM	75H.21	ASG02	HM
	75H.17	ASG0706	DBC	75H.17	ASG0706	DBC	75J.21	ASG3000	HM	75H.21	ASG3000	HM
	75H.17	ASG0706	DBC	75H.17	ASG0706	DBC	75J.21	ASG3000	HM	75H.21	ASG3000	HM
	75H.37	ASG0106	DBG-N									
	75H.37	ASG0106	DBG-N									



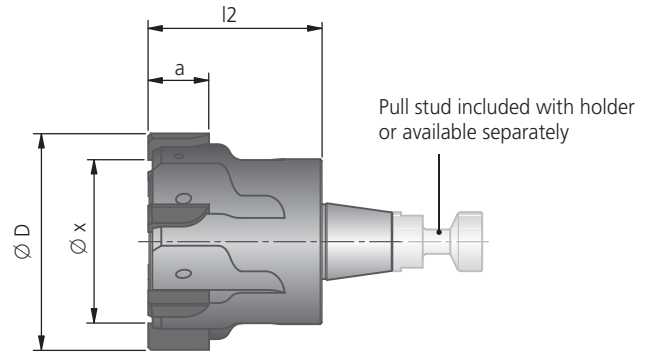
Cutting speed and feed see pages 100-101.

Important: See chapter  for more application details and safety notes!

DIHART REAMAX® TS

Reaming Head – expandable

Ø 0.7087 – 2.5591 inch
(Ø 18.000 – 65.000 mm)



■ Custom reaming head – selection options!

Selection: Cutting material, material, coolant supply										
Order No.	Order No.	Cutting material / coating	for material							
			P	M	K	N	S	H		
75J.21	75H.21	HM	● ¹⁾	● ¹⁾	● ¹⁾	● ¹⁾	● ¹⁾	● ¹⁾	● ¹⁾	● ¹⁾
75J.71	75H.71	TiN	●	●	●	● ⁴⁾	●	●	● ⁵⁾	●
75J.37	75H.37	DBG-N			●				●	●
75J.47	75H.47	DBF		●	●				●	●
75J.17	75H.17	DBC				●			●	
75J.93	75H.93	DST	●		● ²⁾	● ³⁾				
75J.67	75H.67	DJC			● ²⁾					
75J.87	75H.87	DJF			●					

Selection example: material St37, cutting material DST, central coolant supply, bore without interruption = Order No. 75H.93

● main area of application ○ suitable in some cases

¹⁾ conventional machining · ²⁾ material group 10.0&10.1 · ³⁾ material group 12.0 · ⁴⁾ material group 12.1 · ⁵⁾ material group 12.0&12.1

(..) = mm

Dimensions						
Ø D	min. diameter for front cutting Ø x	a	l2	No. of teeth	lbs	
0.7087 – 0.7873 (18.000 – 19.999)	Ø D – 0.157 (Ø D – 4.0)	0.236 (6.0)	0.787 (20)	6	0.07	
0.7874 – 0.8661 (20.000 – 21.999)	Ø D – 0.157 (Ø D – 4.0)	0.236 (6.0)	0.787 (20)	6	0.07	
0.8662 – 1.0629 (22.000 – 26.999)	Ø D – 0.165 (Ø D – 4.2)	0.236 (6.0)	0.787 (20)	6	0.09	
1.0630 – 1.2519 (27.000 – 31.799)	Ø D – 0.213 (Ø D – 5.4)	0.236 (6.0)	0.984 (25)	6	0.09	
1.2520 – 1.3779 (31.800 – 34.999)	Ø D – 0.236 (Ø D – 6.0)	0.236 (6.0)	0.984 (25)	8	0.11	
1.3780 – 1.6535 (35.000 – 41.999)	Ø D – 0.272 (Ø D – 6.9)	0.236 (6.0)	0.984 (25)	8	0.29-0.33	
1.6536 – 2.0472 (42.000 – 51.999)	Ø D – 0.295 (Ø D – 7.5)	0.236 (6.0)	1.181 (30)	8	0.44-0.55	
2.0473 – 2.5591 (52.000 – 65.000)	Ø D – 0.346 (Ø D – 8.8)	0.315 (8.0)	1.378 (35)	10	0.77-0.99	

Order example: Order No. 75H.93 · Bore diameter 65 mm · Bore tolerance H6 · Material St37 or ASG3000 (Cutting geometry page 14-15)

Preferred range available from stock. See page 94-95.

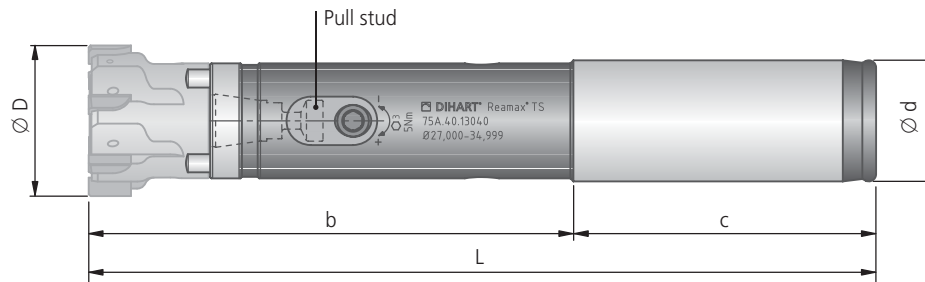
Patented design

Ø 0.7087 – 2.5591 inch
(Ø 18.000 – 65.000 mm)

DIHART REAMAX® TS

Holder with cylindrical shank similar to DIN 1835

with internal coolant supply ■



(..) = mm

Ø D	Short version						Long version					
	Order No.	L	b	c	Ø d	lbs	Order No.	L	b	c	Ø d	lbs
0.7087 – 0.7873 (18.000 - 19.999)	75A.40.13010	5.118 (130)	3.150 (80)	1.968 (50)	0.787 (20)	0.44	75A.40.15010	7.480 (190)	5.512 (140)	1.968 (50)	0.787 (20)	0.66
0.7874 – 0.8661 (20.000 - 21.999)	75A.40.13020	5.118 (130)	3.150 (80)	1.968 (50)	0.787 (20)	0.44	75A.40.15020	7.480 (190)	5.512 (140)	1.968 (50)	0.787 (20)	0.66
0.8662 – 1.0629 (22.000 - 26.999)	75A.40.13030	5.118 (130)	3.150 (80)	1.968 (50)	0.787 (20)	0.66	75A.40.15030	8.268 (210)	6.299 (160)	1.968 (50)	0.787 (20)	0.88
1.0630 – 1.2519 (27.000 - 31.799)	75A.40.13040	6.929 (176)	4.724 (120)	2.205 (56)	0.984 (25)	1.10	75A.40.15040	9.291 (236)	7.087 (180)	2.205 (56)	0.984 (25)	1.54
1.2520 – 1.3779 (31.800 - 34.999)												
1.3780 – 1.6535 (35.000 - 41.999)	75A.40.13050	6.929 (176)	4.724 (120)	2.205 (56)	0.984 (25)	1.32	75A.40.15050	10.079 (256)	7.874 (200)	2.205 (56)	0.984 (25)	2.20
1.6536 – 2.0472 (42.000 - 51.999)	75A.40.13060	7.087 (180)	4.724 (120)	2.362 (60)	1.260 (32)	1.98	75A.40.15060	11.024 (280)	8.661 (220)	2.362 (60)	1.260 (32)	3.31
2.0473 – 2.5591 (52.000 - 65.000)	75A.40.13070	7.087 (180)	4.724 (120)	2.362 (60)	1.260 (32)	2.20	75A.40.15070	11.024 (280)	8.661 (220)	2.362 (60)	1.260 (32)	4.41

Includes: REAMAX® TS holder complete with operating key, pull stud and open-end wrench (→ page 21).
Please order reaming head separately.

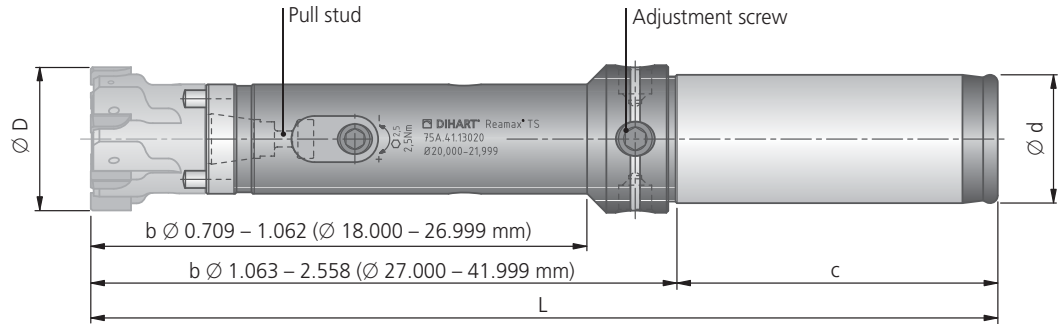


DIHART REAMAX® TS



DAH® Zero Holder with cylindrical shank similar to DIN 1835

Ø 0.7087 – 1.6535 inch
(Ø 18.000 – 41.999 mm)

- with internal coolant supply
- holder is set to a run-out of < 0.0002" (< 0.005 mm)



(..) = mm

Ø D	Short version						Long version					
	Order No.	L	b	c	Ø d		Order No.	L	b	c	Ø d	
0.7087 – 0.7873 (18.000 - 19.999)	75A.41.13010	5.709 (145)	3.150 (80)	1.968 (50)	0.787 (20)	0.44	75A.41.15010	8.071 (205)	5.512 (140)	1.968 (50)	0.787 (20)	0.66
0.7874 – 0.8661 (20.000 - 21.999)	75A.41.13020	5.709 (145)	3.150 (80)	1.968 (50)	0.787 (20)	0.66	75A.41.15020	8.071 (205)	5.512 (140)	1.968 (50)	0.787 (20)	0.88
0.8662 – 1.0629 (22.000 - 26.999)	75A.41.13030	5.709 (145)	3.150 (80)	1.968 (50)	0.787 (20)	0.66	75A.41.15030	8.858 (225)	6.299 (160)	1.968 (50)	0.787 (20)	0.88
1.0630 – 1.3779 (27.000 - 34.999)	75A.41.13040	6.929 (176)	4.724 (120)	2.205 (56)	0.984 (25)	1.10	75A.41.15040	9.291 (236)	7.087 (180)	2.205 (56)	0.984 (25)	1.54
1.3780 – 1.6535 (35.000 - 41.999)	75A.41.13050	6.929 (176)	4.724 (120)	2.205 (56)	0.984 (25)	1.10	75A.41.15050	10.079 (256)	7.874 (200)	2.205 (56)	0.984 (25)	2.31

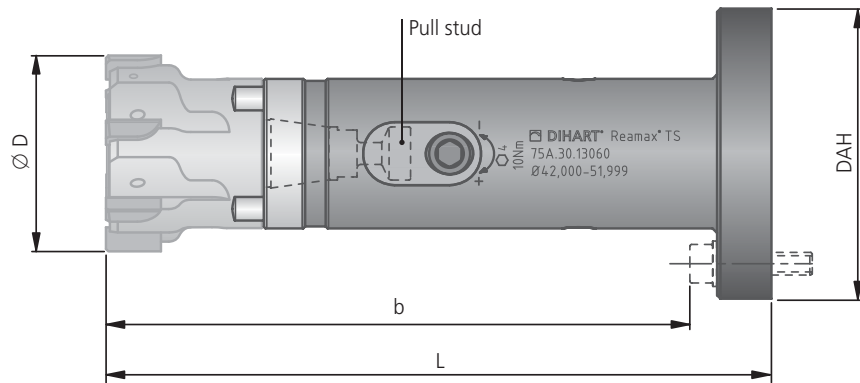
Includes: DAH® Zero holder complete with operating key, pull stud and open-end wrench (→ page 21).
Please order reaming head separately.

Patented design



Ø 1.6536 – 2.5591 inch
(Ø 42.000 – 65.000 mm)

DIHART REAMAX® TS Holder with DAH® Connection

with internal coolant supply ■



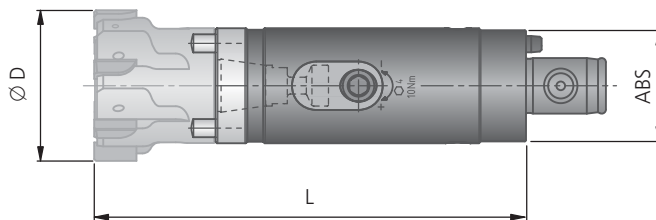
(..) = mm

Ø D	Short version					Long version				
	Order No.	L	b	DAH		Order No.	L	b	DAH	
1.6536 – 2.0472 (42.000 - 51.999)	75A.30.13060	5.433 (138)	4.724 (120)	81	1.98	75A.30.15060	9.370 (238)	8.661 (220)	81	3.31
2.0473 – 2.5591 (52.000 - 65.000)	75A.30.13070	5.433 (138)	4.724 (120)	81	2.20	75A.30.15070	9.370 (238)	8.661 (220)	81	4.41


Includes: REAMAX® TS holder with operating key, pull stud and open-end wrench (→ page 21).
Please order reaming head separately. DAH® compensation holder see Chapter 8.

Ø 1.3780 – 2.5591 inch
(Ø 35.000 – 65.000 mm)

Holder with ABS® Connection with internal coolant supply ■



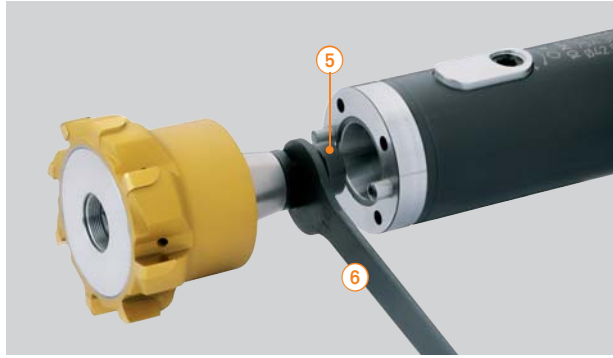
(..) = mm

Dimensions				
Ø D	Order No.	L	ABS	
1.3780 – 1.6535 (35.000 - 41.999)	75A.60.13050	4.331 (110)	32	0.92
1.6536 – 2.0472 (42.000 - 51.999)	75A.60.13060	4.527 (115)	32	1.17
2.0473 – 2.5591 (52.000 - 65.000)	75A.60.13070	4.921 (125)	40	1.83

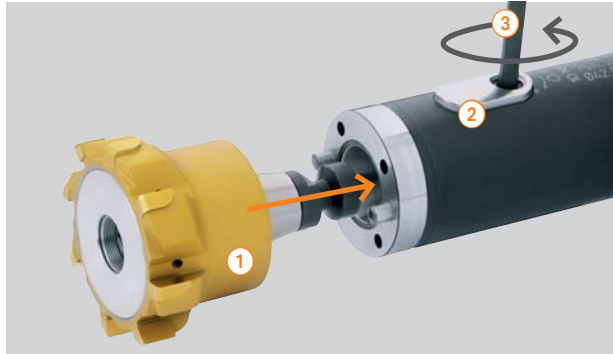
Includes: REAMAX® TS holder with operating key, pull stud and open-end wrench (→ page 21).
Please order reaming head separately.

DIHART REAMAX® TS

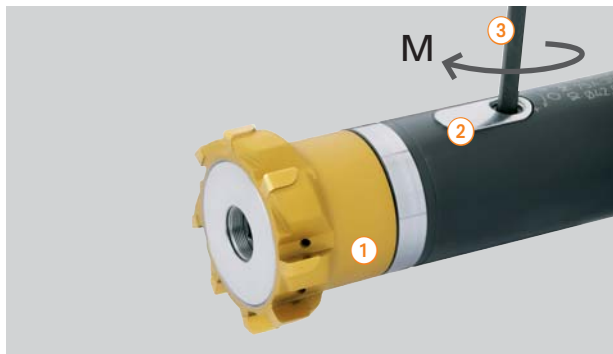
Assembly instructions



Clean taper/face contact thoroughly (grease and debris free). Screw retention knob ⑤ into reaming head and tighten with open-end wrench ⑥.

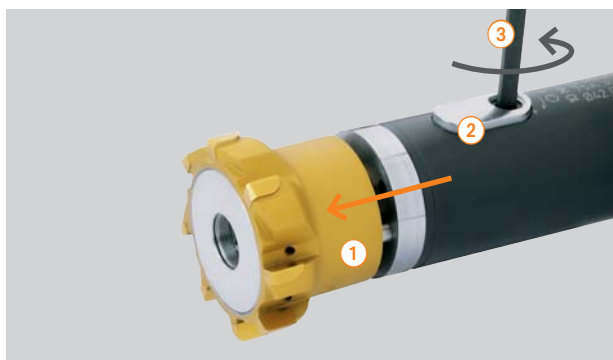


Open clamping jaws ② with key ③. Insert reaming head ①.

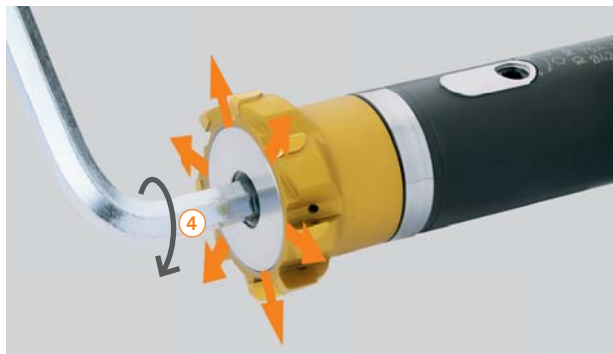


Close clamping jaws ② with key ③, noting recommended torque. When inserting the reaming head ① this is drawn into its final position by the clamping jaws ②.

Dia. range	Torque M
0.7087 – 0.7873 (18.000 - 19.999)	13 in-lbs (1.5 Nm)
0.7874 – 0.8661 (20.000 - 21.999)	22 in-lbs (2.5 Nm)
0.8662 – 1.0629 (22.000 - 26.999)	35 in-lbs (4 Nm)
1.0630 - 1.3779 (27.000 - 34.999)	44 in-lbs (5 Nm)
1.3780 - 1.6535 (35.000 - 41.999)	53 in-lbs (6 Nm)
1.6535 - 2.0472 (42.000 - 51.999)	88 in-lbs (10 Nm)
2.0473 - 2.5591 (52.000 - 65.000)	111 in-lbs (13 Nm)



When removing, the reaming head ① is pressed out of its position by the clamping jaws ② which allows it to be easily removed from the holder: open the clamping jaws ② with the key ③, remove the reaming head ①.



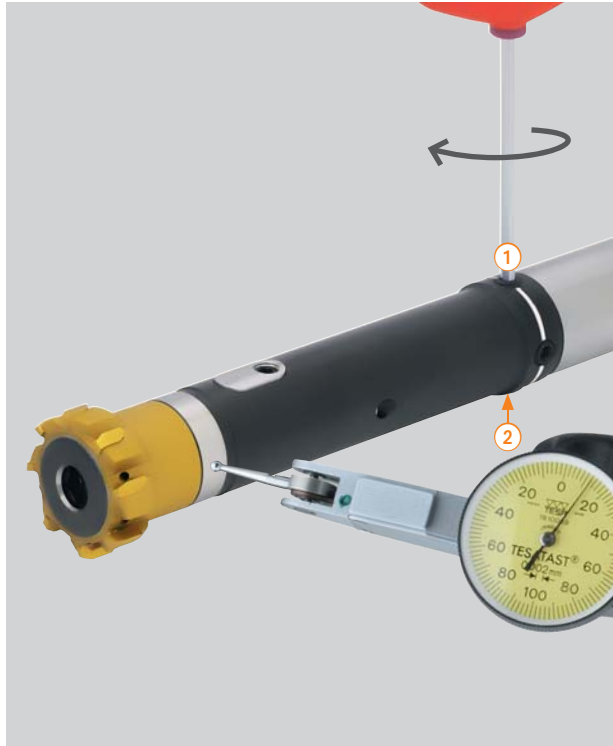
Adjusting to compensate for wear

The bore tolerances as small as IT4 can be achieved by adjusting with the hexagonal key ④. Hexagonal wrench not included with REAMAX® TS heads or holders.

Patented design

DIHART REAMAX® TS

Operating Instruction DAH® Zero



Adjusting:





- Set the indicator dial by adjusting the bezel position.
- Locate the highest run-out point on the dial by rotating the tool.
- Turn the adjustment screw clockwise using an Allen key ①, correcting the run-out. Over-tension by approx. 5 µm.
- Engage the opposite adjustment screws ② and drive back the tool by the specified over-tension value.
- Engage the two other adjustment screws.
- Align all 4 adjustment screws until concentricity is < 2 µm.

Please note:

- Only unscrew the adjustment screws by a max of ½ to 1 rotation.
- Never use the holder without the reamer head clamped and then only when the adjustment screws are tightened.
- In order to properly set this tool, an indicator with 0.002mm or 0.0001" discrimination is required.
- Indicate the tool when mounted in the machine spindle.

Replacement parts / Accessories

(..) = mm

Ø D	③ Clamping key 				④ Hexagonal key* 	⑤ Retention knob 	⑥ Open-end wrench for retention knob 	
	Size	Order No.	L	Torque M	Size	Order No.	Size	Order No.
0.7087 – 0.7873 (18.000 - 19.999)	8IP	L05 01240		13.3 in-lbs (1.5 Nm)	SW 4	15E.30.10010	SW 5	18589 10005
0.7874 – 0.8661 (20.000 - 21.999)	SW 2.5	18050 10025	(100)	22.1 in-lbs (2.5 Nm)	SW 5	15E.30.10020	SW 5	18589 10005
0.8662 – 1.0629 (22.000 - 26.999)	SW 3	18050 10030	(100)	35.4 in-lbs (4 Nm)	SW 5	15E.30.10030	SW 6	18589 10006
1.0630 - 1.3779 (27.000 - 34.999)	SW 3	18050 10030	(100)	44.3 in-lbs (5 Nm)	SW 8	15E.30.10040	SW 8	18589 10008
1.3780 - 1.6535 (35.000 - 41.999)	SW 3	18050 10030	(100)	53.1 in-lbs (6 Nm)	SW 6	15E.30.10050	SW 10	18589 10010
1.6535 - 2.0472 (42.000 - 51.999)	SW 4	18050 10040	(100)	88.5 in-lbs (10 Nm)	SW 8	15E.30.10050	SW 10	18589 10010
2.0473 - 2.5590 (52.000 - 64.999)	SW 5	18050 10050	(100)	115 in-lbs (13 Nm)	SW 10	15E.30.10070	SW 13	18589 10013

* not included with REAMAX® TS heads or holders.



The new dimension in high performance reaming

More performance. More flexibility. DIHART's high-speed reaming series, REAMAX®, provides maximum cutting performance through multiple cutting edges and offers all the advantages of replaceable cutting inserts in one system.

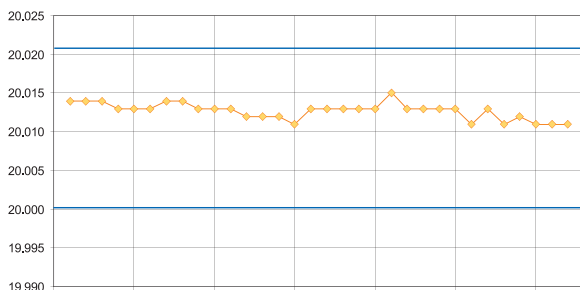
- Maximum efficiency and complete process capability
- High rigidity during maximum cutting speed
- No size setting when blades are replaced
- Maximum flexibility for combining cutting materials and coatings along with diameters and geometry are available and can be chosen for each specific application
- Made to order, short delivery time
- Precise repeatability and replacement accuracy
- Designed for inner coolant supply and minimal quantity lubrication (MQL)

Reaming tools

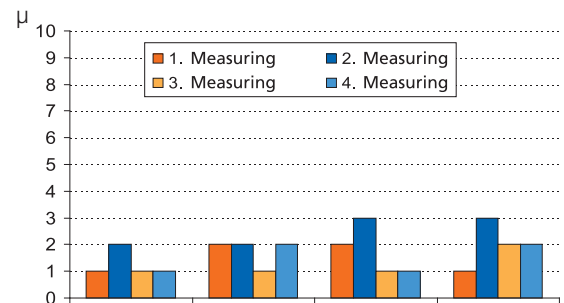
The modular reaming tool consists of a tool holder with cylindrical shaft and the REAMAX® replaceable head. A high precision short taper ensures the connection between the replaceable head and the holder. Precise repeatability from head to head allows for minimal tool change time.

Maximum process efficiency and accurate repeatability

Result in steel with DIHART REAMAX® -replaceable head



Replacement accuracy of the DIHART REAMAX® -connection



BENEFITS for you:

- Precision ground modular system for guaranteed consistency
- Maximum stability for the most demanding machining tasks
- Extremely high repeatability through a tapered flat bearing face
- Extremely high machining performance for the maximum efficiency
- Minimum quantity lubrication (MQL) optimized for environmentally friendly use

Simple possible replacement

The DIHART REAMAX® replaceable head is fixed on to the tool holder with a tie-rod and a clamping nut. There is no need for time and cost intensive setting to the final size as the heads are manufactured specifically for each application to the exact diameter and tolerance. DIHART REAMAX® offers replacement time with no idle time.

Application:

- All current materials
- Through and blind holes
- 3 × D and 5 × D
- High speed – up to 985 ft/min (300 m/min)
- Feed – up to 0.094 in/rev (2.4 mm/rev)

DIHART REAMAX®	Page
Tool Recommendation	24 – 25
Replaceable Head	
Ø 0.4724 – 1.5748 inch (Ø 12.000 – 40.000 mm)	26
Holder	
Cylindrical shank	27
Assembly Instructions	28
Replacement parts / Accessories	29



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DIHART REAMAX®

Tool Recommendation

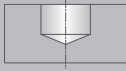
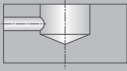
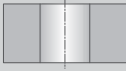
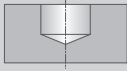
Material group	Strength Rm (lbf/in ²)	Hardness HB	Material	Material example AISI / SAE	High-speed machining					
										
					Order No.	Cutting geometry (ASG)	Cutting material/coating	Order No.	Cutting geometry (ASG)	Cutting material/coating
P	1.0	≤ 72,500	non-alloy steels	1010 1144 1213	640.92	ASG05	DST	640.70	ASG05	TiN
	2.0	72,500 - 130,000	non-alloy / low alloy steels	1055 5115 5120	640.92	ASG05	DST	640.70	ASG05	TiN
	2.1	< 72,500	lead alloys	12L14	640.92	ASG05	DST	640.70	ASG05	TiN
	3.0	> 130,000	non alloy / low alloy steels: heat resistant structural, heat treated, nitride and tools steels	1064 4140	640.92	ASG05	DST	640.71	ASG3000	TiN
	4.0	> 130,000	high alloy steels	H13 H21	640.70	ASG0106	TiN	640.71	ASG0106	TiN
	4.1		HSS	M10 T4						
S	5.0		250 special alloys: Inconel, Hastelloy, Nimonic, stc.	Inconel® 718 Nimonic® 80A						
	5.1	58,000	titanium, titanium alloys	Ti-6Al-4V						
M	6.0	≤ 87,000	stainless steels	304L 316	640.49	ASG0106	DBF	640.49	ASG0106	DBF
	6.1	< 130,000	stainless steels	630	640.49	ASG0106	DBF	640.49	ASG0106	DBF
	7.0	> 130,000	stainless / fireproof steels	403 420	640.49	ASG0106	DBF	640.49	ASG0106	DBF
K	8.0		180 gray cast iron	Class 25 G3000	640.37	ASG3000	DBG-N	640.37	ASG3000	DBG-N
	8.1		250 alloy gray cast iron	A436 Type 2	640.37	ASG3000	DBG-N	640.37	ASG3000	DBG-N
	9.0	≤ 87,000	130 ductile cast iron, ferritic	60-40-18 D4512	640.93	ASG3000	DST	640.37	ASG3000	DBG-N
	9.1		230 ductile cast iron, ferritic / perlitic	80-55-06 D5506	640.93	ASG3000	DST	640.37	ASG3000	DBG-N
	10.0	> 87,000	250 spheroidal graphite cast iron, perlitic malleable iron	100-70-03 07003	640.93	ASG3000	DST	640.37	ASG3000	DBG-N
	10.1		200 alloyed spheroidal graphite cast iron	A43D2	640.37	ASG3000	DBG-N	640.37	ASG3000	DBG-N
	10.2		300 vermicular cast iron		640.37	ASG3000	DBG-N	640.37	ASG3000	DBG-N
N	12.0		90 copper alloy, brass, lead-alloy bronze, lead bronze: good cut	316	640.93	ASG3000	DST	640.71	ASG3000	TiN
	12.1		100 copper alloy, brass, bronze: average cut		640.71	ASG3000	TiN	640.71	ASG3000	TiN
	13.0		60 wrought aluminum alloys	6151 7075	640.27	ASG0706	DBC	640.27	ASG0706	DBC
	13.1		75 cast aluminum alloy: Si-content < 10% magnesium alloy	380 A356.0	640.27	ASG0706	DBC	640.27	ASG0706	DBC
	14.0		100 cast aluminum alloy: Si-content > 10%	383 A413.0	640.27	ASG0706	DBC	640.27	ASG0706	DBC
H	15.0	203,000	hardened steels < 45 HRC		640.37	ASG0106	DBG-N			
	16.0	261,000	hardened steels > 45 HRC, ≤ 55 HRC		640.37	ASG0106	DBG-N			

For inquiries concerning tools for materials without a recommendation, please contact us.

Patent applied for inside and outside Germany.


DIHART REAMAX® Tool Recommendation



High-speed machining							Conventional machining					
												
Order No.	Cutting geometry (ASG)	Cutting material/coating	Order No.	Cutting geometry (ASG)	Cutting material/coating	Order No.	Cutting geometry (ASG)	Cutting material	Order No.	Cutting geometry (ASG)	Cutting material	
640.93	ASG3000	DST	640.71	ASG3000	TiN	640.21	ASG3000	HM	640.21	ASG3000	HM	
640.93	ASG3000	DST	640.71	ASG3000	TiN	640.21	ASG02	HM	640.21	ASG02	HM	
640.93	ASG3000	DST	640.71	ASG3000	TiN	640.21	ASG3000	HM	640.21	ASG3000	HM	
640.93	ASG3000	DST	640.71	ASG3000	TiN	640.21	ASG3000	HM	640.21	ASG3000	HM	
640.71	ASG0106	TiN	640.71	ASG0106	TiN	640.21	ASG0106	HM	640.21	ASG0106	HM	
						640.21	ASG03	HM	640.21	ASG03	HM	
640.49	ASG0106	DBF	640.49	ASG0106	DBF	640.21	ASG0106	HM	640.21	ASG0106	HM	
640.49	ASG0106	DBF	640.49	ASG0106	DBF	640.21	ASG0106	HM	640.21	ASG0106	HM	
640.49	ASG0106	DBF	640.49	ASG0106	DBF	640.21	ASG0106	HM	640.21	ASG0106	HM	
640.37	ASG3000	DBG-N	640.37	ASG3000	DBG-N	640.21	ASG3000	HM	640.21	ASG3000	HM	
640.37	ASG3000	DBG-N	640.37	ASG3000	DBG-N	640.21	ASG3000	HM	640.21	ASG3000	HM	
640.93	ASG3000	DST	640.37	ASG3000	DBG-N	640.21	ASG02	HM	640.21	ASG02	HM	
640.93	ASG3000	DST	640.37	ASG3000	DBG-N	640.21	ASG3000	HM	640.21	ASG3000	HM	
640.93	ASG3000	DST	640.37	ASG3000	DBG-N	640.21	ASG3000	HM	640.21	ASG3000	HM	
640.37	ASG3000	DBG-N	640.37	ASG3000	DBG-N	640.21	ASG3000	HM	640.21	ASG3000	HM	
640.37	ASG3000	DBG-N	640.37	ASG3000	DBG-N	640.21	ASG3000	HM	640.21	ASG3000	HM	
640.93	ASG3000	DST	640.71	ASG3000	TiN	640.21	ASG0106	HM	640.21	ASG0106	HM	
640.71	ASG3000	TiN	640.71	ASG3000	TiN	640.21	ASG0106	HM	640.21	ASG0106	HM	
640.27	ASG0706	DBC	640.27	ASG0706	DBC	640.21	ASG02	HM	640.21	ASG02	HM	
640.27	ASG0706	DBC	640.27	ASG0706	DBC	640.21	ASG3000	HM	640.21	ASG3000	HM	
640.27	ASG0706	DBC	640.27	ASG0706	DBC	640.21	ASG3000	HM	640.21	ASG3000	HM	
640.37	ASG0106	DBG-N										
640.37	ASG0106	DBG-N										



Cutting speed and feed see pages 100-101.

Important: See chapter  for more application details and safety notes!

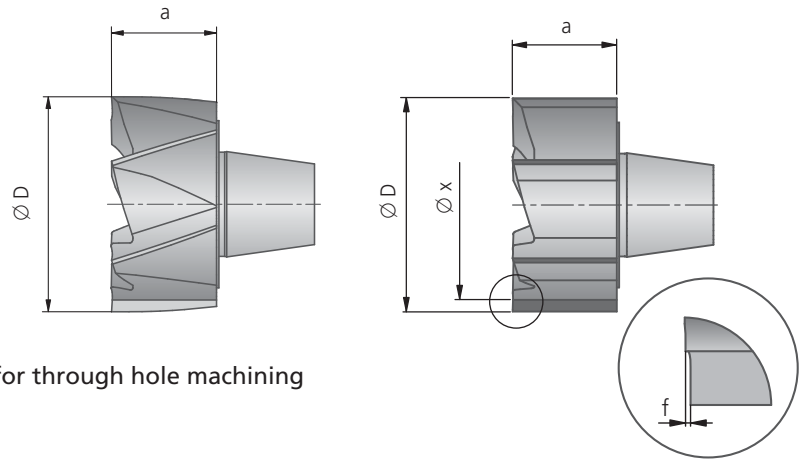
DIHART REAMAX®

Replaceable Heads

Ø 0.4724 – 1.5748 inch
(Ø 12.000 – 40.000 mm)

■ for through and blind hole machining

Please note: do not use Ø 0.472 – 0.492" (Ø12.000 - 12.500 mm) for blind hole machining



for through hole machining

■ Custom reaming head – selection options!

Selection: Cutting material, material, coolant supply														
Order No.	Order No.	Cutting material / coating	for material			for material								
			P	M	K	N	S	H	P	M	K	N	S	H
640.20	640.21	HM	● ¹⁾	● ¹⁾	● ¹⁾	● ¹⁾	● ¹⁾	● ¹⁾	● ¹⁾	● ¹⁾	● ¹⁾	● ¹⁾	● ¹⁾	● ¹⁾
640.70	640.71	TiN	●	●		● ⁴⁾	●		●	●		● ⁵⁾	●	
640.36	640.37	DBG-N						●	●					●
640.48	640.49	DBF		●	●				●	●	●			
640.26	640.27	DBC				●						●		
640.92	640.93	DST	●			● ³⁾								
640.66	640.67	DJC			● ²⁾									

Selection example: material St37, cutting material DST, central coolant supply, bore without interruption = Order No. 640.93

● main area of application ○ suitable in some cases

¹⁾ conventional machining · ²⁾ material group 10.0&10.1 · ³⁾ material group 12.0 · ⁴⁾ material group 12.1 · ⁵⁾ material group 12.0&12.1

(..) = mm

Dimensions				
Ø D	min. diameter for front cutting Ø x ~	a ~	l2 ~	No. of teeth
0.4724 – 0.6299 (12.000 – 15.999)	Ø D – 0.098 (Ø D – 2.5)	0.354 (9.0)	0.020 (0.5)	6
0.6300 – 0.8660 (16.000 – 21.999)	Ø D – 0.118 (Ø D – 3.0)	0.354 (9.0)	0.020 (0.5)	6
0.8661 – 1.0235 (22.000 – 25.999)	Ø D – 0.118 (Ø D – 3.0)	0.354 (9.0)	0.020 (0.5)	8
1.0236 – 1.2598 (26.000 – 32.000)	Ø D – 0.157 (Ø D – 4.0)	0.354 (9.0)	0.020 (0.5)	8
1.2599 – 1.5748 (32.001 – 40.000)	Ø D – 0.157 (Ø D – 4.0)	0.354 (9.0)	0.020 (0.5)	8

Order example: Order No. 640.93 · Bore diameter 21 mm · Bore tolerance H6 · Material St37 or ASG3000 (Cutting geometry page 24-25)

Preferred range available from stock. See page 94.

