ITS BORE

ITS-BORE
BHE MB50-50x50
ø2.5-110
0.5 ø
0.01 ø
Non. 0.002 ø
LOCK
BHEH 24x75
CW 32

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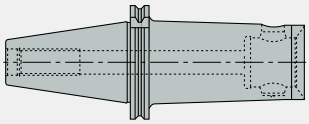
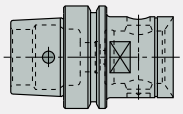
The ITS BORE System

Shanks

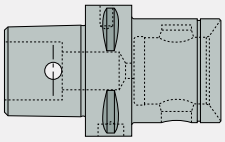
SKA/SKB SKA-FC pages 455-456



HSK Pages 458-459



CAMFIX Page 459



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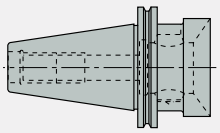
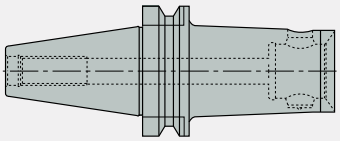


BT/BTB BT-FC Pages 459-460



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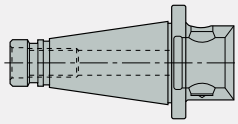
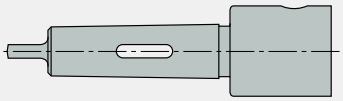
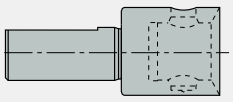


MTT/MTD Page 463



ST Pages 461-462



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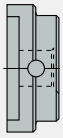
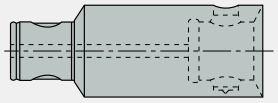


Extensions and Reducers

EX Page 464



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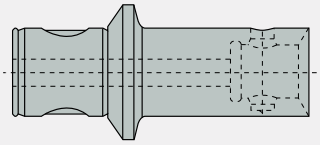

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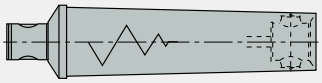

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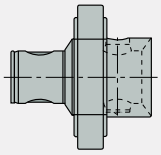
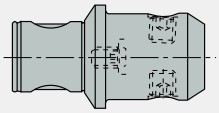


Toolholders

EMH Page 466



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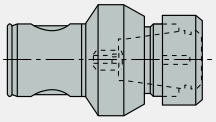

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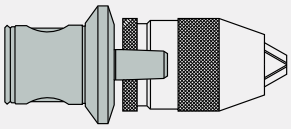

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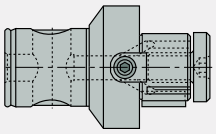

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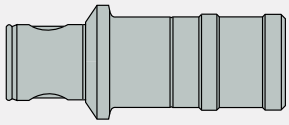

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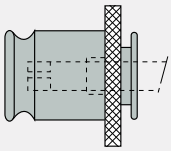
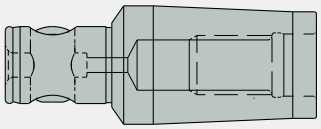
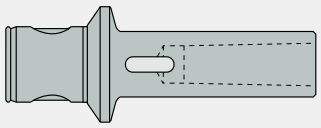


ODP see ISCAR MILLING LINES catalog



AMT Page 470



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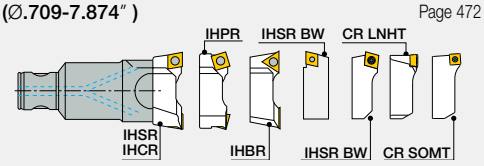
The ITS BORE System

Rough Boring Heads

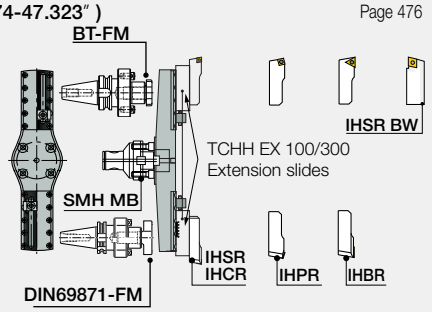
BHR MB 16, 20, 25, 32, 40, 50, 63, 80

(Ø.709-7.874″) Page 472



TCH AL 200, 300, 400, 500, 600, 700, 800

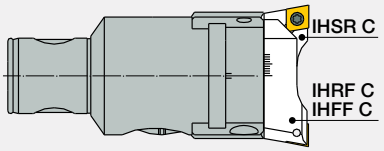
(Ø7.874-47.323″) Page 476



Rough & Fine Boring Heads

BHCI MB 25, 32, 40, 50, 63, 80

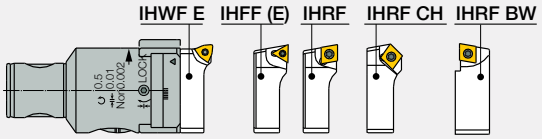
(Ø1.102-4.724″) Page 481



Fine Boring Heads (400 Minch)

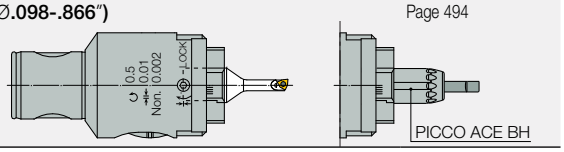
BHEI MB 14, 16, 20, 25, 32, 40

(Ø.571-2.598″) Page 489



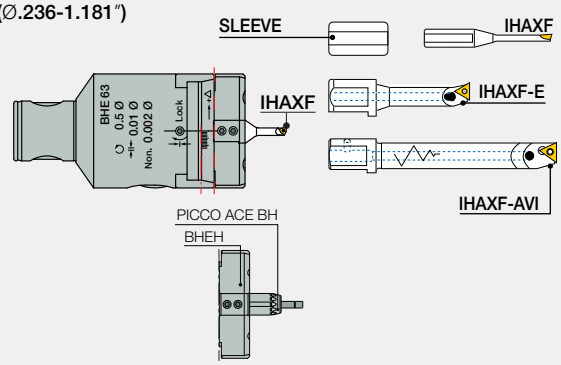
BHEI MB-H 32, 50

(Ø.098-.866″) Page 494



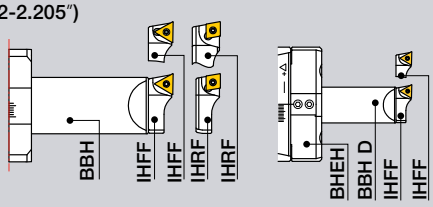
BHEI MB 50, 63, 80

(Ø.236-1.181″)

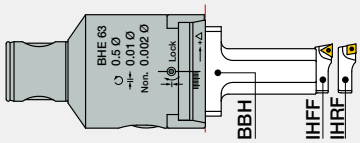


pages 491-493

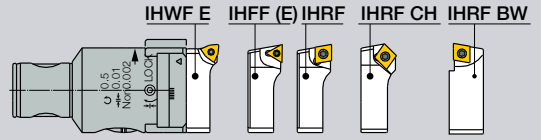
(Ø1.102-2.205″)



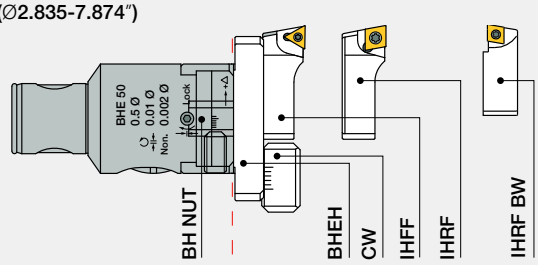
(Ø1.575-3.543″)



(Ø2.126-4.527″)



(Ø2.835-7.874″)



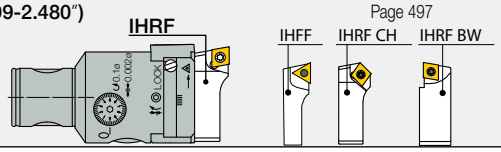
The ITS BORE System

Fine Boring Heads (80 Minch)

BHFI MB 16, 20, 25, 32, 40

(Ø.709-2.480″)

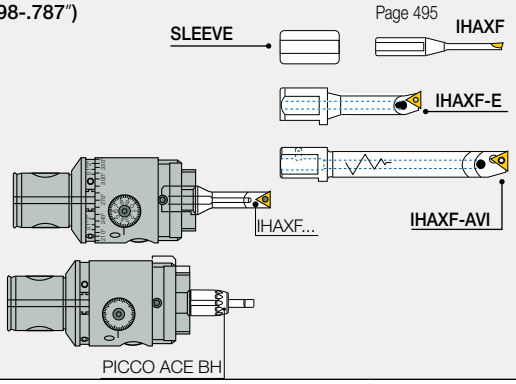
Page 497



BHFI MB 50-BL

(Ø.098-.787″)

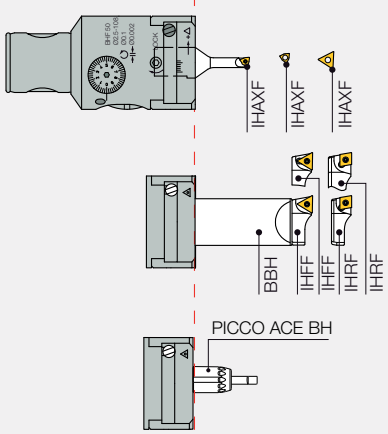
Page 495



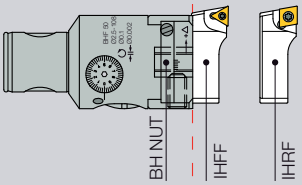
BHFI MB 50-50X60

(Ø.236-1.181″)

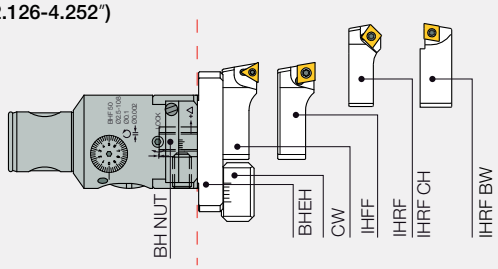
pages 497, 500



(Ø1.102-2.126″)



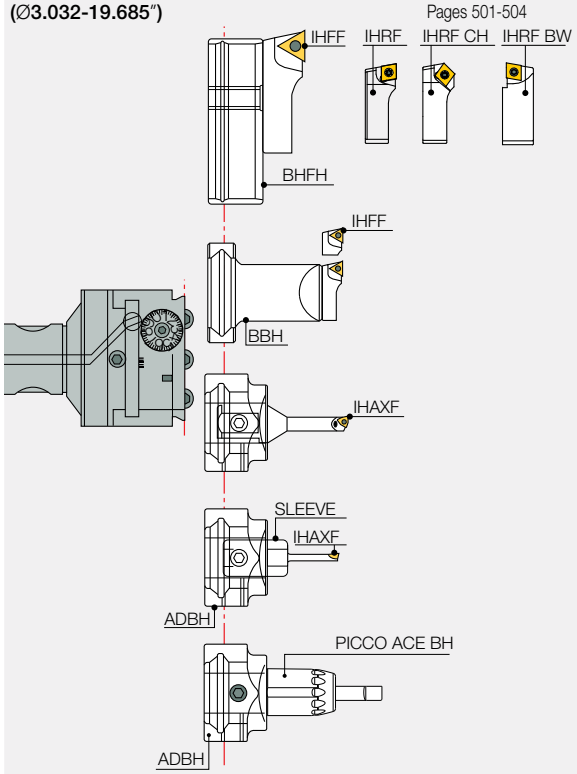
(Ø2.126-4.252″)



BHFI MB 50, 63, 80

(Ø3.032-19.685″)

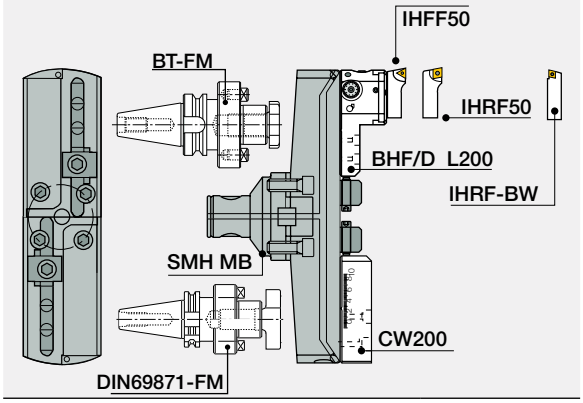
Pages 501-504



TCH AL 200, 300, 400, 500, 600, 700, 800

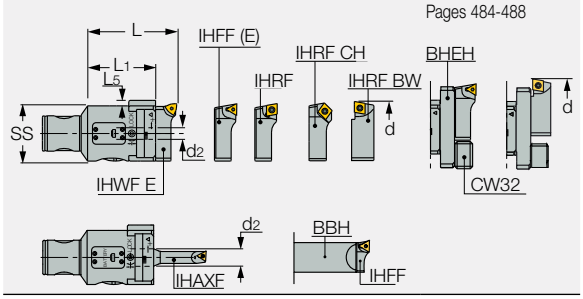
(Ø7.874-47.323″)

Page 511

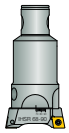
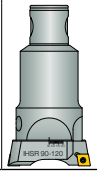
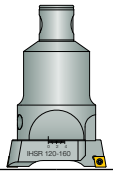
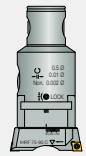
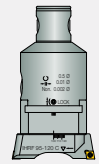
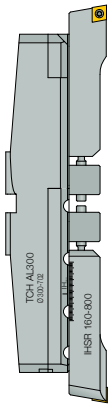


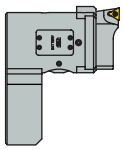
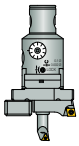
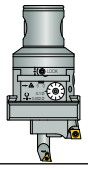
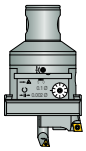
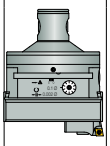
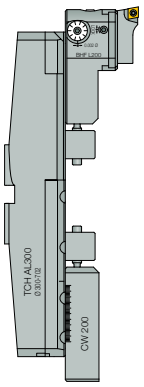
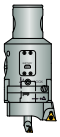
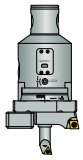
BHD 32, 40, 50, 63, 80

Pages 484-488



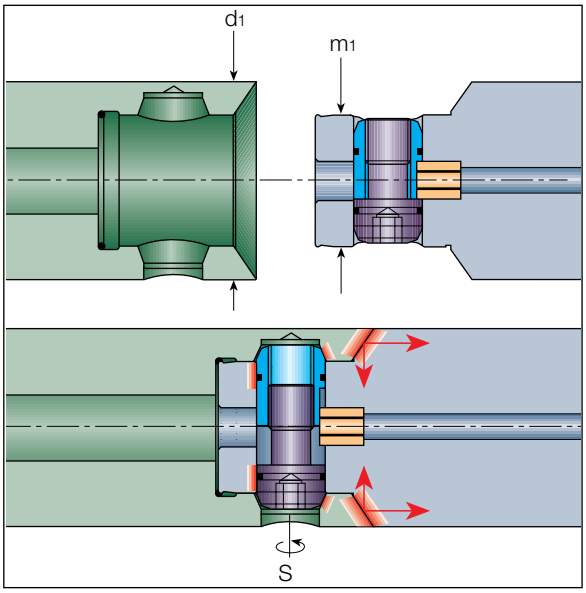
ITS BORE Boring Heads Selection Guide

MB Size	14	16	20	25	32	40	50	63	80	
Rough — BHR-TCH Ø.709-47.323		BHR MB16-16 Ø.709-.866	BHR MB20-20 Ø.866-1.102	BHR MB25-25 Ø1.102-1.496	BHR MB32-32 Ø1.398-1.969	BHR MB40-40 Ø1.969-2.677	BHR MB50-50 Ø2.677-3.543 BHR MB50-63 Ø3.543-4.724 	BHR MB63-63 Ø3.543-4.724 	BHR MB80-80 Ø4.724-7.874 	**Roughing**
		Page 472								
Rough + Finish — BHCI Ø1.102-4.724 400 µinch				BHCI MB25-25 Ø1.102-1.417	BHCI MB32-32 Ø1.417-1.811	BHCI MB40-40 Ø1.811-2.362	BHCI MB50-50 Ø2.362-2.953	BHCI MB63-63 Ø2.953-3.740 	BHCI MB80-80 Ø3.740-4.724 	
				Page 481						Page 476

MB Size	14	16	20	25	32	40	50	63	80	
Finish — BHEI Ø.236-7.874 400 µinch	BHEI MB14-14 Ø.571-.709	BHEI MB16-16 Ø.709-.945	BHEI MB20-20 Ø.866-1.181	BHEI MB25-25 Ø1.102-1.575	BHEI MB32-32 Ø1.378-2.087	BHEI MB40-40 Ø1.890-2.598	BHEI MB50-50 Ø.236-4.331	BHEI MB63-63 Ø.236-4.921	BHEI MB80-80 Ø.236-7.874	TCH AL200 Ø7.874-23.701 TCH AL300 Ø11.811-27.638 TCH AL400 Ø15.748-31.575 TCH AL500 Ø19.685-35.512 TCH AL600 Ø23.622-39.449 TCH AL700 Ø27.559-43.386 TCH AL800 Ø31.496-47.323
	Page 489									**Finishing**
BHEI H Ø.098-.866 400 µinch					BHEI MB32-32...H Ø.098-.472 Page 494		BHEI MB50-50...H Ø.236-.866 Page 494			BHD 50 L200 Ø7.874-47.323  Page 510
BHFI Ø.098-47.323 80 µinch		BHFI MB16-16 Ø.709-.906	BHFI MB20-20 Ø.866-1.142	BHFI MB25-25 Ø1.102-1.496	BHFI MB32-32 Ø1.398-1.968	BHFI MB40-40 Ø1.890-2.480	BHFI MB50-50 Ø.236-4.252 BHFI MB50-63 Ø.098-6.299 BHFI MB50-80 Ø.098-8.661 	BHFI MB63-63 Ø.098-6.299 	BHFI MB80-80 Ø.098-8.661 	BHFI MB80-125 Ø1.417-19.685 	BHFI L8.000 Ø8.000-47.323 Page 510
		Page 497						Page 501		
BHFI BL Ø.098-.866 80 µinch							BHFI MB50-50... BL Ø.236-.866 Page 495			
BHD MB Ø.098-47.323 80 µinch					BHD MB32-32-83 Ø1.378-2.008	BHD MB40-40-90 Ø1.889-2.519	BHD MB50-50X60 Ø.098-4.331 	BHD MB63-63X89 Ø.236-4.921	BHD MB80-80X104 Ø.236-7.874 	
					Page 484					Page 511

MB Connection

ITSBORE is a modular toolholder system for boring, milling, drilling and tapping. This rigid, high-precision system is manufactured in one of the world's most advanced production facilities. The system is designed with extreme flexibility and simplicity, making it suitable for machine tools, machining centers and flexible manufacturing systems. It is recommended for machining strict tolerances with a high degree of surface finish. Its cylindrical-conical coupling and radial-expanding pin ensure maximum rigidity and concentricity in boring and milling. The system has an internal coolant supply in all components.

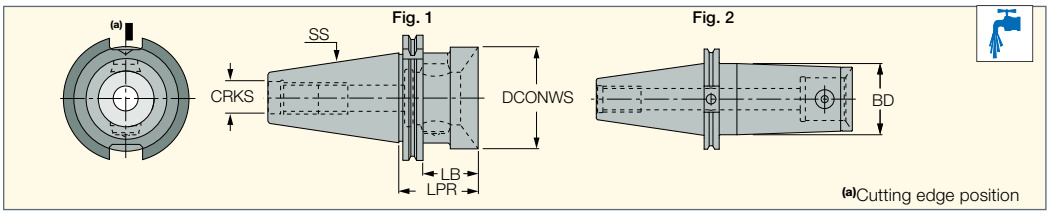


Designation	d_1	m_1	S Allen Key (mm)	Tightening Torque (lbfxft) ⚠	Maximum Driving Torque (lbfxft)
MB 14	.55	.39	2.5	1.5-1.8	30
MB 16	.63	.39	2.5	1.5-1.8	30
MB 20	.79	.51	3	3.0-3.3	52
MB 25	.98	.63	3	4.8-5.5	88
MB 32	1.26	.79	4	5.2-5.9	148
MB 40	1.58	.98	5	12-13	295
MB 50	1.97	1.26	6	22-26	516
MB 63	2.48	1.65	8	52-59	1180
MB 80	3.15	1.65	8	52-59	1180
MB 110	4.33	2.99	14	148-162	4650

ITSBORE

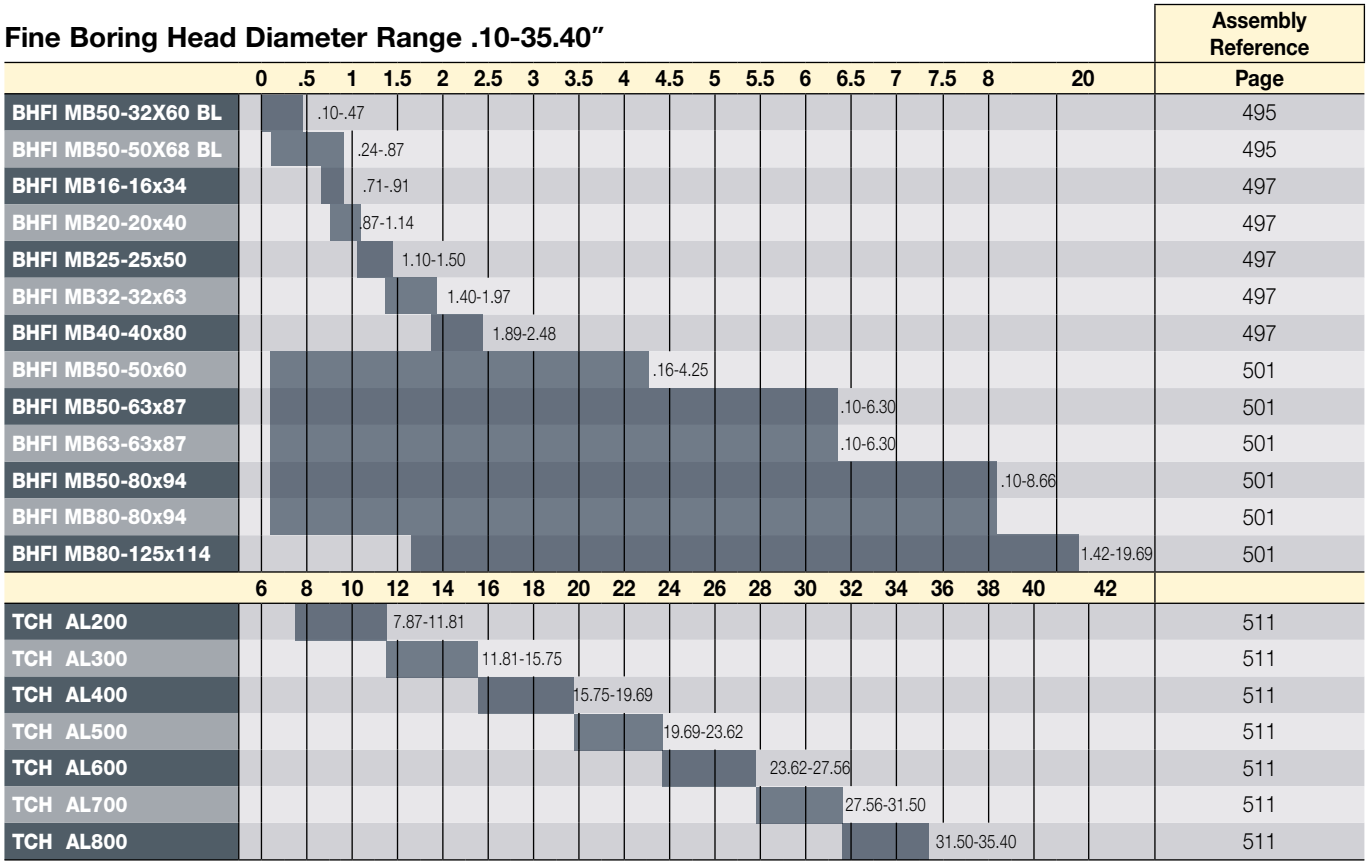
CATI-MB

MB Modular Boring System
Connections with Caterpillar
AD Form Tapered Shanks



Designation	SS	DCONWS	LPR	LB	BD	CRKS	Fig.	Lbs	
CATI 40 MB50	40	50.0000	2.600	1.850	-	5/8-11	1.	2.43	HW 6.0
CATI 40 MB50X4.724	40	50.0000	4.724	3.976	1.970	5/8-11	2.	3.75	HW 6.0
CATI 40 MB63	40	63.0000	3.937	-	-	5/8-11	1.	4.19	HW 8.0
CATI 45 MB50	45	50.0000	1.890	1.140	-	3/4-10	1.	3.75	HW 6.0
CATI 50 MB50	50	50.0000	1.890	1.142	-	1-8	1.	5.29	HW 6.0
CATI 50 MB50X4.724	50	50.0000	4.724	3.976	2.756	1-8	2.	9.06	HW 6.0
CATI 50 MB63	50	63.0000	2.205	1.453	-	1-8	1.	6.39	HW 8.0
CATI 50 MB63X5.906	50	63.0000	5.906	5.157	2.756	1-8	2.	11.03	HW 8.0
CATI 50 MB80	50	80.0000	2.441	1.693	-	1-8	1.	7.06	HW 8.0
CATI 50 MB80X7.087	50	80.0000	7.087	6.339	3.150	1-8	2.	15.21	HW 8.0

Fine Boring Head Diameter Range .10-35.40"



Note: TCH AL should be used with BHFI L8.000 or with BHD 50 L200 for fine boring applications.