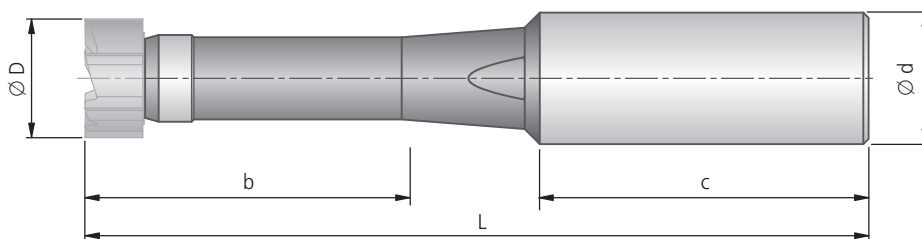
Patented design

Ø 0.4724 – 1.5748 inch
(Ø 12.000 – 40.000 mm)



DIHART REAMAX®

Holder with cylindrical shank similar to DIN 1835

- with internal coolant supply ■
- suitable for minimum quantity lubrication (MQL) ■
- not suitable for shrink fit ■



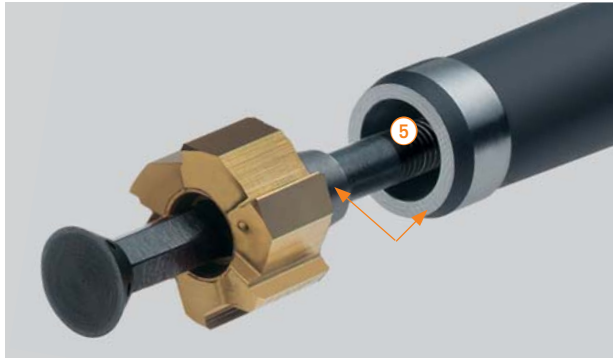
(..) = mm

for Ø D	Short version						Long version					
	Order No.	L	b	c	Ø d	 lbs	Order No.	L	b	c	Ø d	 lbs
0.4724 – 0.6299 (12.000 – 15.999)	640.01.001	4.213 (107)	1.890 (48)	1.890 (48)	0.630 (16)	0.24	640.81.001	5.394 (137)	2.953 (75)	1.890 (48)	0.630 (16)	0.29
0.6300 – 0.8660 (16.000 – 21.999)	640.01.002	4.685 (119)	2.520 (64)	1.969 (50)	0.787 (20)	0.40	640.81.002	6.653 (169)	4.370 (111)	1.968 (50)	0.787 (20)	0.51
0.8661 – 1.0235 (22.000 – 25.999)	640.01.003	5.512 (140)	3.071 (78)	2.205 (56)	0.984 (25)	0.75	640.81.003	7.746 (196)	5.157 (131)	2.205 (56)	0.984 (25)	0.97
1.0236 – 1.2598 (26.000 – 32.000)	640.01.005	6.299 (160)	4.094 (104)	2.205 (56)	0.984 (25)	1.01	640.81.005	8.898 (226)	6.693 (170)	2.205 (56)	0.984 (25)	1.43
1.2599 – 1.5748 (32.001 – 40.000)	640.01.006	7.835 (199)	5.472 (139)	2.362 (60)	1.260 (32)	1.90	640.81.006	10.630 (270)	8.268 (210)	2.362 (60)	1.260 (32)	2.49

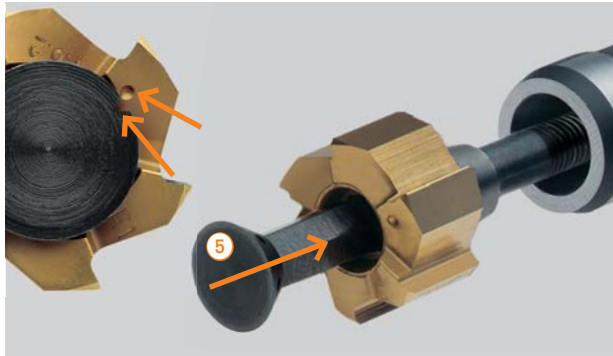
Includes: REAMAX® holder complete with operating key, open-end wrench, tie rod, seal disc and clamping nut (page 29).
Please order replaceable head separately.

DIHART REAMAX®

Assembly instructions



Clean taper/face contact thoroughly (grease and debris free).
Apply light grease on tie bar thread (5).



Locate tie bar (5) on insert and holder.
Important note: for taper size 3, 4 and 5, fit with marking on tie bar and insert aligned.



Draw in tie bar with the clamping nut. Before tightening, turn insert and tie bar clockwise until it stops.
Tighten the clamping nut as far as possible using the torque key to the recommended torque M.

Dia Range	Torque M
0.4724 – 0.6299 (12.000 – 15.999)	35 - 44 in-lbs (4-5 Nm)
0.6300 – 0.8660 (16.000 – 21.999)	53 - 62 in-lbs (6-7 Nm)
0.8661 – 1.0235 (22.000 – 25.999)	88 - 106 in-lbs (10-12 Nm)
1.0236 – 1.2598 (26.000 – 32.000)	159 - 177 in-lbs (18-20 Nm)
1.2599 – 1.5748 (32.001 – 40.000)	230 - 248 in-lbs (26-28 Nm)



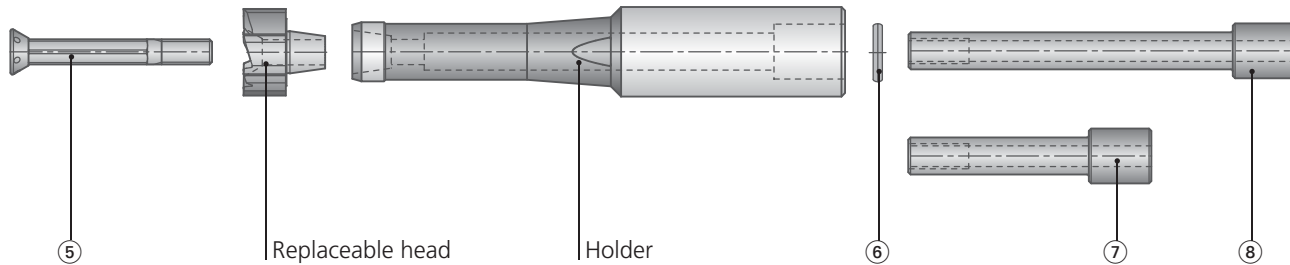
Removing the replaceable head:
Loosen the clamping screw.
Pull tie bar from holder and head.





Locate clamping key (3) in head and loosen insert by turning.




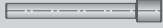
DIHART REAMAX®

Replacement parts / Accessories



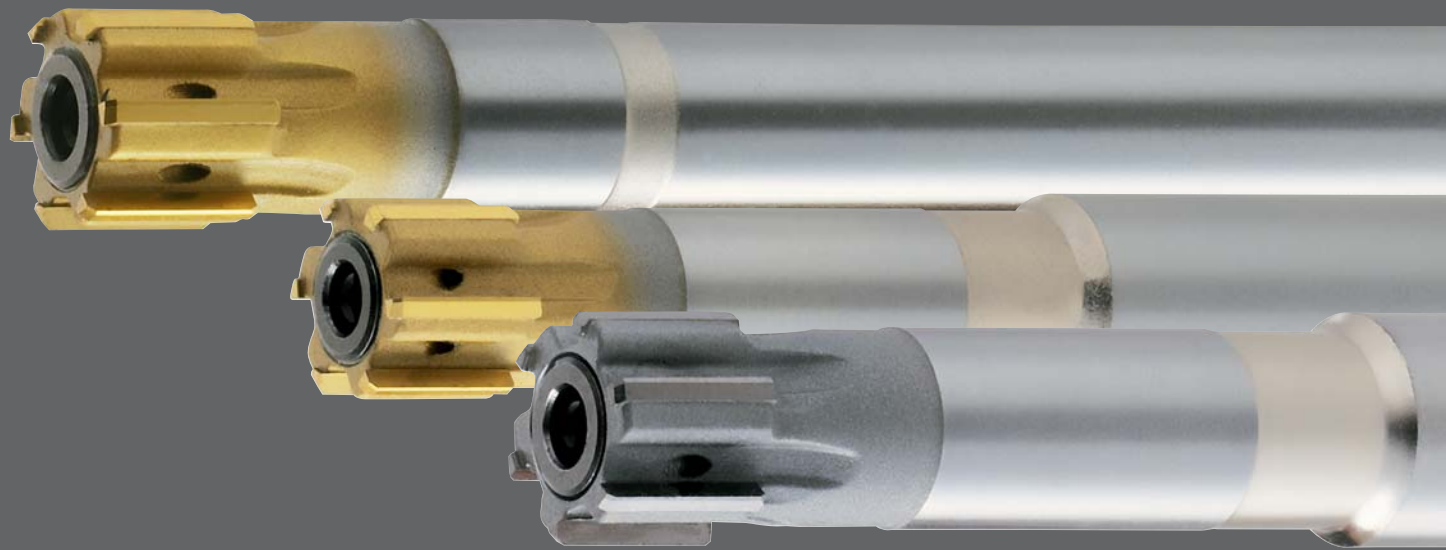
(..) = mm

Ø D	Size	③ Clamping key 			L	④ Open-end wrench 	
		Order No. short version	L	Order No. long version		Size	Order No.
0.4724 – 0.6299 (12.000 – 15.999)	SW 4	18050 10040	(100)	18050 20040	(200)	SW 12	18589 00012
0.6300 – 0.8660 (16.000 – 21.999)	SW 5	18050 10050	(100)	18050 10055	(350)	SW 14	18589 00014
0.8661 – 1.0235 (22.000 – 25.999)	SW 7	18050 10070	(100)	18050 35070	(350)	SW 19	18589 00019
1.0236 – 1.2598 (26.000 – 32.000)	SW 8	18050 10080	(100)	18050 35080	(350)	SW 22	18589 00022
1.2599 – 1.5748 (32.001 – 40.000)	SW 10	18050 20100	(200)	18050 35100	(350)	SW 27	18589 00027

for Ø D	⑤ Tie-rod  Order No.	⑥ Seal disc DIN 472  Order No.	⑦ Clamping nut short version  Order No.	⑧ Clamping nut long version  Order No.
0.4724 – 0.6299 (12.000 – 15.999)	640.03.001	55232 01010	640.04.001	640.84.001
0.6300 – 0.8660 (16.000 – 21.999)	640.03.002	55232 01210	640.04.002	640.84.002
0.8661 – 1.0235 (22.000 – 25.999)	640.03.003	55232 01610	640.04.003	640.84.003
1.0236 – 1.2598 (26.000 – 32.000)	640.03.004	55232 01610	640.04.005	640.84.005
1.2599 – 1.5748 (32.001 – 40.000)	640.03.005	55232 02210	640.04.006	640.84.006

Includes: REAMAX® holder complete with operating key, open-end wrench, tie rod, seal disc and clamping nut.

DIHART Monomax® – Expandable



DIHART Monomax®

One-piece tools – known as monobloc tools – are one of DIHART's specialities. The demands which have been made over decades are reflected in an enormous number of types and variations. This successful tool program has been completely revised with many standards available through efficient manufacturing.

BENEFITS for you:

- Designed for small hole diameters
- Wear compensation for extremely small hole tolerances
- Extremely durable due to one piece construction
- Precision ground to size

Application:

- Non-alloy and low alloy steels
- Stainless, heat resistant and high alloy steels
- Grey cast iron and spheroidal graphite cast iron
- Copper alloys, brass and bronze
- Aluminum
- Titanium, titanium alloys, CGI and plastic on request

Versions:

- Short and long versions
- Through and blind hole coolant outlets available
- Uncoated and coated carbide or DST
- Diameter range 0.2205 – 1.0197 inch (5.600 – 25.899 mm)



DIHART Monomax® Page

Tool Recommendation 32 – 33

Monomax® – Expandable

Ø 0.2205 – 1.0197 inch (Ø 5.600 – 25.899 mm) with cylindrical shank – short version 34 – 35

Ø 0.2205 – 1.0197 inch (Ø 5.600 – 25.899 mm) with cylindrical shank – long version 36 – 37

1



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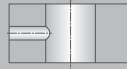


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DIHART Monomax® – Expandable

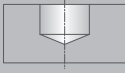
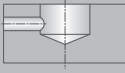

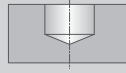
Tool Recommendation

Material group	Strength Rm (lbf/in ²)	Hardness HB	Material	Material example ANSI / SAE	High-speed machining						
											
					Order No. long short	Cutting geometry (ASG)	Cutting material/ coating	Order No. long short	Cutting geometry (ASG)	Cutting material/ coating	
P	1.0	≤ 72,500	non-alloy steels	1010 1144 1213	56J.93 56R.93	ASG4000	DST	56J.71 56R.71	ASG4000	TiN	
	2.0	72,500 - 130,000	non-alloy / low alloy steels	1055 5115 5120	56J.93 56R.93	ASG4000	DST	56J.71 56R.71	ASG4000	TiN	
	2.1	< 72,500	lead alloys	12L14	56J.93 56R.93	ASG4000	DST	56J.71 56R.71	ASG4000	TiN	
	3.0	> 130,000	non alloy / low alloy steels: heat resistant structural, heat treated, nitride and tools steels	1064 4140	56J.93 56R.93	ASG4000	DST	56J.71 56R.71	ASG3000	TiN	
	4.0	> 130,000	high alloy steels	H13 H21	56J.71 56R.71	ASG0106	TiN	56J.71 56R.71	ASG0106	TiN	
	4.1		HSS	M10 T4							
S	5.0		250	special alloys: Inconel, Hastelloy, Nimonic, stc.	Inconel® 718 Nimonic® 80A						
	5.1	58,000		titanium, titanium alloys	Ti-6Al-4V						
M	6.0	≤ 87,000		stainless steels	304L 316	56J.47 56R.47	ASG0106	DBF	56J.47 56R.47	ASG0106	DBF
	6.1	< 130,000		stainless steels	630	56J.47 56R.47	ASG0106	DBF	56J.47 56R.47	ASG0106	DBF
	7.0	> 130,000		stainless / fireproof steels	403 420	56J.47 56R.47	ASG0106	DBF	56J.47 56R.47	ASG0106	DBF
K	8.0		180	gray cast iron	Class 25 G3000	56J.37 56R.37	ASG3000	DBG-N	56J.37 56R.37	ASG3000	DBG-N
	8.1		250	alloy gray cast iron	A436 Type 2	56J.37 56R.37	ASG3000	DBG-N	56J.37 56R.37	ASG3000	DBG-N
	9.0	≤ 87,000	130	ductile cast iron, ferritic	60-40-18 D4512	56J.93 56R.93	ASG3000	DST	56J.37 56R.37	ASG3000	DBG-N
	9.1		230	ductile cast iron, ferritic / perlitic	80-55-06 D5506	56J.93 56R.93	ASG3000	DST	56J.37 56R.37	ASG3000	DBG-N
	10.0	> 87,000	250	spheroidal graphite cast iron, perlitic malleable iron	100-70-03 07003	56J.93 56R.93	ASG3000	DST	56J.37 56R.37	ASG3000	DBG-N
	10.1		200	alloyed spheroidal graphite cast iron	A43D2	56J.37 56R.37	ASG3000	DBG-N	56J.37 56R.37	ASG3000	DBG-N
	10.2		300	vermicular cast iron		56J.37 56R.37	ASG3000	DBG-N	56J.37 56R.37	ASG3000	DBG-N
N	12.0		90	copper alloy, brass, lead-alloy bronze, lead bronze: good cut	316	56J.93 56R.93	ASG3000	DST	56J.71 56R.71	ASG3000	TiN
	12.1		100	copper alloy, brass, bronze: average cut		56J.71 56R.71	ASG3000	TiN	56J.71 56R.71	ASG3000	TiN
	13.0		60	wrought aluminum alloys	6151 7075	56J.17 56R.17	ASG0706	DBC	56J.17 56R.17	ASG0706	DBC
	13.1		75	cast aluminum alloy: Si-content < 10% magnesium alloy	380 A356.0	56J.17 56R.17	ASG0706	DBC	56J.17 56R.17	ASG0706	DBC
	14.0		100	cast aluminum alloy: Si-content > 10%	383 A413.0	56J.17 56R.17	ASG0706	DBC	56J.17 56R.17	ASG0706	DBC
H	15.0	203,000		hardened steels < 45 HRC		56J.37 56R.37	ASG0106	DBG-N			
	16.0	261,000		hardened steels > 45 HRC, ≤ 55 HRC		56J.37 56R.37	ASG0106	DBG-N			

For inquiries concerning tools for materials without a recommendation, please contact us.


DIHART Monomax® – Expandable Tool Recommendation



	High-speed machining						Conventional machining					
												
	Order No. long short	Cutting geometry (ASG)	Cutting material/ coating	Order No. long short	Cutting geometry (ASG)	Cutting material/ coating	Order No. long short	Cutting geometry (ASG)	Cutting material	Order No. long short	Cutting geometry (ASG)	Cutting material
	56H.93 56Q.93	ASG3000	DST	56H.71 56Q.71	ASG3000	TiN	56J.21 56R.21	ASG3000	HM	56H.21 56Q.21	ASG3000	HM
	56H.93 56Q.93	ASG3000	DST	56H.71 56Q.71	ASG3000	TiN	56J.21 56R.21	ASG02	HM	56H.21 56Q.21	ASG02	HM
	56H.93 56Q.93	ASG3000	DST	56H.71 56Q.71	ASG3000	TiN	56J.21 56R.21	ASG3000	HM	56H.21 56Q.21	ASG3000	HM
	56H.93 56Q.93	ASG3000	DST	56H.71 56Q.71	ASG3000	TiN	56J.21 56R.21	ASG3000	HM	56H.21 56Q.21	ASG3000	HM
	56H.71 56Q.71	ASG0106	TiN	56H.71 56Q.71	ASG0106	TiN	56J.21 56R.21	ASG0106	HM	56H.21 56Q.21	ASG0106	HM
							56J.21 56R.21	ASG03	HM	56H.21 56Q.21	ASG03	HM
	56H.47 56Q.47	ASG0106	DBF	56H.47 56Q.47	ASG0106	DBF	56J.21 56R.21	ASG0106	HM	56H.21 56Q.21	ASG0106	HM
	56H.47 56Q.47	ASG0106	DBF	56H.47 56Q.47	ASG0106	DBF	56J.21 56R.21	ASG0106	HM	56H.21 56Q.21	ASG0106	HM
	56H.47 56Q.47	ASG0106	DBF	56H.47 56Q.47	ASG0106	DBF	56J.21 56R.21	ASG0106	HM	56H.21 56Q.21	ASG0106	HM
	56H.37 56Q.37	ASG3000	DBG-N	56H.37 56Q.37	ASG3000	DBG-N	56J.21 56R.21	ASG3000	HM	56H.21 56Q.21	ASG3000	HM
	56H.37 56Q.37	ASG3000	DBG-N	56H.37 56Q.37	ASG3000	DBG-N	56J.21 56R.21	ASG3000	HM	56H.21 56Q.21	ASG3000	HM
	56H.93 56Q.93	ASG3000	DST	56H.37 56Q.37	ASG3000	DBG-N	56J.21 56R.21	ASG02	HM	56H.21 56Q.21	ASG02	HM
	56H.93 56Q.93	ASG3000	DST	56H.37 56Q.37	ASG3000	DBG-N	56J.21 56R.21	ASG3000	HM	56H.21 56Q.21	ASG3000	HM
	56H.93 56Q.93	ASG3000	DST	56H.37 56Q.37	ASG3000	DBG-N	56J.21 56R.21	ASG3000	HM	56H.21 56Q.21	ASG3000	HM
	56H.37 56Q.37	ASG3000	DBG-N	56H.37 56Q.37	ASG3000	DBG-N	56J.21 56R.21	ASG3000	HM	56H.21 56Q.21	ASG3000	HM
	56H.37 56Q.37	ASG3000	DBG-N	56H.37 56Q.37	ASG3000	DBG-N	56J.21 56R.21	ASG3000	HM	56H.21 56Q.21	ASG3000	HM
	56H.93 56Q.93	ASG3000	DST	56H.71 56Q.71	ASG3000	TiN	56J.21 56R.21	ASG0106	HM	56H.21 56Q.21	ASG0106	HM
	56H.71 56Q.71	ASG3000	TiN	56H.71 56Q.71	ASG3000	TiN	56J.21 56R.21	ASG0106	HM	56H.21 56Q.21	ASG0106	HM
	56H.17 56Q.17	ASG0706	DBC	56H.17 56Q.17	ASG0706	DBC	56J.21 56R.21	ASG02	HM	56H.21 56Q.21	ASG02	HM
	56H.17 56Q.17	ASG0706	DBC	56H.17 56Q.17	ASG0706	DBC	56J.21 56R.21	ASG3000	HM	56H.21 56Q.21	ASG3000	HM
	56H.17 56Q.17	ASG0706	DBC	56H.17 56Q.17	ASG0706	DBC	56J.21 56R.21	ASG3000	HM	56H.21 56Q.21	ASG3000	HM
	56H.37 56Q.37	ASG0106	DBG-N									
	56H.37 56Q.37	ASG0106	DBG-N									



Cutting speed and feed see pages 100-101

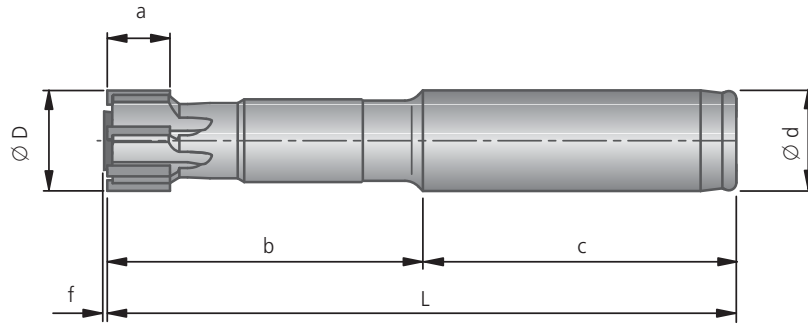
Important: See chapter  for more application details and safety notes!

DIHART Monomax® – Expandable

Short version with cylindrical shank similar to DIN 1835

Ø 0.2205 – 1.0197 inch
(Ø 5.600 – 25.899 mm)

- with internal coolant supply
- coolant supply available for blind or through hole applications



Custom reaming tool – selection options!

Inch shank

Selection: Cutting material, material, coolant supply														
Order No.	Order No.	Cutting material / coating	for material			for material								
			P	M	K	N	S	H	P	M	K	N	S	H
55J.21	55H.21	HM	● ¹⁾	● ¹⁾	● ¹⁾	● ¹⁾	● ¹⁾		● ¹⁾	● ¹⁾	● ¹⁾	● ¹⁾	● ¹⁾	
55J.71	55H.71	TiN	●	●		● ⁴⁾	●		●	●		● ⁵⁾	●	
55J.37	55H.37	DBG-N			●			●	●		●			●
55J.47	55H.47	DBF		●	●				●	●	●			
55J.17	55H.17	DBC				●						●		
55J.93	55H.93	DST	●			● ³⁾								
55J.67	55H.67	DJC			● ²⁾									

Selection example: material St37, cutting material DST, central coolant supply, bore without interruption = Order No. 56H93

● main area of application ○ suitable in some cases

¹⁾ conventional machining · ²⁾ material group 10.0&10.1 · ³⁾ material group 12.0 · ⁴⁾ material group 12.1 · ⁵⁾ material group 12.0&12.1

(..) = mm

Dimensions						
Ø D	Cylindrical shank Ø d × c inch	L inch	b inch	f ~inch	a ~inch	No. of teeth
0.2205 – 0.3503 (5.600 – 8.899)	0.500 × 1.772	3.346	1.575	0.004	0.374	4
0.3504 – 0.6259 (8.900 – 15.899)	0.500 × 1.772	3.740	1.969	0.004	0.374	6
0.6260 – 0.7440 (15.900 – 18.899)	0.625 × 1.969	3.937	1.969	0.004	0.374	6
0.7441 – 1.0197 (18.900 – 25.899)	0.750 × 2.362	4.724	2.362	0.004	0.374	6

Order example: Order No. 55H.93 · Bore diameter 24 mm · Bore tolerance H6 · Material St37 or ASG4000 (Cutting geometry page 32-33)

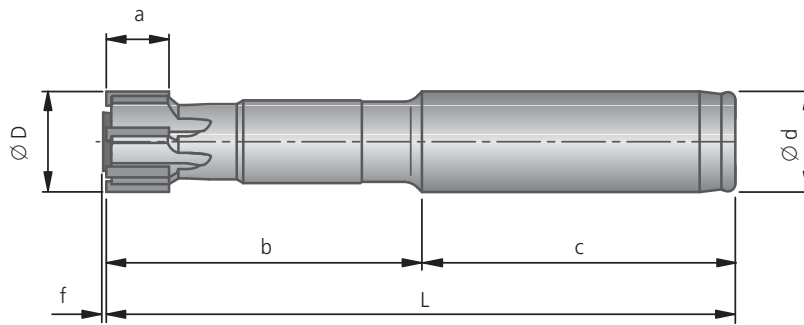
Notes: Preferred range available from stock, see page 96-97.

Ø 5.600 – 25.899 mm
(Ø 0.2205 – 1.0197 inch)

DIHART Monomax® – Expandable

Short version with cylindrical shank similar to DIN 1835

with internal coolant supply ■
coolant supply available for blind or through hole applications ■



Metric shank

Custom reaming tool – selection options! ■

Selection: Cutting material, material, coolant supply														
Order No.	Order No.	Cutting material / coating	for material			for material								
			P	M	K	N	S	H	P	M	K	N	S	H
56J.21	56H.21	HM	● ¹⁾	● ¹⁾	● ¹⁾	● ¹⁾	● ¹⁾		● ¹⁾	● ¹⁾	● ¹⁾	● ¹⁾	● ¹⁾	
56J.71	56H.71	TiN	●	●		● ⁴⁾	●		●	●		● ⁵⁾	●	
56J.37	56H.37	DBG-N			●			●	●		●			●
56J.47	56H.47	DBF		●	●				●	●	●			
56J.17	56H.17	DBC				●						●		
56J.93	56H.93	DST	●			● ³⁾								
56J.67	56H.67	DJC			● ²⁾									

Selection example: material St37, cutting material DST, central coolant supply, bore without interruption = Order No. 56H93

● main area of application ● suitable in some cases

¹⁾ conventional machining · ²⁾ material group 10.0&10.1 · ³⁾ material group 12.0 · ⁴⁾ material group 12.1 · ⁵⁾ material group 12.0&12.1

(..) = inch

Dimensions						
Ø D	Cylindrical shank Ø d × c mm	L mm	b mm	f ~mm	a ~mm	No. of teeth
5.600 – 8.899 (0.2205 – 0.3503)	12 × 45	85	40	0.1	9.5	4
8.900 – 15.899 (0.3504 – 0.6259)	12 × 45	95	50	0.1	9.5	6
15.900 – 18.899 (0.6260 – 0.7440)	16 × 50	100	50	0.1	9.5	6
18.900 – 25.899 (0.7441 – 1.0197)	20 × 60	120	60	0.1	9.5	6

Order example: Order No. 56H.93 · Bore diameter 24 mm · Bore tolerance H6 · Material St37 or ASG4000 (Cutting geometry page 32-33)

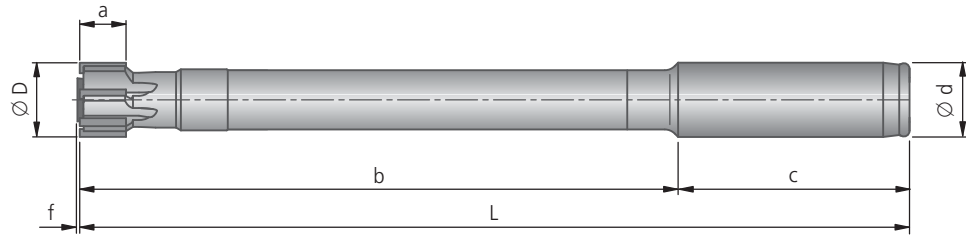
Notes: Preferred range available from stock, see page 96-97.

DIHART Monomax® – Expandable

Long version with cylindrical shank similar to DIN 1835

Ø 0.2205 – 1.0197 inch
(Ø 5.600 – 25.899 mm)

- with internal coolant supply
- coolant supply available for blind or through hole applications



Custom reaming tool – selection options!

Inch shank

Selection: Cutting material, material, coolant supply														
Order No.	Order No.	Cutting material / coating	for material			for material								
			P	M	K	N	S	H	P	M	K	N	S	H
55R.21	55Q.21	HM	● ¹⁾	● ¹⁾	● ¹⁾	● ¹⁾	● ¹⁾	● ¹⁾	● ¹⁾	● ¹⁾	● ¹⁾	● ¹⁾	● ¹⁾	● ¹⁾
55R.71	55Q.71	TiN	●	●		● ⁴⁾	●		●	●		● ⁵⁾	●	
55R.37	55Q.37	DBG-N			●			●	●		●			●
55R.47	55Q.47	DBF		●	●				●	●	●			
55R.17	55Q.17	DBC				●						●		
55R.93	55Q.93	DST	●			● ³⁾								
55R.67	55Q.67	DJC			● ²⁾									

Selection example: material St37, cutting material DST, central coolant supply, bore without interruption = Order No. 56H93

● main area of application ○ suitable in some cases

¹⁾conventional machining · ²⁾material group 10.0&10.1 · ³⁾material group 12.0 · ⁴⁾material group 12.1 · ⁵⁾material group 12.0&12.1

(..) = mm

Dimensions						
Ø D	Cylindrical shank Ø d × c inch	L inch	b inch	f ~inch	a ~inch	No. of teeth
0.2205 – 0.3503 (5.600 – 8.899)	0.500 × 1.772	5.118	3.346	0.004	0.374	4
0.3504 – 0.3897 (8.900 – 9.899)	0.500 × 1.772	5.118	3.346	0.004	0.374	6
0.3898 – 0.6259 (9.900 – 15.899)	0.500 × 1.772	5.699	4.528	0.004	0.374	6
0.6260 – 0.7440 (15.900 – 18.899)	0.625 × 1.969	7.087	5.118	0.004	0.374	6
0.7441 – 1.0197 (18.900 – 25.899)	0.750 × 2.362	7.874	5.512	0.004	0.374	6

Order example: Order No. 55Q.93 · Bore diameter 24 mm · Bore tolerance H6 · Material St37 or ASG4000 (Cutting geometry page 32-33)

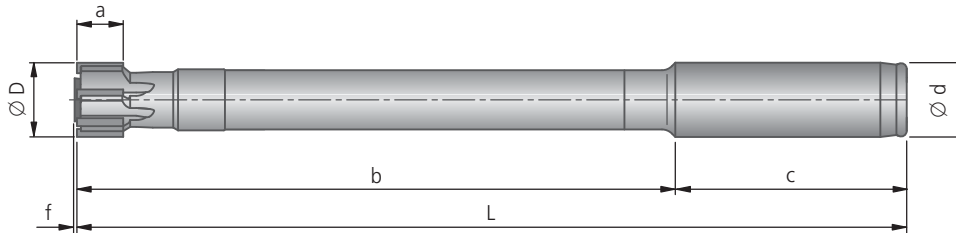
Notes: Preferred range available from stock, see page 96-97.

Ø 5.600 – 25.899 mm
(Ø 0.2205 – 1.0197 inch)

DIHART Monomax® – Expandable

Long version with cylindrical shank similar to DIN 1835

with internal coolant supply ■
coolant supply available for blind or through hole applications ■



Metric shank

Custom reaming tool – selection options! ■

Selection: Cutting material, material, coolant supply														
Order No.	Order No.	Cutting material / coating	for material			for material								
			P	M	K	N	S	H	P	M	K	N	S	H
56R.21	56Q.21	HM	● ¹⁾	● ¹⁾	● ¹⁾	● ¹⁾	● ¹⁾		● ¹⁾	● ¹⁾	● ¹⁾	● ¹⁾	● ¹⁾	
56R.71	56Q.71	TiN	●	●		● ⁴⁾	●		●	●		● ⁵⁾	●	
56R.37	56Q.37	DBG-N			●			●	●		●			●
56R.47	56Q.47	DBF		●	●				●	●	●			
56R.17	56Q.17	DBC				●						●		
56R.93	56Q.93	DST	●			● ³⁾								
56R.67	56Q.67	DJC			● ²⁾									

Selection example: material St37, cutting material DST, central coolant supply, bore without interruption = Order No. 56H93

● main area of application ● suitable in some cases

¹⁾ conventional machining · ²⁾ material group 10.0&10.1 · ³⁾ material group 12.0 · ⁴⁾ material group 12.1 · ⁵⁾ material group 12.0&12.1

(..) = inch

Dimensions						
Ø D	Cylindrical shank Ø d × c mm	L mm	b mm	f ~mm	a ~mm	No. of teeth
5.600 – 8.899 (0.2205 – 0.3503)	12 × 45	130	85	0.1	9.5	4
8.900 – 9.899 (0.3504 – 0.3897)	12 × 45	130	85	0.1	9.5	6
9.900 – 15.899 (0.3898 – 0.6259)	12 × 45	160	115	0.1	9.5	6
15.900 – 18.899 (0.6260 – 0.7440)	16 × 50	180	130	0.1	9.5	6
18.900 – 25.899 (0.7441 – 1.0197)	20 × 60	200	140	0.1	9.5	6

Order example: Order No. 56Q.93 · Bore diameter 24 mm · Bore tolerance H6 · Material St37 or ASG4000 (Cutting geometry page 32-33)

Notes: Preferred range available from stock, see page 96-97.



Universal high-performance solid carbide reaming tool

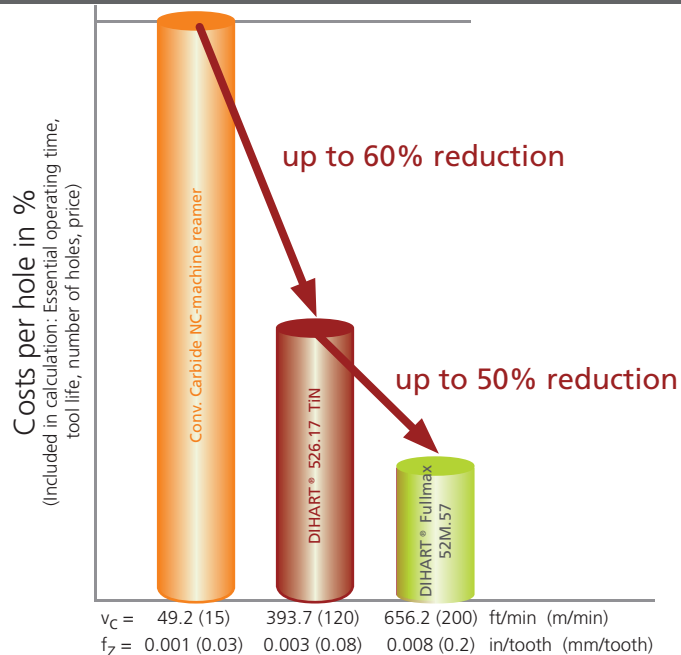
KOMET DIHART® is expanding its solid carbide reaming range with a completely overhauled universal reaming tool, available from stock in the main dimensions both with H7 tolerance and in 0.0004" (0.010 mm) size increments.

The combination of knowledge and experience gained with the previous product line has enabled us to systematically develop the cutting geometry and achieve incredibly high cutting performance in various different materials – even those hardened up to HRC62. At the same time, the modified cutting edge geometry reduces chatter marks and improves chip formation. In addition to optimal cutting edge cooling, the targeted coolant also aids smooth evacuation of chips that are formed. A high-performance coating completes the new design, and can be used for various materials. This results in significant improved wear resistance.

These characteristics and properties combine to create the kind of precision for which KOMET® is known on the market, as well as its high standards of dimensional accuracy and surface finish quality.

Application specific dimensions can be supplied in the diameter range from 0.1181 – 0.7874 inch (3 to 20 mm). In addition, preferred ranges are available from stock for diameters 4, 5, 6, 8, 10, 12 mm. Additionally, blind hole and through hole coolant variations are available.