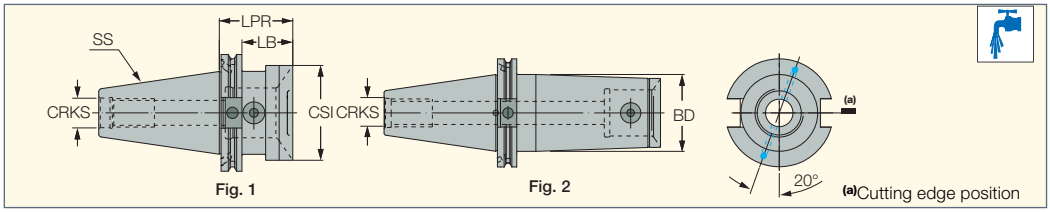
BHFI Fine Boring Heads

High precision machining to a close tolerance with high surface quality.
These heads enable a fine diametric adjustment as small as **.00008"** with a direct reading.

ITSBORE

CATI-MB-AB

MB Modular Boring System Connections with Caterpillar ADB Tapered Shanks



Designation	SS	CSI	LB	LPR	BD	CRKS	Fig.	CDI(1)	Lbs	
CATI 40 MB50AB	40	MB50	1.850	2.600	-	5/8-11	1.	0	2.71	HW 6.0
CATI 50 MB50AB	50	MB50	1.142	1.890	-	1-8	1.	0	6.66	HW 6.0
CATI 50 MB80X7.087AB	50	MB80	6.339	7.087	3.150	1-8	2.	0	17.00	HW 8.0

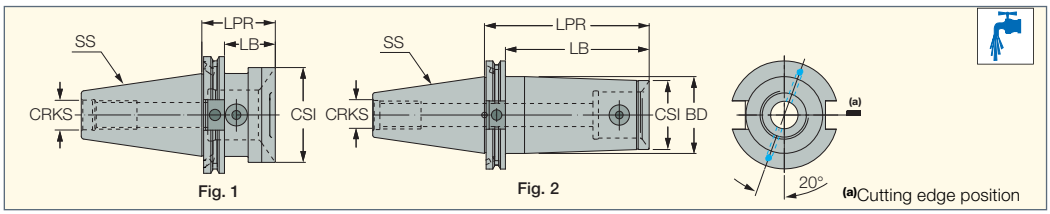
- Note: Holders with holes in the flange also feature central coolant holes (type ADB). Remove the sealing cap screws in the flange for type B coolant option.

(1) 1 - Slot for data chip, 0 - Without slot for data chip

ITSBORE

CATI-FC-MB

MB Modular Boring System Connections with Caterpillar ADB Form Face Contact Tapered Shanks



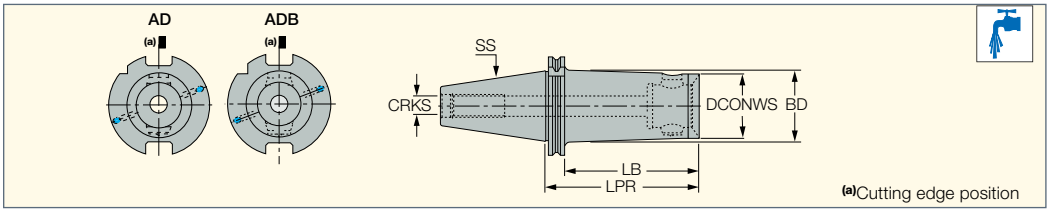
Designation	SS	CSI	BD	LB	LPR	CRKS	Fig.	CDI(1)	Lbs	
CATI 40 FC MB50 A/B	40	MB50	-	1.850	2.600	5/8-11	1.	0	2.43	HW 6.0
CATI 40 FC MB50X4.724 A/B	40	MB50	1.970	3.976	4.724	5/8-11	2.	0	5.95	HW 6.0
CATI 40 FC MB63 A/B	40	MB63	-	-	3.937	5/8-11	1.	0	4.19	HW 8.0
CATI 50 FC MB110X5.90 A/B	50	MB110	4.330	5.160	5.906	1-8	2.	0	9.92	HW 10.0
CATI 50 FC MB50A/B	50	MB50	-	1.140	1.890	1-8	1.	0	3.75	HW 6.0
CATI 50 FC MB50X4.724A/B	50	MB50	2.760	3.976	4.724	1-8	2.	0	6.39	HW 6.0
CATI 50 FC MB63A/B	50	MB63	-	1.460	2.200	1-8	1.	0	4.41	HW 8.0
CATI 50 FC MB63X5.906A/B	50	MB63	2.760	5.157	5.906	1-8	2.	0	7.50	HW 8.0
CATI 50 FC MB80A/B	50	MB80	-	1.690	2.440	1-8	1.	0	4.41	HW 8.0

(1) 1 - Slot for data chip, 0 - Without slot for data chip

ITSBORE

SKA-MB

MB Modular Connection System with DIN69871 Form AD/ADB / ISO7388/1 Taper Shanks



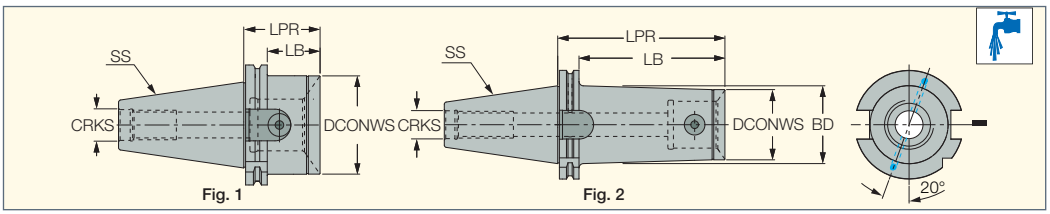
Designation	SS	DCONWS	LPR	LB	BD	CRKS	Lbs	
SKA 30-MB32	30	1.2598	1.181	.413	-	M12	.88	HW 4.0
SKA 30-MB50	30	1.9685	2.362	1.614	-	M12	1.47	HW 6.0
SKA 40-MB40	40	1.5748	1.772	1.024	-	M16	2.07	HW 5.0
SKA 40-MB40X120 ADB	40	1.5748	4.724	3.976	1.752	M16	3.75	HW 5.0
SKA 40-MB50	40	1.9685	1.890	1.142	-	M16	2.19	HW 6.0
SKA 40-MB50X120 ADB	40	1.9685	4.724	3.976	-	M16	4.50	HW 6.0
SKA 40-MB63	40	2.4803	3.150	2.402	-	M16	3.34	HW 8.0
SKA 45-MB50	45	1.9685	1.890	1.142	-	M20	3.91	HW 6.0
SKA 50-MB110X150	50	4.3307	5.906	5.157	-	M24	18.67	HW 10.0
SKA 50-MB50	50	1.9685	1.890	1.142	-	M24	6.22	HW 6.0
SKA 50-MB50X120 ADB	50	1.9685	4.724	3.976	2.362	M24	8.88	HW 6.0
SKA 50-MB63	50	2.4803	2.205	1.457	-	M24	6.50	HW 8.0
SKA 50-MB63X150 ADB	50	2.4803	5.906	5.157	2.756	M24	6.21	HW 8.0
SKA 50-MB80	50	3.1496	2.441	1.693	-	M24	7.74	HW 8.0
SKA 50-MB80X180 ADB	50	3.1496	7.087	6.339	-	M24	17.42	HW 8.0
SKA 60-MB110X100	60	4.3307	3.937	3.189	-	M30	23.15	HW 10.0
SKA 60-MB110X200	60	4.3307	7.874	7.126	-	M30	39.69	HW 10.0
SKA 60 MB63X60	60	2.4803	2.362	1.614	2.795	M30	20.88	HW 8.0
SKA 60-MB80X65	60	3.1496	2.559	1.811	-	M30	22.89	HW 8.0

• Verify that the weight of the entire tool assembly does not exceed the machine spindle's carrying capability • The coolant passages of holders with A/B suffix are plugged with screws so they can be used either as SKA or SKB (through coolant).

ITSBORE

SKA-FC-MB

MB Modular Boring Connection System with DIN 69871 Face Contact ADB Tapered Shanks

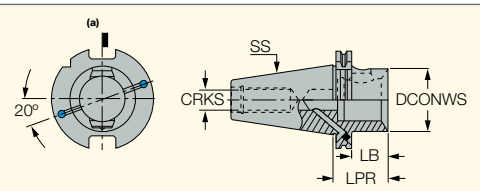


Designation	SS	DCONWS	LPR	BD	LB	CRKS	Fig.	Lbs	
SKA 40 FC MB50 ADB	40	1.9685	1.890	-	1.142	M16	1.	1.98	HW 6.0
SKA 40 FC MB50X120 ADB	40	1.9685	4.724	-	3.976	M16	2.	3.75	HW 6.0
SKA 40 FC MB63 ADB	40	2.4803	3.150	-	-	M16	1.	3.31	HW 8.0
SKA 50 FC MB50 ADB	50	1.9685	1.890	-	1.142	M24	1.	5.95	HW 6.0
SKA 50 FC MB50X120 ADB	50	1.9685	4.724	2.362	3.976	M24	2.	7.72	HW 6.0
SKA 50 FC MB63 ADB	50	2.4803	2.205	-	1.457	M24	1.	6.17	HW 8.0
SKA 50 FC MB63X150 ADB	50	2.4803	5.906	2.972	5.157	M24	2.	11.03	HW 8.0
SKA 50 FC MB80 ADB	50	3.1496	2.441	-	1.693	M24	1.	7.50	HW 8.0
SKA 50 FC MB80X180 ADB	50	3.1496	7.087	-	6.339	M24	2.	15.21	HW 8.0

ITSBORE

SKB-MB

MB Modular Connection System with DIN69871 Form B (coolant through flange) Taper Shanks



(a)Cutting edge position

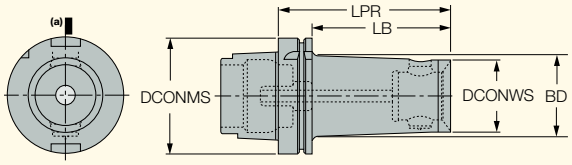
Designation	SS	DCONWS	LB	LPR	CRKS	Lbs	
SKB 40-MB50	40	1.9685	1.142	1.890	M16	2.30	HW 6.0
SKB 40-MB63	40	2.4803	2.402	3.150	M16	3.44	HW 8.0
SKB 50-MB50	50	1.9685	1.142	1.890	M24	6.41	HW 6.0
SKB 50-MB63	50	2.4803	1.457	2.205	M24	6.77	HW 8.0
SKB 50-MB80	50	3.1496	1.693	2.441	M24	7.94	HW 8.0

• Verify that the weight of the entire tool assembly does not exceed the machine spindle's carrying capability.