Practical example:
 Ø 10H7 in 42CrMo4
 Blind hole with $R_z < 6.3$





080013 A

BENEFITS for you:

- Top performance for various materials
- New high-performance for universal use
- Optimized geometry for top cutting performance
- Minimal costs per hole as a result of high cutting data and tool life
- Available from stock with dimensions H7 and 0.0004" (0.010 mm) size increments



DIHART® Fullmax Page

Tool Recommendation 40 – 41

Fullmax



for blind hole machining
 Ø 0.1181 – 0.7874 inch (Ø 3.000 – 20.000 mm) 42

for through hole machining
 Ø 0.1181 – 0.7874 inch (Ø 3.000 – 20.000 mm) 43



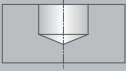
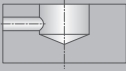
DIHART® Fullmax

Tool Recommendation

Material group	Strength Rm (lbf/in ²)	Hardness HB	Material	Material example ANSI / SAE	High-speed machining					
										
					Order No.	Cutting geometry (ASG)	Cutting material/coating	Order No.	Cutting geometry (ASG)	Cutting material/coating
P	1.0	≤ 72,500	non-alloy steels	1010 1144 1213	52P.57	ASG2210	DBG-U	52P.57	ASG2210	DBG-U
	2.0	72,500 - 130,000	non-alloy / low alloy steels	1055 5115 5120	52P.57	ASG2210	DBG-U	52P.57	ASG2210	DBG-U
	2.1	< 72,500	lead alloys	12L14	52P.57	ASG2210	DBG-U	52P.57	ASG2210	DBG-U
	3.0	> 130,000	non alloy / low alloy steels: heat resistant structural, heat treated, nitride and tools steels	1064 4140	52P.57	ASG2210	DBG-U	52P.57	ASG2210	DBG-U
	4.0	> 130,000	high alloy steels	H13 H21	52P.57	ASG2210	DBG-U	52P.57	ASG2210	DBG-U
	4.1		HSS	M10 T4						
S	5.0		250 special alloys: Inconel, Hastelloy, Nimonic, stc.	Inconel® 718 Nimonic® 80A						
	5.1	58,000	titanium, titanium alloys	Ti-6Al-4V						
M	6.0	≤ 87,000	stainless steels	304L 316	52P.57	ASG2210	DBG-U	52P.57	ASG2210	DBG-U
	6.1	< 130,000	stainless steels	630	52P.57	ASG2210	DBG-U	52P.57	ASG2210	DBG-U
	7.0	> 130,000	stainless / fireproof steels	403 420	52P.57	ASG2210	DBG-U	52P.57	ASG2210	DBG-U
K	8.0		180 gray cast iron	Class 25 G3000	52P.57	ASG2210	DBG-U	52P.57	ASG2210	DBG-U
	8.1		250 alloy gray cast iron	A436 Type 2	52P.57	ASG2210	DBG-U	52P.57	ASG2210	DBG-U
	9.0	≤ 87,000	130 ductile cast iron, ferritic	60-40-18 D4512	52P.57	ASG2210	DBG-U	52P.57	ASG2210	DBG-U
	9.1		230 ductile cast iron, ferritic / perlitic	80-55-06 D5506	52P.57	ASG2210	DBG-U	52P.57	ASG2210	DBG-U
	10.0	> 87,000	250 spheroidal graphite cast iron, perlitic malleable iron	100-70-03 07003	52P.57	ASG2210	DBG-U	52P.57	ASG2210	DBG-U
	10.1		200 alloyed spheroidal graphite cast iron	A43D2	52P.57	ASG2210	DBG-U	52P.57	ASG2210	DBG-U
N	10.2		300 vermicular cast iron		52P.57	ASG2210	DBG-U	52P.57	ASG2210	DBG-U
	12.0		90 copper alloy, brass, lead-alloy bronze, lead bronze: good cut	316	52P.57	ASG2210	DBG-U	52P.57	ASG2210	DBG-U
H	12.1		100 copper alloy, brass, bronze: average cut		52P.57	ASG2210	DBG-U	52P.57	ASG2210	DBG-U
	13.0		60 wrought aluminum alloys	6151 7075						
	13.1		75 cast aluminum alloy: Si-content < 10% magnesium alloy	380 A356.0						
	14.0		100 cast aluminum alloy: Si-content > 10%	383 A413.0						
H	15.0	203,000	hardened steels < 45 HRC							
	16.0	261,000	hardened steels > 45 HRC, ≤ 55 HRC							

For inquiries concerning tools for materials without a recommendation, please contact us.



High-speed machining						
						
Order No.	Cutting geometry (ASG)	Cutting material/ coating	Order No.	Cutting geometry (ASG)	Cutting material/ coating	
52M.57	ASG2110	DBG-U	52M.57	ASG2110	DBG-U	
52M.57	ASG2110	DBG-U	52M.57	ASG2110	DBG-U	
52M.57	ASG2110	DBG-U	52M.57	ASG2110	DBG-U	
52M.57	ASG2110	DBG-U	52M.57	ASG2110	DBG-U	
52M.57	ASG2110	DBG-U	52M.57	ASG2110	DBG-U	
52M.57	ASG2110	DBG-U	52M.57	ASG2110	DBG-U	
52M.57	ASG2110	DBG-U	52M.57	ASG2110	DBG-U	
52M.57	ASG2110	DBG-U	52M.57	ASG2110	DBG-U	
52M.57	ASG2110	DBG-U	52M.57	ASG2110	DBG-U	
52M.57	ASG2110	DBG-U	52M.57	ASG2110	DBG-U	
52M.57	ASG2110	DBG-U	52M.57	ASG2110	DBG-U	
52M.57	ASG2110	DBG-U	52M.57	ASG2110	DBG-U	
52M.57	ASG2110	DBG-U	52M.57	ASG2110	DBG-U	
52M.57	ASG2110	DBG-U	52M.57	ASG2110	DBG-U	
52M.57	ASG2110	DBG-U	52M.57	ASG2110	DBG-U	
52M.57	ASG2110	DBG-U	52M.57	ASG2110	DBG-U	
52M.57	ASG2110	DBG-U	52M.57	ASG2110	DBG-U	
52M.57	ASG2110	DBG-U	52M.57	ASG2110	DBG-U	
52M.57	ASG2110	DBG-U	52M.57	ASG2110	DBG-U	
52M.57	ASG2110	DBG-U	52M.57	ASG2110	DBG-U	
52M.57	ASG2110	DBG-U	52M.57	ASG2110	DBG-U	
52M.57	ASG2110	DBG-U	52M.57	ASG2110	DBG-U	
52M.57	ASG2110	DBG-U	52M.57	ASG2110	DBG-U	
52M.57	ASG2110	DBG-U	52M.57	ASG2110	DBG-U	
52M.57	ASG2110	DBG-U	52M.57	ASG2110	DBG-U	
52M.57	ASG2110	DBG-U	52M.57	ASG2110	DBG-U	
52M.57	ASG2110	DBG-U	52M.57	ASG2110	DBG-U	
52M.57	ASG2110	DBG-U	52M.57	ASG2110	DBG-U	
52M.57	ASG2110	DBG-U	52M.57	ASG2110	DBG-U	
52M.57	ASG2110	DBG-U	52M.57	ASG2110	DBG-U	
52M.57	ASG2110	DBG-U	52M.57	ASG2110	DBG-U	
52M.57	ASG2110	DBG-U	52M.57	ASG2110	DBG-U	
52M.57	ASG2110	DBG-U	52M.57	ASG2110	DBG-U	

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9



Cutting speed and feed see pages 99.

Important: See chapter  for more application details and safety notes!

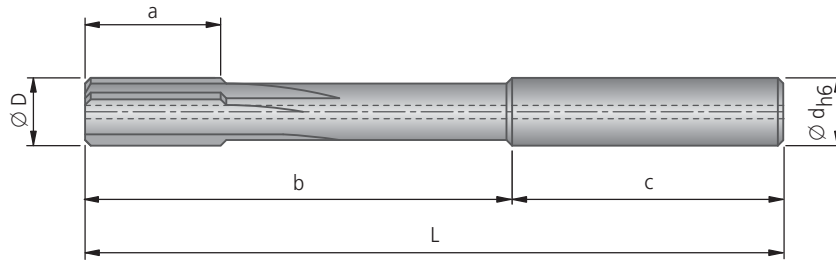
DIHART® Fullmax with cylindrical shank DIN 6535 HA

Ø 0.1181 – 0.7874 inch
(Ø 3.000 – 20.000 mm)



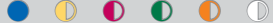
■ from Ø 0.1181" (3 mm) with internal coolant supply



for blind hole machining



Custom reaming tool – selection options!

Selection: material		
 Order No.	Cutting material / coating	 for material P M K N S H 
52M.57	DBG-U	

● main area of application ○ suitable in some cases

(..) = mm

Dimensions					
Ø D	Cylindrical shank Ø d × c	L	b	a ~	No. of teeth
0.1165 – 0.1596 (2.959 – 4.054)	0.157 × 1.102 (4 × 28)	2.362 (60)	1.260 (32)	0.472 (12)	4
0.1597 – 0.2382 (4.055 – 6.050)	0.236 × 1.417 (6 × 36)	2.992 (76)	1.575 (40)	0.472 (12)	4
0.2383 – 0.3170 (6.051 – 8.051)	0.315 × 1.417 (8 × 36)	3.976 (101)	2.560 (65)	0.630 (16)	6
0.3171 – 0.3957 (8.052 – 10.051)	0.394 × 1.575 (10 × 40)	4.252 (108)	2.677 (68)	0.630 (16)	6
0.3958 – 0.4744 (10.052 – 12.050)	0.472 × 1.772 (12 × 45)	5.118 (130)	3.346 (85)	0.787 (20)	6
0.4745 – 0.5532 (12.051 – 14.052)	0.551 × 1.772 (14 × 45)	5.118 (130)	3.346 (85)	0.787 (20)	6
0.5533 – 0.6319 (14.053 – 16.050)	0.630 × 1.890 (16 × 48)	5.906 (150)	4.016 (102)	0.787 (20)	6
0.6320 – 0.7106 (16.051 – 18.050)	0.709 × 1.890 (18 × 48)	5.906 (150)	4.016 (102)	0.787 (20)	6
0.7107 – 0.7894 (18.051 – 20.050)	0.787 × 1.969 (20 × 50)	6.230 (160)	4.331 (110)	0.787 (20)	6

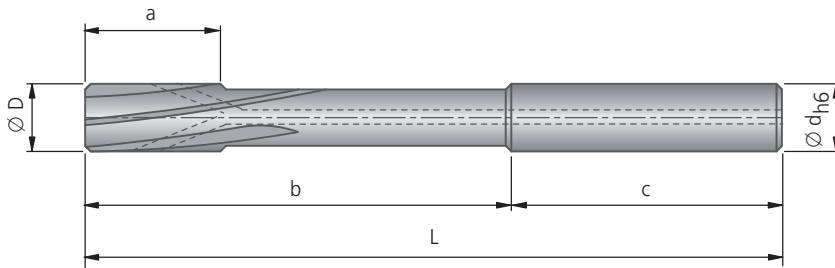
Order example: Order No. 52M.57 · Bore diameter 4.02 mm · Bore tolerance $^{+0.05}_0$ · Material GGG40 (Cutting geometry page 40-41)

Ø 0.1181 – 0.7874 inch
(Ø 3.000 – 20.000 mm)

DIHART® Fullmax
with cylindrical shank DIN 6535 HA

from Ø 0.1181" (3 mm) with internal coolant supply ■

for through hole machining



Custom reaming tool – selection options! ■

Selection: material		
 Order No.	Cutting material / coating	 for material
52P.57	DBG-U	

● main area of application ● suitable in some cases

(..) = mm

Dimensions					
Ø D	Cylindrical shank Ø d × c	L	b	a ~	No. of teeth
0.1165 – 0.1596 (2.959 – 4.054)	0.157 × 1.102 (4 × 28)	2.362 (60)	1.260 (32)	0.472 (12)	4
0.1597 – 0.2382 (4.055 – 6.050)	0.236 × 1.417 (6 × 36)	2.992 (76)	1.575 (40)	0.472 (12)	4
0.2383 – 0.3170 (6.051 – 8.051)	0.315 × 1.417 (8 × 36)	3.976 (101)	2.560 (65)	0.630 (16)	6
0.3171 – 0.3957 (8.052 – 10.051)	0.394 × 1.575 (10 × 40)	4.252 (108)	2.677 (68)	0.630 (16)	6
0.3958 – 0.4744 (10.052 – 12.050)	0.472 × 1.772 (12 × 45)	5.118 (130)	3.346 (85)	0.787 (20)	6
0.4745 – 0.5532 (12.051 – 14.052)	0.551 × 1.772 (14 × 45)	5.118 (130)	3.346 (85)	0.787 (20)	6
0.5533 – 0.6319 (14.053 – 16.050)	0.630 × 1.890 (16 × 48)	5.906 (150)	4.016 (102)	0.787 (20)	6
0.6320 – 0.7106 (16.051 – 18.050)	0.709 × 1.890 (18 × 48)	5.906 (150)	4.016 (102)	0.787 (20)	6
0.7107 – 0.7894 (18.051 – 20.050)	0.787 × 1.969 (20 × 50)	6.230 (160)	4.331 (110)	0.787 (20)	6

Order example: Order No. 52P.57 · Bore diameter 4.02 mm · Bore tolerance $^{+0.05}_{-0}$ · Material GGG40 (Cutting geometry page 49-49)

DIHART® Duomax / Cutting Ring

1

We have put our entire wealth of experience into the new generation of DIHART® Cutting Ring, called Duomax.

The DIHART® Duomax cutting ring for reaming basic and through holes is established and often copied due to its cost-effectiveness. This is one of the modular multi-blade tooling systems that features the easily replaceable DIHART® Cutting Ring on a holder. The user gets a finish-ground tool which does not require any time-consuming setting and adjustment work to the individual cutting edges.

2

The indexable inserts for reaming have two fully utilisable cutting edges. Each set of indexable inserts saves you a retipping cycle and thereby reduces tool costs and time, as well as effort spent on logistics. After doubling tool life by utilizing both insert edges, repair time is reduced due to fewer manufacturing steps than with a conventional brazed cutting ring. Additionally, the tool life of the basic body is also longer, because it is no longer subjected to thermal stress. In addition, the precision and stability of the basic body has been further improved through optimization of the basic shape.

3

A variety of cutting tool materials and a variety of coatings will be conceivable which cannot be used on brazed tools. Overall, the flexibility with regards to selecting the specific cutting material and coating for each reaming operation will significantly increase productivity. Moreover, tolerance and geometry changes can be accomplished quickly and with little effort.

4

5



BENEFITS for you:

- Retipping for extremely high cost efficiency
- For large hole diameters
- Modular multi-blade tooling system
- Compensation for wear through simple adjustment
- A variety of cutting materials and coatings
- Extremely high flexibility

The cutting ring system is one of the modular tool ranges from DIHART®. The ring has support zones for non-deformational accommodation of the cutting forces. Expansion zones permit an elastic expansion of the ring for compensating for wear on the cutters.

Through repeated regrinding or retipping, the service life of the ring can be increased many times over. Cutting edge wear is compensated – all functional surfaces are fully reground. Repaired tools have the same functionality as new ones.

BENEFITS for you:

- For large hole diameters
- Multiple blade
- Modular
- Compensation for wear through simple readjustment
- A variety of cutting materials and coatings
- Can be reground and refitted with cutters for extremely high cost efficiency



DIHART® Duomax / Cutting Ring Page

Tool Recommendation 46 – 49

Duomax
Ø 2.3858 – 4.3543 inch (Ø 60.600 – 110.599 mm) 50

Cutting Ring
Ø 2.3858 – 4.3543 inch (Ø 60.600 – 110.599 mm) 51

Holder
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Replacement parts / Accessories 55

Assembly Instructions
Duomax 56 - 57
Cutting Ring 58 - 59



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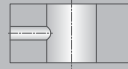


9



DIHART® Duomax Tool Recommendation



Material group	Strength Rm (lbf/in ²)	Hardness HB	Material	Material example ANSI / SAE	High-speed machining					
										
					Order No.	Cutting geometry (ASG)	Cutting material/coating	Order No.	Cutting geometry (ASG)	Cutting material/coating
P	1.0	≤ 72,500	non-alloy steels	1010 1144 1213	33G.93	ASG4000	DST	33G.71	ASG4000	TiN
	2.0	72,500 - 130,000	non-alloy / low alloy steels	1055 5115 5120	33G.93	ASG4000	DST	33G.71	ASG4000	TiN
	2.1	< 72,500	lead alloys	12L14	33G.93	ASG4000	DST	33G.71	ASG4000	TiN
	3.0	> 130,000	non alloy / low alloy steels: heat resistant structural, heat treated, nitride and tools steels	1064 4140	33G.93	ASG4000	DST	33G.71	ASG3000	TiN
	4.0	> 130,000	high alloy steels	H13 H21	33G.71	ASG0106	TiN	33G.71	ASG0106	TiN
	4.1		HSS	M10 T4						
S	5.0		250 special alloys: Inconel, Hastelloy, Nimonic, stc.	Inconel® 718 Nimonic® 80A						
	5.1	58,000	titanium, titanium alloys	Ti-6Al-4V						
M	6.0	≤ 87,000	stainless steels	304L 316	33G.47	ASG0106	DBF	33G.47	ASG0106	DBF
	6.1	< 130,000	stainless steels	630	33G.47	ASG0106	DBF	33G.47	ASG0106	DBF
	7.0	> 130,000	stainless / fireproof steels	403 420	33G.47	ASG0106	DBF	33G.47	ASG0106	DBF
K	8.0		180 gray cast iron	Class 25 G3000	33G.37	ASG3000	DBG-N	33G.37	ASG3000	DBG-N
	8.1		250 alloy gray cast iron	A436 Type 2	33G.37	ASG3000	DBG-N	33G.37	ASG3000	DBG-N
	9.0	≤ 87,000	130 ductile cast iron, ferritic	60-40-18 D4512	33G.93	ASG3000	DST	33G.47	ASG3000	DBF
	9.1		230 ductile cast iron, ferritic / perlitic	80-55-06 D5506	33G.93	ASG3000	DST	33G.47	ASG3000	DBF
	10.0	> 87,000	250 spheroidal graphite cast iron, perlitic malleable iron	100-70-03 07003	33G.93	ASG3000	DST	33G.47	ASG3000	DBF
	10.1		200 alloyed spheroidal graphite cast iron	A43D2	33G.37	ASG3000	DBG-N	33G.37	ASG3000	DBG-N
10.2		300 vermicular cast iron		33G.37	ASG3000	DBG-N	33G.37	ASG3000	DBG-N	
N	12.0		90 copper alloy, brass, lead-alloy bronze, lead bronze: good cut	316	33G.93	ASG3000	DST	33G.71	ASG3000	TiN
	12.1		100 copper alloy, brass, bronze: average cut		33G.71	ASG3000	TiN	33G.71	ASG3000	TiN
	13.0		60 wrought aluminum alloys	6151 7075	33G.17	ASG0706	DBC	33G.17	ASG0706	DBC
	13.1		75 cast aluminum alloy: Si-content < 10% magnesium alloy	380 A356.0	33G.17	ASG0706	DBC	33G.17	ASG0706	DBC
	14.0		100 cast aluminum alloy: Si-content > 10%	383 A413.0	33G.17	ASG0706	DBC	33G.17	ASG0706	DBC
H	15.0	203,000	hardened steels < 45 HRC							
	16.0	261,000	hardened steels > 45 HRC, ≤ 55 HRC							

For inquiries concerning tools for materials without a recommendation, please contact us.

DIHART® Duomax Tool Recommendation



	High-speed machining						Conventional machining					
	Order No.	Cutting geometry (ASG)	Cutting material/coating	Order No.	Cutting geometry (ASG)	Cutting material/coating	Order No.	Cutting geometry (ASG)	Cutting material	Order No.	Cutting geometry (ASG)	Cutting material
	33G.93	ASG3000	DST	33G.71	ASG3000	TiN	33G.21	ASG3000	HM	33G.21	ASG3000	HM
	33G.93	ASG3000	DST	33G.71	ASG3000	TiN	33G.21	ASG02	HM	33G.21	ASG02	HM
	33G.93	ASG3000	DST	33G.71	ASG3000	TiN	33G.21	ASG3000	HM	33G.21	ASG3000	HM
	33G.93	ASG3000	DST	33G.71	ASG3000	TiN	33G.21	ASG3000	HM	33G.21	ASG3000	HM
	33G.71	ASG0106	TiN	33G.71	ASG0106	TiN	33G.21	ASG0106	HM	33G.21	ASG0106	HM
							33G.21	ASG03	HM	33G.21	ASG03	HM
	33G.47	ASG0106	DBF	33G.47	ASG0106	DBF	33G.21	ASG0106	HM	33G.21	ASG0106	HM
	33G.47	ASG0106	DBF	33G.47	ASG0106	DBF	33G.21	ASG0106	HM	33G.21	ASG0106	HM
	33G.47	ASG0106	DBF	33G.47	ASG0106	DBF	33G.21	ASG0106	HM	33G.21	ASG0106	HM
	33G.37	ASG3000	DBG-N	33G.37	ASG3000	DBG-N	33G.21	ASG3000	HM	33G.21	ASG3000	HM
	33G.37	ASG3000	DBG-N	33G.37	ASG3000	DBG-N	33G.21	ASG3000	HM	33G.21	ASG3000	HM
	33G.93	ASG3000	DST	33G.47	ASG3000	DBF	33G.21	ASG02	HM	33G.21	ASG02	HM
	33G.93	ASG3000	DST	33G.47	ASG3000	DBF	33G.21	ASG3000	HM	33G.21	ASG3000	HM
	33G.93	ASG3000	DST	33G.47	ASG3000	DBF	33G.21	ASG3000	HM	33G.21	ASG3000	HM
	33G.37	ASG3000	DBG-N	33G.37	ASG3000	DBG-N	33G.21	ASG3000	HM	33G.21	ASG3000	HM
	33G.37	ASG3000	DBG-N	33G.37	ASG3000	DBG-N	33G.21	ASG3000	HM	33G.21	ASG3000	HM
	33G.93	ASG3000	DST	33G.71	ASG3000	TiN	33G.21	ASG0106	HM	33G.21	ASG0106	HM
	33G.71	ASG3000	TiN	33G.71	ASG3000	TiN	33G.21	ASG0106	HM	33G.21	ASG0106	HM
	33G.17	ASG0706	DBC	33G.17	ASG0706	DBC	33G.21	ASG02	HM	33G.21	ASG02	HM
	33G.17	ASG0706	DBC	33G.17	ASG0706	DBC	33G.21	ASG3000	HM	33G.21	ASG3000	HM
	33G.17	ASG0706	DBC	33G.17	ASG0706	DBC	33G.21	ASG3000	HM	33G.21	ASG3000	HM

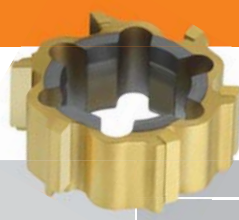


Cutting speed and feed see pages 100-101.

Important: See chapter for more application details and safety notes!

DIHART® Cutting Ring

Tool Recommendation

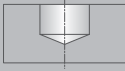
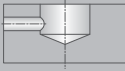

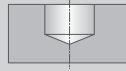


Material group	Strength Rm (lbf/in ²)	Hardness HB	Material	Material example ANSI / SAE	High-speed machining					
					Order No.	Cutting geometry (ASG)	Cutting material/coating	Order No.	Cutting geometry (ASG)	Cutting material/coating
P	1.0	≤ 72,500	non-alloy steels	1010 1144 1213	300.45	ASG4000	DST	300.05	ASG4000	TiN
	2.0	72,500 - 130,000	non-alloy / low alloy steels	1055 5115 5120	300.45	ASG4000	DST	300.05	ASG4000	TiN
	2.1	< 72,500	lead alloys	12L14	300.45	ASG4000	DST	300.05	ASG4000	TiN
	3.0	> 130,000	non alloy / low alloy steels: heat resistant structural, heat treated, nitride and tools steels	1064 4140	300.45	ASG4000	DST	300.05	ASG3000	TiN
	4.0	> 130,000	high alloy steels	H13 H21	300.05	ASG0106	TiN	300.05	ASG0106	TiN
	4.1		HSS	M10 T4						
S	5.0		250 special alloys: Inconel, Hastelloy, Nimonic, stc.	Inconel® 718 Nimonic® 80A						
	5.1	58,000	titanium, titanium alloys	Ti-6Al-4V						
M	6.0	≤ 87,000	stainless steels	304L 316	300.05	ASG0106	TiN	300.05	ASG0106	TiN
	6.1	< 130,000	stainless steels	630	300.05	ASG0106	TiN	300.05	ASG0106	TiN
	7.0	> 130,000	stainless / fireproof steels	403 420	300.05	ASG0106	TiN	300.05	ASG0106	TiN
K	8.0		180 gray cast iron	Class 25 G3000	300.07	ASG3000	DBG-N	300.07	ASG3000	DBG-N
	8.1		250 alloy gray cast iron	A436 Type 2	300.07	ASG3000	DBG-N	300.07	ASG3000	DBG-N
	9.0	≤ 87,000	130 ductile cast iron, ferritic	60-40-18 D4512	300.45	ASG3000	DST	300.07	ASG3000	DBG-N
	9.1		230 ductile cast iron, ferritic / perlitic	80-55-06 D5506	300.07	ASG3000	DST	300.07	ASG3000	DBG-N
	10.0	> 87,000	250 spheroidal graphite cast iron, perlitic malleable iron	100-70-03 07003	300.07	ASG3000	DST	300.07	ASG3000	DBG-N
	10.1		200 alloyed spheroidal graphite cast iron	A43D2	300.07	ASG3000	DBG-N	300.07	ASG3000	DBG-N
	10.2		300 vermicular cast iron		300.07	ASG3000	DBG-N	300.07	ASG3000	DBG-N
N	12.0		90 copper alloy, brass, lead-alloy bronze, lead bronze: good cut	316	300.45	ASG3000	DST	300.05	ASG3000	TiN
	12.1		100 copper alloy, brass, bronze: average cut		300.05	ASG3000	TiN	300.05	ASG3000	TiN
	13.0		60 wrought aluminum alloys	6151 7075	300.17	ASG0706	DBC	300.17	ASG0706	DBC
	13.1		75 cast aluminum alloy: Si-content < 10% magnesium alloy	380 A356.0	300.17	ASG0706	DBC	300.17	ASG0706	DBC
	14.0		100 cast aluminum alloy: Si-content > 10%	383 A413.0	300.17	ASG0706	DBC	300.17	ASG0706	DBC
H	15.0	203,000	hardened steels < 45 HRC							
	16.0	261,000	hardened steels > 45 HRC, ≤ 55 HRC							

For inquiries concerning tools for materials without a recommendation, please contact us.


DIHART® Cutting Ring Tool Recommendation



High-speed machining							Conventional machining					
												
Order No.	Cutting geometry (ASG)	Cutting material/coating	Order No.	Cutting geometry (ASG)	Cutting material/coating	Order No.	Cutting geometry (ASG)	Cutting material	Order No.	Cutting geometry (ASG)	Cutting material	
300.45	ASG3000	DST	300.05	ASG3000	TiN	300.25	ASG3000	HM	300.25	ASG3000	HM	
300.45	ASG3000	DST	300.05	ASG3000	TiN	300.25	ASG02	HM	300.25	ASG02	HM	
300.45	ASG3000	DST	300.05	ASG3000	TiN	300.25	ASG3000	HM	300.25	ASG3000	HM	
300.45	ASG3000	DST	300.05	ASG3000	TiN	300.25	ASG3000	HM	300.25	ASG3000	HM	
300.05	ASG0106	TiN	300.05	ASG0106	TiN	300.25	ASG0106	HM	300.25	ASG0106	HM	
						300.25	ASG03	HM	300.25	ASG03	HM	
300.05	ASG0106	TiN	300.05	ASG0106	TiN	300.25	ASG0106	HM	300.25	ASG0106	HM	
300.05	ASG0106	TiN	300.05	ASG0106	TiN	300.25	ASG0106	HM	300.25	ASG0106	HM	
300.05	ASG0106	TiN	300.05	ASG0106	TiN	300.25	ASG0106	HM	300.25	ASG0106	HM	
300.07	ASG3000	DBG-N	300.07	ASG3000	DBG-N	300.25	ASG3000	HM	300.25	ASG3000	HM	
300.07	ASG3000	DBG-N	300.07	ASG3000	DBG-N	300.25	ASG3000	HM	300.25	ASG3000	HM	
300.45	ASG3000	DST	300.07	ASG3000	DBG-N	300.25	ASG02	HM	300.25	ASG02	HM	
300.07	ASG3000	DST	300.07	ASG3000	DBG-N	300.25	ASG3000	HM	300.25	ASG3000	HM	
300.07	ASG3000	DST	300.07	ASG3000	DBG-N	300.25	ASG3000	HM	300.25	ASG3000	HM	
300.07	ASG3000	DBG-N	300.07	ASG3000	DBG-N	300.25	ASG3000	HM	300.25	ASG3000	HM	
300.07	ASG3000	DBG-N	300.07	ASG3000	DBG-N	300.25	ASG3000	HM	300.25	ASG3000	HM	
300.45	ASG3000	DST	300.05	ASG3000	TiN	300.25	ASG0106	HM	300.25	ASG0106	HM	
300.05	ASG3000	TiN	300.05	ASG3000	TiN	300.25	ASG0106	HM	300.25	ASG0106	HM	
300.17	ASG0706	DBC	300.17	ASG0706	DBC	300.25	ASG02	HM	300.25	ASG02	HM	
300.17	ASG0706	DBC	300.17	ASG0706	DBC	300.25	ASG3000	HM	300.25	ASG3000	HM	
300.17	ASG0706	DBC	300.17	ASG0706	DBC	300.25	ASG3000	HM	300.25	ASG3000	HM	



Cutting speed and feed see pages 100-101.

Important: See chapter  for more application details and safety notes!

DIHART® Duomax

Indexable insert cutting ring for tolerances S8-E8

Ø 2.3858 – 4.3543 inch
(Ø 60.600 – 110.599 mm)



1



2



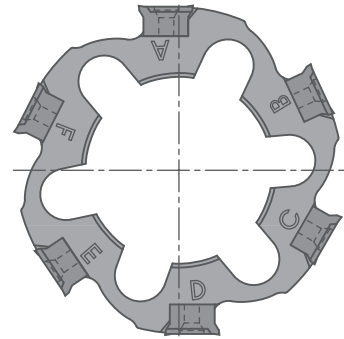
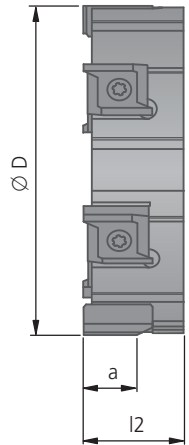
3



4



5



Selection: Cutting material, material

Order No.	Cutting material / coating	for material						for material					
		P	M	K	N	S	H	P	M	K	N	S	H
33G.21	HM	● ¹⁾	● ¹⁾	● ¹⁾	● ¹⁾	● ¹⁾		● ¹⁾	● ¹⁾	● ¹⁾	● ¹⁾	● ¹⁾	
33G.71	TiN	●	●		● ⁴⁾	●		●	●		● ⁵⁾	●	
33G.37	DBG-N			●			●	●		●			●
33G.47	DBF		●	●				●	●	●			
33G.17	DBC				●						●		
33G.93	DST	●		●	● ³⁾								
33G.67	DJC			● ²⁾									
33G.87	DJF			●									

Selection example:
Material St37, cutting material DST, = Order No. 33G.93

● main area of application ● suitable in some cases

¹⁾conventional machining · ²⁾material group 10.0&10.1 · ³⁾material group 12.0 · ⁴⁾material group 12.1 · ⁵⁾material group 12.0&12.1

(..) = mm

Dimensions			
Ø D	a ~	l2 ~	No. of teeth
2.3858 – 3.1338 (60.600 – 79.599)	0.406 (10.3)	0.772 (19.6)	6
3.1339 – 3.9605 (79.600 – 100.599)	0.406 (10.3)	0.772 (19.6)	8
3.9606 – 4.3543 (100.600 – 110.599)	0.406 (10.3)	0.772 (19.6)	10

Order example: Order No. 33G.93 · Bore diameter 62 mm · Bore tolerance H7
Material St37 or ASG4000 (Cutting geometry page 46-47)

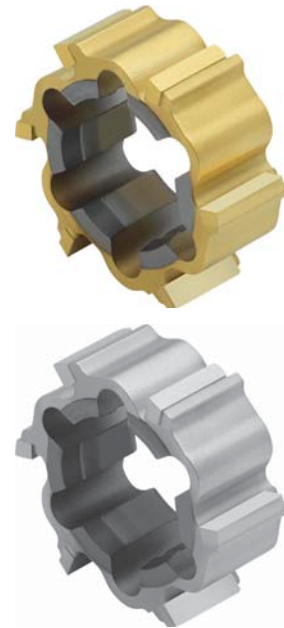
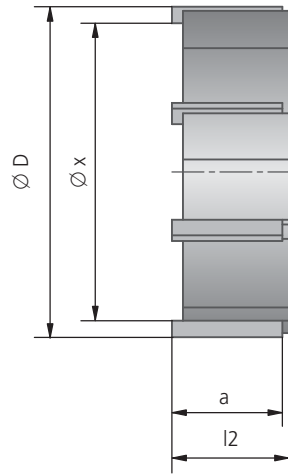
Assembly parts, Accessories

Clamping screw	Torque key	Replaceable blade
Order No. Description	Order No.	Order No. Description
N00 57710 S3090-9IP	L05 03311 2.25 Nm	L05 00740 9IP

Supply includes: Cutting ring Duomax mounted with inserts and clamping screws. Please order torque key and replaceable blade separately.

Ø 2.3858 – 4.3543 inch
(Ø 60.600 – 110.599 mm)

DIHART® Cutting Ring



Selection: Cutting material, material

Order No.	Cutting material / coating	for material						for material					
		P	M	K	N	S	H	P	M	K	N	S	H
300.25	HM	● ¹⁾	● ¹⁾	● ¹⁾	● ¹⁾	● ¹⁾	● ¹⁾	● ¹⁾	● ¹⁾	● ¹⁾	● ¹⁾	● ¹⁾	● ¹⁾
300.05	TiN	●	●	●	● ⁴⁾	●	●	●	●	●	● ⁵⁾	●	●
300.07	DBG-N			●			●	●		●			●
300.47	DBF		●	●				●	●	●			
300.17	DBC				●						●		
300.45	DST	●		●	● ³⁾								
300.08	DJC			● ²⁾									

Selection example:
Material St37, cutting material DST, = Order No. 300.45

● main area of application ● suitable in some cases

¹⁾conventional machining · ²⁾material group 10.0&10.1 · ³⁾material group 12.0 · ⁴⁾material group 12.1 · ⁵⁾material group 12.0&12.1

(..) = mm

Dimensions

Ø D	min. diameter for front cutting Ø x ~	a ~	HM TiN DBG-N l2 ~	DST DJC l2 ~	No. of teeth
2.3858 – 3.1338 (60.600 – 79.599)	Ø D – 0.331 (Ø D – 8.4)	0.630 (16.0)	0.728 (18.5)	0.689 (17.5)	6
3.1339 – 3.9605 (79.600 – 100.599)	Ø D – 0.331 (Ø D – 8.4)	0.630 (16.0)	0.728 (18.5)	0.689 (17.5)	8
3.9606 – 4.3543 (100.600 – 110.599)	Ø D – 0.331 (Ø D – 8.4)	0.630 (16.0)	0.728 (18.5)	0.689 (17.5)	10

Cutting ring from dia. 0.6929 to 2.3857 inch (17.600 to 60.599 mm) and Ø 4.3544 to 11.8346 inch (Ø110.600 to 300.599 mm) available by request.