ITSBORE

HSK A-MB

MB Modular Connection System with DIN 69893 HSK A Taper Shanks



(a)Cutting edge position

Designation	DCONMS	DCONWS	LB	LPR	BD	Lbs			
HSK A40 MB32	1.575	1.2598	1.102	1.890	-	.71	COOLING TUBE HSK A40	WRENCH COOL TUBE HSK40*	HW 4.0
HSK A50 MB50	1.968	1.9685	-	2.598	-	1.51	COOLING TUBE HSK A50	WRENCH COOL TUBE HSK50*	HW 6.0
HSK A63 MB40	2.480	1.5748	1.339	2.362	-	2.02	COOLING TUBE HSK A63	WRENCH COOL TUBE HSK63*	HW 5.0
HSK A63 MB40X120	2.480	1.5748	3.701	4.724	1.811	3.55	COOLING TUBE HSK A63	WRENCH COOL TUBE HSK63*	HW 5.0
HSK A63 MB50	2.480	1.9685	1.575	2.598	-	2.30	COOLING TUBE HSK A63	WRENCH COOL TUBE HSK63*	HW 6.0
HSK A63 MB50X120	2.480	1.9685	3.701	4.724	-	2.32	COOLING TUBE HSK A63	WRENCH COOL TUBE HSK63*	HW 6.0
HSK A63 MB63	2.480	2.4803	-	2.953	-	2.54	COOLING TUBE HSK A63	WRENCH COOL TUBE HSK63*	HW 8.0
HSK A80 MB50	3.150	1.9685	1.732	2.756	-	3.54	COOLING TUBE HSK A 80	WRENCH COOL TUBE HSK80*	HW 6.0
HSK A80 MB63	3.150	2.4803	2.126	3.150	-	3.31	COOLING TUBE HSK A 80	WRENCH COOL TUBE HSK80*	HW 8.0
HSK A80 MB80	3.150	3.1496	-	3.386	-	5.59	COOLING TUBE HSK A 80	WRENCH COOL TUBE HSK80*	HW 8.0
HSK A100 MB50	3.937	1.9685	1.693	2.835	-	5.69	COOLING TUBE HSK A100	WRENCH COOL TUBE HSK100*	HW 6.0
HSK A100 MB50X120	3.937	1.9685	3.583	4.724	2.362	2.32	COOLING TUBE HSK A100	WRENCH COOL TUBE HSK100*	HW 6.0
HSK A100 MB63	3.937	2.4803	2.087	3.228	-	6.31	COOLING TUBE HSK A100	WRENCH COOL TUBE HSK100*	HW 8.0
HSK A100 MB63X150	3.937	2.4803	4.764	5.906	2.756	10.40	COOLING TUBE HSK A100	WRENCH COOL TUBE HSK100*	HW 8.0
HSK A100 MB80	3.937	3.1496	2.323	3.465	-	7.94	COOLING TUBE HSK A100	WRENCH COOL TUBE HSK100*	HW 8.0
HSK A100 MB80X180	3.937	3.1496	5.945	7.087	-	14.33	COOLING TUBE HSK A100	WRENCH COOL TUBE HSK100*	HW 8.0

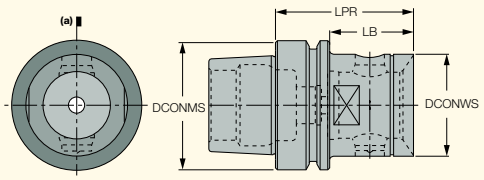
• A cooling tube must be used with all coolant through HSK spindles • Verify that the weight of the entire tool assembly does not exceed the machine spindle's carrying capability.

* Optional, to be ordered separately

ITSBORE

HSK E-MB

MB Modular Connection System with DIN 69893 E Taper Shanks



(a)Cutting edge position

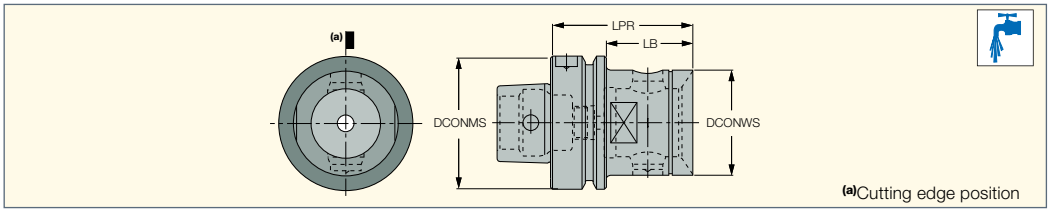
Designation	DCONMS	DCONWS	LB	LPR	Lbs	
HSK E40 MB32	1.575	1.2598	.866	1.654	.66	HW 4.0
HSK E50 MB50	1.968	1.9685	-	2.598	1.57	HW 6.0
HSK E63 MB50	2.480	1.9685	1.575	2.598	4.12	HW 6.0

• A cooling tube must be used with all coolant through HSK spindles • Verify that the weight of the entire tool assembly does not exceed the machine spindle's carrying capability.

ITSBORE

HSK F-MB

MB Modular Connection System with DIN 69893 F Taper Shank



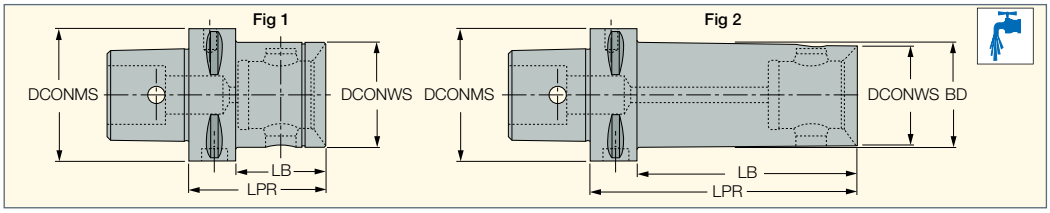
Designation	DCONMS	DCONWS	LB	LPR	Lbs	
HSK F 63 MB50	2.480	1.9685	1.535	2.559	2.21	HW 6.0

- A cooling tube must be used with all coolant through HSK spindles
- Verify that the weight of the entire tool assembly does not exceed the machine spindle's carrying capability.

ITSBORE CAMFIX

C#-MB

MB Modular Boring Connection System with CAMFIX Exchangeable Shanks



Designation	DCONMS	DCONWS	LPR	LB	BD	Fig.	Lbs			
C4 MB32X42	1.575	1.2598	1.654	.866	-	1.	.66	HW 4.0	COOLING TUBE C4*	WRENCH COOL TUBE C4*
C4 MB40X45	1.575	1.5748	1.772	-	-	1.	.88	HW 5.0	COOLING TUBE C4*	WRENCH COOL TUBE C4*
C5 MB50X55	1.968	1.9685	2.165	-	-	1.	1.58	HW 6.0	COOLING TUBE C5*	WRENCH COOL TUBE C5*
C6 MB40X50	2.480	1.5748	1.968	1.102	-	1.	1.98	HW 5.0	COOLING TUBE C6*	WRENCH COOL TUBE C6*
C6 MB40X120	2.480	1.5748	4.724	3.858	1.732	2.	3.31	HW 5.0	COOLING TUBE C6*	WRENCH COOL TUBE C6*
C6 MB50X55	2.480	1.9685	2.165	1.299	1.968	2.	1.76	HW 6.0	COOLING TUBE C6*	WRENCH COOL TUBE C6*
C6 MB50X67	2.480	1.9685	2.638	1.772	-	1.	2.43	HW 6.0	COOLING TUBE C6*	WRENCH COOL TUBE C6*
C6 MB50X120	2.480	1.9685	4.724	3.858	2.126	2.	4.19	HW 6.0	COOLING TUBE C6*	WRENCH COOL TUBE C6*
C6 MB63X77	2.480	2.4803	3.031	-	-	1.	3.41	HW 8.0	COOLING TUBE C6*	WRENCH COOL TUBE C6*
C8 MB50X60	3.150	1.9685	2.362	1.181	-	1.	4.38	HW 6.0	COOLING TUBE C8*	WRENCH COOL TUBE C8*
C8 MB50X120	3.150	1.9685	4.724	3.543	2.126	2.	6.17	HW 6.0	COOLING TUBE C8*	WRENCH COOL TUBE C8*
C8 MB63X70	3.150	2.4803	2.756	1.575	-	1.	4.76	HW 8.0	COOLING TUBE C8*	WRENCH COOL TUBE C8*
C8 MB63X150	3.150	2.4803	5.906	4.724	2.638	2.	8.82	HW 8.0	COOLING TUBE C8*	WRENCH COOL TUBE C8*
C8 MB80X75	3.150	3.1496	2.953	-	-	1.	5.73	HW 8.0	COOLING TUBE C8*	WRENCH COOL TUBE C8*
C8 MB80X120	3.150	3.1496	4.724	-	-	1.	9.48	HW 8.0	COOLING TUBE C8*	WRENCH COOL TUBE C8*

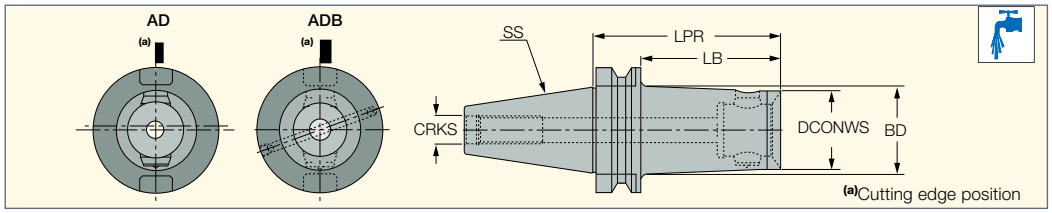
- Verify that the weight of the entire tool assembly does not exceed the machine spindle's carrying capability.

* Optional, to be ordered separately

ITSBORE

BT-MB

MB Modular Connection System with BT MAS-403 FORM AD/ADB Taper Shanks



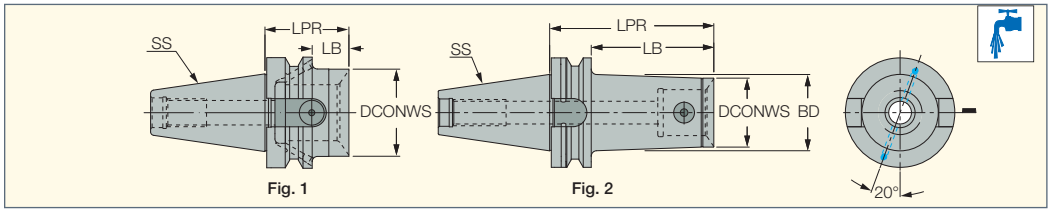
Designation	SS	DCONWS	LB	LPR	BD	CRKS	Lbs	
BT30 MB32	30	1.2598	.417	1.260	-	M12	.84	HW 4.0
BT30 MB50	30	1.9685	1.520	2.362	-	M12	1.54	HW 6.0
BT40 MB40	40	1.5748	.709	1.772	-	M16	2.18	HW 5.0
BT40 MB40X120 ADB	40	1.5748	3.661	4.724	1.752	M16	3.93	HW 5.0
BT40 MB50	40	1.9685	.827	1.890	-	M16	2.21	HW 6.0
BT40 MB50X120 ADB	40	1.9685	3.661	4.724	-	M16	4.58	HW 6.0
BT40 MB63	40	2.4803	1.535	2.598	-	M16	2.98	HW 8.0
BT45 MB50	45	1.9685	1.142	2.441	-	M20	5.12	HW 6.0
BT50 MB50	50	1.9685	1.102	2.598	-	M24	8.33	HW 6.0
BT50 MB50X120 ADB	50	1.9685	3.228	4.724	2.362	M24	10.23	HW 6.0
BT50 MB63	50	2.4803	1.457	2.953	-	M24	8.78	HW 8.0
BT50 MB63X150 ADB	50	2.4803	4.409	5.906	2.756	M24	12.90	HW 8.0
BT50 MB80	50	3.1496	1.457	2.953	-	M24	9.48	HW 8.0
BT50 MB80X180 ADB	50	3.1496	5.591	7.087	-	M24	18.06	HW 8.0
BT50 MB110X140	50	4.3307	4.016	5.512	-	M24	14.99	HW 10.0
BT60 MB110X110	60	4.3307	2.480	4.331	-	M30	25.36	HW 10.0
BT60 MB110X200	60	4.3307	5.984	7.874	-	M30	39.91	HW 10.0

- Verify that the weight of the entire tool assembly does not exceed the machine spindle's carrying capability.

ITSBORE

BT-FC-MB

MB Modular Boring System with BT MAS-403 Face Contact ADB Tapered Shanks



Designation	SS	DCONWS	LPR	BD	LB	Fig.	Lbs	
BT40 FC MB50	40	1.9685	1.890	-	.827	1.	1.98	HW 6.0
BT40 FC MB50X120 ADB	40	1.9685	4.724	-	3.661	2.	4.19	HW 5.0
BT40 FC MB63	40	2.4803	2.598	-	-	1.	2.65	HW 8.0
BT50 FC MB50	50	1.9685	2.598	-	1.102	1.	7.28	HW 6.0
BT50 FC MB50X120 ADB	50	1.9685	4.724	2.362	3.228	2.	9.26	HW 6.0
BT50 FC MB63	50	2.4803	2.953	-	1.457	1.	8.16	HW 8.0
BT50 FC MB63X150 ADB	50	2.4803	5.906	2.756	4.409	2.	12.79	HW 8.0
BT50 FC MB80	50	3.1496	2.953	-	1.457	1.	8.82	HW 8.0
BT50 FC MB80X180 ADB	50	3.1496	7.087	-	5.591	2.	16.54	HW 8.0

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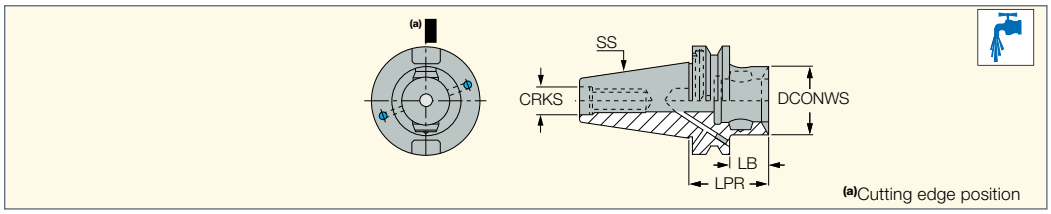
BTB-MB

MB Modular Connection System with BT MAS-403 Type B Taper Shanks



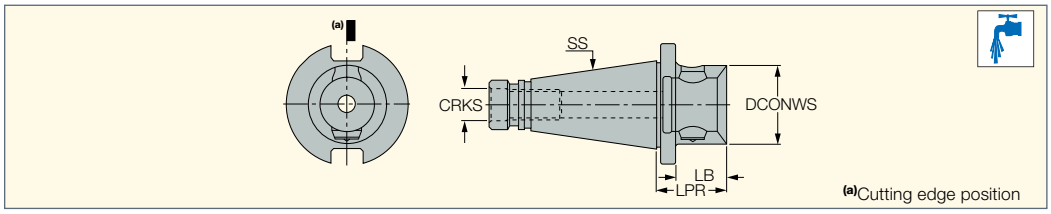
Designation	SS	DCONWS	LB	LPR	CRKS	Lbs	
BTB40 MB50	40	1.9685	.827	1.890	M16	2.12	HW 6.0
BTB40 MB63	40	2.4803	-	2.598	M16	2.95	HW 8.0
BTB50 MB50X66	50	1.9685	1.102	2.598	M24	8.57	HW 6.0
BTB50 MB63X75	50	2.4803	1.457	2.953	M24	8.82	HW 8.0
BTB50 MB80	50	3.1496	1.457	2.953	M24	9.48	HW 8.0

- Verify that the weight of the entire tool assembly does not exceed the machine spindle's carrying capability.

ITSBORE

ISO-MB

MB Modular Connection System with ISO 297 Taper Shanks



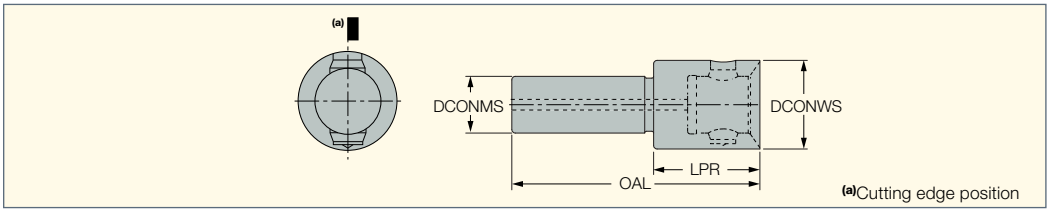
Designation	SS	DCONWS	LB	LPR	CRKS	Lbs	
ISO 40-MB50	40	1.9685	1.417	1.890	UNC 5/8"-11	2.28	HW 6.0
ISO 40-MB63	40	2.4803	-	2.362	UNC 5/8"-11	3.00	HW 8.0
ISO 50-MB50	50	1.9685	1.299	1.890	UNC 1.0"-8	6.23	HW 6.0
ISO 50-MB63	50	2.4803	1.614	2.205	UNC 1.0"-8	6.49	HW 8.0
ISO 50-MB80	50	3.1496	1.772	2.362	UNC 1.0"-8	7.85	HW 8.0

- Verify that the weight of the entire tool assembly does not exceed the machine spindle's carrying capability.

ITSBORE

ST-MB

MB Modular Connection System
with Straight Cylindrical Shanks



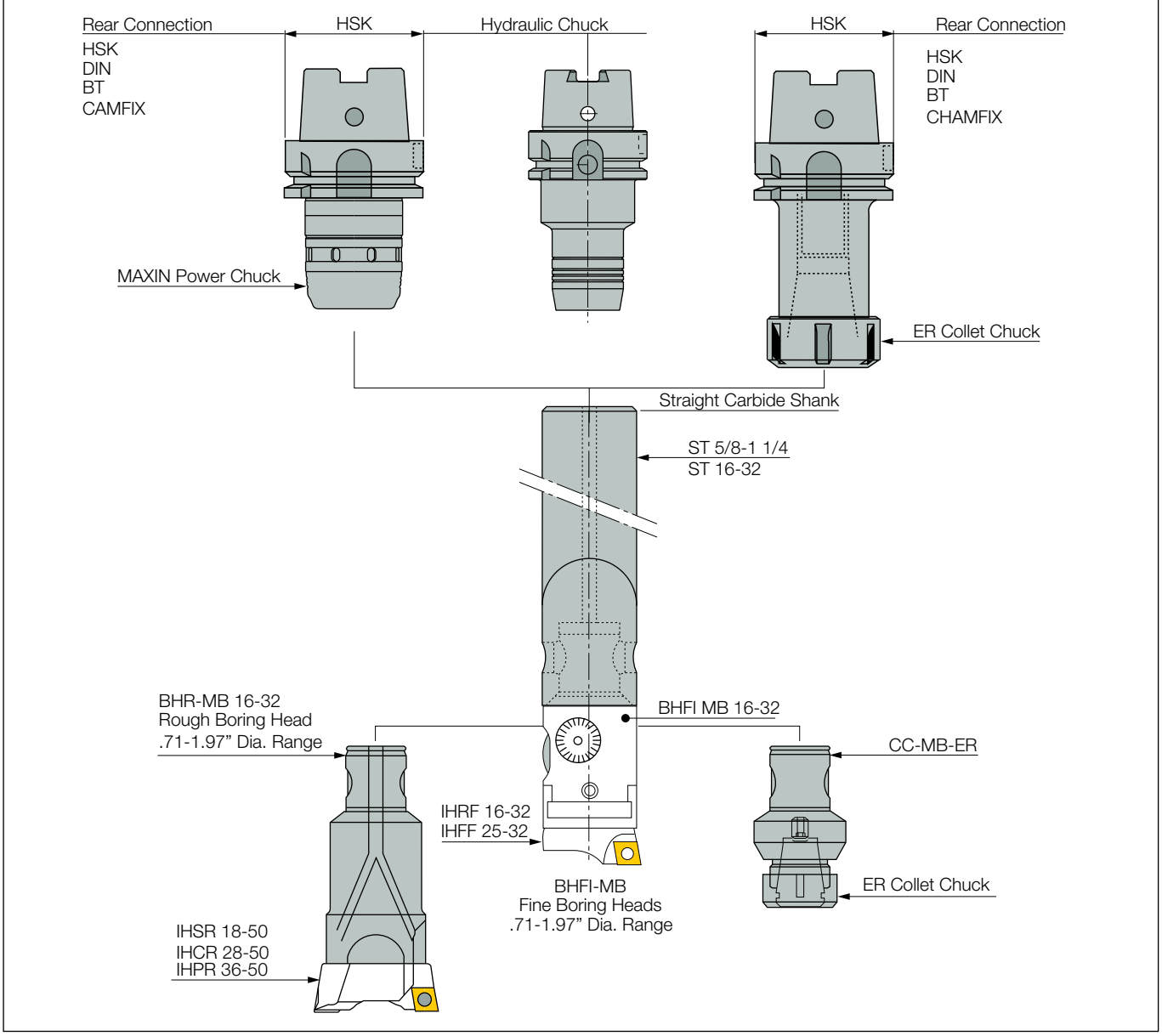
Designation	DCONMS	DCONWS	OAL	Lbs
ST 1.00-MB32	1.000	1.2600	3.937	.92
ST 1.25-MB50	1.250	1.9690	5.512	2.51

- Verify that the weight of the entire tool assembly does not exceed the machine spindle's carrying capability.

ITSBORE

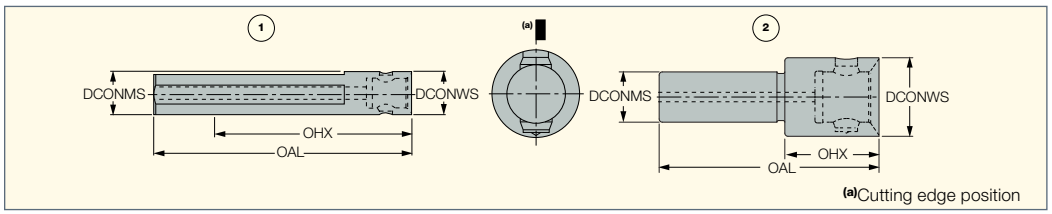
ST-MB Straight Carbide Shank with MB Connection Assembly Options

ST5/8-1 1/4 MB16-MB32 Diameter Range: .71-1.97”



ITSBORE

ST-MB
MB Modular Connection System
with Straight Cylindrical Shanks



M E T R I C							
Designation	DCONMS	DCONWS	OAL	OHX(1)	CSP(2)	Fig.	kg	
ST 16-MB16	16.00	16.00	100.00	66.0	1	1.	0.15	HW 2.5
ST 20-MB20	20.00	20.00	125.00	85.0	1	1.	0.27	HW 3.0
ST 25-MB32	25.00	32.00	100.00	35.0	0	2.	0.41	HW 4.0
ST 32-MB50	32.00	50.00	140.00	60.0	0	2.	0.42	HW 6.0

- Verify that the weight of the entire tool assembly does not exceed the machine spindle's carrying capability.

(1) Maximum overhang

(2) 0 - Without coolant supply, 1 - With coolant supply

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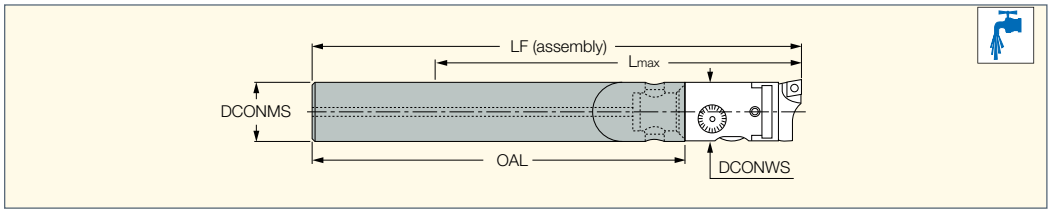
ST-MB-E
MB Modular Connection System
with Cylindrical Carbide Shanks

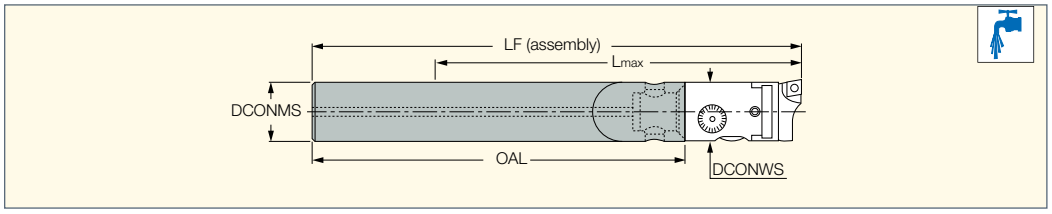


Designation	DCONMS	DCONWS	OAL	LF	L max	lbs	
ST5/8-MB16X4.33E	.625	16.0000	4.331	5.669	3.940	.63	HW 2.5
ST5/8-MB16X5.51E	.625	16.0000	5.512	6.850	4.920	6.62	HW 2.5
ST5/8-MB16X6.69E	.625	16.0000	6.693	8.031	6.300	6.62	HW 2.5
ST3/4-MB20X5.31E	.750	20.0000	5.315	6.890	4.920	1.08	HW 3.0
ST3/4-MB20X6.69E	.750	20.0000	6.693	8.268	6.300	1.44	HW 3.0
ST3/4-MB20X8.27E	.750	20.0000	8.268	9.843	7.870	6.62	HW 3.0
ST 1-MB25X6.29E	1.000	25.0000	6.299	8.268	6.300	2.22	HW 3.0
ST 1-MB25X8.07E	1.000	25.0000	8.071	10.039	7.870	2.93	HW 3.0
ST 1-MB25X10.04E	1.000	25.0000	10.039	12.008	9.840	3.73	HW 3.0
ST 11/4-MB32X7.67E	1.250	32.0000	7.677	10.157	7.870	4.20	HW 4.0
ST 11/4-MB32X9.84E	1.250	32.0000	9.843	12.323	9.840	5.47	HW 4.0
ST 11/4-MB32X12.40E	1.250	32.0000	12.402	14.882	12.600	7.17	HW 4.0

- Verify that the weight of the entire tool assembly does not exceed the machine spindle's carrying capability.