Order example: Order No. 300.45 · Bore diameter 70 mm · Bore tolerance H6 · Material St37 or ASG4000 (Cutting geometry page 48-49)

DIHART® Duomax / Cutting Ring

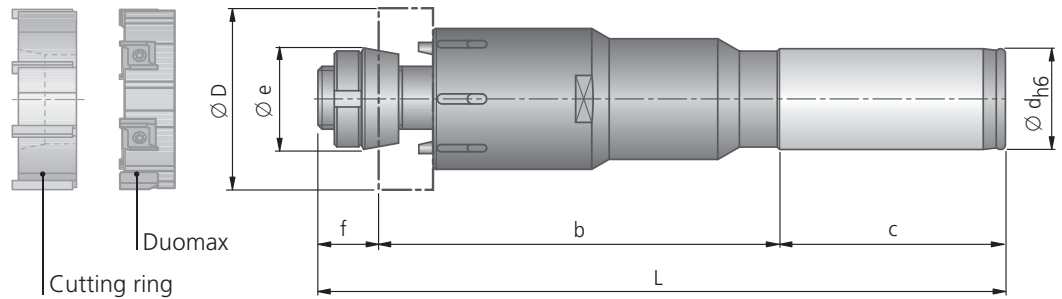
Holder with inch/metric cylindrical shank similar to DIN 1835

Ø 60.600 – 100.599 mm
(Ø 2.3858 – 3.9605 inch)

- with internal coolant supply
- cylindrical shank with flat available on request



for through hole machining



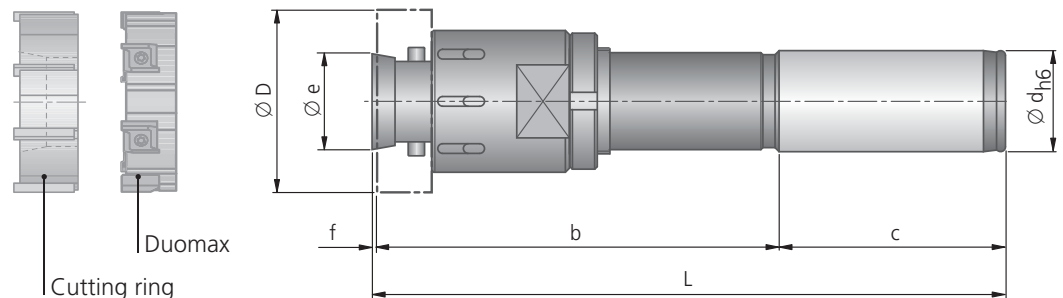
[...] denotes inch shank tools

for through hole machining				short version				long version			
for Cutting Ring / Duomax Ø D	Cylindrical shank Ø d × c	Ø e	f	Order No.	L	b	lbs	Order No.	L	b	lbs
60.600 – 70.599 [2.3858 – 2.7794]	32 × 60 [1.500 × 2.756]	40.0 [1.575]	24.5 [0.965]	503.76.008 [503.81.009]	189.5 [7.855]	105 [4.134]	3.99	504.76.009 [504.81.009]	321.5 [12.657]	237 [8.937]	7.63
70.600 – 79.599 [2.7795 – 3.1338]	32 × 60 [1.500 × 2.756]	40.0 [1.575]	24.5 [0.965]	503.76.009 [503.81.010]	189.5 [7.855]	105 [4.134]	4.41	504.76.010 [504.81.010]	321.5 [12.657]	237 [8.937]	8.53
79.600 – 90.599 [3.1339 – 3.5668]	40 × 70 [1.500 × 2.756]	56.2 [2.213]	28.5 [1.122]	503.76.010 [503.81.011]	203.5 [8.012]	105 [4.134]	7.50	504.76.011 [504.81.011]	338.5 [12.657]	240 [9.449]	13.54
90.600 – 100.599 [3.5669 – 3.9605]	40 × 70 [1.500 × 2.756]	56.2 [2.213]	28.5 [1.122]	503.76.011 [503.81.012]	203.5 [8.012]	105 [4.134]	13.54	504.76.012 [504.81.012]	338.5 [12.657]	240 [9.449]	

Includes: Cutting ring holder with conical screw, bushing and adjusting nut (page 55). Please order cutting ring separately.



for blind hole machining



[...] denotes inch shank tools

for blind hole machining				short version				long version					
for Cutting Ring / Duomax Ø D	Cylindrical shank Ø d × c	Ø e	f	Order No.	Order No.	L	b	lbs	Order No.	Order No.	L	b	lbs
60.600 – 70.599 (2.3858 – 3.1338)	32 × 60 [1.500 × 2.756]	37.0 [1.457]	1.5 [0.059]	513.76.008 [513.36.008]	513.81.008 [513.41.008]	166.5 [6.949]	105 [4.134]	3.92	514.76.008 [514.36.008]	514.81.008 [514.41.008]	298.5 [12.146]	237 [9.331]	6.39
70.600 – 79.599 (3.1339 – 3.1338)	32 × 60 [1.500 × 2.756]	37.0 [1.457]	1.5 [0.059]	513.76.009 [513.36.009]	513.81.009 [513.41.009]	166.5 [6.949]	105 [4.134]	3.88	514.76.009 [514.36.009]	514.81.009 [514.41.009]	298.5 [12.146]	237 [9.331]	6.63
79.600 – 90.599 (3.1339 – 3.5668)	40 × 70 [1.500 × 2.756]	53.2 [2.094]	1.5 [0.059]	513.76.010 [513.36.010]	513.81.010 [513.41.010]	176.5 [6.949]	105 [4.134]	6.90	514.76.010 [514.36.010]	514.81.010 [514.41.010]	311.5 [12.264]	240 [9.449]	10.80
90.600 – 100.599 (3.5669 – 3.9605)	40 × 70 [1.500 × 2.756]	53.2 [2.094]	1.5 [0.059]	513.76.011 [513.36.011]	513.81.011 [513.41.011]	176.5 [6.949]	105 [4.134]		514.76.011 [514.36.011]	514.81.011 [514.41.011]	311.5 [12.264]	240 [9.449]	12.24

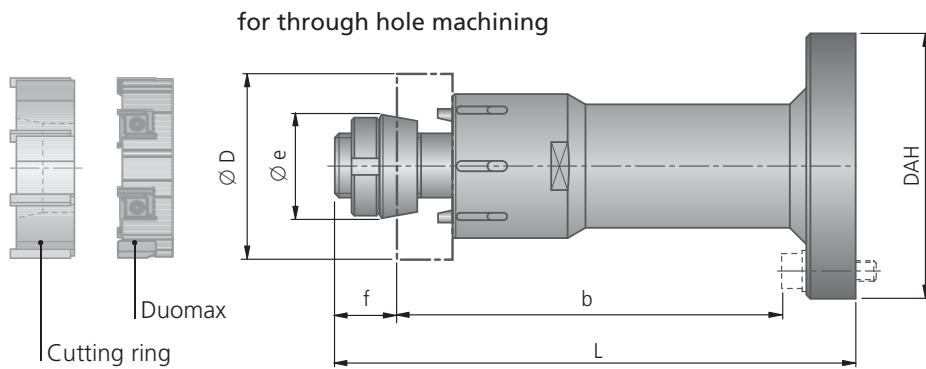
Includes: Cutting ring holder with conical screw, bushing and adjusting nut (page 55). Please order cutting ring separately.

(*Can also be used for through hole machining)

DIHART® Duomax / Cutting Ring Holder with DAH® Connection

Ø 2.3858 – 4.3543 inch
(Ø 60.600 – 110.559 mm)

■ with internal coolant supply

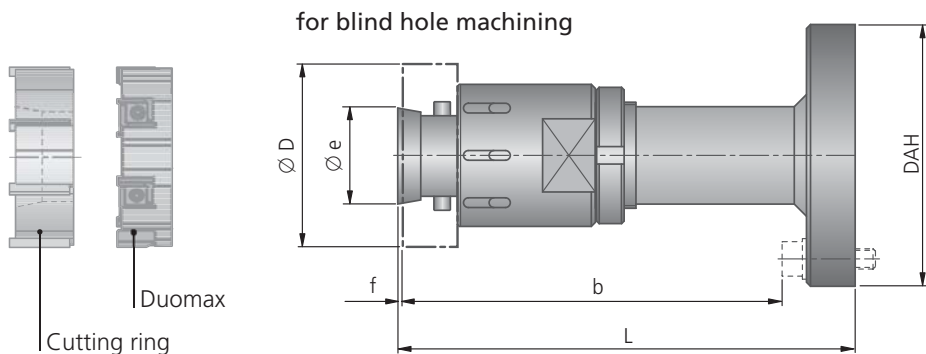


(..) = mm

for through hole machining

for Ø D	Ø e	f	Order No.	DAH	L	b	lbs	Order No.	DAH	L	b	lbs
2.3858 – 2.7794 (60.600 – 70.599)	1.575 (40.0)	0.964 (24.5)	507.02.008	115	5.748 (146)	3.779 (96)	5.51	507.02.043	81	5.571 (141.5)	3.898 (99)	3.75
2.7795 – 3.1338 (70.600 – 79.599)	1.575 (40.0)	0.964 (24.5)	507.02.009	115	5.748 (146)	3.779 (96)	6.15	507.02.044	81	5.571 (141.5)	3.898 (99)	4.19
3.1339 – 3.5668 (79.600 – 90.599)	2.213 (56.2)	1.122 (28.5)	507.02.010	115	5.906 (150)	3.779 (96)	8.38					
3.5669 – 3.9605 (90.600 – 100.599)	2.213 (56.2)	1.122 (28.5)	507.02.011	115	5.906 (150)	3.779 (96)	9.30					
3.9606 – 4.3543 (100.600 – 110.599)	2.890 (73.4)	1.398 (35.5)	507.02.012	115	6.220 (158)	3.819 (97)	12.12					

Includes: Adjusting nut, conical ring and drive pins (page 55). Please order cutting ring separately.



(..) = mm

for blind hole machining

for Ø D	Ø e	f	Order No.	Order No.	DAH	L	b	lbs
2.3858 – 2.7794 (60.600 – 70.599)	1.457 (37.0)	0.059 (1.5)	517.76.008	517.81.008	115	5.787 (147)	4.724 (120)	5.55
2.7795 – 3.1338 (70.600 – 79.599)	1.457 (37.0)	0.059 (1.5)	517.76.009	517.81.009	115	5.787 (147)	4.724 (120)	5.55
3.1339 – 3.5668 (79.600 – 90.599)	2.094 (53.2)	0.059 (1.5)	517.76.010	517.81.010	115	6.181 (157)	5.118 (130)	8.71
3.5669 – 3.9605 (90.600 – 100.599)	2.094 (53.2)	0.059 (1.5)	517.76.011	514.81.011	115	6.181 (157)	5.118 (130)	9.55

Includes: Cutting ring holder with conical screw, bushing and adjusting nut (page 55). Please order cutting ring separately.

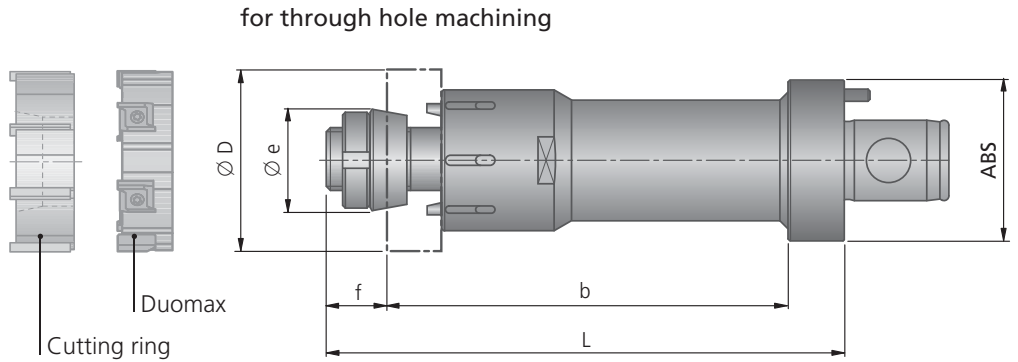
DAH® adapters see chapter 9.

(*Can also be used for through hole machining)

DIHART® Duomax / Cutting Ring Holder with ABS® Connection

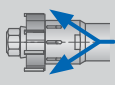

Ø 2.3858 – 4.3543 inch
(Ø 60.600 – 110.599 mm)

■ with internal coolant supply

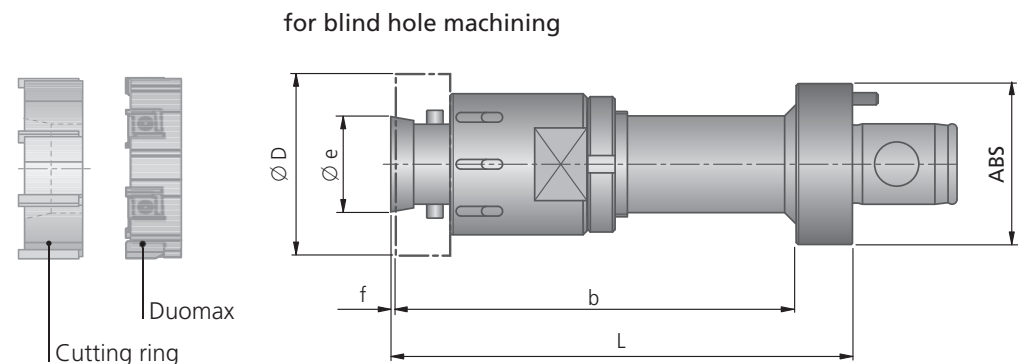


(..) = mm

for through hole machining

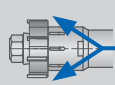
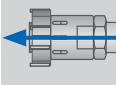

for Ø D	 Order No.	ABS	Ø e	f	L	b	
2.3858 – 2.5826 (60.600 – 65.599)	508.53.020	50	1.575 (40.0)	0.964 (24.5)	5.650 (143.5)	4.134 (105)	4.30
2.5827 – 2.7794 (65.600 – 70.599)	508.53.021	63	1.575 (40.0)	0.964 (24.5)	5.886 (149.5)	4.134 (105)	5.14
2.7795 – 3.1338 (70.600 – 79.599)	508.53.009	63	1.575 (40.0)	0.964 (24.5)	5.886 (149.5)	4.134 (105)	5.51
3.1339 – 3.5668 (79.600 – 90.599)	508.53.010	63	2.213 (56.2)	1.122 (28.5)	6.043 (153.5)	4.134 (105)	7.83
3.5669 – 3.9605 (90.600 – 100.599)	508.53.011	63	2.213 (56.2)	1.122 (28.5)	6.043 (153.5)	4.134 (105)	8.66
3.9606 – 4.3543 (100.600 – 110.599)	508.53.022	80	2.890 (73.4)	1.398 (35.5)	6.575 (167)	4.193 (106.5)	13.69

Includes: Adjusting nut, conical ring and drive pins (page 55). Please order cutting ring separately.



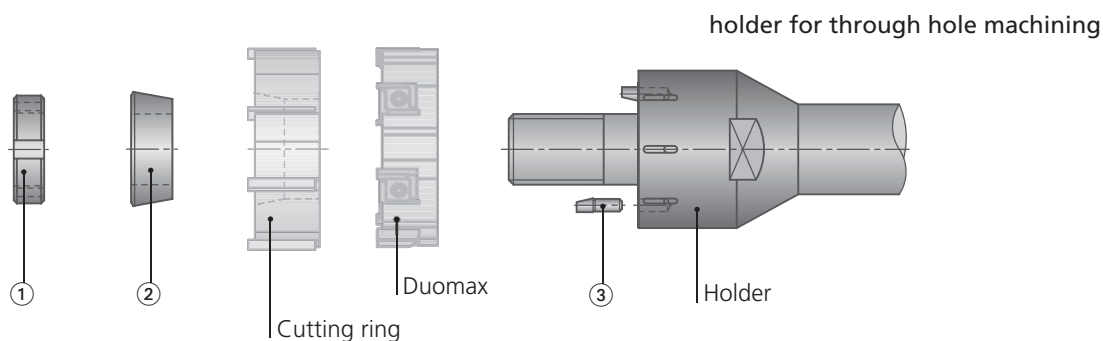
(..) = mm

for blind hole machining




for Ø D	 Order No.	 Order No.	ABS	Ø e	f	L	b	
2.3858 – 2.5826 (60.600 – 65.599)	518.78.013	518.82.013	50	1.457 (37.0)	0.059 (1.5)	4.744 (120.5)	4.134 (105)	3.86
2.5827 – 2.7794 (65.600 – 70.599)	518.78.014	518.82.014	63	1.457 (37.0)	0.059 (1.5)	4.980 (126.5)	4.134 (105)	4.74
2.7795 – 3.1338 (70.600 – 79.599)	518.78.009	518.82.009	63	1.457 (37.0)	0.059 (1.5)	4.980 (126.5)	4.134 (105)	4.92
3.1339 – 3.5668 (79.600 – 90.599)	518.78.010	518.82.010	63	2.094 (53.2)	0.059 (1.5)	4.980 (126.5)	4.134 (105)	7.25
3.5669 – 3.9605 (90.600 – 100.599)	518.78.011	518.82.011	63	2.094 (53.2)	0.059 (1.5)	4.980 (126.5)	4.134 (105)	7.94

Includes: Cutting ring holder with conical screw, bushing and adjusting nut (page 55). Please order cutting ring separately.
(*Can also be used for through hole machining)

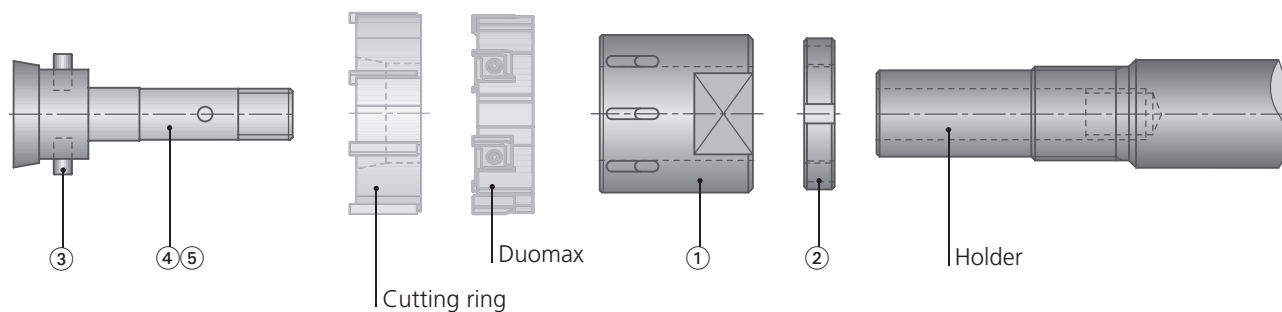
DIHART® Duomax / Cutting Ring Replacement parts / Accessories






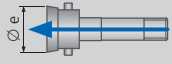
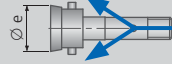
(..) = mm

for Ø D	① Adjusting nut  Order No.	② Conical ring  Order No.	③ Drive pin  Order No.
2.3858 – 3.1338 (60.600 – 79.599)	099.00.090	301.80.006	300.30.007
3.1339 – 3.9605 (79.600 – 100.599)	099.00.092	301.80.007	300.30.008
3.9606 – 4.3543 (100.600 – 110.599)	099.00.095	306.20.001	300.30.008

holder for blind hole machining

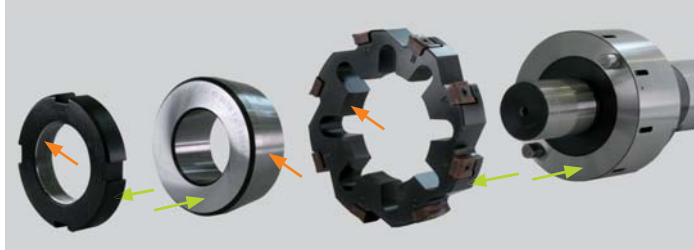


(..) = mm

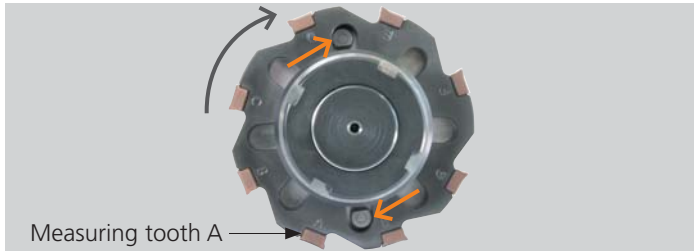
for Ø D	① Bushing  Order No.	② Adjusting Nut  Order No.	③ Drive Pin  Order No.	④ Conical screw  Order No. Ø e	⑤ Conical screw  Order No. Ø e
2.3858 – 2.7794 (60.600 – 70.599)	510.15.008	350.23.002	350.14.002	510.45.007 1.457 (37.0)	510.55.007 1.457 (37.0)
2.7795 – 3.1338 (70.600 – 79.599)	510.15.009	350.23.002	350.14.002	510.45.007 1.457 (37.0)	510.55.007 1.457 (37.0)
3.1339 – 3.5668 (79.600 – 90.599)	510.15.010	350.23.003	350.14.003	510.45.008 2.094 (53.2)	510.55.008 2.094 (53.2)
3.5669 – 3.9605 (90.600 – 100.599)	510.15.011	350.23.003	350.14.003	510.45.008 2.094 (53.2)	510.55.008 2.094 (53.2)

DIHART® Duomax

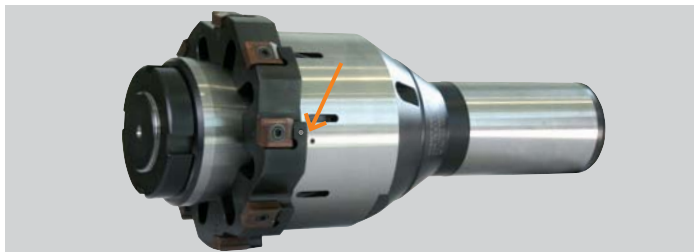
Assembly instructions: Cutting ring holders for through hole machining



Arrow markings:
 → light grease
 → Face surfaces on holder and Duomax are grease-free



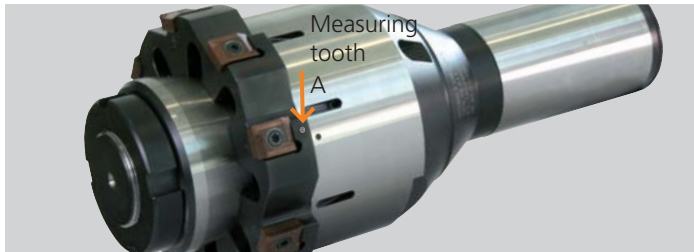
Positioning of the drive pins to the right of letter A (the measuring tooth is located at letter A and is also marked on the holder with a spot).
 Before tightening and adjusting, turn the Duomax against the direction of machining until hitting the drive pins.



Please observe the marking on holder and Duomax, check alignment of the coolant bores.



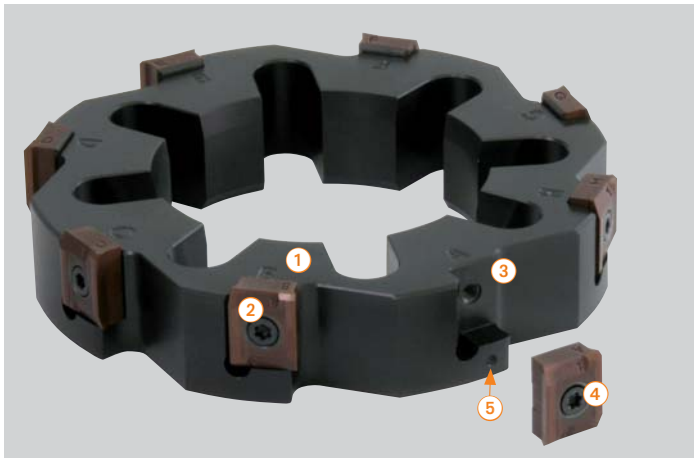
Adjust the diameter to the middle of the tolerance (counter-clockwise thread).



The diameter can only be measured at the marked cutting edges (measuring tooth A) due to unequal angular position!

If the diameter was set too large, the conical ring must be loosened and the Duomax readjusted.

Assembly instructions inserts



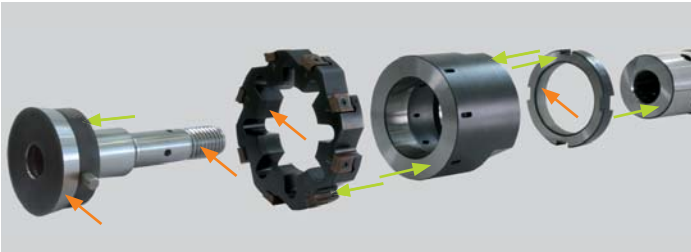
Cleaning:

Make sure that the insert seats ③ and inserts are absolutely clean/grease-free. If necessary, remove tiny dust particles with compressed air!

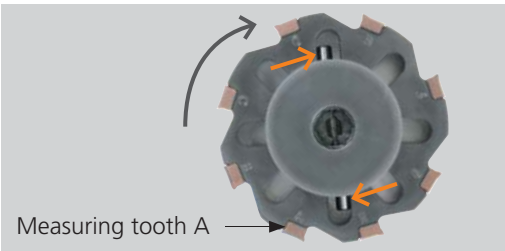
Assembly:

- All inserts and insert seats are marked with letters ①. This ensures correct assignment to the insert seat.
- The number markings ② ensure that all inserts are positioned correctly.
- Tighten the screw ④ (order no. N00 57710) to 2.25 Nm. Torque wrench order no. L05 03311

Assembly instructions: Cutting ring holder for blind hole machining



Arrow markings:
 → light grease
 → Face surfaces on holder and Duomax are grease-free



Positioning of the drive pins to the right of letter A (the measuring tooth is located at letter A and is also marked on the holder with a spot). Before tightening and adjusting, turn the Duomax against the direction of machining until hitting the drive pins.

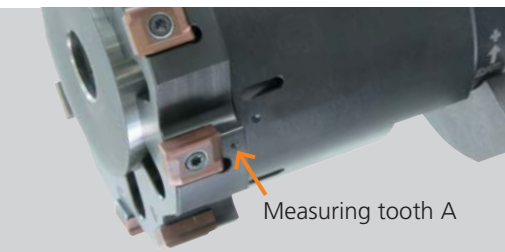


Screw the nut onto the holder with the smooth face against the bush. Mount the Duomax with the conical screw. After fastening the conical screw check that there is space between bush and Duomax. Fasten conical screw according to index table.

Dia. range (mm)	Torque M
2.4016 – 3.1102 (61 – 79)	1062 – 1239 in-lbs (120 – 140 Nm)
3.1496 – 3.9370 (80 – 100)	1593 – 1947 in-lbs (180 – 220 Nm)



Please observe the marking on holder and Duomax, check alignment of the coolant bores. Adjust the diameter to the middle of the tolerance.



The diameter can only be measured at the marked cutting edges (measuring tooth A) due to unequal angular position!

If the diameter was set too large, the nut must be loosened and the Duomax readjusted.

Measuring the diameter:

The measuring tooth is located at letter A and is also marked on the holder with a spot ⑤.

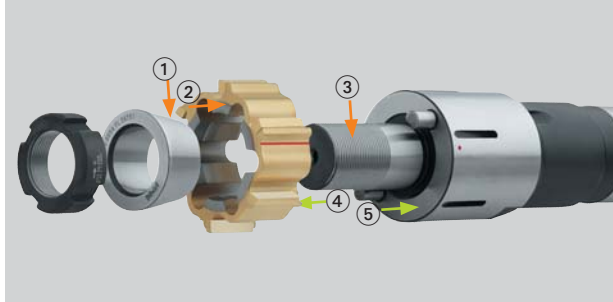
Caution!

- Uneven flute spacing!
- There are 2 cutters 180° opposite = measuring tooth A.
- Measure the diameter at the front of the cutter (see illustration). Measuring further back will yield an incorrect measurement as inserts are ground with back taper.
- Avoid damaging the cutting edges.
- When turning the insert, the diameter must be readjusted.
- Delivery status: Duomax tools delivered with inserts mounted – ready for assembly with holder.



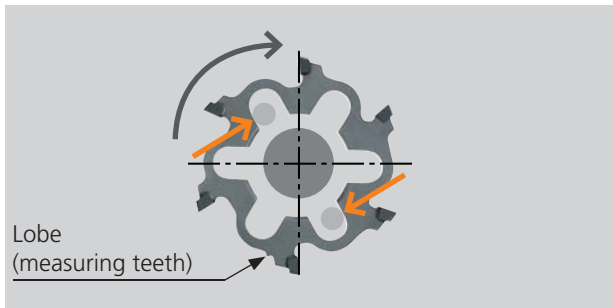
DIHART® Cutting Ring

Assembly instructions: Cutting ring holders for through hole machining

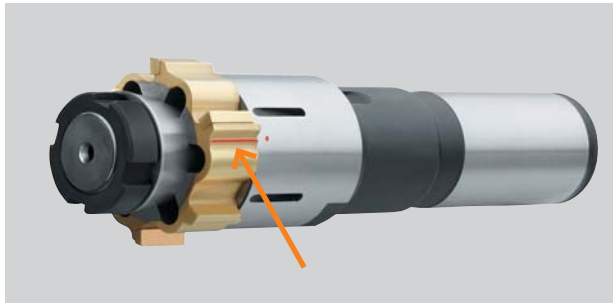


Greasing before assembly:

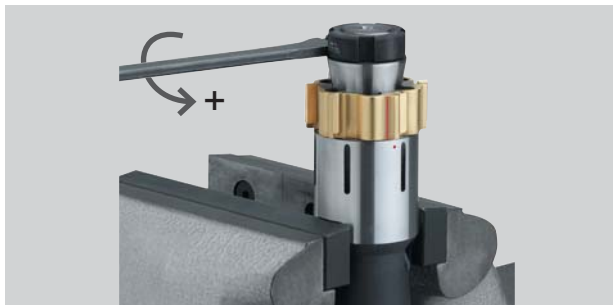
- Grease conical ring ① and I.D. cone of cutting ring ② on \varnothing 3.150 inch (80 mm) or larger.
- light grease ③
- No grease and must be free of debris ④ & ⑤



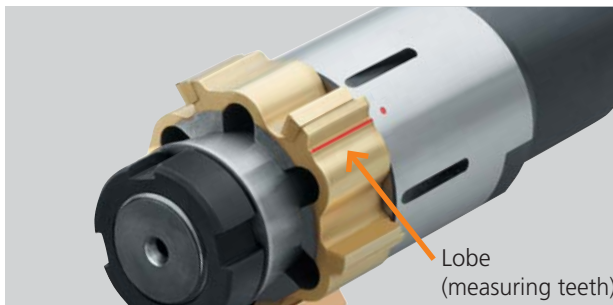
The position for the drive pins is marked with a lobe or in red. Before tightening and adjusting, rotate the cutting ring against the direction of machining until contact is made with the drive pins.



Align the markings on the cutting ring holder and cutting ring, to be sure that the coolant holes are aligned with the cutting edges.



Set-up the diameter utilizing the adjusting nut to the middle of the tolerance (counter-clockwise thread).



The diameter can only be measured at the marked cutting edges due to unequal flute spacing! (refer to page 111).



Measure the diameter

If the diameter was set too large, the adjusting nut must be loosened and the above process repeated.

Assembly instructions: Cutting ring holder for blind hole machining



1



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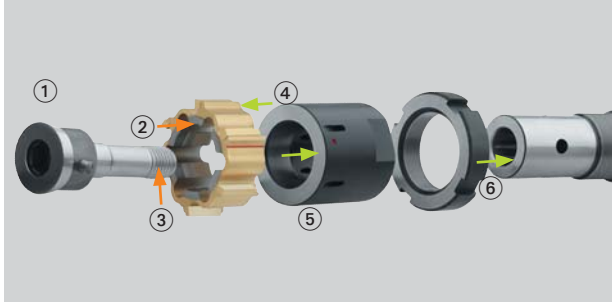
7



8

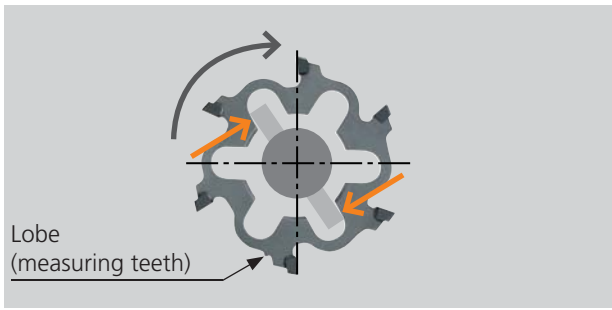


9



Greasing before assembly:

- Grease conical screw ① and I.D. cone of cutting ring ② on \varnothing 3.150 inch (80 mm) or larger.
- light grease ③
- No grease and must be free of debris ④, ⑤ & ⑥

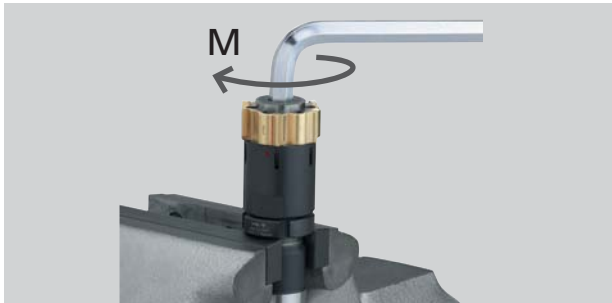


Screw the adjusting nut onto the holder with the smooth face away from the shank. Slide the bushing onto the holder with the wrench flats towards the shank. Mount the cutting ring with the conical screw.

After assembling the conical screw check that there is space between the bushing and cutting ring.

Tighten conical screw observing the specified torque M.

Dia. range (mm)	Torque M
2.3622 (60.00)	797 – 974 in-lbs (90 – 110 Nm)
2.3623 – 3.1495 (60.01 – 79.99)	1062 – 1239 in-lbs (120 – 140 Nm)
3.1496 – 3.9370 (80.00 – 100.0)	1593 – 1947 in-lbs (180 – 220 Nm)

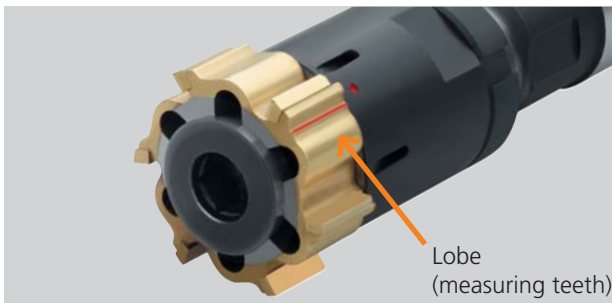


The position for the drive pins is marked with a lobe or in red. Before tightening and adjusting, rotate the cutting ring against the direction of machining until contact is made with the drive pins.



Align the markings on bushing and cutting ring to be sure that the coolant holes are aligned with the cutting edges.

Set-up the diameter to the middle of the tolerance.



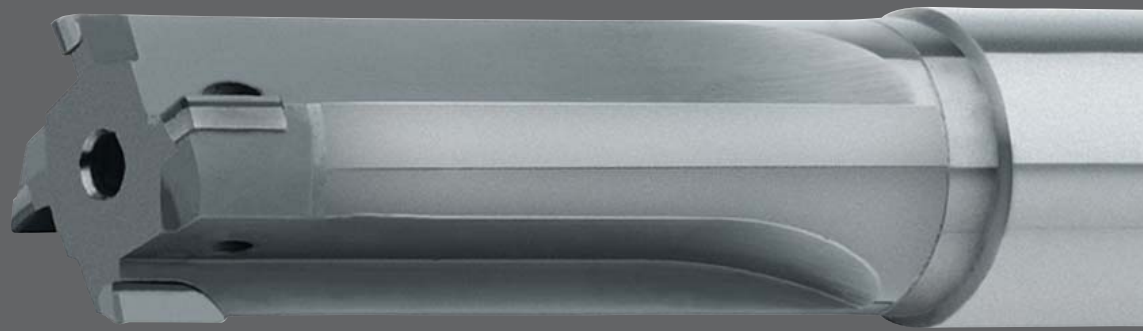
The diameter can only be measured at the marked cutting edges due to unequal flute spacing!

Measure the diameter

If the diameter was set too large, the adjusting nut must be loosened and the above process repeated.



DIHART® PCD Reamers



BENEFITS for you:

- 2 and 4 blade versions
- High stability from the carbide body
- Optimized for finishing pre-cast bores
- Through coolant supply for through and blind holes
- Newest cutting geometry



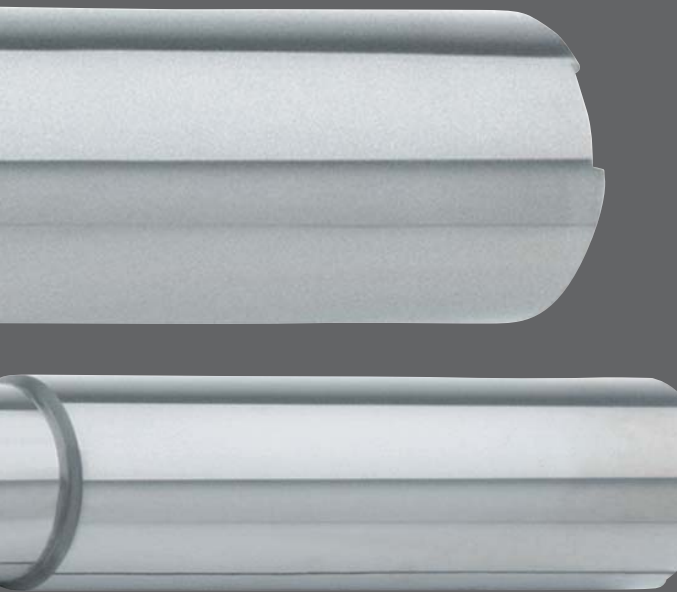
DIHART® PCD Reamers Page

Tool Recommendation 62 – 63

PCD Reamer


2 cutting edges
 Ø 0.15175 – 0.7913 inch (Ø 4.000 – 20.100 mm) 64

4 cutting edges
 Ø 0.3780 – 0.7913 inch (Ø 9.601 – 20.100 mm) 65



DIHART® PCD Reamers

Tool Recommendation

Material group	Strength Rm (lbf/in ²)	Hardness HB	Material	Material example ANSI / SAE	High-speed machining					
										
					Order No. 4 edges 2 edges	Cutting geometry (ASG)	Cutting material/ coating	Order No. 4 edges 2 edges	Cutting geometry (ASG)	Cutting material/ coating
P	1.0	≤ 72,500	non-alloy steels	1010 1144 1213						
	2.0	72,500 - 130,000	non-alloy / low alloy steels	1055 5115 5120						
	2.1	< 72,500	lead alloys	12L14						
	3.0	> 130,000	non alloy / low alloy steels: heat resistant structural, heat treated, nitride and tools steels	1064 4140						
	4.0	> 130,000	high alloy steels	H13 H21						
	4.1		HSS	M10 T4						
S	5.0		250 special alloys: Inconel, Hastelloy, Nimonic, stc.	Inconel® 718 Nimonic® 80A						
	5.1	58,000	titanium, titanium alloys	Ti-6Al-4V						
M	6.0	≤ 87,000	stainless steels	304L 316						
	6.1	< 130,000	stainless steels	630						
	7.0	> 130,000	stainless / fireproof steels	403 420						
K	8.0		180 gray cast iron	Class 25 G3000						
	8.1		250 alloy gray cast iron	A436 Type 2						
	9.0	≤ 87,000	130 ductile cast iron, ferritic	60-40-18 D4512						
	9.1		230 ductile cast iron, ferritic / perlitic	80-55-06 D5506						
	10.0	> 87,000	250 spheroidal graphite cast iron, perlitic malleable iron	100-70-03 07003						
	10.1		200 alloyed spheroidal graphite cast iron	A43D2						
N	10.2		300 vermicular cast iron							
	12.0		90 copper alloy, brass, lead-alloy bronze, lead bronze: good cut	316	690.11 690.10	ASG1101	PCD	690.11 690.10	ASG1101	PCD
	12.1		100 copper alloy, brass, bronze: average cut							
	13.0		60 wrought aluminum alloys	6151 7075	690.11 690.10	ASG1101	PCD	690.11 690.10	ASG1101	PCD
	13.1		75 cast aluminum alloy: Si-content < 10% magnesium alloy	380 A356.0						
14.0		100 cast aluminum alloy: Si-content > 10%	383 A413.0	690.11 690.10	ASG1101	PCD	690.11 690.10	ASG1101	PCD	
H	15.0	203,000	hardened steels < 45 HRC							
	16.0	261,000	hardened steels > 45 HRC, ≤ 55 HRC							

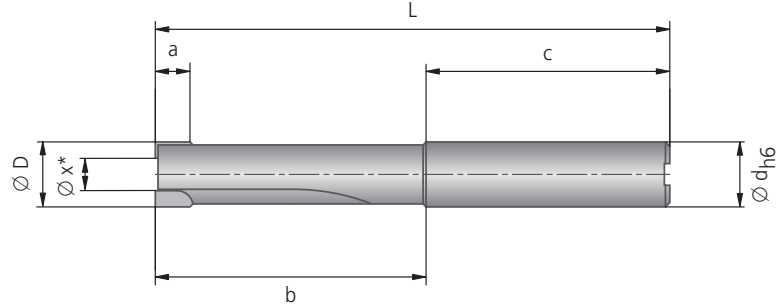
For inquiries concerning tools for materials without a recommendation, please contact us.


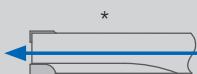
DIHART® PCD Reamers

With 2 cutting edges

Ø 0.1575 – 0.7913 inch
(Ø 4.000 – 20.100 mm)

- with internal coolant supply
- solid carbide body



PCD Reamers		
Cutting material / coating	 Order No.	 Order No.
PCD	690.10	690.13

(..) = mm

Dimensions							
Ø D	min. diameter for front cutting Ø x ~	L	b	c	a	Ø dh6 mm	max stock allowance on dia. Ø
*0.1575 – 0.1811 (4.000 – 4.600)	Ø D – 0.094 (Ø D – 2.4)	2.520 (64)	1.102 (28)	1.417 (36)	0.276 (7)	6	0.02 (0.5)
*0.1812 – 0.2008 (4.601 – 5.100)	Ø D – 0.102 (Ø D – 2.6)	2.520 (64)	1.102 (28)	1.417 (36)	0.276 (7)	6	0.02 (0.5)
*0.2009 – 0.2205 (5.101 – 5.600)	Ø D – 0.106 (Ø D – 2.7)	2.520 (64)	1.102 (28)	1.417 (36)	0.276 (7)	6	0.02 (0.5)
0.2206 – 0.2402 (5.601 – 6.100)	Ø D – 0.110 (Ø D – 2.8)	2.795 (71)	1.378 (35)	1.417 (36)	0.276 (7)	6	0.06 (1.5)
0.2403 – 0.2598 (6.101 – 6.600)	Ø D – 0.134 (Ø D – 3.4)	2.992 (76)	1.575 (40)	1.417 (36)	0.276 (7)	8	0.06 (1.5)
0.2599 – 0.2795 (6.601 – 7.100)	Ø D – 0.134 (Ø D – 3.4)	2.992 (76)	1.575 (40)	1.417 (36)	0.276 (7)	8	0.06 (1.5)
0.2796 – 0.2992 (7.101 – 7.600)	Ø D – 0.134 (Ø D – 3.4)	2.992 (76)	1.575 (40)	1.417 (36)	0.276 (7)	8	0.08 (2.0)
0.2993 – 0.3189 (7.601 – 8.100)	Ø D – 0.141 (Ø D – 3.6)	2.992 (76)	1.575 (40)	1.417 (36)	0.276 (7)	8	0.10 (2.5)
0.3190 – 0.3386 (8.101 – 8.600)	Ø D – 0.141 (Ø D – 3.6)	3.346 (85)	1.575 (40)	1.772 (45)	0.276 (7)	12	0.10 (2.5)
0.3387 – 0.3583 (8.601 – 9.100)	Ø D – 0.161 (Ø D – 4.1)	3.346 (85)	1.575 (40)	1.772 (45)	0.276 (7)	12	0.12 (3.0)
0.3584 – 0.3976 (9.101 – 10.100)	Ø D – 0.181 (Ø D – 4.6)	3.346 (85)	1.575 (40)	1.772 (45)	0.276 (7)	12	0.12 (3.0)
0.3977 – 0.4567 (10.101 – 11.600)	Ø D – 0.197 (Ø D – 5.0)	3.740 (95)	1.969 (50)	1.772 (45)	0.276 (7)	12	0.12 (3.0)
0.4568 – 0.5552 (11.601 – 14.100)	Ø D – 0.236 (Ø D – 6.0)	3.740 (95)	1.969 (50)	1.772 (45)	0.276 (7)	12	0.16 (4.0)
0.5553 – 0.5945 (14.101 – 15.100)	Ø D – 0.260 (Ø D – 6.6)	3.858 (98)	1.969 (50)	1.890 (48)	0.276 (7)	16	0.16 (4.0)
0.5946 – 0.6339 (15.101 – 16.100)	Ø D – 0.280 (Ø D – 7.1)	3.858 (98)	1.969 (50)	1.890 (48)	0.276 (7)	16	0.16 (4.0)
0.6340 – 0.7126 (16.101 – 18.100)	Ø D – 0.315 (Ø D – 8.0)	4.252 (108)	2.362 (60)	1.890 (48)	0.276 (7)	16	0.20 (5.0)
0.7127 – 0.7913 (18.101 – 20.100)	Ø D – 0.339 (Ø D – 8.6)	4.331 (110)	2.362 (60)	1.968 (50)	0.276 (7)	20	0.20 (5.0)

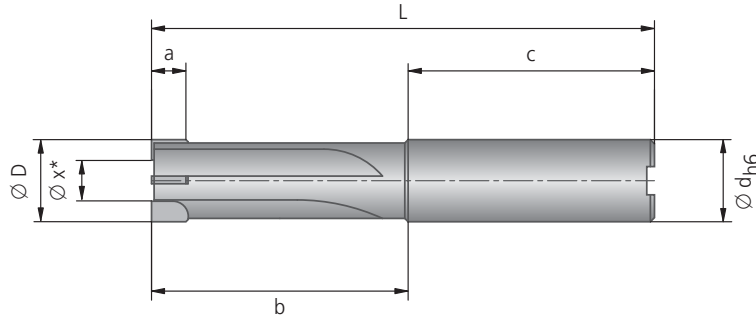
Order example: Order No. **690.10** · Bore diameter **0.7087"** · Bore tolerance **+.0005/-0** · Material **A360.2** (Cutting geometry page 62-63)
* only available with central coolant supply.

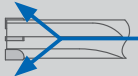

Ø 0.3780 – 0.7913 inch
(Ø 9.601 – 20.100 mm)

DIHART® PCD Reamers

With 4 cutting edges

with internal coolant supply ■
solid carbide body ■



PCD Reamers		
Cutting material / coating	 Order No.	 Order No.
PCD	690.11	690.14

(..) = mm

Dimensions							
Ø D	min. diameter for front cutting Ø x ~	L	b	c	a	Ø dh6 mm	max stock allowance on dia. Ø
0.3780 – 0.3976 (9.601 – 10.100)	Ø D – 0.141 (Ø D – 3.6)	3.346 (85)	1.575 (40)	1.772 (45)	0.276 (7)	12	0.06 (1.5)
0.3977 – 0.4567 (10.101 – 11.600)	Ø D – 0.150 (Ø D – 3.8)	3.740 (95)	1.969 (50)	1.772 (45)	0.276 (7)	12	0.06 (1.5)
0.4568 – 0.5552 (11.601 – 14.100)	Ø D – 0.150 (Ø D – 3.8)	3.740 (95)	1.969 (50)	1.772 (45)	0.276 (7)	12	0.08 (2.0)
0.5553 – 0.5945 (14.101 – 15.100)	Ø D – 0.154 (Ø D – 3.9)	3.858 (98)	1.969 (50)	1.890 (48)	0.276 (7)	16	0.08 (2.0)
0.5946 – 0.6339 (15.101 – 16.100)	Ø D – 0.154 (Ø D – 3.9)	3.858 (98)	1.969 (50)	1.890 (48)	0.276 (7)	16	0.08 (2.0)
0.6340 – 0.7126 (16.101 – 18.100)	Ø D – 0.181 (Ø D – 4.6)	4.252 (108)	2.362 (60)	1.890 (48)	0.276 (7)	16	0.12 (3.0)
0.7127 – 0.7913 (18.101 – 20.100)	Ø D – 0.181 (Ø D – 4.6)	4.331 (110)	2.362 (60)	1.968 (50)	0.276 (7)	20	0.12 (3.0)

Order example: Order No. 690.11 · Bore diameter 0.7087" · Bore tolerance +.0005/-0 · Material A360.2 (Cutting geometry page 62-63)



DIHART® Reaming with Insert Technology

1



2



Application specific

Reaming tools with indexable insert technology can also be combined with other tool systems, e.g. with REAMAX® TS.

3



Monoblock tools both fixed and adjustable

Reaming tools are available as monoblock tools with indexable insert technology from a diameter of 46 mm and are designed in either adjustable or fixed versions.

4



5



Stepped tools

Stepped tools are individually manufactured as special tools and are available in a fixed design.

6



7



In collaboration with the application specialists at KOMET®, it is also possible for fixed versions and individual stepped tools as well as diameters to be designed and manufactured which can be combined with the various different tool connections from the DIHART® range.

Indexable insert reaming tools are available on request. They are designed as integral tools or as a modular tool system, depending on the application. For extremely small tolerances, they can also be produced in adjustable versions.

The tools can be supplied in single or multi-step versions from a diameter of 46 mm.



DIHART® Page

Insert Reaming 68 – 71

Assembly instructions, Inquiry forms

MicroSet System 72 – 75

Assembly instructions, Inquiry forms

Special Tools 76 – 77

1



2



3



4



5



6



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8



9



Reaming with Indexable Insert Technology

The Technology

The use of indexable inserts for multi-blade reamers is revolutionizing reaming and setting new levels in precision and function.

Each insert has two cutting edges. Unlike boring tools, inserts for reaming tools are ground as a complete set directly on the body in their specific insert pocket.

The positions of the individual cutting edges on an insert are precisely defined during manufacturing for the application. Cutting edges ground in a single operation ensure the degree of precision required for high precision bore machining.

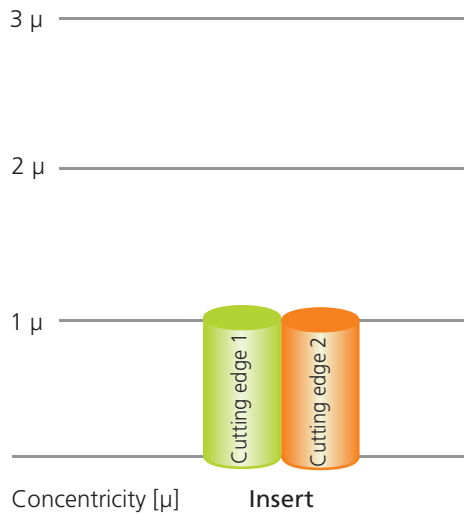
Numerous cutting materials and coatings are available for machining a wide variety of materials.

BENEFITS for you:

- Ground to size for maximum precision
- Low cost per bore
- Short set-up time
- Maximum flexibility
- Concept can be used for an extremely wide variety of DIHART® tools
- Low cost changes to tool and geometry
- Certain applications can be adjusted for wear compensation for extremely small bore tolerances

Precision of rotations

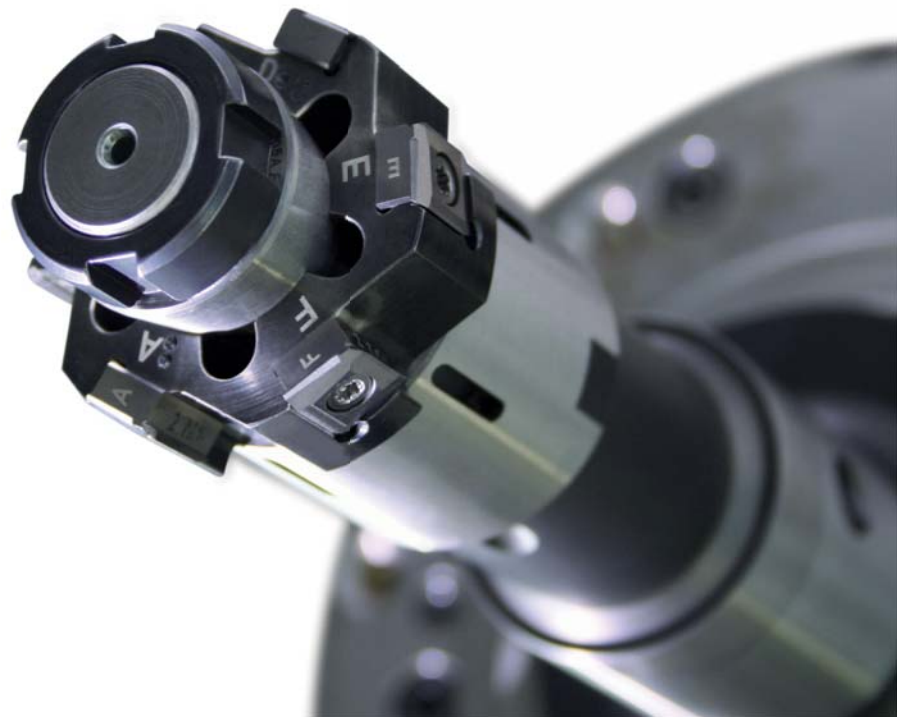
Cutting edge 1 – Cutting edge 2



Two cutting edge insert

Inserts can be indexed for the shortest possible set-up without affecting the tools' precision.

Set-up time is reduced and tool life is doubled by using two cutting edges.



Design your own tool!

There is an inquiry form on page 70.

Enter the required dimensions and send us your inquiry. We check your specifications for technical feasibility and you receive a prompt reply.

Assembly instructions

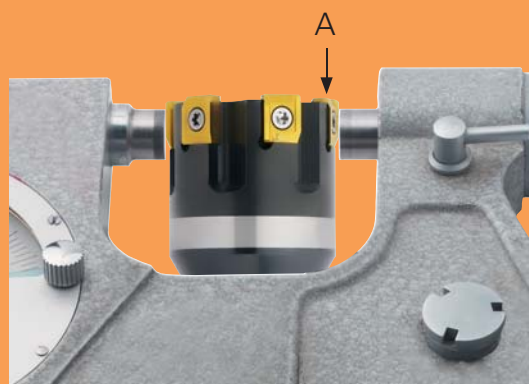
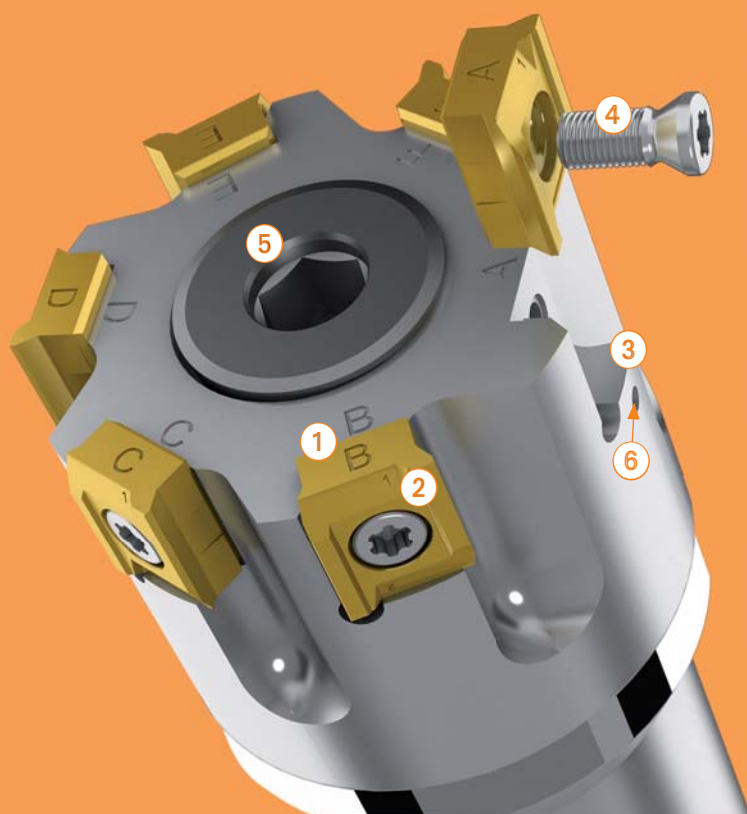
Cleaning:

Make sure that the insert seats ③ and indexable inserts are absolutely clean (grease and debris free). If necessary, remove tiny dust particles with compressed air!

Assembly:

- All indexable inserts and insert seats are marked with letters ①. This ensures correct assignment to the insert seat.
- The number markings ② ensure that all indexable inserts are positioned correctly.

Tighten the screw ④ (order no. N00 57710) to 22 in-lbs (2.5 Nm) (torque wrench order no. L05 00940)



Measuring the diameter:

The measuring inset is located at letter A and is also marked on the holder with a punch mark ⑥. If the diameter is too large, loosen the conical screw ⑤ and turn it to the right to set the correct diameter. The conical screw ⑤ does not have to be removed completely!

Caution!

- Uneven flute spacing!
- There are 2 inserts 180° opposed = measuring flute A.
- Measure the diameter at the front of the cutter (see illustration). Measuring further back will yield an incorrect measurement as inserts are ground with a back taper.
- Avoid damaging the cutting edges.
- When indexing the insert on an adjustable holder, the diameter may need to be adjusted.

Patent applied for inside and outside Germany (WSP-Reaming)



1



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Design your own tool!

Unique: Reaming with Indexable Insert Technology

The use of inserts is revolutionizing multiple blade reaming and setting new levels in precision, function and economy. We'll check your specifications for technical feasibility and reply promptly.

Company:

Contact:

Department:

E-Mail:

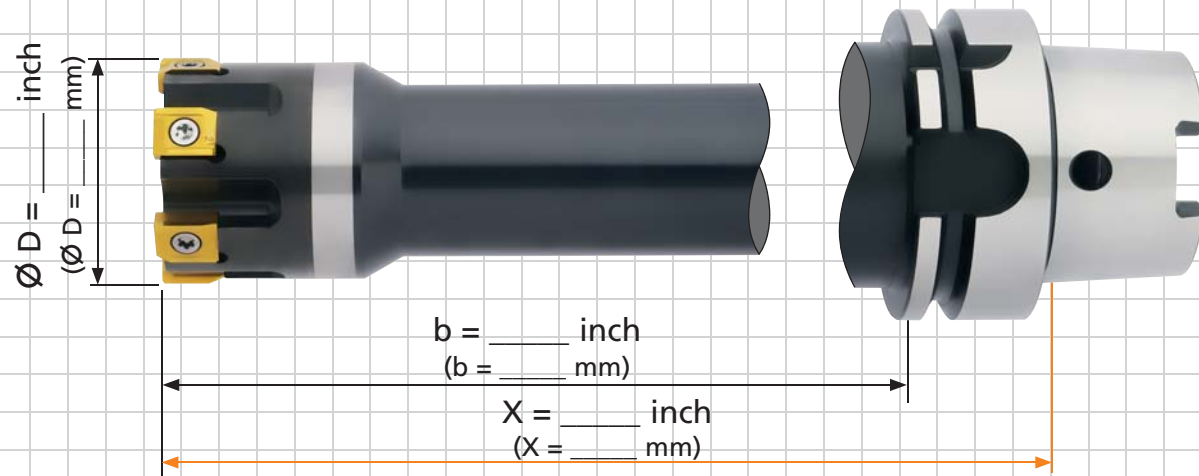
Telephone:

Customer-No.:

Fax:

Distributor:

Date:



Material to be machined:

Machining method

through hole blind hole

Length of bore:

Interrupted cut

yes no

Bore tolerance:

Required surface finish:

Stock allowance on dia.:

Required cutting material/coating

carbide TiN DBG-N

DST DJC PCD

DBF DBC DJF

other:

Other:

No. of inserts (Z)

for calculating the feed rate

f_z inch/tooth (mm/tooth):

$\varnothing D$	Z
1.7953 – 3.1338 (45.600 – 79.599)	6
3.1339 – 3.9605 (79.600 – 100.599)	8
3.9606 – 4.3542 (100.600 – 110.599)	10
4.3543 – 5.4960 (110.600 – 139.599)	12

Connection (Type and size)

CAT _____

HSK _____
DIN 69893 A

ISO _____
DIN 69871 AD/B

BT _____
JIS B 6339 AD/B
(MAS 403 BT)

DAH _____

ABS _____

\varnothing _____ inch
 (\varnothing _____ mm)
similar DIN 1835

other _____

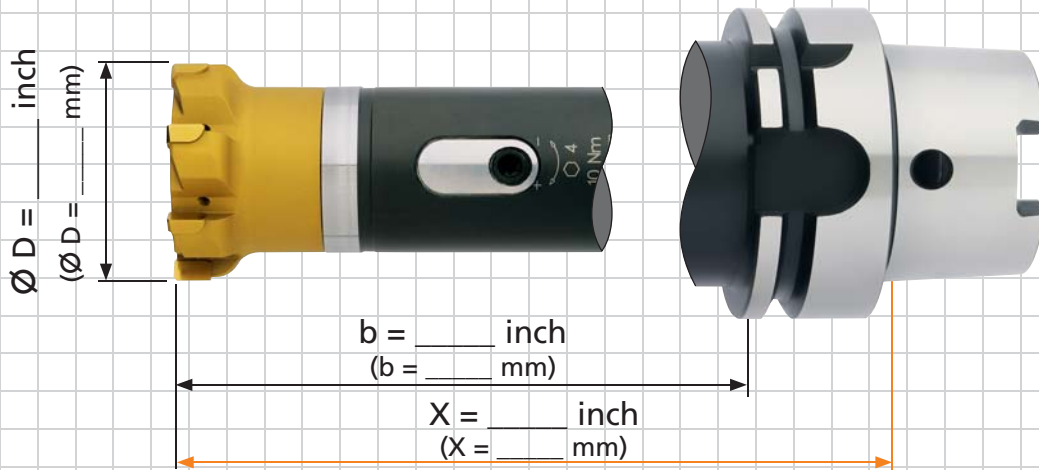
No standard solution within our range? Dimensions not what you require?

Easy Special makes it possible for you create your own combination of standard modules in the widest variety of dimensions.

Select the series, define the effective length and choose the desired adapter for the tool.

We'll check your specifications for technical feasibility and reply promptly.

Company:	Contact:
Department:	E-Mail:
Telephone:	Customer-No.:
Fax:	Distributor:
Date:	



Material to be machined:	Reamer Style	Connection (Type and size)
Machining method <input type="checkbox"/> through hole <input type="checkbox"/> blind hole	<input type="checkbox"/> REAMAX® TS	<input type="checkbox"/> CAT
Length of bore: _____	_____	<input type="checkbox"/> HSK _____ <small>DIN 69893 A</small>
Interrupted cut <input type="checkbox"/> yes <input type="checkbox"/> no	<input type="checkbox"/> REAMAX®	<input type="checkbox"/> ISO _____ <small>DIN 69871 AD/B</small>
Bore tolerance: _____	_____	<input type="checkbox"/> BT _____ <small>JIS B 6339 AD/B (MAS 403 BT)</small>
Required surface finish: _____	<input type="checkbox"/> Monomax®	<input type="checkbox"/> DAH _____
Stock allowance on dia.: _____	_____	<input type="checkbox"/> ABS _____
Required cutting material/coating <input type="checkbox"/> carbide <input type="checkbox"/> TiN <input type="checkbox"/> DBG-N <input type="checkbox"/> DST <input type="checkbox"/> DJC <input type="checkbox"/> PCD <input type="checkbox"/> DBF <input type="checkbox"/> DBC <input type="checkbox"/> DJF <input type="checkbox"/> other: _____	<input type="checkbox"/> Solid carbide reamer <input type="checkbox"/> Duomax <input type="checkbox"/> Cutting ring	<input type="checkbox"/> Ø _____ inch <input type="checkbox"/> (Ø _____ mm) <small>similar DIN 1835</small> <input type="checkbox"/> other _____
Other: _____	_____	_____



DIHART® MicroSet System

Reaming with Adjustable Inserts

The new reamers from DIHART® which boast individually adjustable inserts are an alternative to the ready-to-use ground tool variants. These reamers also feature multiple blades and offer maximum flexibility, reduce logistics with regard to retipping and enable cost savings thanks to the inserts which are available from stock.

The single-blade inserts are set to a diameter with a back taper using a newly developed fine adjustment system for indexable inserts with μm accuracy. This makes hole tolerances of $\geq \text{IT5}$ easily achievable. The reference dimension is provided by two measuring blocks.

Only 14 inserts and sizes for the diameter range of 40 to 140 mm. Maximum flexibility in terms of fields of application, availability and variety of cutting materials and coatings are features of this tool series, because certain components, tolerances, volumes, etc., often determine which combinations are used.

BENEFITS for you:

- Maximum flexibility
- Reduces logistics with regards to retipping
- Inserts available from stock
- Individually adjustable inserts
- Simple handling when making adjustments and changing the inserts

Variant:

- Diameter range of 1.5748 – 5.5118 inch (40 – 140 mm)
- Hole tolerances of $\geq \text{IT5}$
- Use with cast metal, solutions for steel, stainless steel, aluminum and other materials to follow

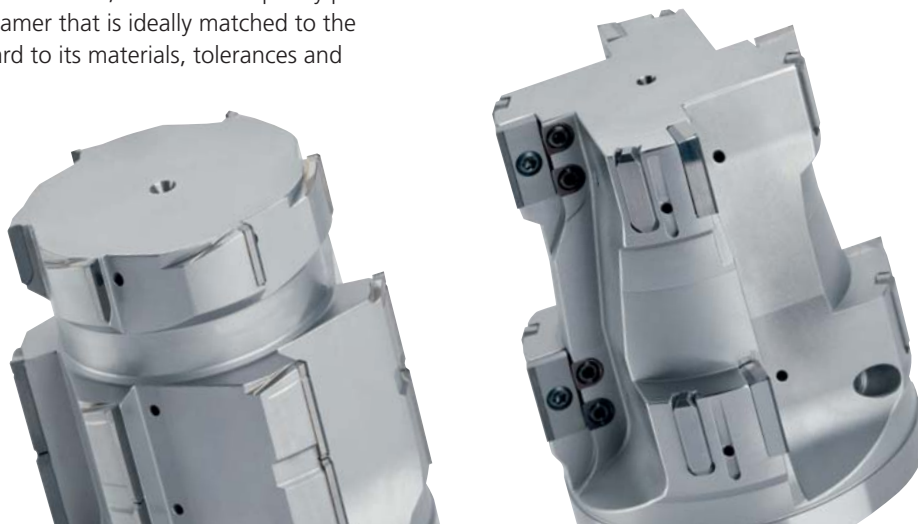
Precision and productivity

Even when the demands on a component are particularly high and the highest precision is required, the DIHART® MicroSet system gives you a special advantage: The tools can be readjusted at any time. All that needs to be done is to readjust the indexable inserts in the precision adjustment system to the required diameter. Only when the cutting edges are worn do they need to be replaced.

The special strengths of the MicroSet system can truly be seen when used with special tools, especially with stepped tools that the user can set-up themselves. Thanks to the variety of possible combinations, the user can quickly put together a suitable reamer that is ideally matched to the component with regard to its materials, tolerances and volumes.

The MicroSet tool shown uses this advantage perfectly and solves the application requirements better than the previously used brazed PCD tools. An inability to correct the brazed PCD plates, particularly in the second stage, results in operating times of different lengths and irregular repair costs.

The standard indexable inserts available from stock (fitted with PCD in this case) make up for long repair cycles and not only increase the flexibility of the system but also the productivity and the profitability of an application.





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BENEFITS for you:

- Simplified logistics thanks to standard indexable inserts available from stock
- Can be fitted with CBN or PCD indexable inserts for a variety of machining requirements
- Easy readjustment using a precision-controlled adjustment system
- Can be used as a repeat operation tool e.g. integrated milling and reaming
- Setting easily completed on an electronic presetting device



Design your own tool!

Reaming with Adjustable Inserts

The tools are specially manufactured for each application, with four to eight cutting edges on a basic body and for length/diameter ratios up to 2xD.

We'll check your specifications for technical feasibility and reply promptly.

Company: _____

Contact: _____

Department: _____

E-Mail: _____

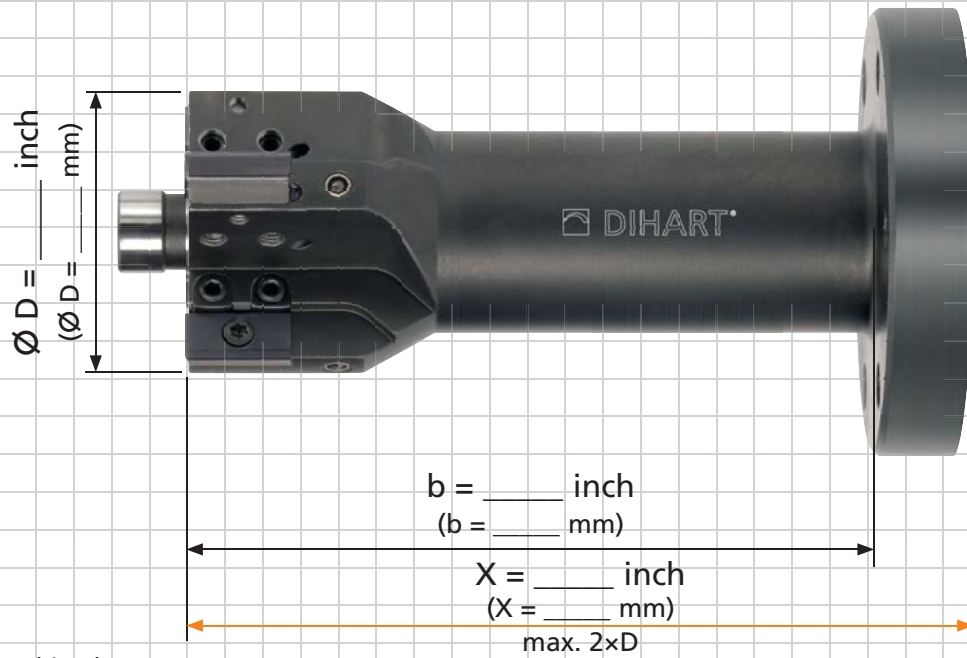
Telephone: _____

Customer-No.: _____

Fax: _____

Distributor: _____

Date: _____



Material to be machined: _____

Machining method

through hole blind hole

Length of bore: _____

Interrupted cut

yes no

Bore tolerance: _____

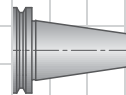
Required surface finish: _____

Required cutting material/coating

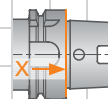
- carbide TiN DBG-N
- DST DJC PCD
- DBF DBC DJF
- other: _____

Other: _____

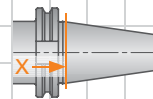
Connection (Type and size)



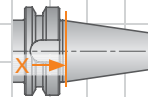
CAT _____



HSK _____
DIN 69893 A



ISO _____
DIN 69871 AD/B



BT _____
JIS B 6339 AD/B
(MAS 403 BT)



DAH _____

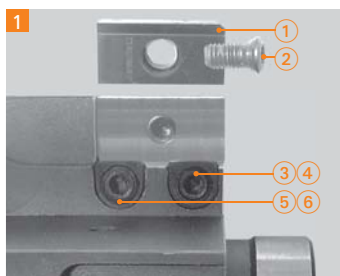
other

Ø 1.5748 – 5.5118 inch
(Ø 40.000 – 140.000 mm)

DIHART® MicroSet System

Insert		Assembly parts		Accessories		Setting device	
Ø D	Order No.	DBG-N	Clamping screw	Wedge	Torque key	Replaceable blade	Order No.
		K	Order No. Description	Order No.	Order No. Description	Order No.	
1.5748 – 1.7716 (40.000 – 44.999)	70W.37.01040A	●	N00 57241 S3070-8IP 2.25 Nm	15F.00.30001	L05 03311 8IP 2.25 Nm	L05 00730	059.33.4154
1.7717 – 1.9685 (45.000 – 49.999)	70W.37.01045A						
1.9686 – 2.1653 (50.000 – 54.999)	70W.37.01050A						
2.1654 – 2.3622 (55.000 – 59.999)	70W.37.01055A						
2.3623 – 2.5590 (60.000 – 64.999)	70W.37.01060A						
2.5591 – 2.7559 (65.000 – 69.999)	70W.37.01065A						
2.7560 – 2.9527 (70.000 – 74.999)	70W.37.01070A						
2.9528 – 3.1496 (75.000 – 79.999)	70W.37.01075A						
3.1497 – 3.5433 (80.000 – 89.999)	70W.37.01080A						
3.5434 – 3.9370 (90.000 – 99.999)	70W.37.01090A						
3.9371 – 4.3307 (100.000 – 109.999)	70W.37.01100A						
4.3308 – 4.7244 (110.000 – 119.999)	70W.37.01110A						
4.7245 – 5.1180 (120.000 – 129.999)	70W.37.01120A						
5.1181 – 5.5118 (130.000 – 140.000)	70W.37.01130A						

Assembly instructions



Assembly parts (Fig. 1)

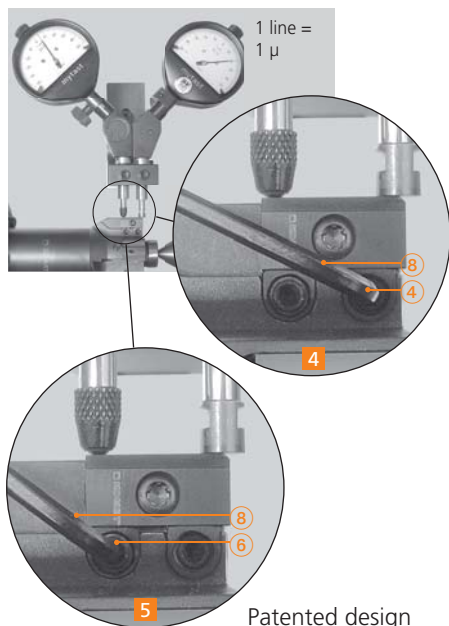
- ① indexable insert
- ② clamping screw

Setting machining dia.

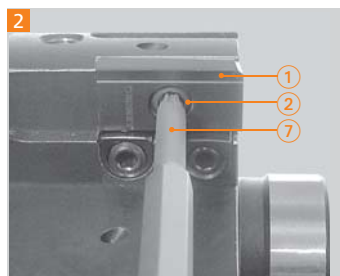
- ③ adjusting wedge, ④ differential screw

Setting conicity

- ⑤ adjusting wedge, ⑥ differential screw



Patented design



Fit the indexable insert:

Make sure that the insert seat is clean.

Place the indexable insert ① into the insert seat and tighten the clamping screw ② only slightly.

Use TORX Plus® torque wrench ⑦ (2.25 Nm) (Fig.2).

Reference dia. as reference dimension "0" for setting the machining dia. and conicity (Fig. 3), reference dia. is marked on tool.

Preset the machining dia. (Fig. 4) and conicity (Fig. 5):

Use an Allen key ⑧ (width across flats SW2) to turn the differential screws ④ and ⑥ until the indexable insert ① is set to approx. 10 µm below the desired machining dia. and approx. 25 µm over the reference dia.

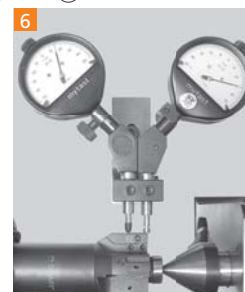
Secure the insert:

Use a TORX Plus® torque wrench ⑦ (2.25 Nm) to secure the indexable insert ① at the preset tightening torque (Fig. 2).

Set the final machining dia. (Fig. 4) and conicity (Fig 5):

When tightened, the indexable insert ① is set to the machining diameter and the specified conicity using the differential screws ④ and ⑥.

Tool after setting (Fig 6).



DIHART® Special Tools

Special Solutions and Multi-Step Tools – More Possibilities, Lower Machining Costs

The development of customer-specific solutions represents a major area of expertise for DIHART®.