ITSBORE

ST-MB-E
MB Modular Connection System
with Cylindrical Carbide Shanks



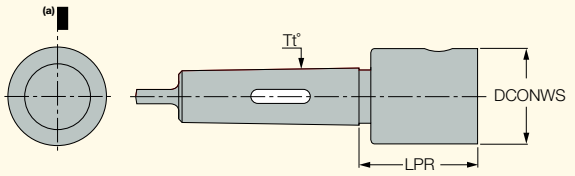
M E T R I C							
Designation	DCONMS	DCONWS	OAL	LF	L max	kg	
ST 16-MB16X110E	16.00	16.00	110.00	144.00	100.0	0.28	HW 2.5
ST 16-MB16X140E	16.00	16.00	140.00	174.00	125.0	0.17	HW 2.5
ST 16-MB16X170E	16.00	16.00	170.00	204.00	160.0	0.42	HW 2.5
ST 20-MB20X135E	20.00	20.00	135.00	175.00	125.0	0.40	HW 3.0
ST 20-MB20X170E	20.00	20.00	170.00	210.00	160.0	0.69	HW 3.0
ST 20-MB20X210E	20.00	20.00	210.00	250.00	200.0	0.40	HW 3.0
ST 25-MB25X160E	25.00	25.00	160.00	210.00	160.0	0.40	HW 3.0
ST 25-MB25X205E	25.00	25.00	205.00	255.00	200.0	1.28	HW 3.0
ST 25-MB25X255E	25.00	25.00	255.00	305.00	250.0	1.55	HW 3.0
ST 32-MB32X195E	32.00	32.00	195.00	258.00	200.0	1.96	HW 4.0
ST 32-MB32X250E	32.00	32.00	250.00	313.00	250.0	2.50	HW 4.0
ST 32-MB32X315E	32.00	32.00	315.00	378.00	320.0	3.30	HW 4.0

- Verify that the weight of the entire tool assembly does not exceed the machine spindle's carrying capability.

ITSBORE

MTT-MB

MB Modular Connection System with DIN 228/B 1806 Morse Taper Shanks



(a)Cutting edge position

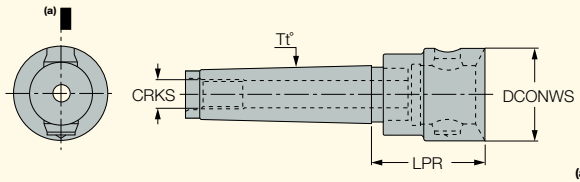
Designation	Tt°	DCONWS	LPR	Lbs	
MTT 5-MB63	MT5	2.4803	2.559	4.76	HW 8.0

- Verify that the weight of the entire tool assembly does not exceed the machine spindle's carrying capability.

ITSBORE

MTD-MB

MB Modular Connection System with DIN 228/A 220 Morse Taper Shanks



(a)Cutting edge position

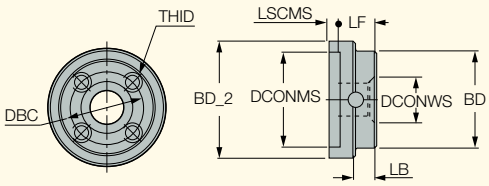
Designation	Tt°	DCONWS	LPR	CRKS	Lbs	
MTD 4-MB50	MT4	1.9685	2.480	M16	2.05	HW 6.0
MTD 4-MB50 SIP	MT4	1.9685	2.480	M14	2.17	HW 6.0

- Verify that the weight of the entire tool assembly does not exceed the machine spindle's carrying capability.

ITSBORE

DIN2079-MB

MB Modular Connection System with DIN 2079 Spindle Connecting Interface



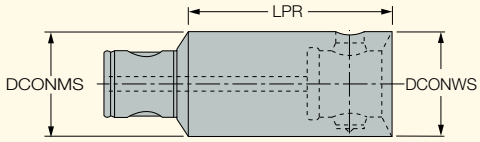
Designation	LF	DCONWS	LSCMS	LB	BD	BD_2	DCONMS	DBC	THID	Lbs	
DIN2079 MB50 40	1.378	1.9685	.394	.827	3.543	4.331	3.500	2.626	M12	4.31	HW 6.0
DIN2079 MB63 40	1.850	2.4803	.394	1.220	3.543	4.331	3.500	2.626	M12	4.54	HW 8.0
DIN2079 MB63 50	1.772	2.4803	.472	1.220	5.315	5.906	5.062	4.000	M16	10.14	HW 8.0
DIN2079 MB80 50	1.969	3.1496	.472	1.417	5.315	5.906	5.062	4.000	M16	11.03	HW 8.0

- Standard connection plate that can be assembled easily on most CNC spindle machines with a DIN2079 interface. This connection plate enables the use of ITS BORE components with the MB connection by using any standard adapter with four screws. It is affixed to the machine spindle.

ITSBORE

EX-MB

Extensions for the MB Modular Connection System



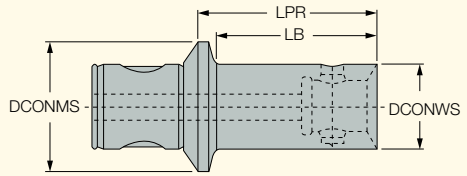
Designation	DCONMS	LPR	DCONWS	Lbs
EX 14X25-MB14	.551	.984	.5512	.09
EX 16X25-MB16	.630	.984	.6299	.12
EX 20X32-MB20	.787	1.260	.7874	.19
EX 25X25-MB25	.984	.984	.9842	.23
EX 25X40-MB25	.984	1.575	.9842	.35
EX 32X32-MB32	1.260	1.260	1.2598	.45
EX 32X50-MB32	1.260	1.968	1.2598	.69
EX 40X40-MB40	1.575	1.575	1.5748	.85
EX 40X63-MB40	1.575	2.480	1.5748	1.35
EX 50X50-MB50	1.968	1.968	1.9685	1.54
EX 50X80-MB50	1.968	3.150	1.9685	2.65
EX 50X100-MB50	1.968	3.937	1.9685	3.37
EX 63X63-MB63	2.480	2.480	2.4803	3.28
EX 63X100-MB63	2.480	3.937	2.4803	5.27
EX 63X125-MB63	2.480	4.921	2.4803	6.59
EX 80X80-MB80	3.150	3.150	3.1496	6.84
EX 80X125-MB80	3.150	4.921	3.1496	10.80
EX 80X160-MB80	3.150	6.299	3.1496	13.78
EX 110X140-MB110	4.331	5.512	4.3307	23.04
EX 110X200-MB110	4.331	7.874	4.3307	31.53

- Verify that the weight of the entire tool assembly does not exceed the machine spindle's carrying capability.

ITSBORE

RE MB-MB

Reducers for the MB Modular Connection System



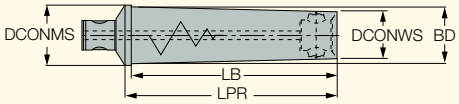
Designation	DCONMS	DCONWS	LPR	LB	Lbs
RE MB16-MB14X24	.630	.5512	.984	.768	.10
RE MB20-MB14X19	.787	.5512	.787	.571	.07
RE MB20-MB16X20	.787	.6299	.787	.630	.12
RE MB25-MB14X19	.984	.5512	.787	.531	.13
RE MB25-MB16X20	.984	.6299	.787	.591	.18
RE MB25-MB20X25	.984	.7874	.984	.787	.21
RE MB32-MB14X25	1.260	.5512	.984	.689	.18
RE MB32-MB16X24	1.260	.6299	.945	.709	.30
RE MB32-MB20X25	1.260	.7874	.984	.787	.31
RE MB32-MB25X28	1.260	.9842	1.102	.906	.35
RE MB40-MB14X25	1.575	.5512	.984	.650	.50
RE MB40-MB16X24	1.575	.6299	.945	.669	.49
RE MB40-MB20X26	1.575	.7874	1.024	.787	.52
RE MB40-MB25X28	1.575	.9842	1.102	.866	.56
RE MB40-MB32X32	1.575	1.2598	1.260	1.063	.65
RE MB50-MB14X25	1.968	.5512	.984	.571	.88
RE MB50-MB14X39	1.968	.5512	1.535	1.201	.92
RE MB50-MB16X24	1.968	.6299	.945	.591	.86
RE MB50-MB16X40	1.968	.6299	1.575	1.220	.90
RE MB50-MB16X74	1.968	.6299	2.913	2.559	1.04
RE MB50-MB20X26	1.968	.7874	1.024	.709	.88
RE MB50-MB20X70	1.968	.7874	2.756	2.441	1.11
RE MB50-MB20X93	1.968	.7874	3.661	3.346	1.23
RE MB50-MB25X117	1.968	.9842	4.606	4.331	1.50
RE MB50-MB25X28	1.968	.9842	1.102	.827	.94
RE MB50-MB25X87	1.968	.9842	3.425	3.150	1.40
RE MB50-MB32X144	1.968	1.2598	5.669	5.394	2.41
RE MB50-MB32X32	1.968	1.2598	1.260	.984	1.02
RE MB50-MB32X87	1.968	1.2598	3.425	3.150	1.57
RE MB50-MB40X176	1.968	1.5748	6.929	6.693	4.12
RE MB50-MB40X36	1.968	1.5748	1.417	1.181	1.13
RE MB50-MB40X87	1.968	1.5748	3.425	3.150	2.14
RE MB63-MB50X40	2.480	1.9685	1.575	1.339	2.14
RE MB80-MB50X45	3.150	1.9685	1.772	1.417	2.98
RE MB80-MB63X60	3.150	2.4803	2.362	2.047	3.91
RE MB110-MB80X70	4.331	3.1496	2.756	2.047	13.23

- Verify that the weight of the entire tool assembly does not exceed the machine spindle's carrying capability.

ITSBORE

RE MB-AVI

MB Modular System Vibration Damping Reducers



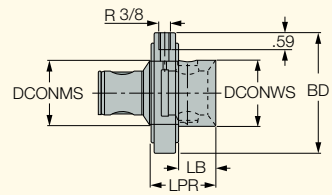
Designation	DCONMS	DCONWS	LPR	BD	LB	Lbs
RE MB50-MB16X74-AVI	1.968	.6299	2.913	.689	2.559	1.13
RE MB50-MB20X93-AVI	1.968	.7874	3.661	.846	3.346	1.42
RE MB50-MB25X117-AVI	1.968	.9842	4.606	1.063	4.331	2.03
RE MB50-MB32X144-AVI	1.968	1.2598	5.669	1.378	5.433	3.24
RE MB50-MB40X176-AVI	1.968	1.5748	6.929	1.850	6.693	5.87
RE MB63-MB50X220-AVI	2.480	1.9685	8.661	2.362	8.425	11.03
RE MB80-MB63X280-AVI	3.150	2.4803	11.024	3.031	10.709	22.93

- Verify that the weight of the entire tool assembly does not exceed the machine spindle's carrying capability.

ITSBORE

CHR MB

Coolant Supply Collar for the MB Modular Boring System



Designation	DCONMS	DCONWS	BD	LB	LPR	RPMX(1)	CP(2)	Lbs
CHR MB63	2.480	2.4803	4.528	1.378	2.480	3500	145	7.28

- Important: coolant flow must be started prior to rotating the spindle to avoid damage of the O-rings
- Verify that the weight of the entire tool assembly does not exceed the machine spindle's carrying capability.