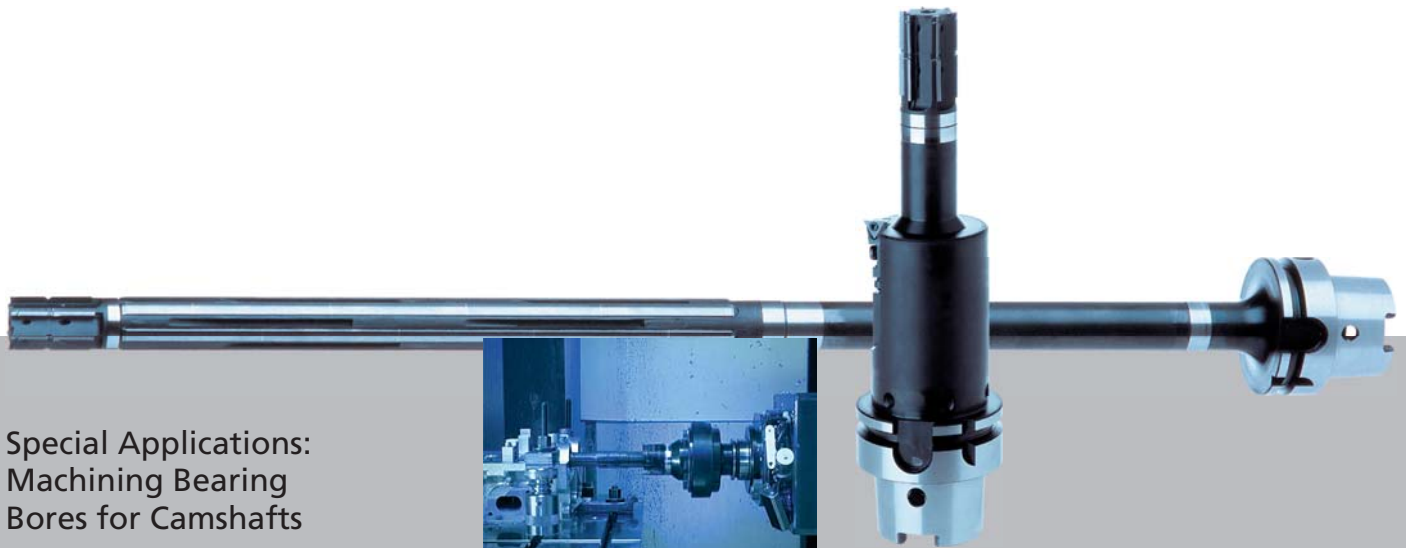
It is often difficult to carry out machining tasks with standard tools because of the demands for form, tolerance or quality that require special process analysis and tool development work.

The form on page 114 of this catalog can be used to inquire about and order special tools.

References to applications can be found in our application examples.

BENEFITS for you:

- Application specific design
- Reduction of cycle time
- Technical advice by experienced DIHART® engineers
- Combination of several machining operations
- Highest efficiency, productivity and cost reduction



Special Applications: Machining Bearing Bores for Camshafts

Example:
Finish machining operation for camshaft bearing for cylinder heads in Ck AlSi9Cu3 for automotive engines.

The task:
To simplify the process on transfer lines or machining centers.

The solution:
Using application-specific tooling, machining the cylinder heads on transfer lines is reduced to one station. On machining centers, a short pilot tool, fitted with PCD blades is initially used to pre-machine the bores for the first step. The finishing tool (also with PCD blades), which matches the length of the engine, then reams all the bores to size: $\varnothing 1.025''$ ($\varnothing 26.045$ mm) H7.

The concept has now become well established in engine and vehicle manufacturing.

The cutting data is as follows:

$v_C = 721$ ft/min (220 m/min);
 $f = 42.5$ in/min (1080 mm/min)

Multi-flute stepped reaming tools and special solutions from DIHART® improve the economics of reaming. The latest generation of tools is characterized by extremely high cutting speeds and feeds. Designed to suit workpiece and material, they guarantee dimensional stability and reliable production.

Multi-step tools

Multi-step and modular reaming tools from DIHART® improve production performance. DIHART® increases the range of functions for the tools and, in doing so, reduces machining time and costs.



Special tools

- Use of latest technology
- Tool design to suit application
- Technical support from DIHART® experts
- Multi-flute reaming tools for best bore quality and economy
- Reduction in secondary costs



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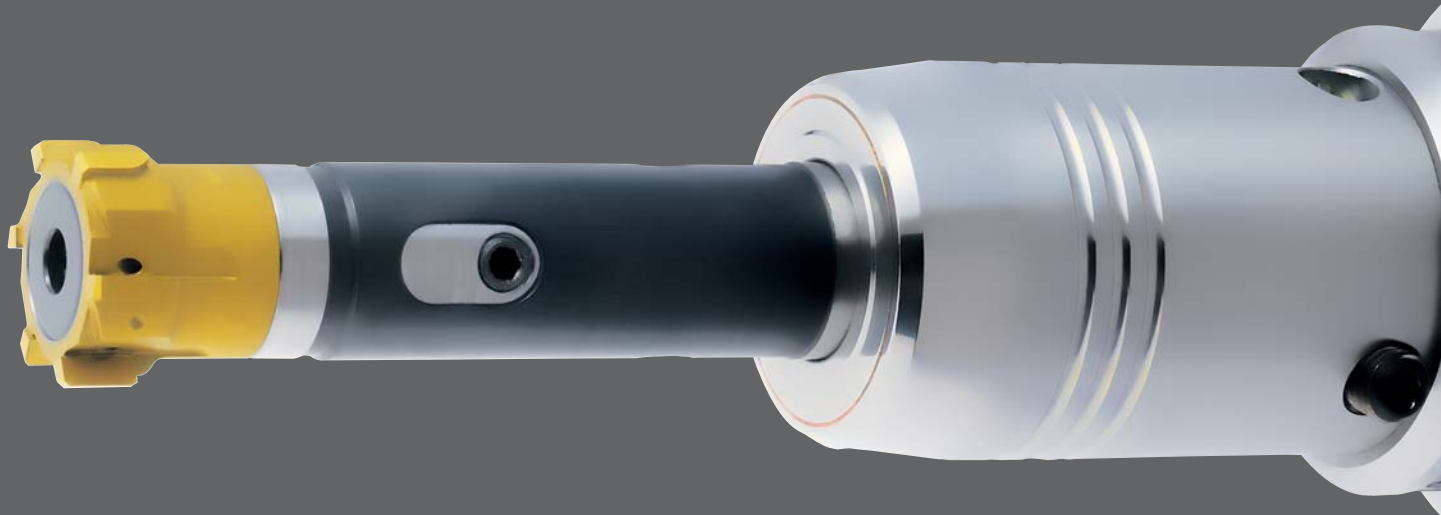
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DIHART® Compensating Holder



DIHART DAH® compensating holders are static compensating systems; DPS floating holders are dynamic compensating systems. Axial and radial run-out are very easily compensated for.

Using the patented DAH® from DIHART® the concentricity of reaming tools and all rotating machining tools can be adjusted quickly, effortlessly and precisely, right on the machine.

Precision bore machining can then be executed with extremely high cutting speeds and feed values.

The bore quality achieved, such as circularity, cylindricity and surface finish will satisfy your production needs.

The use of the DAH® enables you to machine precision bores up to tolerance class IT 4.



DIHART® Compensating Holder Page

DAH® Compensating Holder

HSK-A adapter	80
ABS® adapter	80
SK / BT taper	81
CAT / MS taper	82
Replacement parts / accessories	83
Assembly instructions	88

Adapter for DAH®

Hydraulic chuck	84
ABS®	84
Cylindrical shank	85

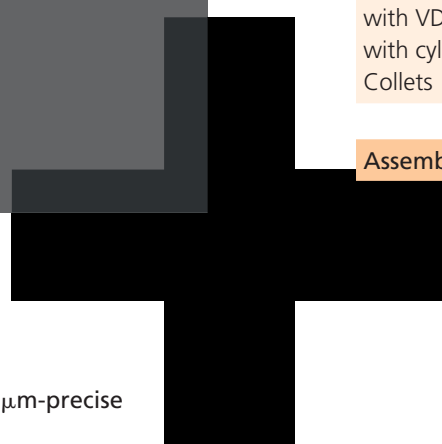
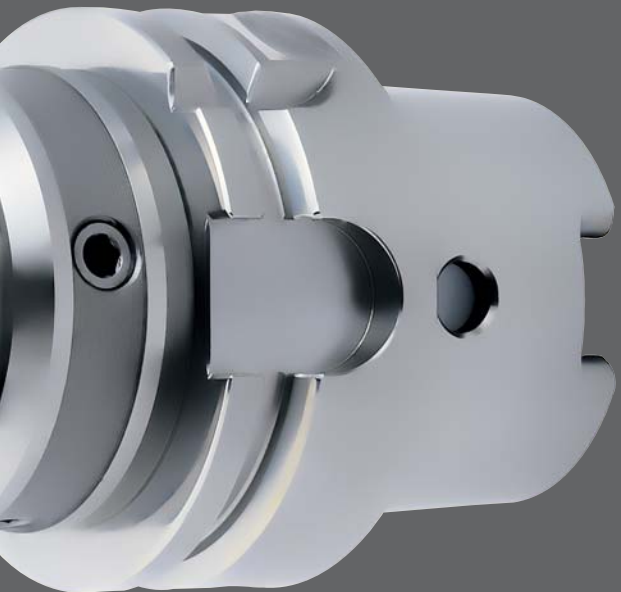
DAH® 50 HS Compensating Holder 86

Reducer sleeve	87
for high-speed machining	89

DPS Floating Holder

with VDI connection	90
with cylindrical shank	90
Collets	91

Assembly Instructions 88



BENEFITS for you:

- Compensation systems for μm -precise concentricity
- Easy correction of concentricity and axial error
- High-speed machining
- With internal coolant supply
- Minimal run-out contributed to longer tool life

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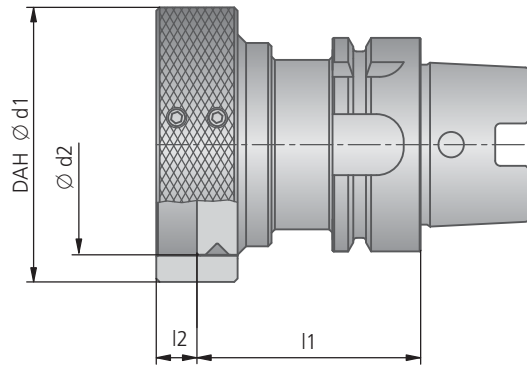


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DIHART DAH® Compensating Holder with HSK Adapter DIN 69893 A

■ with internal coolant supply



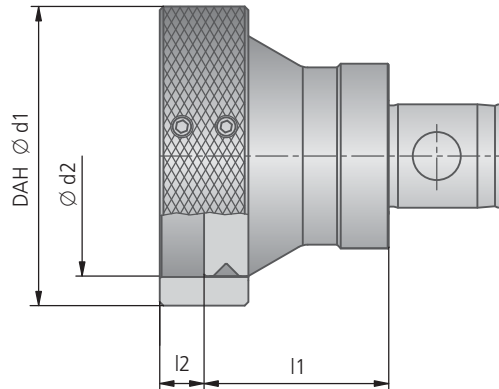
(..) = mm

HSK-A						
Order No.	DAH Ø d1	HSK-A	Ø d2	l1	l2	
545.07.011	63	63	1.969 (50)	2.598 (66)	0.472 (12)	3.24
545.07.002	81	40	2.559 (65)	2.047 (52)	0.472 (12)	2.14
545.07.003	81	50	2.559 (65)	2.598 (66)	0.472 (12)	3.06
545.07.004	81	63	2.559 (65)	2.598 (66)	0.472 (12)	3.92
545.07.009	81	80	2.559 (65)	2.992 (76)	0.472 (12)	5.78
545.07.010	81	100	2.559 (65)	2.992 (76)	0.472 (12)	7.89
545.07.005	115	80	3.937 (100)	2.992 (76)	0.630 (16)	3.86
545.07.006	115	100	3.937 (100)	3.110 (79)	0.630 (16)	11.42


Includes: DAH® compensating holder complete with assembling screws and DAH® ring. DAH® replacement parts see page 83.

with ABS® Adapter

■ with internal coolant supply



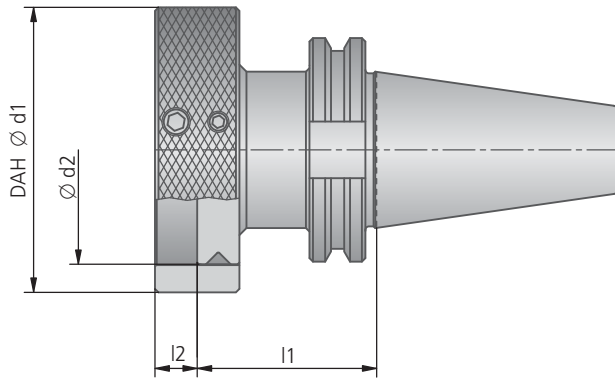
(..) = mm

ABS®						
Order No.	DAH Ø d1	ABS	Ø d2	l1	l2	
545.00.001	81	40	2.559 (65)	1.969 (50)	0.472 (12)	1.98
545.00.003	81	50	2.559 (65)	1.969 (50)	0.472 (12)	3.20
545.00.002	115	63	3.937 (100)	2.126 (54)	0.630 (16)	6.06

Includes: DAH® compensating holder complete with assembling screws and DAH® ring. DAH® replacement parts see page 83.

Patented design

DIHART DAH® Compensating Holder with Taper Shank DIN 69871 AD/B




with internal coolant supply ■
long version on request ■



(..) = mm

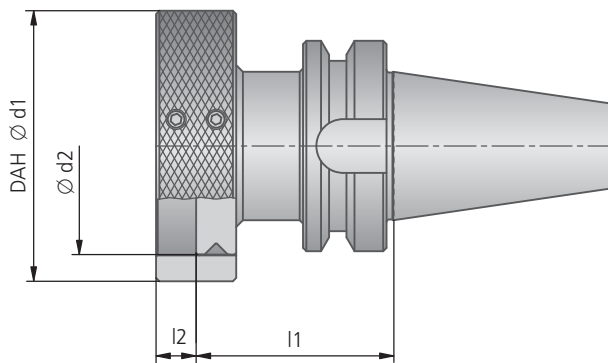
DIN 69871 AD/B

Order No.	DAH Ø d1	SK taper	Ø d2	l1	l2	 lbs
545.10.010	63	30	1.969 (50)	2.008 (51)	0.472 (12)	2.16
545.10.011	63	40	1.969 (50)	2.008 (51)	0.472 (12)	3.20
545.10.001	81	40	2.559 (65)	2.008 (51)	0.472 (12)	3.57
545.10.003	81	50	2.559 (65)	2.008 (51)	0.472 (12)	8.13
545.10.004	115	50	3.937 (100)	2.716 (69)	0.630 (16)	12.37

Includes: DAH® compensating holder complete with assembling screws and DAH® ring. DAH® replacement parts see page 83.


with Taper Shank JIS B 6339 AD/B (MAS 403 BT)

with internal coolant supply ■
long version on request ■



(..) = mm

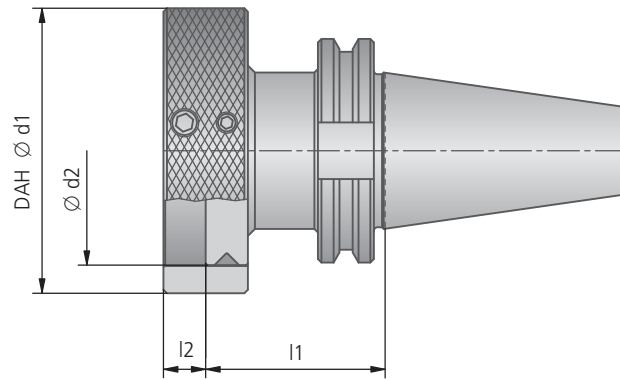
JIS B 6339 AD/B

Order No.	DAH Ø d1	BT taper	Ø d2	l1	l2	 lbs
545.77.011	63	40	1.969 (50)	2.323 (59)	0.472 (12)	3.42
545.77.001	81	40	2.559 (65)	2.323 (59)	0.472 (12)	3.95
545.77.003	81	50	2.559 (65)	2.756 (70)	0.472 (12)	10.32
545.77.004	115	50	3.937 (100)	3.464 (88)	0.630 (16)	14.55

Includes: DAH® compensating holder complete with assembling screws and DAH® ring. DAH® replacement parts see page 83.

DIHART DAH® Compensating Holder with CAT / MS Taper

■ with internal coolant supply through taper or flange (MS)



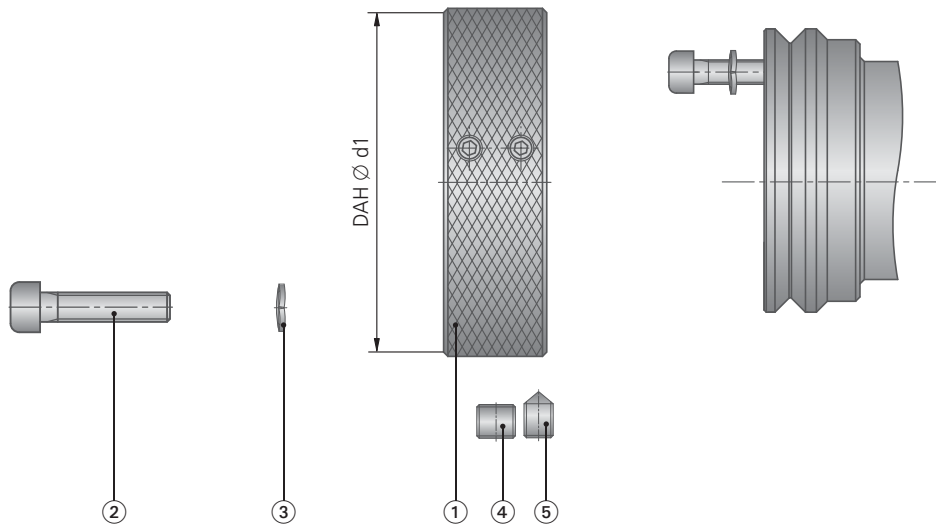
(..) = mm





CAT / MS Taper					
Order No.	DAH Ø d1	CAT MS Taper	Ø d2	l1	l2
545.87.010	63	30	1.969 (50)	2.008 (51)	0.472 (12)
545.87.011	63	40	1.969 (50)	2.008 (51)	0.472 (12)
545.87.001	81	40	2.559 (65)	2.008 (51)	0.472 (12)
545.87.003	81	50	2.559 (65)	2.008 (51)	0.472 (12)
545.87.004	115	50	3.937 (100)	2.716 (69)	0.630 (16)

Includes: DAH® compensating holder complete with assembling screws and DAH® ring. DAH® replacement parts see page 83.

DIHART DAH® Compensating Holder

Replacement parts / Accessories



	①	②		③	④		⑤	
for DAH Ø d1	Adjusting ring Complete with ④ & ⑤ Order No.	Assembling screw  Description Order No.		Spring washer  Order No.	Radial adjustment screw  Description Order No.		Hanger point screw  Article Order No.	
63	545.25.010	M5x22	545.26.001A	545.27.001	M8x6	5505108006	M6x8	5505206008
81	545.25.001	M5x22	545.26.001A	545.27.001	M8x6	5505108006	M6x10	5505206010
115	545.25.002	M8x30	545.26.002	545.27.002	M8x8	5505108008	M8x10	5505208010 (x2)

Replacement parts ABS®

ABS location spigot	
ABS	Order No. Spares assortment
32	N00 17661
40	N00 17671
50	N00 17681
63	N00 17691
80	N00 17701

ABS location hole	
ABS	Order No. Spares assortment
32	N00 15261
40	N00 15271
50	N00 15281
63	N00 15291
80	N00 15301

Replacement parts HSK-A

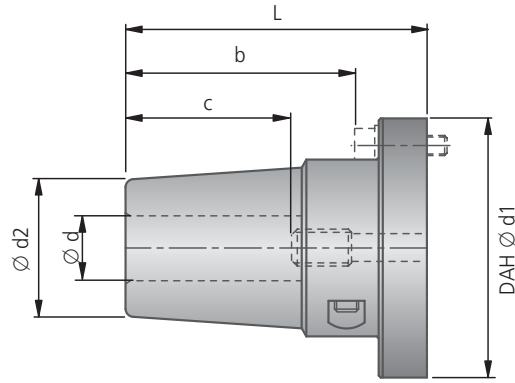
HSK-A Coolant supply unit		
HSK-A	Order No. Spares assortment	Order No. O ring
40	51391 00040	52911 00751 (x2)
50	51391 00050	52911 00920 (x2)
63	51391 00063	52911 01025 (x1) 52911 01020 (x1)
80	51391 00080	52911 01320 (x2)
100	51391 00100	52911 01430 (x2)

Individual spares (spares assortment) are supplied for replacement purposes only. Any other use is not permitted and represents an infringement of the patent.

Includes HSK-A spares assortment: Coolant tube, locking collar and two O rings.

DIHART DAH® Bushing Hydraulic chuck

- with internal coolant supply
- easy length adjustment from outside



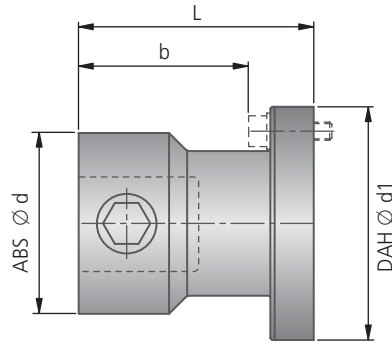
(..) = mm

Hydraulic chuck							
Order No.	Ø d	DAH Ø d1	Ø d2	L	b	c	lbs
545.62.004	0.472 (12)	63	0.945 (24)	2.756 (70)	2.047 (52)	1.378 – 1.772 (35 – 45)	0.95
545.62.015	0.630 (16)	81	1.338 (34)	2.953 (75)	2.244 (57)	1.535 – 1.929 (39 – 49)	
545.62.016	0.787 (20)	81	1.457 (37)	2.953 (75)	2.244 (57)	1.614 – 2.008 (41 – 51)	1.72
545.62.017	0.984 (25)	81	1.968 (50)	4.331 (110)	3.622 (92)	1.811 – 2.205 (46 – 56)	3.15
545.62.018	1.260 (32)	81	2.362 (60)	4.527 (115)	3.819 (97)	2.008 – 2.401 (51 – 61)	3.79

Includes: DAH® adapter complete with length adjustment screw. Reducer sleeve see page 87.

for tools with ABS® connection

- with internal coolant supply



(..) = mm

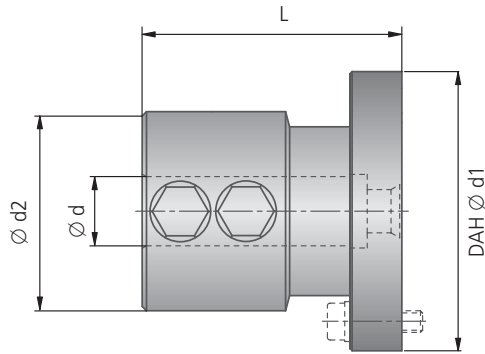
ABS					
Order No.	ABS Ø d	DAH Ø d1	L	b	lbs
545.40.006	32	63	1.653 (42)	0.945 (24)	
545.40.007	32	81	1.378 (35)	0.669 (17)	
545.40.001	40	81	1.378 (35)	0.669 (17)	0.97
545.40.003	50	81	2.559 (65)	1.850 (47)	1.83
545.40.004	50	115	1.811 (46)	0.807 (20.5)	2.62
545.40.002	63	115	2.047 (52)	1.043 (26.5)	3.22

Includes: DAH® adapter complete with ABS® hardware.

Patented design

DIHART DAH® Cylindrical Shank Bushing for use with DIN 1835 B cylindrical shank weldon

with internal coolant supply ■

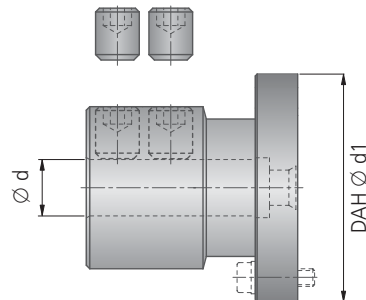


(..) = mm

DAH				
Order No.	Ø d	DAH Ø d1	Ø d2	L
545.85.001	0.500 (12.7)	81	1.575 (40)	2.047 (52)
545.85.002	0.625 (15.9)	81	1.575 (40)	2.047 (52)
545.85.003	0.750 (19.1)	81	1.772 (45)	2.441 (62)
545.85.004	1.000 (25.4)	81	1.890 (48)	2.441 (62)
545.85.005	1.500 (38.1)	115	2.835 (72)	2.992 (76)

Supply includes: DAH® adapter complete with set screw. For replacement parts, see below

Replacement parts



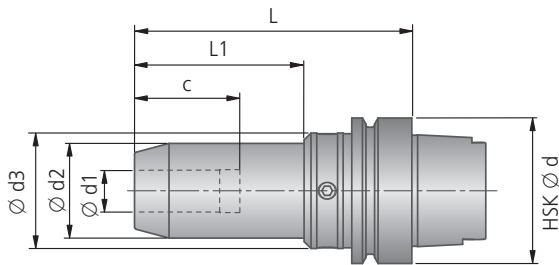
(..) = mm

for Cylindrical Shank Bushing		
DAH Ø d1	Ø d2	Order No.
81	0.500 (12.7)	5505108012 (x2)
81	0.625 (15.9)	5505108012 (x2)
81	0.750 (19.1)	5505108012 (x2)
81	1.000 (25.4)	5505108012 (x2)
115	1.500 (38.1)	5505112016 (x2)

DIHART DAH® 50 HS Compensating Holder

HSK Adapter

- with internal coolant supply
- clamping range \varnothing 0.118 – 0.787 inch (\varnothing 3 – 20 mm)

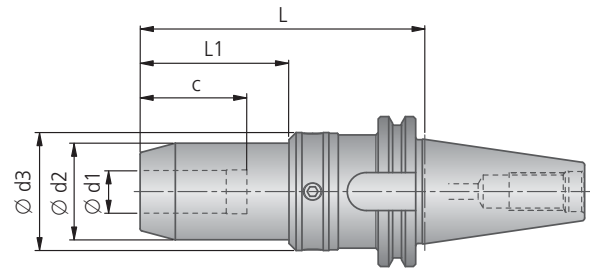


(..) = mm

HSK								
Order No.	HSK Ø d	Ø d1	Ø d2	Ø d3	L	L1	c	lbs
54B.10.00030	63	0.787 (20)	1.614 (41)	1.968 (50)	4.331 (110)	2.484 (63.1)	2.067 (52.5)	2.87
54B.10.00040	63	0.984 (25)	1.988 (50.5)	2.382 (60.5)	5.315 (135)	2.839 (72.1)	2.244 (57)	4.76

Taper Shank DIN 69871 AD/B

- with internal coolant supply
- clamping range \varnothing 0.118 – 0.787 inch (\varnothing 3 – 20 mm)

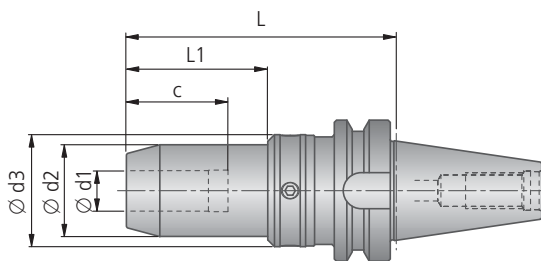


(..) = mm

DIN 69871 AD								
Order No.	ISO Taper	Ø d1	Ø d2	Ø d3	L	L1	c	lbs
54B.90.00030	40	0.787 (20)	1.614 (41)	1.968 (50)	4.331 (110)	2.559 (65)	1.614 (41)	3.31

Taper Shank JIS B 6339 AD (MAS 403 BT)

- with internal coolant supply
- clamping range \varnothing 0.118 – 0.787 inch (\varnothing 3 – 20 mm)

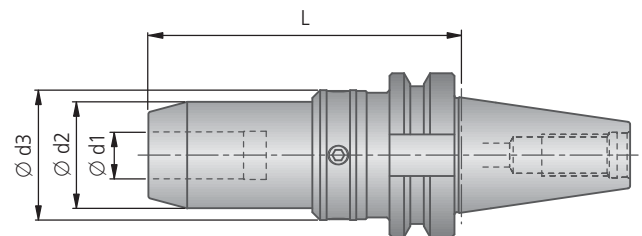


(..) = mm

JIS B 6339 AD (MAS 403 BT)								
Order No.	BT Taper	Ø d1	Ø d2	Ø d3	L	L1	c	lbs
54B.91.00030	40	0.787 (20)	1.614 (41)	1.968 (50)	4.331 (110)	2.720 (69.1)	1.614 (41)	3.75

Taper Shank CAT

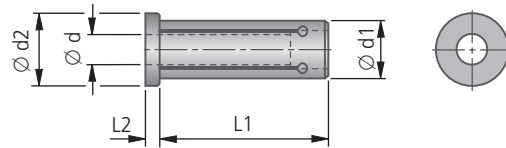
- with internal coolant supply
- clamping range \varnothing 0.118 – 0.787 inch (\varnothing 3 – 20 mm)




(..) = mm

CAT40					
Order No.	CAT Taper	Ø d1	Ø d2	Ø d3	L
54B.93.00030	40	0.750 (19.05)	1.614 (41)	1.969 (50)	4.764 (121)
54B.93.00035	40	0.787 (20)	1.614 (41)	1.969 (50)	4.764 (121)

Includes: DAH® 50 HS compensating holder complete with adjustment ring and adjustment screws.
Reducer sleeve for clamping range \varnothing 0.118 – 0.630 inch (\varnothing 3 – 16 mm) see page 87.



(..) = mm

Reducer sleeve						
Order No.	Ø d	Ø d1	Ø d2	L1	L2	
L01 14291	0.118 (3)	0.472 (12)	0.748 (19)	1.772 (45)	0.079 (2)	0.22
L01 14301	0.157 (4)					
L01 14311	0.197 (5)					
L01 14321	0.236 (6)					
L01 14331	0.315 (8)					
L01 14261	0.118 (3)	0.787 (20)	1.142 (29)	1.988 (50.5)	0.079 (2)	0.22
L01 14271	0.157 (4)					
L01 14281	0.197 (5)					
L01 14201	0.236 (6)					
L01 14211	0.315 (8)					
L01 14221	0.394 (10)					
L01 14231	0.472 (12)					
L01 14241	0.551 (14)					
L01 14251	0.630 (16)					
L01 14400	0.236 (6)	0.984 (25)	1.142 (29)	2.165 (55)	0.079 (2)	0.22
L01 14410	0.315 (8)					
L01 14420	0.394 (10)					
L01 14430	0.472 (12)					
L01 14440	0.551 (14)					
L01 14450	0.630 (16)					
L01 14460	0.709 (18)					
L01 14470	0.787 (20)					
L01 14501	0.236 (6)	1.260 (32)	1.535 (39)	2.382 (60.5)	0.118 (3)	0.66
L01 14511	0.315 (8)					
L01 14521	0.394 (10)					
L01 14531	0.472 (12)					
L01 14541	0.551 (14)					
L01 14551	0.630 (16)					
L01 14561	0.709 (18)					
L01 14571	0.787 (20)					
L01 14581	0.984 (25)					



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DIHART DAH® Compensating Holder

Assembly instructions



Clean grinding surfaces thoroughly
 → dry and free of grease and debris.



Pre-load evenly with the 6 assembling screws ②
 (compressing the spring washer flat)



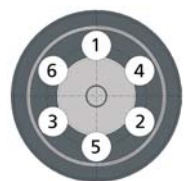
Adjusting the DAH® must be done in the machine, on the spindle where the tool will be in use!
 Center the indicator on the gauge line as shown.
 KOMET recommends using an indicator with either 0.0001" or 0.002 µm increments

Determine the run-out by rotating the tool until the indicator is at its highest reading.
 Rotate so that the adjustment screw ④ is at the highest point.
 Tighten the adjusting screw ④ so that the indicated run-out is reduced in half.
 Repeat this procedure until the run-out error is < 5 µm (0.0002").



Tighten the assembling screws ② in a cross-wise pattern.
 Please observe the specified torque M in the index-table. After fastening, fix the adjusting ring ① by locking the thread pin ④.

DAH Ø d1	Torque M
63	62 – 80 in-lbs (7 – 9 Nm)
81	62 – 80 in-lbs (7 – 9 Nm)
115	221 – 310 in-lbs (25 – 35 Nm)



Cross-wise pattern

A final check should show a run-out of < 5 µm (0.0002").

DIHART DAH® 50 Compensating Holder High-speed machining – with maximum quality

For maximum precision and concentricity

DIHART's DAH® 50 HS compensating holders ensure that the tool runs concentrically. They allow precision adjustment of the tool in the μm range at the cutting edge, reducing any machine spindle error to a minimum.

Maximum concentricity guarantees reliable production for extremely close tolerances.

The quality of the bore, including surface finish, roundness, parallelism and above all, dimensional accuracy are improved considerably.

This significantly increases the process capability of DIHART® multiple blade reamers.

BENEFITS for you:

- Proven hydraulic clamping
- Maximum concentricity and repeatability
< 1μ for uniform blade contact
- Extremely simple run-out adjustment
- Compact design
- Optimum vibration dampening for excellent surface quality
- Reducer sleeves increase clamping \varnothing range.
- Speeds up to 25,000 rpm
- Compatible with minimum quantity lubrication (MQL)

Simple handling – reduced machine down times

In comparison to previous solutions, the hydraulic chuck is integrated into the new DIHART® compensating holders: this means one less connection.

Four adjustable screws allow rapid and precise adjustment of the concentricity of the multi-blade reamer, reducing run-out to virtually zero. The extremely slim design of these new compensating holders ensures that they fit easily into practically all tool magazines.

The DIHART DAH® 50 HS compensating holders enable the run-out of a tool to be adjusted with μm -precision at the cutting edge, reducing to a minimum any machine spindle error.

Simple, time-saving control using adjustment ring with adjustment screws.

Alignment module:
1 adjustment ring, 4 adjustment screws

Connection on tool-side
with hydraulic chuck

Tightening screw
for clamping tool



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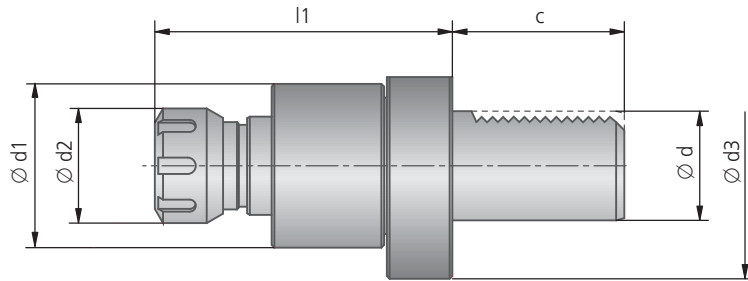


DIHART® DPS Floating Holder




VDI connection DIN 69880

- for stationary tools
- with internal coolant supply

- angular compensation 30' (not adjustable)
- radial play 0.003" (0.08 mm) (not adjustable)



(..) = mm

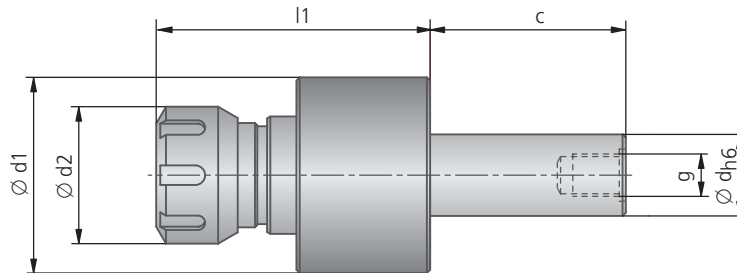
VDI								Assembly parts	Accessories
Oder No.	VDI Ø d	Ø d1	Ø d2	Ø d3	l1	c	 lbs	 Order No.	 Size
57B.49.00010	1.181 (30)	2.323 (59)	1.653 (42)	2.677 (68)	4.291 (109)	2.165 (55)	4.08	51200 00425	ER 25
57B.49.00020	1.575 (40)	2.323 (59)	1.653 (42)	3.268 (83)	4.291 (109)	2.480 (63)	5.73	51200 00425	ER 25
57B.49.00030	1.575 (40)	2.520 (64)	1.968 (50)	3.268 (83)	4.567 (116)	2.480 (63)	6.04	51200 00432	ER 32
57B.49.00040	1.968 (50)	2.520 (64)	1.968 (50)	3.858 (98)	4.567 (116)	3.071 (78)	7.94	51200 00432	ER 32

Includes: DPS floating holder with collet nut. Please order collets and seal discs (page 91) separately.




cylindrical shank similar to DIN 1835

- for stationary tools
- with internal coolant supply

- angular compensation 30' (not adjustable)
- radial play 0.003" (0.08 mm) (not adjustable)

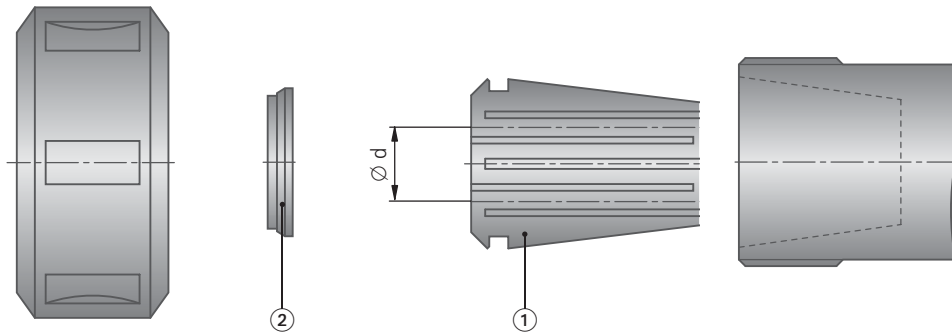


(..) = mm

Cylindrical shank								Assembly parts	Accessories
Oder No.	Cylindrical shank Ø dh6	Ø d1	Ø d2	l1	c	g	 lbs	 Order No.	 Size
57B.40.00010	0.984 (25)	2.323 (59)	1.653 (42)	3.307 (84)	2.362 (60)	G 1/4	2.45	51200 00425	ER 25
57B.40.00020	1.260 (32)	2.520 (64)	1.968 (50)	3.583 (91)	3.150 (80)	G 3/8	3.75	51200 00432	ER 32
57B.50.00010	1.000 (25.4)	2.323 (59)	1.653 (42)	3.307 (84)	2.362 (60)	G 1/4	2.27	51200 00425	ER 25
57B.50.00020	1.250 (31.75)	2.520 (64)	1.968 (50)	3.583 (91)	3.150 (80)	G 3/8	3.90	51200 00432	ER 32

Includes: DPS floating holder with collet nut. Please order collets and seal discs (page 91) separately.