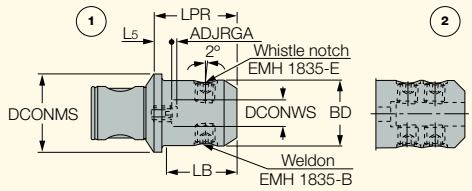
(1) Maximum RPM

(2) Coolant pressure (PSI)

ITSBORE

EMH MB

Weldon and Whistle Notch Side-Lock Holders with the MB Modular Boring Connection System



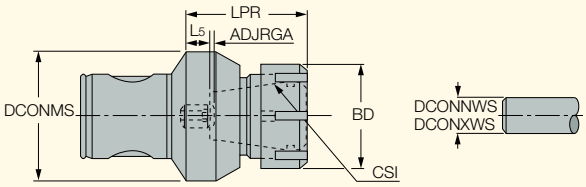
Designation	DCONMS	DCONWS	BD	LB	LPR	L5	ADJRGA	Fig.	Lbs
EMH MB50-1/4	1.969	.250	.980	.930	1.380	.280	.080	1.	1.06
EMH MB50-3/8	1.969	.380	1.380	1.650	2.050	.430	.120	1.	1.54
EMH MB50-1/2	1.969	.500	1.650	1.890	2.240	.430	.120	1.	1.87
EMH MB50-5/8	1.969	.630	1.890	2.400	2.640	.670	.160	1.	2.49
EMH MB50-3/4	1.969	.750	1.970	-	2.640	.630	.160	1.	2.59
EMH MB63-5/8	2.480	.630	1.890	2.090	2.520	.550	.160	1.	3.22
EMH MB63-1	2.480	1.000	2.480	-	3.070	.590	.160	2.	4.69
EMH MB63-1 1/4	2.480	1.250	2.760	-	3.070	.550	.160	2.	5.34
EMH MB80-1 1/2	3.150	1.500	3.150	-	3.270	.430	.160	2.	7.23
EMH MB80-2	3.150	2.000	3.740	-	3.940	.470	.160	2.	10.36

- Verify that the weight of the entire tool assembly does not exceed the machine spindle's carrying capability.

ITSBORE

CC MB-ER

DIN 6499 ER Collet Chuck with the MB Modular Boring Connection System

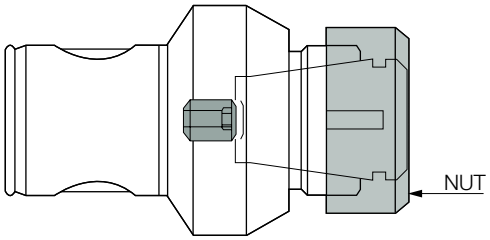


Designation	DCONMS	CSI	DCONNWS(1)	DCONXWS(2)	BD	LPR	L5	ADJRGA	Lbs		
CC MB16 ER11M	.630	ER11	.020	.276	.630	.984	.098	.079	.11	NUT ER11 MINI	WRENCH ER11 MINI*
CC MB20 ER16M	.787	ER16	.020	.394	.866	1.260	.039	.079	.11	NUT ER16 MINI	WRENCH ER16 MINI*
CC MB25 ER20M	.984	ER20	.039	.512	1.102	1.575	.098	.079	.32	NUT ER20 MINI	WRENCH ER20 MINI*
CC MB32 ER25M	1.260	ER25	.039	.630	1.378	1.654	.059	.079	.51	NUT ER25 MINI	WRENCH ER25 MINI*
CC MB40 ER25	1.575	ER25	.039	.630	1.654	1.772	.197	.079	.98	NUT ER25 TOP	WRENCH ER25*
CC MB50 ER25	1.968	ER25	.039	.630	1.654	1.890	.276	.079	1.48	NUT ER25 TOP	WRENCH ER25*
CC MB50 ER32	1.968	ER32	.079	.787	1.968	2.165	.276	.079	1.75	NUT ER32 TOP	WRENCH ER32*
CC MB63 ER32	2.480	ER32	.079	.787	1.968	2.323	.472	.079	2.98	NUT ER32 TOP	WRENCH ER32*
CC MB63 ER40	2.480	ER40	.118	1.024	2.480	2.520	.472	.079	3.43	NUT ER40 TOP	WRENCH ER40*

(1) Minimum diameter

(2) Maximum diameter

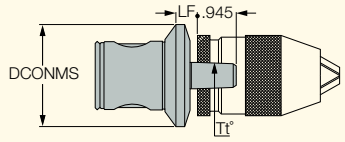
* Optional, to be ordered separately



ITSBORE

DC MB

DIN238 DC Drill Chuck Arbor with the MB Modular Connection System



Designation	DCONMS	Tt°	LF	Lbs
DC MB50 B16	1.968	B16	.394	.88
DC MB63 B16	2.480	B16	.531	.90

- Without drill chuck.

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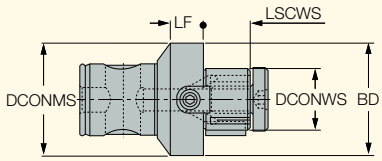
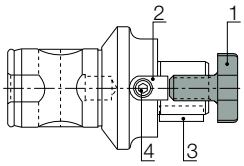
SMH MB

Shell Mill Holders with MB Modular Boring System Connection



Designation	DCONMS	DCONWS	BD	LSCWS	LF	Lbs
SMH MB50-3/4	1.969	.750	1.570	.680	.590	1.16
SMH MB50-1	1.969	1.000	1.960	.680	.590	1.40
SMH MB63-3/4	2.480	.750	1.570	.680	.650	1.98
SMH MB63-1	2.480	1.000	2.360	.680	.590	2.33
SMH MB63-1 1/4	2.480	1.250	2.750	.680	.750	2.82
SMH MB80-1 1/2	3.150	1.500	3.460	.940	.940	5.05
SMH MB80-2	3.150	2.000	3.850	.940	1.060	6.58

- When mounting slitting cutters, remove the drive dogs and use spacer rings.
- Verify that the weight of the entire tool assembly does not exceed the machine spindle's carrying capability.



Spare Parts

Designation	(1)	(2)	(3)	(4)
SMH MB50-3/4	SCREW 3/8-24 SEM 3/4	BH DOG DRIVE SMH 3/4"	KEY SMH 3/4"	M4X10SMH KEY SCREW
SMH MB50-1	SCREW 1/2-20 SEM 1	BH DOG DRIVE SMH 1"	KEY SMH 1"	M5X12SMH KEY SCREW
SMH MB63-3/4	SCREW 3/8-24 SEM 3/4	BH DOG DRIVE SMH 3/4"	KEY SMH 3/4"	M4X10SMH KEY SCREW
SMH MB63-1	SCREW 1/2-20 SEM 1	BH DOG DRIVE SMH 1"	KEY SMH 1"	M5X12SMH KEY SCREW
SMH MB63-1 1/4	SCREW 5/8-18 SEM 1-1/4	BH DOG DRIVE SMH 11/4"	KEY SMH 11/4"	M6X16SMH KEY SCREW
SMH MB80-1 1/4	SCREW 5/8-18 SEM 1-1/4	BH DOG DRIVE SMH 11/4"	KEY SMH 11/4"	M6X16SMH KEY SCREW
SMH MB80-1 1/2	SCREW 3/4-16 SEM 1-1/2	BH DOG DRIVE SMH 11/2"	KEY SMH 11/2"	M6X18SMH KEY SCREW
SMH MB80-2	SCREW 1-14 SEM 2-1/2	BH DOG DRIVE SMH 2"	KEY SMH 2"	M6X25SMH KEY SCREW

* Optional, to ordered separately

Spare Parts

Designation				
SMH MB50-3/4	SCREW 3/8-24 SEM 3/4"	BH DOG DRIVE SMH 3/4"		M4X10SMH KEY SCREW
SMH MB50-1		BH DOG DRIVE SMH 1"		
SMH MB63-3/4	SCREW 3/8-24 SEM 3/4"	BH DOG DRIVE SMH 3/4"		M4X10SMH KEY SCREW
SMH MB63-1		BH DOG DRIVE SMH 1"		
SMH MB63-1 1/4		BH DOG DRIVE SMH 11/4"	PF63-11/4 COD.3	
SMH MB80-1 1/2	SCREW 3/4-16 SEM 1-1/2			SR M6X18 DIN912
SMH MB80-2	SCREW 1-14 SEM 2-1/2	BH DOG DRIVE SMH 2"		

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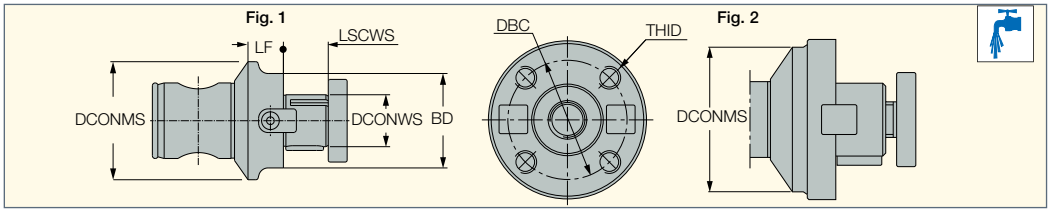
SMH MB

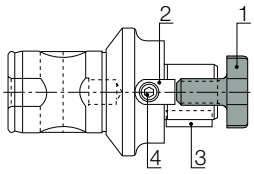
Shell Mill Holders with the MB Modular Boring Connection System



M E T R I C									
Designation	DCONMS	DCONWS	BD	DBC	THID	LF	LSCWS	Fig.	kg
SMH MB40-16	40.00	16.00	32.00	-	-	15.00	17.00	1.	0.32
SMH MB40-22	40.00	22.00	40.00	-	-	13.00	19.00	1.	0.38
SMH MB50-16	50.00	16.00	32.00	-	-	15.00	17.00	1.	0.48
SMH MB50-22	50.00	22.00	40.00	-	-	15.00	19.00	1.	0.55
SMH MB50-27	50.00	27.00	50.00	-	-	15.00	21.00	1.	0.66
SMH MB50-32	50.00	32.00	60.00	-	-	15.00	24.00	1.	0.79
SMH MB63-22	63.00	22.00	60.00	-	-	15.00	19.00	1.	1.01
SMH MB63-27	63.00	27.00	60.00	-	-	15.00	21.00	1.	1.09
SMH MB63-32	63.00	32.00	70.00	-	-	15.00	24.00	1.	1.24
SMH MB80-32	80.00	32.00	88.00	-	-	24.00	24.00	1.	2.09
SMH MB80-40	80.00	40.00	88.00	66.70	M12	24.00	27.00	2.	2.25
SMH MB80-50	80.00	50.00	90.00	-	-	24.00	30.00	2.	2.58
SMH MB80-60 (1)	80.00	60.00	128.50	101.60	M16	31.50	40.00	2.	4.19
SMH MB110-60 (1)	110.00	60.00	128.50	101.60	M16	36.00	40.00	2.	7.56

• When mounting slitting cutters, remove the drive dogs and use spacer rings. • Verify that the weight of the entire tool assembly does not exceed the machine spindle's carrying capability.

(1) Shell locking screw not supplied



Spare Parts

Designation	(1)	(2)	(3)	(4)
SMH MB40-16	M 8 CLAMP SCREW SEM 16	BH DOG DRIVE SMH 16	KEY SMH 16	M3X8 SMH KEY SCREW
SMH MB40-22	M 10 CLAMP SCREW SEM 22	BH DOG DRIVE SMH 22	KEY SMH 22	M4X10SMH KEY SCREW
SMH MB50-16	M 8 CLAMP SCREW SEM 16	BH DOG DRIVE SMH 16	KEY SMH 16	M3X8 SMH KEY SCREW
SMH MB50-22	M 10 CLAMP SCREW SEM 22	BH DOG DRIVE SMH 22	KEY SMH 22	M4X10SMH KEY SCREW
SMH MB50-27	M 12 CLAMP SCREW SEM 27	BH DOG DRIVE SMH 27	KEY SMH 27	M5X12SMH KEY SCREW
SMH MB50-32	M 16 CLAMP SCREW SEM 32	BH DOG DRIVE SMH 32	KEY SMH 32	M6X16SMH KEY SCREW
SMH MB63-27	M 12 CLAMP SCREW SEM 27	BH DOG DRIVE SMH 27	KEY SMH 27	M5X12SMH KEY SCREW
SMH MB63-32	M 16 CLAMP SCREW SEM 32	BH DOG DRIVE SMH 32	KEY SMH 32	M6X16SMH KEY SCREW
SMH MB80-32	M 16 CLAMP SCREW SEM 32	BH DOG DRIVE SMH 32	KEY SMH 32	M6X16SMH KEY SCREW
SMH MB80-40	M 20 CLAMP SCREW SEM 40	BH DOG DRIVE SMH 40	KEY SMH 40	M6X18SMH KEY SCREW