DIHART® Collets for DPS floating holder



(..) = mm

Ø d ①	Ø d ②	ER32		ER25	
		Collet Order No.	Seal disc Order No.	Collet Order No.	Seal disc Order No.
0.157 – 0.119 (4.00 – 3.01)	0.137 – 0.119 (3.50 – 3.01)	A33 55000.0400	52806 32035	A33 54000.0400	52806 25035
	0.157 – 0.138 (4.00 – 3.51)		52806 32040		52806 25040
0.196 – 0.158 (5.00 – 4.01)	0.177 – 0.158 (4.50 – 4.01)	A33 55000.0500	52806 32045	A33 54000.0500	52806 25045
	0.196 – 0.178 (5.00 – 4.51)		52806 32050		52806 25050
0.236 – 0.197 (6.00 – 5.01)	0.216 – 0.197 (5.50 – 5.01)	A33 55000.0600	52806 32055	A33 54000.0600	52806 25055
	0.236 – 0.217 (6.00 – 5.51)		52806 32060		52806 25060
0.275 – 0.237 (7.00 – 6.01)	0.255 – 0.237 (6.50 – 6.01)	A33 55000.0700	52806 32065	A33 54000.0700	52806 25065
	0.275 – 0.256 (7.00 – 6.51)		52806 32070		52806 25070
0.314 – 0.276 (8.00 – 7.01)	0.295 – 0.276 (7.50 – 7.01)	A33 55000.0800	52806 32075	A33 54000.0800	52806 25075
	0.314 – 0.296 (8.00 – 7.51)		52806 32080		52806 25080
0.354 – 0.315 (9.00 – 8.01)	0.334 – 0.315 (8.50 – 8.01)	A33 55000.0900	52806 32085	A33 54000.0900	52806 25085
	0.354 – 0.335 (9.00 – 8.51)		52806 32090		52806 25090
0.393 – 0.355 (10.00 – 9.01)	0.374 – 0.355 (9.50 – 9.01)	A33 55000.1000	52806 32095	A33 54000.1000	52806 25095
	0.393 – 0.375 (10.00 – 9.51)		52806 32100		52806 25100
0.433 – 0.394 (11.00 – 10.01)	0.413 – 0.394 (10.50 – 10.01)	A33 55000.1100	52806 32105	A33 54000.1100	52806 25105
	0.433 – 0.414 (11.00 – 10.51)		52806 32110		52806 25110
0.472 – 0.434 (12.00 – 11.01)	0.452 – 0.434 (11.50 – 11.01)	A33 55000.1200	52806 32115	A33 54000.1200	52806 25115
	0.472 – 0.453 (12.00 – 11.51)		52806 32120		52806 25120
0.511 – 0.473 (13.00 – 12.01)	0.492 – 0.473 (12.50 – 12.01)	A33 55000.1300	52806 32125	A33 54000.1300	52806 25125
	0.511 – 0.493 (13.00 – 12.51)		52806 32130		52806 25130
0.551 – 0.512 (14.00 – 13.01)	0.531 – 0.512 (13.50 – 13.01)	A33 55000.1400	52806 32135	A33 54000.1400	52806 25135
	0.551 – 0.532 (14.00 – 13.51)		52806 32140		52806 25140
0.590 – 0.552 (15.00 – 14.01)	0.570 – 0.552 (14.50 – 14.01)	A33 55000.1500	52806 32145	A33 54000.1500	52806 25145
	0.590 – 0.571 (15.00 – 14.51)		52806 32150		52806 25150
0.630 – 0.591 (16.00 – 15.01)	0.610 – 0.591 (15.50 – 15.01)	A33 55000.1600	52806 32155	A33 54000.1600	52806 25155
	0.630 – 0.611 (16.00 – 15.51)		52806 32160		52806 25160
0.669 – 0.630 (17.00 – 16.01)	0.649 – 0.630 (16.50 – 16.01)	A33 55000.1700	52806 32165		
	0.669 – 0.650 (17.00 – 16.51)		52806 32170		
0.708 – 0.670 (18.00 – 17.01)	0.688 – 0.670 (17.50 – 17.01)	A33 55000.1800	52806 32175		
	0.708 – 0.689 (18.00 – 17.51)		52806 32180		
0.748 – 0.709 (19.00 – 18.01)	0.728 – 0.709 (18.50 – 18.01)	A33 55000.1900	52806 32185		
	0.748 – 0.729 (19.00 – 18.51)		52806 32190		
0.787 – 0.749 (20.00 – 19.01)	0.767 – 0.749 (19.50 – 19.01)	A33 55000.2000	52806 32195		
	0.787 – 0.768 (20.00 – 19.51)		52806 32200		



The Factory of Ideas

The IDEEN-FABRIK+ (Factory of Ideas) reflects the evolution of the KOMET GROUP from a tool manufacturer into a creative expert for solutions covering all aspects of boring, reaming, thread milling and mechatronic tools.

The main objective is to offer our customers and employees scope for creative working and learning.

On a total area of 8,200 sqft, we have created a modern, multi-story factory environment. The IDEEN-FABRIK+ was deliberately constructed not as a separately detached training building, but integrated directly above a manufacturing facility.

While the metal chips fly down below, ideas are exchanged above. By this, we aim to demonstrate that the work here is always associated with new ideas and creative ambition.

The IDEEN-FABRIK+ and a comprehensive seminar program for customers as well as employees offer you a measurable and permanent competitive advantage in your markets.

Ask for our no-obligation specialist seminar brochure.



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DIHART® Information Page

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TOOLS+IDEAS®

The KOMET GROUP is the worldwide technology leader for innovative tool concepts and complete solutions for holemaking.

Our customers know us as a manufacturer of premium tools, and know the ideas behind our solutions. Additional creativity is still unused and remains to be discovered. We have set the objective of maximizing added value, creating benefits for our customers.

We call this TOOLS+IDEAS®. A new and different way of being able to offer our customers long-term, sustainable advantages through a plus in support and services.

Our IDEEN-FABRIK+ in Besigheim is the first step in this direction.

Preferred Diameter Range

DIHART REAMAX® TS / REAMAX®



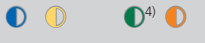



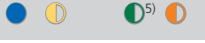

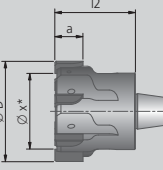
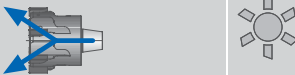



Our modular reaming systems; REAMAX®, REAMAX® TS as well as the adjustable DIHART Monomax® are offered in a wide range of diameters with H7 tolerances and are currently available in preferred diameter ranges.





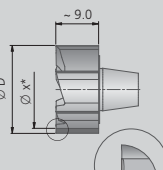
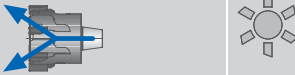



The new preferred diameter ranges of DIHART® reamers offer the enduser shorter delivery times.

The preferred ranges are stocked and produced in large batch sizes allowing users to benefit

from the advantages of more cost-effective production. Initially designed for ISO H7 tolerances and for diameters of 0.2362 to 1.9685 inch (6 to 50 mm), it covers the most commonly used tolerance range in a wide machining range.

The new preferred diameter ranges are suitable for all steels up to 900 N/mm², cast metal, nodular cast iron, vermicular cast iron, light alloy and aluminum materials.

REAMAX® TS	Cutting material / coating					TiN						DBG-N											
	for material					P	M	K	N	S	H	P	M	K	N	S	H	P	M	K	N	S	H
Reaming head - expandable	without interruption 																						
finish ground to H7 tolerance	with interruption 																						
 *min. diameter for front cutting						Cutting geometry (ASG)						Cutting geometry (ASG)						Cutting geometry (ASG)					
						 Order No.						 Order No.						 Order No.					
	18 (0.7087)	14	6	20	6	75J.71.18H7N						75J.71.18H7D						75J.37.18H7N					
	20 (0.7874)	16	6	20	6	75J.71.20H7N						75J.71.20H7D						75J.37.20H7N					
	22 (0.8661)	17.8	6	20	6	75J.71.22H7N						75J.71.22H7D						75J.37.22H7N					
	24 (0.9449)	19.8	6	20	6	75J.71.24H7N						75J.71.24H7D						75J.37.24H7N					
	25 (0.9842)	20.8	6	20	6	75J.71.25H7N						75J.71.25H7D						75J.37.25H7N					
	28 (1.1024)	22.6	6	25	6	75J.71.28H7N						75J.71.28H7D						75J.37.28H7N					
	30 (1.1811)	24.6	6	25	6	75J.71.30H7N						75J.71.30H7D						75J.37.30H7N					
	32 (1.2598)	26	6	25	8	75J.71.32H7N						75J.71.32H7D						75J.37.32H7N					
	35 (1.3779)	28.1	6	25	8	75J.71.35H7N						75J.71.35H7D						75J.37.35H7N					
	40 (1.5748)	33.1	6	25	8	75J.71.40H7N						75J.71.40H7D						75J.37.40H7N					
50 (1.9685)	42.5	6	30	8	75J.71.50H7N						75J.71.50H7D						75J.37.50H7N						

REAMAX®	Cutting material / coating					DBG-N						DST											
	for material					P	M	K	N	S	H	P	M	K	N	S	H	P	M	K	N	S	H
Replaceable head-solid	without interruption 																						
finish ground to H7 tolerance	with interruption 																						
 *min. diameter for front cutting						Cutting geometry (ASG)						Cutting geometry (ASG)						Cutting geometry (ASG)					
						 Order No.						 Order No.						 Order No.					
	15 (0.5906)	12.5	9	0.5	6	640.37.15H7N						640.93.15H7N						640.93.15H7D					
	16 (0.6299)	13	9	0.5	6	640.37.16H7N						640.93.16H7N						640.93.16H7D					
	18 (0.7087)	15	9	0.5	6	640.37.18H7N						640.93.18H7N						640.93.18H7D					
	20 (0.7874)	17	9	0.5	6	640.37.20H7N						640.93.20H7N						640.93.20H7D					
	22 (0.8661)	19	9	0.5	6	640.37.22H7N						640.93.22H7N						640.93.22H7D					
	24 (0.9449)	21	9	0.5	6	640.37.24H7N						640.93.24H7N						640.93.24H7D					
	25 (0.9842)	22	9	0.5	8	640.37.25H7N						640.93.25H7N						640.93.25H7D					
28 (1.1024)	24	9	0.5	8	640.37.28H7N						640.93.28H7N						640.93.28H7D						
30 (1.1811)	26	9	0.5	8	640.37.30H7N						640.93.30H7N						640.93.30H7D						

Preferred Diameter Range

Short delivery times!

BENEFITS for you:

- Short delivery times!
- High-precision manufacturing for guaranteed quality and processing
- Modular tooling systems for maximum flexibility
- Cost per bore significantly reduced

	DBF						DBC						DST						DJF											
	P	M	K	N	S	H	P	M	K	N	S	H	P	M	K	N	S	H	P	M	K	N	S	H	P	M	K	N	S	H
	● ● ● ● ● ●						●						● ● ²⁾ ● ³⁾						● ● ²⁾ ● ³⁾						●					
	● ● ● ● ● ●						●																							
	Cutting geometry (ASG)						Cutting geometry (ASG)						Cutting geometry (ASG)						Cutting geometry (ASG)						Cutting geometry (ASG)					
	Order No.						Order No.						Order No.						Order No.						Order No.					
	75J.47.18H7N						75J.17.18H7G						75J.93.18H7N						75J.93.18H7D						75J.87.18H7N					
	75J.47.20H7N						75J.17.20H7G						75J.93.20H7N						75J.93.20H7D						75J.87.20H7N					
	75J.47.22H7N						75J.17.22H7G						75J.93.22H7N						75J.93.22H7D						75J.87.22H7N					
	75J.47.24H7N						75J.17.24H7G						75J.93.24H7N						75J.93.24H7D						75J.87.24H7N					
	75J.47.25H7N						75J.17.25H7G						75J.93.25H7N						75J.93.25H7D						75J.87.25H7N					
	75J.47.28H7N						75J.17.28H7G						75J.93.28H7N						75J.93.28H7D						75J.87.28H7N					
	75J.47.30H7N						75J.17.30H7G						75J.93.30H7N						75J.93.30H7D						75J.87.30H7N					
	75J.47.32H7N						75J.17.32H7G						75J.93.32H7N						75J.93.32H7D						75J.87.32H7N					
	75J.47.35H7N						75J.17.35H7G						75J.93.35H7N						75J.93.35H7D						75J.87.35H7N					
	75J.47.40H7N						75J.17.40H7G						75J.93.40H7N						75J.93.40H7D						75J.87.40H7N					
	75J.47.50H7N						75J.17.50H7G						75J.93.50H7N						75J.93.50H7D						75J.87.50H7N					

¹⁾ conventional machining · ²⁾ material group 10.0&10.1 · ³⁾ material group 12.0 · ⁴⁾ material group 12.1 · ⁵⁾ material group 12.0&12.1

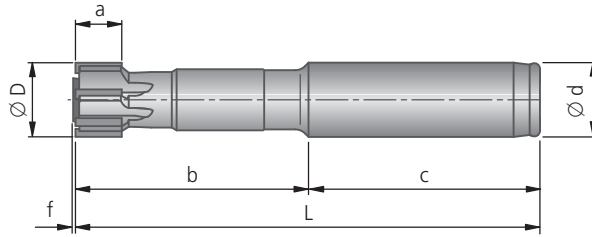


Preferred Diameter Range

DIHART Monomax® - short & long

■ Monomax® - short version

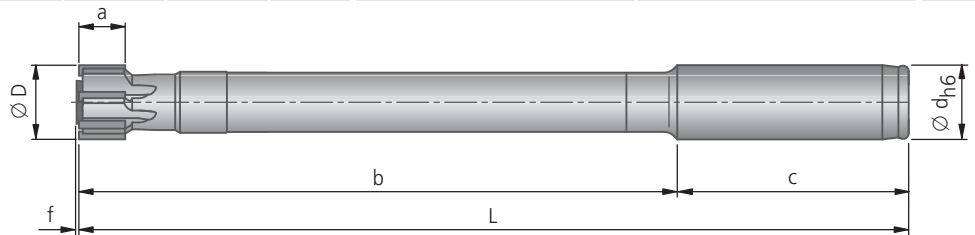
Reaming tool - expandable
finish ground for H7 tolerance
cylindrical shank similar to DIN 1835



Cutting material / coating							TiN											
for material							P	M	K	N	S	H	P	M	K	N	S	H
without interruption							●	●	● ⁴⁾	●			●	●	● ⁴⁾	●		
with interruption							●	●	● ⁵⁾	●			●	●	● ⁵⁾	●		
							Cutting geometry (ASG)			Cutting geometry (ASG)								
							Order No.			Order No.								
Ø D ^{H7} (inch)	Ø d × c	L	b	f ~	a ~	No. of teeth	56J.71.06H7N			56J.71.06H7D								
6 (0.2362)	12 × 45	85	40	0.1	9.5	4	56J.71.08H7N			56J.71.08H7D								
8 (0.3150)	12 × 45	85	40	0.1	9.5	4	56J.71.10H7N			56J.71.10H7D								
10 (0.3937)	12 × 45	95	50	0.1	9.5	6	56J.71.12H7N			56J.71.12H7D								
12 (0.4724)	12 × 45	95	50	0.1	9.5	6	56J.71.14H7N			56J.71.14H7D								
14 (0.5512)	12 × 45	95	50	0.1	9.5	6	56J.71.15H7N			56J.71.15H7D								
15 (0.5905)	12 × 45	95	50	0.1	9.5	6	56J.71.16H7N			56J.71.16H7D								
16 (0.6299)	16 × 50	100	50	0.1	9.5	6	56J.71.18H7N			56J.71.18H7D								
18 (0.7087)	16 × 50	100	50	0.1	9.5	6	56J.71.20H7N			56J.71.20H7D								
20 (0.7874)	20 × 60	120	60	0.1	9.5	6												

■ Monomax® - long version

Reaming tool - expandable
finish ground for H7 tolerance
cylindrical shank similar to DIN 1835



Cutting material / coating							TiN											
for material							P	M	K	N	S	H	P	M	K	N	S	H
without interruption							●	●	● ⁴⁾	●			●	●	● ⁴⁾	●		
with interruption							●	●	● ⁵⁾	●			●	●	● ⁵⁾	●		
							Cutting geometry (ASG)			Cutting geometry (ASG)								
							Order No.			Order No.								
Ø D ^{H7} (inch)	Ø d × c	L	b	f ~	a ~	No. of teeth	56R.71.06H7N			56R.71.06H7D								
6 (0.2362)	12 × 45	130	85	0.1	9.5	4	56R.71.08H7N			56R.71.08H7D								
8 (0.3150)	12 × 45	130	85	0.1	9.5	4	56R.71.10H7N			56R.71.10H7D								
10 (0.3937)	12 × 45	160	115	0.1	9.5	6	56R.71.12H7N			56R.71.12H7D								
12 (0.4724)	12 × 45	160	115	0.1	9.5	6	56R.71.14H7N			56R.71.14H7D								
14 (0.5512)	12 × 45	160	115	0.1	9.5	6	56R.71.15H7N			56R.71.15H7D								
15 (0.5905)	12 × 45	160	115	0.1	9.5	6	56R.71.16H7N			56R.71.16H7D								
16 (0.6299)	16 × 50	180	130	0.1	9.5	6	56R.71.18H7N			56R.71.18H7D								
18 (0.7087)	16 × 50	180	130	0.1	9.5	6	56R.71.20H7N			56R.71.20H7D								
20 (0.7874)	20 × 60	200	140	0.1	9.5	6												

¹⁾conventional machining · ²⁾material group 10.0&10.1 · ³⁾material group 12.0 · ⁴⁾material group 12.1 · ⁵⁾material group 12.0&12.1

Preferred Diameter Range



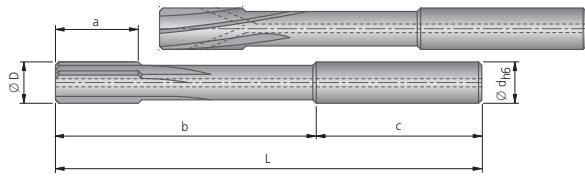
	DBG-N						DBF						DST											
	P	M	K	N	S	H	P	M	K	N	S	H	P	M	K	N	S	H	P	M	K	N	S	H
			●			○		○	●				●			● ³⁾			●			● ³⁾		
	○	●				○	○	○	●															
	Cutting geometry (ASG)						Cutting geometry (ASG)						Cutting geometry (ASG)											
	Order No.						Order No.						Order No.											
	56J.37.06H7N						56J.47.06H7N						56J.93.06H7N											
	56J.37.08H7N						56J.47.08H7N						56J.93.08H7N											
	56J.37.10H7N						56J.47.10H7N						56J.93.10H7N											
	56J.37.12H7N						56J.47.12H7N						56J.93.12H7N											
	56J.37.14H7N						56J.47.14H7N						56J.93.14H7N											
	56J.37.15H7N						56J.47.15H7N						56J.93.15H7N											
	56J.37.16H7N						56J.47.16H7N						56J.93.16H7N											
	56J.37.18H7N						56J.47.18H7N						56J.93.18H7N											
	56J.37.20H7N						56J.47.20H7N						56J.93.20H7N											

	DBG-N						DBF						DST											
	P	M	K	N	S	H	P	M	K	N	S	H	P	M	K	N	S	H	P	M	K	N	S	H
			●			○		○	●				●			● ³⁾			●			● ³⁾		
	○	●				○	○	○	●															
	Cutting geometry (ASG)						Cutting geometry (ASG)						Cutting geometry (ASG)											
	Order No.						Order No.						Order No.											
	56R.37.06H7N						56R.47.06H7N						56R.93.06H7N											
	56R.37.08H7N						56R.47.08H7N						56R.93.08H7N											
	56R.37.10H7N						56R.47.10H7N						56R.93.10H7N											
	56R.37.12H7N						56R.47.12H7N						56R.93.12H7N											
	56R.37.14H7N						56R.47.14H7N						56R.93.14H7N											
	56R.37.15H7N						56R.47.15H7N						56R.93.15H7N											
	56R.37.16H7N						56R.47.16H7N						56R.93.16H7N											
	56R.37.18H7N						56R.47.18H7N						56R.93.18H7N											
	56R.37.20H7N						56R.47.20H7N						56R.93.20H7N											

Preferred Diameter Range

DIHART® Fullmax

- with cylindrical shank DIN 6535 HA
- internal coolant supply
- tolerance + 5 μ



Ø D	Fit sizes which can be used	
.97	U7 X7	1 ▶ 4
.98	N10 N11 R7	
2 .99	M8 N7 N8 N9	
.00	J7 J8 JS7 JS8 JS9	
.01	G7 H8	
.02	F8 H9	
.03	E8 F9 H10	

Example: Ø 4 N8
Blind hole
Bore diameter 4 mm
Bore tolerance N8
Order No. 52M.57.0399

Material						Diameter H7		1/100 Dimensions		
P	M	K	N	S	H					
●	●	●	●	●	●	←	←	←	←	
Ø D ^{H7} (inch)	Ø dxc	L	b	a ~		Order No.	Order No.	Ø D mm	Order No.	Order No.
4 (0.1575)	4 x 28	60	32	12	4	52M.57.04H7	52P.57.04H7	3.97	52M.57.0397	52P.57.0397
5 (0.1969)	6 x 36	76	40	12	4	52M.57.05H7	52P.57.05H7	3.98	52M.57.0398	52P.57.0398
								3.99	52M.57.0399	52P.57.0399
								4.00	52M.57.0400	52P.57.0400
								4.01	52M.57.0401	52P.57.0401
								4.02	52M.57.0402	52P.57.0402
								4.03	52M.57.0403	52P.57.0403
								4.97	52M.57.0497	52P.57.0497
								4.98	52M.57.0498	52P.57.0498
								4.99	52M.57.0499	52P.57.0499
								5.00	52M.57.0500	52P.57.0500
6 (0.2362)	8 x 36	101	65	16	4	52M.57.06H7	52P.57.06H7	5.01	52M.57.0501	52P.57.0501
								5.02	52M.57.0502	52P.57.0502
								5.03	52M.57.0503	52P.57.0503
								5.97	52M.57.0597	52P.57.0597
								5.98	52M.57.0598	52P.57.0598
								5.99	52M.57.0599	52P.57.0599
								6.00	52M.57.0600	52P.57.0600
								6.01	52M.57.0601	52P.57.0601
								6.02	52M.57.0602	52P.57.0602
								6.03	52M.57.0603	52P.57.0603
8 (0.3150)	8 x 36	101	65	16	6	52M.57.08H7	52P.57.08H7	7.97	52M.57.0797	52P.57.0797
								7.98	52M.57.0798	52P.57.0798
								7.99	52M.57.0799	52P.57.0799
								8.00	52M.57.0800	52P.57.0800
								8.01	52M.57.0801	52P.57.0801
								8.02	52M.57.0802	52P.57.0802
								8.03	52M.57.0803	52P.57.0803
								9.97	52M.57.0997	52P.57.0997
								9.98	52M.57.0998	52P.57.0998
								9.99	52M.57.0999	52P.57.0999
10 (0.3937)	10 x 40	108	68	16	6	52M.57.10H7	52P.57.10H7	10.00	52M.57.1000	52P.57.1000
								10.01	52M.57.1001	52P.57.1001
								10.02	52M.57.1002	52P.57.1002
								10.03	52M.57.1003	52P.57.1003
								11.97	52M.57.1197	52P.57.1197
12 (0.4724)	12 x 45	130	85	20	6	52M.57.12H7	52P.57.12H7	11.98	52M.57.1198	52P.57.1198
								11.99	52M.57.1199	52P.57.1199
								12.00	52M.57.1200	52P.57.1200
								12.01	52M.57.1201	52P.57.1201
								12.02	52M.57.1202	52P.57.1202
								12.03	52M.57.1203	52P.57.1203

DIHART® Cutting Data

Guideline values for reaming with Fullmax

Guideline for reaming with Fullmax					V _C	Max. feed f in/tooth (mm/tooth)						
Material group	Strength R _m (lb _f /in ²)	Hardness HB	Material	Material example, material code AISI/SAE		Cutting speed ft/min (m/min)	Feed f _Z					
					Z4		Z4	Z6	Z6	Z6	Z6	
						∅ 0.117-0.159 (∅ 2.97-4.05)	0.160-0.238 (∅ 4.06-6.05)	0.239-0.297 (∅ 6.06-7.55)	0.298-0.474 (∅ 7.56-12.05)	0.475-0.632 (∅ 12.06-16.05)	0.633-0.789 (∅ 16.06-20.05)	
P	1.0	≤72500	non-alloy steels	A570.36 1213 A573.81	590-820 (180-250)	0.004 - 0.008 (0.100 - 0.200)	0.005 - 0.010 (0.125 - 0.250)	0.006 - 0.010 (0.150 - 0.250)	0.007 - 0.012 (0.175 - 0.300)	0.008 - 0.013 (0.200 - 0.330)	0.009 - 0.015 (0.230 - 0.370)	
	2.0	72500-130000	non-alloy / low alloy steels	5120 1055 5115	590-820 (180-250)	0.004 - 0.008 (0.100 - 0.200)	0.005 - 0.010 (0.125 - 0.250)	0.006 - 0.010 (0.150 - 0.250)	0.007 - 0.012 (0.175 - 0.300)	0.008 - 0.013 (0.200 - 0.330)	0.009 - 0.015 (0.230 - 0.370)	
	2.1	<72500	lead alloys	12L13	590-820 (180-250)	0.004 - 0.008 (0.100 - 0.200)	0.005 - 0.010 (0.125 - 0.250)	0.006 - 0.010 (0.150 - 0.250)	0.007 - 0.012 (0.175 - 0.300)	0.008 - 0.013 (0.200 - 0.330)	0.009 - 0.015 (0.230 - 0.370)	
	3.0	>130000	non alloy / low alloy steels: heat resistant structural, heat treated, nitride and tools steels	4140 1064	590-820 (180-250)	0.004 - 0.008 (0.100 - 0.200)	0.005 - 0.010 (0.125 - 0.250)	0.006 - 0.010 (0.150 - 0.250)	0.007 - 0.012 (0.175 - 0.300)	0.008 - 0.013 (0.200 - 0.330)	0.009 - 0.015 (0.230 - 0.370)	
	4.0	>130000	high alloy steels	H13 H21	590-820 (180-250)	0.004 - 0.008 (0.100 - 0.200)	0.005 - 0.010 (0.125 - 0.250)	0.006 - 0.010 (0.150 - 0.250)	0.007 - 0.012 (0.175 - 0.300)	0.008 - 0.013 (0.200 - 0.330)	0.009 - 0.015 (0.230 - 0.370)	
4.1			HSS		590-820 (180-250)							
S	5.0		250 special alloys: Inconel, Hastelloy, Nimonic, stc.	Inconel® 718 Nimonic® 80A	130-200 (40-60)	0.003 - 0.005 (0.075 - 0.125)	0.004 - 0.006 (0.100 - 0.150)	0.004 - 0.007 (0.100 - 0.175)	0.004 - 0.007 (0.100 - 0.175)	0.005 - 0.008 (0.125 - 0.200)	0.005 - 0.009 (0.130 - 0.230)	
	5.1	58000	titanium, titanium alloys	AMS R54520	100-200 (30-60)	0.003 - 0.005 (0.075 - 0.125)	0.004 - 0.006 (0.100 - 0.150)	0.004 - 0.007 (0.100 - 0.175)	0.004 - 0.007 (0.100 - 0.175)	0.005 - 0.008 (0.125 - 0.200)	0.005 - 0.009 (0.130 - 0.230)	
M	6.0	≤87000	stainless steels	304L 316	130-260 (40-80)	0.003 - 0.005 (0.075 - 0.125)	0.004 - 0.006 (0.100 - 0.150)	0.004 - 0.007 (0.100 - 0.175)	0.004 - 0.007 (0.100 - 0.175)	0.005 - 0.008 (0.125 - 0.200)	0.005 - 0.009 (0.130 - 0.230)	
	6.1	<130000	stainless steels	630	130-200 (40-60)	0.003 - 0.005 (0.075 - 0.125)	0.004 - 0.006 (0.100 - 0.150)	0.004 - 0.007 (0.100 - 0.175)	0.004 - 0.007 (0.100 - 0.175)	0.005 - 0.008 (0.125 - 0.200)	0.005 - 0.009 (0.130 - 0.230)	
	7.0	>130000	stainless / fireproof steels	420 403		0.003 - 0.005 (0.075 - 0.125)	0.004 - 0.006 (0.100 - 0.150)	0.004 - 0.007 (0.100 - 0.175)	0.004 - 0.007 (0.100 - 0.175)	0.005 - 0.008 (0.125 - 0.200)	0.005 - 0.009 (0.130 - 0.230)	
K	8.0		180 gray cast iron	No 35 B No 50 B	390-590 (120-180)	0.004 - 0.008 (0.100 - 0.200)	0.005 - 0.010 (0.125 - 0.250)	0.006 - 0.010 (0.150 - 0.250)	0.007 - 0.012 (0.175 - 0.300)	0.008 - 0.013 (0.200 - 0.330)	0.009 - 0.015 (0.230 - 0.370)	
	8.1		250 alloy gray cast iron	A436 Type 2								
	9.0	≤87000	130 ductile cast iron, ferritic	60-40-18	660-820 (200-250)	0.004 - 0.008 (0.100 - 0.200)	0.005 - 0.010 (0.125 - 0.250)	0.006 - 0.010 (0.150 - 0.250)	0.007 - 0.012 (0.175 - 0.300)	0.008 - 0.013 (0.200 - 0.330)	0.009 - 0.015 (0.230 - 0.370)	
	9.1		230 ductile cast iron, ferritic / perlitic	80-55-06								
	10.0	>87000	250 spheroidal graphite cast iron, perlitic malleable iron	100-70-03 70003	200-390 (60-120)	0.004 - 0.008 (0.100 - 0.200)	0.005 - 0.010 (0.125 - 0.250)	0.006 - 0.010 (0.150 - 0.250)	0.007 - 0.012 (0.175 - 0.300)	0.008 - 0.013 (0.200 - 0.330)	0.009 - 0.015 (0.230 - 0.370)	
	10.1		200 alloyed spheroidal graphite cast iron	A43D2								
10.2		300 vermicular cast iron										
N	12.0		90 copper alloy, brass, lead-alloy bronze, lead bronze: good cut	UNS C36000	330-820 (100-250)	0.004 - 0.008 (0.100 - 0.200)	0.005 - 0.010 (0.125 - 0.250)	0.006 - 0.010 (0.150 - 0.250)	0.007 - 0.012 (0.175 - 0.300)	0.008 - 0.013 (0.200 - 0.330)	0.009 - 0.015 (0.230 - 0.370)	
	12.1		100 copper alloy, brass, bronze: average cut		260-490 (80-150)	0.003 - 0.005 (0.075 - 0.125)	0.004 - 0.006 (0.100 - 0.150)	0.004 - 0.007 (0.100 - 0.175)	0.004 - 0.007 (0.100 - 0.175)	0.005 - 0.008 (0.125 - 0.200)	0.005 - 0.009 (0.130 - 0.230)	
	13.0		60 wrought aluminum alloys	GD-ALSi12								
	13.1		75 cast aluminum alloy: Si-content <10% magnesium alloy									
14.0		100 cast aluminum alloy: Si-content > 10%	A360.2									
H	15.0	203000	hardened steels < 45 HRC									
	16.0	261000	hardened steels > 45 HRC, ≤ 55 HRC		100-160 (30-50)	0.001 - 0.003 (0.035 - 0.075)	0.002 - 0.004 (0.040 - 0.100)	0.002 - 0.004 (0.050 - 0.100)	0.002 - 0.004 (0.050 - 0.100)	0.002 - 0.005 (0.052 - 0.130)	0.003 - 0.005 (0.080 - 0.130)	
Reaming allowance in diameter (mm)												
P	S	M	K	N		0.10-0.20	0.10-0.20	0.20	0.20	0.20-0.30	0.30	
H	to HRC48						0.10-0.20	0.10-0.20	0.20	0.20	0.20	0.20
	to HRC62						0.10	0.10	0.10	0.10	0.20	0.20

Please follow the further user and safety instructions on page 112.



DIHART® Cutting Data



Guideline for reaming (except Fullmax)					Cutting speed v_c ft/min (m/min)																	
Material group	Strength Rm (lbf/in ²)	Hardness HB	Material	Material example ANSI / SAE	Reamers short / 3xD								Reamers long / 5xD									
					HM	DST	TiN	DBG-N	DBF	DJC DJF	DBC	PCD	HM	DST	TiN	DBG-N	DBF	DJC DJF	DBC	PCD		
					min-max	min-max	min-max	min-max	min-max	min-max	min-max	min-max	min-max	min-max	min-max	min-max	min-max	min-max	min-max	min-max	min-max	
P	1.0	≤ 72,500	non-alloy steels	1010 1144 1213	19-32 (6-10)	330-660 (100-200)	195-460 (60-140)				330-660 (100-200)				19-32 (6-10)	260-525 (80-160)	195-390 (60-120)			260-525 (80-160)		
	2.0	72,500-130,000	non-alloy / low alloy steels	1055 5115 5120	19-32 (6-10)	330-660 (100-200)	195-460 (60-140)				330-660 (100-200)				19-32 (6-10)	260-525 (80-160)	195-390 (60-120)			260-525 (80-160)		
	2.1	< 72,500	lead alloys	12L14	50-145 (15-45)	330-660 (100-200)	195-460 (60-140)				330-660 (100-200)				50-145 (15-45)	260-525 (80-160)	195-390 (60-120)			260-525 (80-160)		
	3.0	> 130,000	non alloy / low alloy steels: heat resistant structural, heat treated, nitride and tools steels	1064 4140	16-30 (5-9)	260-490 (80-150)	195-360 (60-110)				260-490 (80-150)				16-30 (5-9)	260-390 (80-120)	195-295 (60-90)			260-390 (80-120)		
	4.0	> 130,000	high alloy steels	H13 H21	13-23 (4-7)		50-145 (15-45)								13-23 (4-7)		50-145 (15-45)					
S	4.1		HSS	M10 T4																		
	5.0		250 special alloys: Inconel, Hastelloy, Nimonic, stc.	Inconel® 718 Nimonic® 80A																		
M	5.1	58,000	titanium, titanium alloys	Ti-6Al-4V	16-40 (5-12)									16-40 (5-12)								
	6.0	≤ 87,000	stainless steels	304L 316	16-26 (5-8)		50-130 (15-40)		100-195 (30-60)					16-26 (5-8)		50-130 (15-40)		100-195 (30-60)				
	6.1	<130,000	stainless steels	630	13-19 (4-6)		32-115 (10-35)		65-165 (20-50)					13-19 (4-6)		32-115 (10-35)		65-165 (20-50)				
K	7.0	>130,000	stainless / fireproof steels	403 420	13-19 (4-6)		32-115 (10-35)		65-165 (20-50)					13-19 (4-6)		32-15 (10-35)		65-165 (20-50)				
	8.0		180 gray cast iron	Class 25 G3000	12-82 (10-25)		165-425 (50-130)	260-720 (80-220)	260-720 (80-220)					12-82 (10-25)		65-330 (50-100)	260-490 (80-150)	260-490 (80-150)				
	8.1		250 alloy gray cast iron	A436 Type 2	19-40 (6-12)		100-295 (30-90)	130-425 (40-130)	130-425 (40-130)					19-40 (6-12)		100-295 (30-90)	130-330 (40-100)	130-330 (40-100)				
	9.0	≤ 87,000	130 ductile cast iron, ferritic	60-40-18 D4512	30-59 (9-18)	425-980 (130-300)		425-980 (130-300)	425-980 (130-300)	425-980 (130-300)				30-59 (9-18)	390-590 (120-180)		390-590 (120-180)	390-590 (120-180)	390-590 (120-180)			
	9.1		230 ductile cast iron, ferritic / perlitic	80-55-06 D5506	30-59 (9-18)	330-820 (100-250)		330-820 (100-250)	330-820 (100-250)	330-820 (100-250)				30-59 (9-18)	330-525 (100-160)		330-520 (100-160)	330-520 (100-160)	330-525 (100-160)			
N	10.0	> 87,000	250 spheroidal graphite cast iron, perlitic malleable iron	100-70-03 07003	26-50 (8-15)	260-590 (80-180)		260-590 (80-180)	260-590 (80-180)	260-590 (80-180)				26-50 (8-15)	260-490 (80-150)		260-490 (80-150)	260-490 (80-150)	260-490 (80-150)			
	10.1		200 alloyed spheroidal graphite cast iron	A43D2	19-40 (6-12)		100-195 (30-60)	165-330 (50-100)	165-330 (50-100)					19-40 (6-12)		100-195 (30-60)	165-330 (50-100)	165-330 (50-100)	165-330 (50-100)			
	10.2		300 vermicular cast iron		19-40 (6-12)		100-230 (30-70)	130-425 (40-130)	130-425 (40-130)					19-40 (6-12)		100-230 (30-70)	130-425 (40-130)	130-425 (40-130)	130-425 (40-130)			
H	12.0		90 copper alloy, brass, lead-alloy bronze, lead bronze: good cut	316	12-100 (10-30)	330-1050 (100-320)	260-660 (80-200)							12-100 (10-30)	330-660 (100-200)	260-490 (80-150)						
	12.1		100 copper alloy, brass, bronze: average cut		12-65 (10-20)		165-490 (50-150)							12-65 (10-20)		165-390 (50-120)						
	13.0		60 wrought aluminum alloys	6151 7075	12-100 (10-30)						165-980 (50-300)	360-1080 (110-330)		12-100 (10-30)						165-785 (50-240)	330-785 (100-240)	
	13.1		75 cast aluminum alloy: Si-content <10% magnesium alloy	380 A356.0	12-100 (10-30)						490-980 (150-300)	360-1800 (110-550)		12-100 (10-30)						490-820 (150-250)	330-980 (100-300)	
	14.0		100 cast aluminum alloy: Si-content > 10%	383 A413.0	26-65 (8-20)						490-980 (150-300)	360-1440 (110-440)		26-65 (8-20)						490-820 (150-250)	330-820 (100-250)	
H	15.0	203,000	hardened steels < 45 HRC				130-195 (40-60)										130-195 (40-60)					
	16.0	261,000	hardened steels > 45 HRC, ≤ 55 HRC				100-165 (30-50)										100-165 (30-50)					

(..) = mm



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Feed f_z in/tooth (mm/tooth)									
straight fluted ASG3000, ASG0106, ASG03, ASG11, ASG1101				straight fluted ASG4000, ASG09B, ASG1402				left hand spiraled ASG0501	
< \emptyset 0.472 ($< \emptyset$ 12)	\emptyset 0.472 - 0.984 (\emptyset 12 - 25)	\emptyset 0.984 - 1.968 (\emptyset 25 - 50)	> \emptyset 1.968 ($> \emptyset$ 50)	< \emptyset 0.472 ($< \emptyset$ 12)	\emptyset 0.472 - 0.984 (\emptyset 12 - 25)	\emptyset 0.984 - 1.968 (\emptyset 25 - 50)	> \emptyset 1.968 ($> \emptyset$ 50)	\emptyset 0.189 - 0.500 (\emptyset 4.8 - 12.7)	
min-max	min-max	min-max	min-max	min-max	min-max	min-max	min-max	min-max	
0.002-0.004 (0.05-0.10)	0.003-0.006 (0.07-0.15)	0.003-0.007 (0.09-0.20)	0.004-0.010 (0.10-0.25)	0.003-0.005 (0.07-0.14)	0.004-0.008 (0.10-0.21)	0.005-0.009 (0.12-0.24)	0.005-0.012 (0.13-0.30)	0.003-0.005 (0.07-0.14)	
0.002-0.004 (0.05-0.10)	0.003-0.006 (0.07-0.15)	0.003-0.007 (0.09-0.20)	0.004-0.010 (0.10-0.25)	0.003-0.005 (0.07-0.14)	0.004-0.008 (0.10-0.21)	0.005-0.009 (0.12-0.24)	0.005-0.012 (0.13-0.30)	0.003-0.005 (0.07-0.14)	
0.002-0.004 (0.05-0.10)	0.003-0.006 (0.07-0.15)	0.003-0.007 (0.09-0.20)	0.004-0.010 (0.10-0.25)	0.003-0.005 (0.07-0.14)	0.004-0.008 (0.10-0.21)	0.005-0.009 (0.12-0.24)	0.005-0.012 (0.13-0.30)	0.003-0.005 (0.07-0.14)	
0.001-0.003 (0.04-0.08)	0.002-0.005 (0.06-0.12)	0.002-0.006 (0.07-0.16)	0.003-0.008 (0.08-0.20)	0.002-0.004 (0.06-0.11)	0.003-0.007 (0.08-0.17)	0.003-0.007 (0.09-0.19)	0.004-0.009 (0.10-0.24)	0.002-0.004 (0.06-0.11)	
0.001-0.003 (0.04-0.07)	0.002-0.004 (0.05-0.11)	0.002-0.005 (0.06-0.14)	0.003-0.007 (0.07-0.18)						
0.002-0.004 (0.05-0.11)	0.003-0.007 (0.07-0.17)	0.004-0.009 (0.10-0.24)	0.004-0.012 (0.11-0.30)						
0.001-0.003 (0.04-0.08)	0.002-0.005 (0.06-0.12)	0.003-0.006 (0.07-0.16)	0.003-0.008 (0.08-0.20)					0.002-0.005 (0.06-0.12)	
0.001-0.003 (0.04-0.08)	0.002-0.005 (0.06-0.12)	0.003-0.006 (0.07-0.16)	0.003-0.008 (0.08-0.20)					0.002-0.005 (0.06-0.12)	
0.001-0.003 (0.04-0.08)	0.002-0.005 (0.06-0.12)	0.003-0.006 (0.07-0.16)	0.003-0.008 (0.08-0.20)					0.002-0.005 (0.06-0.12)	
0.002-0.005 (0.06-0.13)	0.003-0.008 (0.08-0.20)	0.004-0.010 (0.11-0.26)	0.005-0.013 (0.12-0.33)					0.003-0.008 (0.08-0.20)	
0.002-0.005 (0.06-0.12)	0.003-0.007 (0.08-0.18)	0.004-0.009 (0.11-0.24)	0.005-0.012 (0.12-0.30)					0.003-0.007 (0.08-0.18)	
0.002-0.005 (0.06-0.13)	0.003-0.008 (0.08-0.20)	0.004-0.010 (0.11-0.26)	0.005-0.013 (0.12-0.33)					0.003-0.008 (0.08-0.20)	
0.002-0.005 (0.06-0.13)	0.003-0.008 (0.08-0.20)	0.004-0.010 (0.11-0.26)	0.005-0.013 (0.12-0.33)					0.003-0.008 (0.08-0.20)	
0.002-0.005 (0.06-0.12)	0.003-0.007 (0.08-0.18)	0.004-0.009 (0.11-0.24)	0.005-0.012 (0.12-0.30)					0.003-0.007 (0.08-0.18)	
0.002-0.005 (0.06-0.12)	0.003-0.007 (0.08-0.18)	0.004-0.009 (0.11-0.24)	0.005-0.012 (0.12-0.30)					0.003-0.007 (0.08-0.18)	
0.002-0.005 (0.06-0.12)	0.003-0.007 (0.08-0.18)	0.004-0.009 (0.11-0.24)	0.005-0.012 (0.12-0.30)					0.003-0.007 (0.08-0.18)	
0.002-0.005 (0.05-0.12)	0.003-0.007 (0.07-0.18)	0.003-0.009 (0.09-0.24)	0.004-0.012 (0.10-0.30)					0.003-0.007 (0.07-0.18)	
0.002-0.005 (0.05-0.12)	0.003-0.007 (0.07-0.18)	0.003-0.009 (0.09-0.24)	0.004-0.012 (0.10-0.30)					0.003-0.007 (0.07-0.18)	
0.002-0.005 (0.05-0.12)	0.003-0.007 (0.07-0.18)	0.003-0.009 (0.09-0.24)	0.004-0.012 (0.10-0.30)					0.003-0.007 (0.07-0.18)	
0.002-0.005 (0.05-0.12)	0.003-0.007 (0.07-0.18)	0.003-0.009 (0.09-0.24)	0.004-0.012 (0.10-0.30)					0.003-0.007 (0.07-0.18)	
0.002-0.005 (0.05-0.12)	0.003-0.007 (0.07-0.18)	0.003-0.009 (0.09-0.24)	0.004-0.012 (0.10-0.30)					0.003-0.007 (0.07-0.18)	
0.001-0.003 (0.04-0.08)	0.002-0.005 (0.06-0.12)	0.003-0.006 (0.07-0.16)	0.003-0.008 (0.08-0.20)						
0.001-0.003 (0.04-0.08)	0.002-0.005 (0.06-0.12)	0.003-0.006 (0.07-0.16)	0.003-0.008 (0.08-0.20)						

Reaming allowance in diameter inch (mm)

0.004-0.008 (0.10-0.20)	0.008-0.012 (0.20-0.30)	0.008-0.016 (0.20-0.40)	0.012-0.020 (0.30-0.50)	0.004-0.008 (0.10-0.20)	0.008-0.012 (0.20-0.30)	0.008-0.016 (0.20-0.40)	0.012-0.020 (0.30-0.50)	0.004-0.008 (0.10-0.20)	
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DIHART® ASG3000 & ASG4000

ASG3000 and ASG4000 – the new chip control geometries for REAMAX®, REAMAX® TS, Monomax®, Cutting ring and Duomax

Long and uncontrolled chips are a common problem.

Remedying this often requires the machine operator to manually intervene, and the resulting poor process reliability in machining makes the operating times and the machining results difficult to estimate and calculate.

The DIHART® reaming specialists set about making systematic improvements. The ASG3000 and ASG4000 were developed.

By adding an additional flute, chip deflection is defined and led along the cutting edge. In long-chipping materials, short and tight helical chips are formed that prevent the classic problem of "birdnesting". In addition, blockages of coolant holes and the erosion of base bodies no longer occur.

With this extra benefit and the same or better performance in terms of drilling quality and tool life in comparison with the existing ASG07 and ASG09 geometry, the ASG3000 and ASG4000 are setting new standards. The ASG3000 is now the first choice of geometry and has replaced the existing ASG07. The ASG4000 replaces the ASG09.

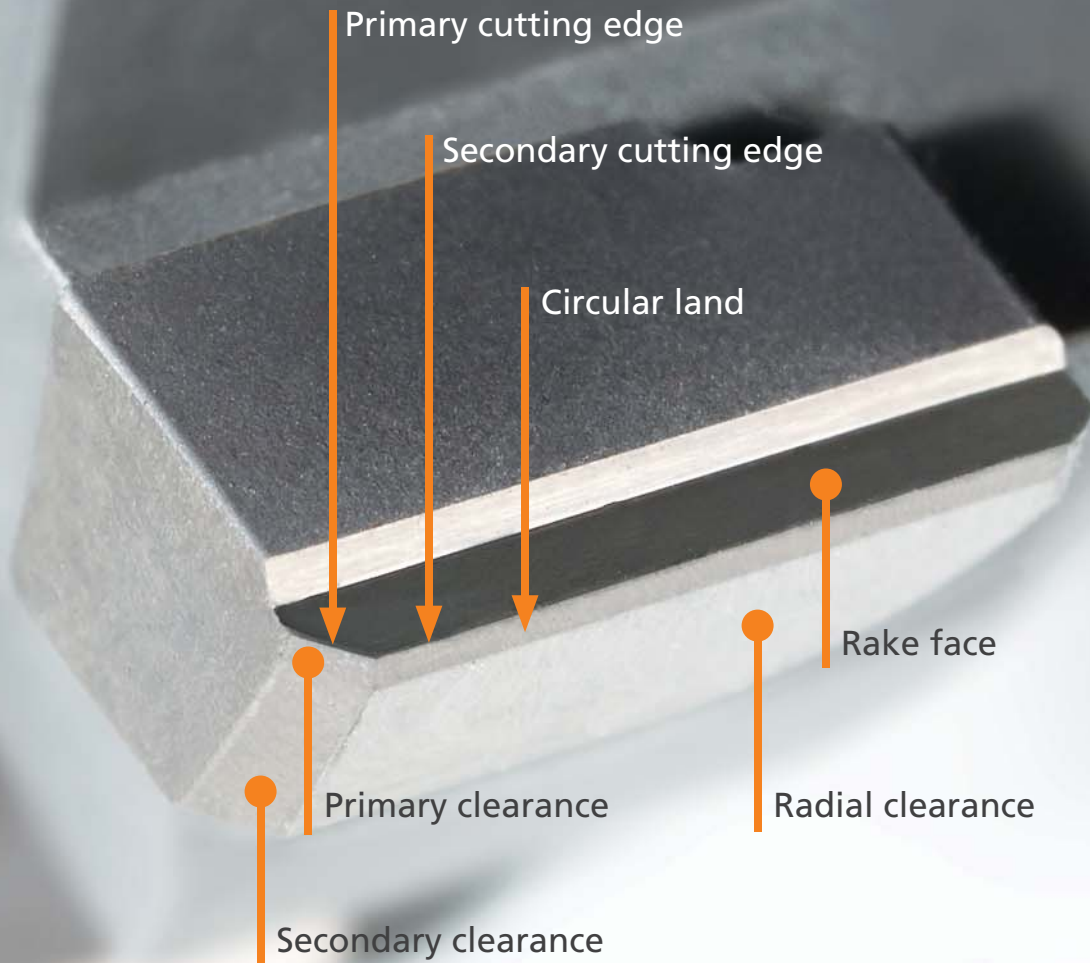
Geometry	Flute form	Chip evacuation	Bevel angles
ASG07	straight		
ASG3000	straight		
ASG09	straight		
ASG4000	straight		

BENEFITS for you:

- Process reliability when working with long-chipping materials
- Improved chip control
- Shorter, tightly twisted chips
- No erosion due to chips on steel base bodies
- No penetration of chips into coolant holes



NEW
ASG3000 & ASG4000



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DIHART® ASG – Cutting Geometries

The cutting geometry (ASG) defines:

- Bevel angle
- Width of circular land
- Back taper
- Flute angle
- Primary and secondary clearances



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Rake face

Circular land








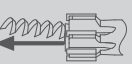
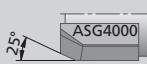


Radial clearance

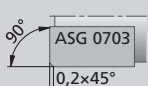
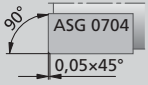
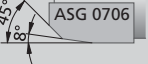



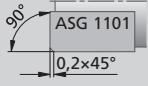
Secondary clearance

Primary clearance

Primary cutting edge

Secondary cutting edge

Standard Geometries			
Geometry	Flute form	Chip evacuation	Bevel angles
ASG0106	straight	↔	
ASG02	straight	↔	
ASG03	straight	↔	
ASG0501	left hand spiraled		
ASG3000	straight	↔	
ASG07	straight	↔	
ASG4000	straight		
ASG09	straight		

Special Geometries			
Geometry	Flute form	Chip evacuation comment	Bevel angles
ASG0703	straight	front cutting	
ASG0704	straight	front cutting for increased positional accuracy	
ASG0706	straight	↔	
ASG09B	straight	chip breaking < Ø 32 mm	
ASG1402	straight	chip breaking > Ø 32 mm	
ASG11	straight		
ASG1101	straight	front cutting	



Cutting materials	HM	HM is a fine-grained carbide, which features high abrasion resistance and achieves good results in standard materials. It is very suitable for coating, and is mainly used as cutting material for coated reamers.
	DST	DST is a high-performance cutting material, very suitable for high-speed reaming. It is ideal for machining non-alloyed or low alloyed steels up to 1200 N/mm ² tensile strength and is also excellent for reaming ductile iron.
Coatings	TiN	TiN is an all purpose coating material. It has a very smooth surface and very little affinity to many materials. This prevents structure deformation which gives excellent surface finish results when reaming, and offers considerably higher cutting data than with non coated carbide reamers.
	DBG-N	DBG-N is a coating which offers a very high grade of hardness. The coating also has very high oxidation resistance; making it a particularly high-performance coating that is very suitable for high cutting speeds and for use with minimum quantity lubrication (MQL) machining.
	DJC	DJC is a combination of the high-performance cutting material DST and the high-performance coating DBG-N. This combination offers very high tool life and higher cutting data can be achieved.
	DJF	DJF is an AlCrN-coated cermet that is particularly well suited for using in spheroidal iron workpieces.
	DBF	DBF is a coating that exhibits a very high level of hardness and a high resistance to oxidation. This makes the coating suitable for cast iron machining. A very smooth layer means that stainless materials can also be successfully machined.
	DBC	DBC is a coating with a very high level of hardness and an extremely smooth surface. It is suitable for machining aluminum and copper alloys.
	DBG-U	DBG-U: The high hot hardness and thermal cycling resistance of this TiAlN coating enable its universal use for moderate and high cutting data.

Additional high-tech coatings are available for special applications.



		Form and positional tolerances				
Tolerance type		Symbols and characteristics to tolerance	Drawing details examples	Explanation	Tolerance zone	
Form tolerances			Straightness of a line or axis		The axis of the cylindrical part of the pin must lie within the cylinder to $t = 0.0012''$ (0.03 mm)	
			Circularity of a disc, a cylinder, a cone, etc.		The circumference line of any cross section must be contained in a circular ring with a width to $t = 0.0008''$ (0.02 mm)	
			Cylindricity		The surface to tolerance must lie within two coaxial cylinders which have a radial spacing to $t = 0.0020''$ (0.05 mm)	
Positional tolerances	Directional tolerances		Parallelism of a line (axis) with reference to a basic straight line		The top axis must lie in a square-shaped area, within 0.0039" (0.1 mm) in the vertical and 0.0079" (0.2 mm) in the horizontal direction. The area will lie parallel to the basic axis of bore A.	
			Parallelism of a surface with reference to a basic plane		Any 3.937" (100 mm) long section of the top surface must lie with a gap of 0.0004" (0.01 mm) between two parallel planes. The planes will lie parallel to the lower surface (basic surface).	
	Location tolerances		Position of lines, axes or surfaces in relation to one another or to one or several basic elements		The axis of the hole must lie within a cylinder with a diameter to tolerance $t = 0.0020''$ (0.05 mm), whose axis lies at the precise geometrical place (with dimensions as shown in boxes).	
			Concentricity of an axis or a point in relation to a basic axis (basic point)		The axis of the part of the shaft to tolerance must lie within a cylinder with a diameter to tolerance $t = 0.0012''$ (0.03 mm), whose axis aligns with the base axis.	



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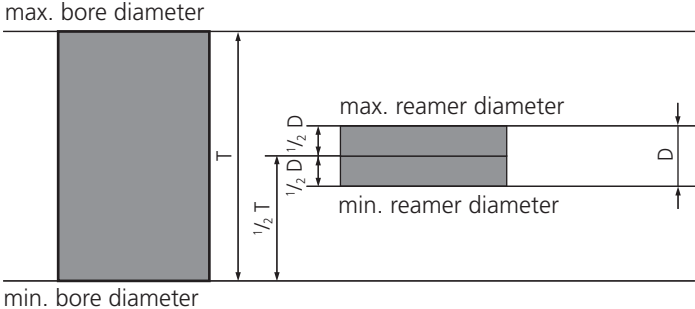


9



Manufacturing tolerance of expandable reamers

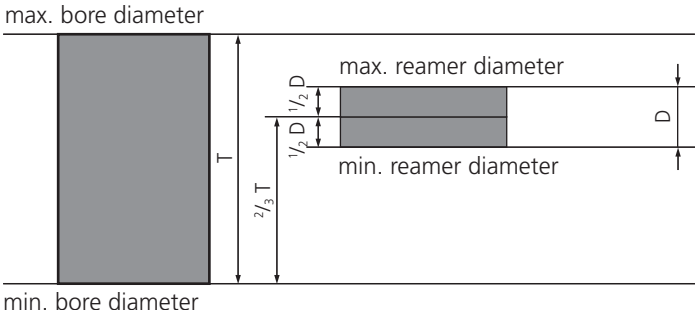
The manufacturing tolerance field D of expandable reamers is centered on the nominal bore tolerance T.
 The expansion feature of these tools allows for wear compensation.



T = Tolerance field of bore
 D = Manufacturing tolerance of reamer

Manufacturing tolerance of solid reamers

The manufacturing tolerance field D of solid reamers is in the upper third of the bore tolerance T.



T = Tolerance field of bore
 D = Manufacturing tolerance of reamer

DIHART® Surface

Attainable surface quality

Material group	Surface finish class	N11	N10	N9	N8	N7	N6	N5	N4	N3	N2	N1	
	RMS values in μ inch	~985	~492.5	~240	~126	~63	~31.5	~15.7	~7.8	~3.9	~1.5	~1.1	
	Mean surface finish R_a	25	12.5	6.3	3.2	1.6	0.8	0.4	0.2	0.1	0.05	0.025	
	Average surface uniformity R_z	100	63	40	25	16	10	6.3	4	2.5	1.6	1	0.63
P 1.0 - 4.0	structural steel, low alloy steels: case-hardened steels, heat-treated steel												
S 5.0	special alloys: Inconel												
M 6.0 - 7.0	titanium, titanium alloys												
	stainless steels, fireproof steels												
K 8.0 - 10.2	gray cast iron ferritic												
	gray cast iron perlitic												
	spheroidal graphite cast iron ferritic												
	spheroidal graphite cast iron perlitic												
N 12.0	copper alloy, brass												
	wrought aluminum alloys												
	cast aluminum alloy: Si-content < 10%												
	cast aluminum alloy: Si-content > 10%												
H 15.0	hardened steels < 45 HRC												
	hardened steels > 45 HRC, \leq 55 HRC												

achievable limited achievability

All other surface values on request.



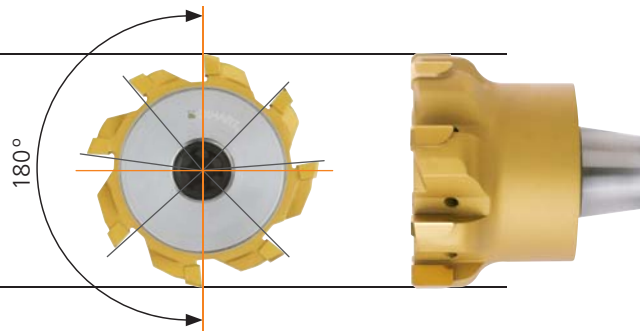
Unequal flute spacing!

Only two cutting edges are 180° opposed.

→ These are the measuring teeth

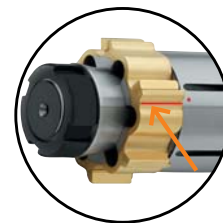
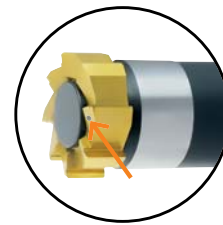
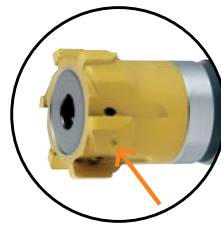
The tool's back taper means that the measurement has to be done at the front edge of the cutting edge.

PCD tipped reamers require non-contact measuring devices! Any attempt to measure a PCD tool with anything other than a non-contact measuring device may result in cutting edge damage.



Designation of measuring teeth

- Drive pin, lobe
- Number
- Punch-mark



1



2



3



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9



DIHART® Technical Data – Troubleshooting

Problems • Possible Causes → Solutions

1



Bore too large

- Run-out of the reamer in the spindle → Use DAH® compensating holder and reduce run-out
- Alignment not precise, reamer cuts at the back end → Correct alignment and use DPS floating holder
- Built-up edge → reduce cutting speed v_c for uncoated carbide cutting material, increase for DST and coated cutting material or increase the coolant concentration
- Reamer too big → have the reamer reworked

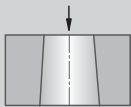
2



Bore too small

- Worn reamer → have the reamer readjusted, replaced or repaired
- Stock allowance too small → Increase stock allowance
- Cutting forces too large → reduce feed or choose a different cutting geometry (ASG)
- Reamer too small → have reamer readjusted, replaced or repaired

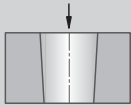
3



Conical bore, tapered

- Poor alignment → Correct alignment and use DPS floating holder
- Misalignment of head-stock in relation to turret → correct turret and use DPS floating holder

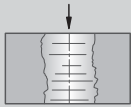
4



Conical bore, lipped

- Poor alignment. Cutting edges press at start → Correct alignment and use DPS floating holder

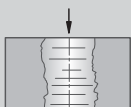
5



Bore not straight

- Run-out of reamer too large → correct run-out using DAH® compensation system
- Poor alignment → Correct alignment and use DPS floating holder
- Asymmetric cutting through uneven entry surface → Countersink bore
- Deformation through clamping of the work piece → Correct clamping of the work piece
- Bore not premachined properly → optimize premachining
- Feed too high → reduce feed

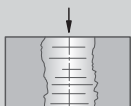
6



Bore shows chatter marks

- Cutting speed too high → reduce cutting speed
- L to D ratio too large → reduce the entry speed, utilize a pilot bore or choose a different cutting geometry (ASG)

7



Surface quality unsatisfactory

- Cutting edge build-up → reduce cutting speed v_c for uncoated carbide cutting material, increase for DST and coated cutting material or increase the coolant concentration
- Cutting edges worn → have reamers repaired or replace tool
- Run-out error of reamer → correct run-out using DAH® compensation system
- Failing or insufficient coolant, chips getting jammed → use internal coolant supply and increase coolant pressure
- Unsuitable coolant → increase the coolant concentration
- Incorrect cutting data → use data according to catalog recommendation

8



Scoring in bore (feed marks)

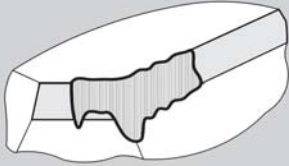
- Cutters worn → replace reamer or have repaired
- Cutting edge build-ups → reduce cutting speed v_c for uncoated carbide cutting material, and increase for DST and coated cutting material or increase the coolant concentration

9



Scoring in bore (retraction marks)

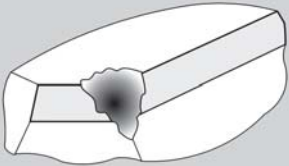
- Reamer is allowed to travel too far out of the bore → Only allow the reamer to travel out of the bore 2 mm more than the cutting length at the most
- Material springs back → do not rapid retract, rather feed (2-3 times) out



Flank wear

Reduce cutting speed or use a cutting material or coating with higher abrasion resistance.

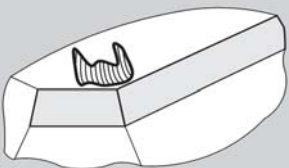
1



Major breakage

Reduce feed rate and stock allowance. Use carbide with coating instead of DST for interrupted bores.

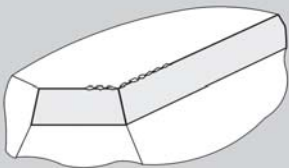
2



Pitting of chip surface

Reduce cutting speed or use a more positive rake angle.

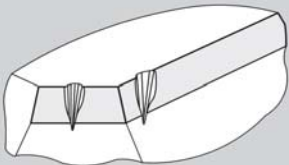
3



Edge wear

Increase cutting speed or use a more positive rake angle.

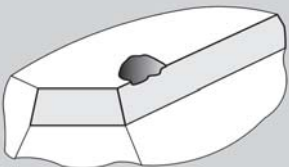
4



Notch wear

Reduce cutting speed or use a cutting material or coating with higher abrasion resistance.

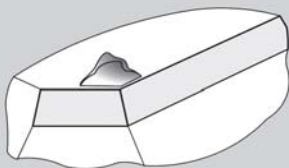
5



Fatigue wear

Reduce feed rate, increase stability of the reamer.

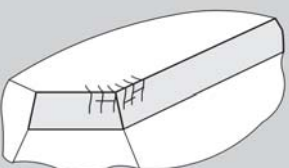
6



Build-up on chip surface

Use positive cutting geometry, increase coolant concentration, reduce cutting speed v_c for uncoated carbide cutting material, increase for DST and coated cutting material.

7



Micro cracks

Use enough coolant and inner coolant supply, reduce cutting speed.

8



9



Safety notes:

- The technical notes provided in the application details depend on the environmental and application conditions (such as machine, environmental temperature, lubrication/coolant used and desired machining results): these are based on proper application conditions, use and compliance with the spindle speed limits given for the tools.
- To prevent damage to machine and tool, we recommend that the drive power be calculated in advance. The drive power which is actually available will be found in the machine manufacturer's spindle speed/performance diagram.
- Safety equipment should be provided to protect personnel from flying chips.
Please see our safety note (enclosed with packing).

Hazard warning:

If using tungsten carbide-based hard metal products together with cobalt as a binder metal, please read our safety data sheets, which are available for you to download from our website.
(<http://www.komet.com/navigation-top/download/msds.html>)

Liability information:

Subject to change. The KOMET GROUP is not liable for damages resulting from selecting the incorrect tools.

Abbreviations used:

ISO	International Organisation for Standardisation	The International Organization for Standardization– abbreviated ISO (grade: “isos”) – is the international federation of standards organizations and develops international standards many sectors
DIN	German Institute for Standardisation (Deutsches Institut für Normung e. V)	The German Institute for Standardization is the most important national standardization organisation in the Federal Republic of Germany.
JIS (MAS-BT)	Japan Industrial Standard	Machine tools from Asia normally use tool holders in accordance with the JIS B standard ... (former designation MAS-BT).
HSK	Hollow shank taper	The hollow shank taper, HSK for short, is used as a tool adaptor in machine tools (standardized according to DIN 69893).
CAT	American Standard	A tool taper developed by Caterpillar with equal sized lands on the outer diameter of the flange. Also called V-flange, CAT is an American standard.
SK	Steep taper	The steep taper is the standardized form of a tool taper for clamping tools in the main spindle of a machine tool (standardized in DIN 69871 part 1).
ABS	Adapter attachment system (ABS)	The KOMET ABS system is often used as a direct adapter in spindles. In contrast to steep taper adapters, with the ABS System, the spindle or shank diameter is decisive for vibration stability and enables a relatively extended tool projection.
DAH	DIHART compensating holder	DIHART compensating holders are static compensating systems. Axis and concentricity errors are compensated for extremely simply.
DPS	DIHART floating holder	DIHART floating holders are dynamic compensating systems. Axis and concentricity errors are compensated for extremely simply.
ASG	Cutting geometry	The cutting geometry defines the following sizes: cutting angle, circular land, back taper, rake angle, primary and secondary relief angle.
HM VHM	Carbide Solid carbide	Carbide in this case means sintered carbide.
TiN	Titanium nitride	TiN is the chemical molecular formula for titanium nitride, a ceramic material with very high hardness and corrosion resistance.
DST	DIHART cutting material	DST is a high-performance cutting material.
DBG-N	DIHART coating	DBG-N is a coating that is characterised by a very high level of hardness.
DJC	DIHART coating	DJC is a combination of the high-performance cutting tool material DST with the high-performance coating DBG-N.
DBF	DIHART coating	DBF is a coating that exhibits a very high level of hardness and a high resistance to oxidation.
DBC	DIHART coating	DBC is a coating with a very high level of hardness and an extremely smooth surface.
PCD	Polycrystalline diamond	Polycrystalline diamond is a synthetically manufactured, extremely hard, mass of diamond particles with random orientation sintered in a metal matrix.
Rm	Tensile strength (N/mm ²)	Tensile strength is a material property and describes the mechanical resistance with which a material opposes plastic deformation or separation.
HB	Brinell hardness testing	Hardness is the mechanical resistance with which a material opposes mechanical penetration by a harder test piece.
R _a R _z	Roughness depth (µm)	R _a = Mean surface finish to DIN 3142 R _z = Average surface uniformity to DIN 4768



1



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**Inquiries:**

In order to meet the requirements of the customers when processing their enquiries following details are needed:

- A completed questionnaire (page 114)
- A part drawing or hand sketch of the application in question

This will enable the quotations department to get an idea of the tools required.

Test-results and tool performance issues:

To process complaints and test-results efficiently following details and items are needed:

- A completed evaluation sheet (page 115)
- A part drawing or hand sketch of the application in question
- If possible the faulty work-piece and/or tool

Then a fast and simple procedure can be provided.

Please forward this information to your local KOMET representative.

The addresses of KOMET GROUP are on the last pages of this catalogue.

For elaboration on tool and machining recommendations, please send the completed questionnaire to your local KOMET representative

Sales Rep: _____

Sales Rep #: _____

Request Date: _____

Distributor

Distributor Acct. No: _____

Inquiry No: _____

Send Quote To: _____

Telephone: _____

Fax: _____

E-Mail: _____

End User

Date of Visit: _____

Technical Contact: _____

Telephone: _____

Fax: _____

E-Mail: _____

Tooling Needed: _____

Quotation

Fixed price Budgetary price

Concept Drawing Required: Yes No

Date Quotation Needed: _____

Tool Delivery Date Requested: _____

Quantity Requested: _____

For OEM's:

Machine on order
 Machine order expected
 Quotation for project

Annual Production / Batch Size: _____

Tool Information

Max tool weight & moment: _____

Max tool width: _____

Max tool length: _____

Bore length: _____

Tool change: Automatic Manual

Tool set-up: Inside machine Outside

Type of connection: _____

Part Information

Drawing Number: _____

Material Specification: _____

Tensile Strength (specify unit): _____

Hardness (specify unit): _____

Application:

Drilling Roughing Semi finish machining Finish machining
 Reaming Threading Milling Other

Stock removal on Ø: _____

Position Requirement: _____

None Fixture Interference See Drawing

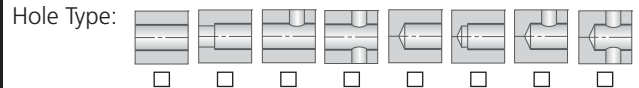
CPK-Value: _____

Reaming Information

Diameter & Tolerance: _____

Pre-machined Ø: _____

Pre-machining Method: _____



Length of Interruption: _____

Bottom Machined: Yes No

Surface Quality (specify unit): _____

Roundness Requirement: _____

Machine Information

Brand / Type: _____

Condition: New Used

No. of Spindles: _____

Operation: Horizontal Vertical

Available Horse Power: _____

Spindle Speed: Variable Yes No

Spindle Speed: rpm_{min} _____ rpm_{max} _____

Tools rotating
 Parts rotating

Feed Type: NC Hydraulic

Spindle Type (CAT, HSK, etc.): _____

Spindle Runout: _____

Coolant: Through Spindle Flood Dry MQL

Coolant Pressure (psi): _____

Coolant Type & Concentration: _____

Sketch or Process Description

Evaluation Sheet

DIHART®

For tests and complaints, please send the completed questionnaire to your local KOMET representative

Company:
Department:
Telephone:
Fax:
Date:

Contact:
E-Mail:
Customer-No.:
Distributor:

1. Work piece

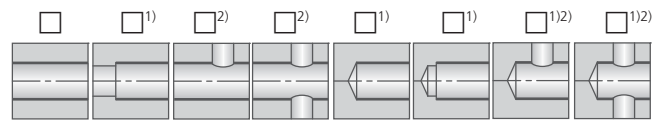
Name of work piece:
Material specification:
Material No.:

Tensile strength:
Heat treatment:
Additional information:

2. Bore

Diameter and tolerance:
Length of bore:
Surface finish CLA / R_t / R_Z:
Circular error allowed:
CPK:
Diameter of pre-reaming:
Method of pre-reaming:
Number of bores, parts per year:

Type of bore



¹) bottom to be reamed? yes no
²) length of interruption: inch / (mm)

3. Machine and tool fixing arrangement

Machine type and brand:
Attachment of spindle:
Tool fixing arrangement:
max. speed: rpm variable fix
max. feed: inch (mm) / min variable fix
Circular accuracy of spindle:

Machining: horizontal vertical
Tool: rotating stationary
Coolant supply through tool shank: yes no
Brand and type of lubricant:
Lubricant ratio of mixture:

4. Tool

Type:
Order No.:

Cutting material / coating:
Cutting geometry (ASG):

5. Test results

Bore:	No. 1	No. 2	No. 3	No. 4	No. 5	No. 6
Cutting speed ft/min (m/min):						
Speed (rpm):						
Feed: <input type="checkbox"/> inch (mm) / rev <input type="checkbox"/> inch (mm) / min						
Concentricity of the tool measured in the machine (µm):						
Bore diameter: entrance						
exit						
Circular error (µm):						
Surface quality: <input type="checkbox"/> CLA <input type="checkbox"/> R _t <input type="checkbox"/> R _Z						
No. of reamed bores:						
Tool life ft (m):						
Performance:						

Overall performance: excellent good unsatisfactory



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18589 10013	21	513.81.008	52	52806 32100	91	52P57.0598	98	5505208010	83
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300.07	51	513.81.010	52	52806 32110	91	52P57.0600	98	55232 01210	29
300.08	51	513.81.011	52	52806 32115	91	52P57.0601	98	55232 01610	29
300.17	51	51391 00040	83	52806 32120	91	52P57.0602	98	55232 02210	29
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33G.47	50	514.76.008	52	52806 32180	91	52P57.1000	98	551.67	34
33G.67	50	514.76.009	52	52806 32185	91	52P57.1001	98	551.71	34
33G.71	50	514.76.010	52	52806 32190	91	52P57.1002	98	551.93	34
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33G.93	50	514.81.008	52	52806 32200	91	52P57.1198	98	55Q.21	36
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350.23.003	55	514.82.009	54	52911 01025	83	52P57.1202	98	55Q.71	36
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