Spare Parts

Designation					
SMH MB40-16	M8 CLAMP SCREW SEM16	BH DOG DRIVE SMH 16	PF 50/16 COD.3	SR M3X8DIN912	BH MB40 COUPLING SET
SMH MB40-22	M10 CLAMP SCREW SEM22	BH DOG DRIVE SMH 22	PF50/22 COD.3	M4X10SMH KEY SCREW	BH MB40 COUPLING SET
SMH MB50-16	M8 CLAMP SCREW SEM16	BH DOG DRIVE SMH 16	PF 50/16 COD.3	SR M3X8DIN912	BH MB50 COUPLING SET
SMH MB50-22	M10 CLAMP SCREW SEM22	BH DOG DRIVE SMH 22	PF50/22 COD.3	M4X10SMH KEY SCREW	BH MB50 COUPLING SET
SMH MB50-27	M12 CLAMP SCREW SEM27	BH DOG DRIVE SMH 27	KEY SMH 27	SR M5X12 DIN912	BH MB50 COUPLING SET M5
SMH MB50-32	M16 CLAMP SCREW SEM32		PF63/32 COD.3	SR M6X16 DIN912	BH MB50 COUPLING SET
SMH MB63-27	M12 CLAMP SCREW SEM27	BH DOG DRIVE SMH 27	KEY SMH 27	SR M5X12 DIN912	BH MB63/80 COUPLING SET
SMH MB63-32	M16 CLAMP SCREW SEM32		PF63/32 COD.3	SR M6X16 DIN912	BH MB63/80 COUPLING SET
SMH MB80-32	M16 CLAMP SCREW SEM32		PF63/32 COD.3	SR M6X16 DIN912	BH MB63/80 COUPLING SET
SMH MB80-40	M20 CLAMP SCREW SEM40		PF80/40 COD.3	SR M6X18 DIN912	BH MB63/80 COUPLING SET

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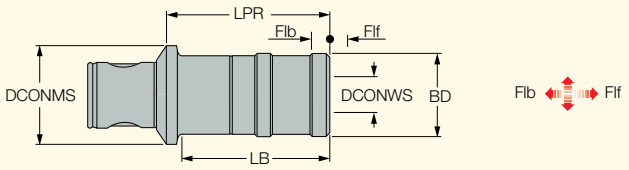
TP MB-M

Tapping Chucks with the
MB Modular Connection System



Designation	DCONMS	Tap min	Tap max	LB	LPR	BD	DCONWS	Flf	Flb	Lbs
TP MB50-M 3-12	1.968	M1	M14	2.559	2.992	1.417	.748	.30	.30	1.73
TP MB50-M 8-20	1.968	M4.5	M20	-	4.173	2.087	1.220	.49	.49	3.53
TP MB63-M 3-12	2.480	M1	M14	2.252	2.756	1.417	.748	.30	.30	2.50
TP MB63-M 8-20	2.480	M4.5	M20	3.661	4.094	2.087	1.220	.49	.49	4.13

- Please verify that the weight of the entire tool assembly does not exceed the machine spindle's carrying capability.

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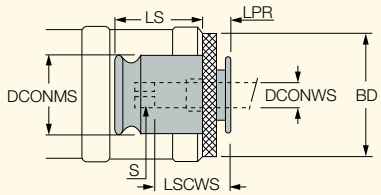
TCS-ANSI

Quick Change Collet
for Solid Taps



Designation	DCONWS(1)	S(2)	Th	BD	DCONMS	LSCWS	LPR	LS
TCS #2 ANSI .255X.191	.255	.191	1/4	1.890	1.220	1.180	.430	1.380
TCS #2 ANSI .429X.322	.429	.322	9/16	1.890	1.220	1.180	.430	1.380
TCS #2 ANSI .542X.406	.542	.406	11/16	1.890	1.220	1.180	.430	1.380

(1) According to tap shank size
(2) Square size

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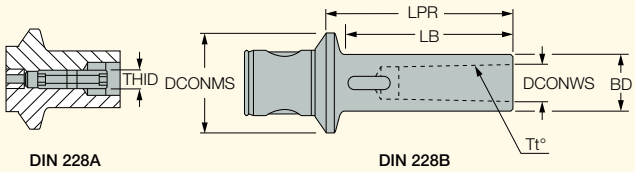
AMT MB-MT

MB Modular Connection System with Morse Taper Tang DIN 228 A/B

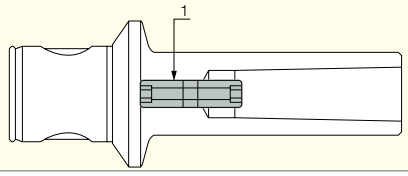


Designation	Tt°	DCONMS	DCONWS	BD	THID	LB	LPR	Lbs
AMT MB50-MT1	MT1	1.968	.475	.787	M6	2.677	3.150	1.15
AMT MB50-MT2	MT2	1.968	.700	1.181	M10	3.386	3.937	1.71
AMT MB50-MT3	MT3	1.968	.938	1.417	M12	4.331	4.724	2.26
AMT MB63-MT3	MT3	2.480	.938	1.417	M12	4.252	4.724	3.09
AMT MB63-MT4	MT4	2.480	1.231	1.890	M16	5.236	5.906	4.86

- Please verify that the weight of the entire tool assembly does not exceed the machine spindle's carrying capability.

AMT

Screw for Shanks – Morse Taper Tang AMT



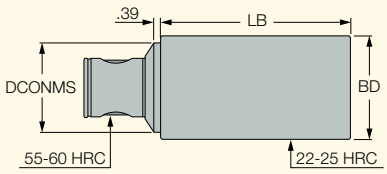
Spare Parts

Designation	1
AMT MB50-MT2	AMT MT2-SCREW
AMT MB50-MT3	AMT MT3-SCREW
AMT MB63-MT3	AMT MT3-SCREW
AMT MB63-MT4	AMT MT4-SCREW

ITSBORE

BLANK MB

Blanks with MB Modular Connection System



Designation	DCONMS	BD	LB	Lbs
BLANK MB50-63X160	1.968	2.480	6.299	9.79
BLANK MB63-80X200	2.480	3.150	7.874	19.34
BLANK MB80-100X250	3.150	3.937	9.843	36.65
BLANK MB110-130X250	4.331	5.118	9.843	39.69

- Material: 39NiCrMo3

Rough Boring Options

Roughing with High Feed			Roughing with High Cutting Depth	Light Roughing or Semi-Finishing Applications

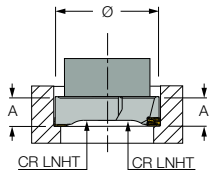
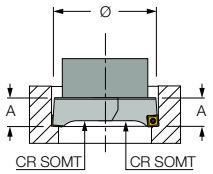
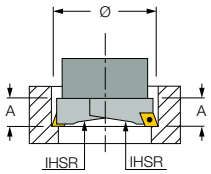
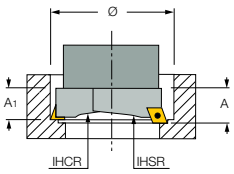
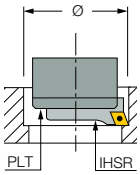

				

Fig. a			Fig. b	Fig. c

1 Radial setting of the cutting edges should be carried out with tool presetting equipment.
2 Boring bars fitted with two insert pockets are for roughing operations involving heavy chip removal.
The double-insert boring bars include:
- Two IHSR/CR SOMT/CR LNHT insert holders on the same plane with the two cutting edges set at an identical radial distance for high feed rate roughing operations (Fig. a).
- An IHCR insert holder and an IHSR insert holder not on the same plane with the two cutting edges set at different radial distances for high-depth roughing operations (Fig. b).
3 Boring bars fitted with a single insert holder are for roughing and finishing operations involving normal chip removal. The serrated surface protection plate PLT should always be used (Fig. c).

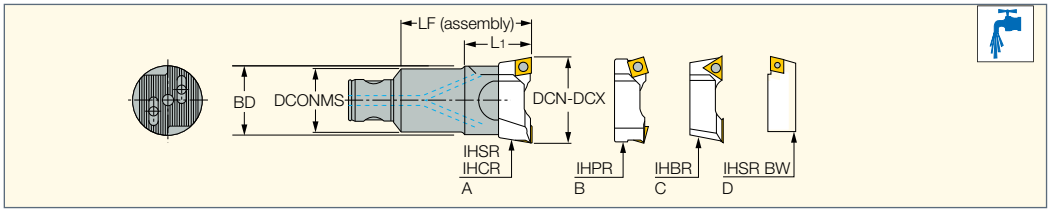
Rough Boring Head Diameter Range

	.39	.79	1.18	1.57	1.97	2.36	2.76	3.15	3.54	3.94	4.33	4.72	5.12	7.87	11.81	15.75	19.69	23.62	27.56	31.50	35.43	39.37	43.31	47.24		Page
BHR MB16-16x34			.71-.87																							
BHR MB20-20x40				.87-1.10																						
BHR MB25-25x50					1.10-1.50																					
BHR MB32-32x63						1.40-1.97																				
BHR MB40-40x80								1.97-2.68																		472
BHR MB50-50x100									2.68-3.54																	
BHR MB50-63x80												3.54-4.72														
BHR MB63-63x125												3.54-4.72														
BHR MB80-80x140														4.72-7.87												
TCH AL200																		7.87-23.70								
TCH AL300																			11.81-27.64							
TCH AL400																				15.75-31.57						
TCH AL 500																					19.69-35.51					476
TCH AL 600																						23.62-39.45				
TCH AL 700																							27.56-43.39			
TCH AL 800																								31.50-47.32		

ITSBORE

BHR MB

Rough Boring Heads for
Diameter Range .709-7.874"



Designation	BD	DCONMS	LF	DCN(1)	DCX(2)	L1	IH(3)	RPMX(4)	Lbs
BHR MB16-16X34	.630	.630	1.339	.709	.866	-	IH...18-22	12000	.14
BHR MB20-20X40	.787	.787	1.594	.866	1.102	-	IH...22-28	12000	.23
BHR MB25-25X50	.984	.984	1.968	1.102	1.496	-	IH...28-38	10000	.40
BHR MB32-32X63	1.260	1.260	2.480	1.398	1.968	-	IH...36-50	10000	.79
BHR MB40-40X80	1.575	1.575	3.150	1.968	2.677	-	IH...50-68	8000	1.54
BHR MB50-50X100	2.165	1.968	3.937	2.677	3.543	1.968	IH...68-90	8000	3.27
BHR MB50-63X80	2.835	1.968	3.150	3.543	4.724	2.362	IH...90-120	8000	3.31
BHR MB63-63X125	2.835	2.480	4.921	3.543	4.724	2.480	IH...90-120	6000	6.81
BHR MB80-80X140	3.740	3.150	5.512	4.724	7.874	2.953	IH...120-800	5000	11.87

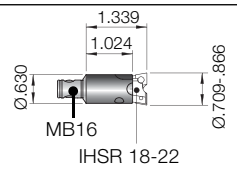
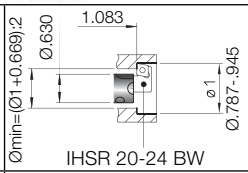
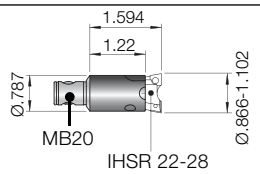
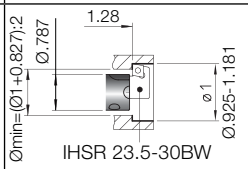
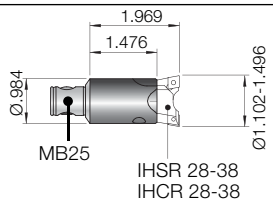
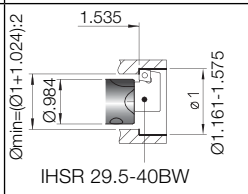
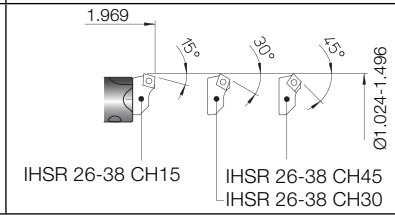
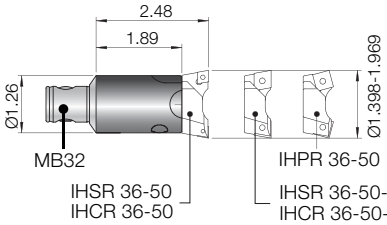
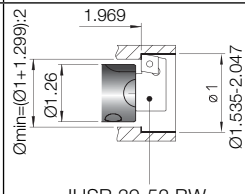
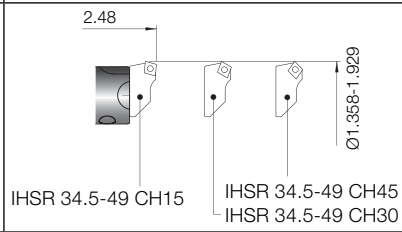
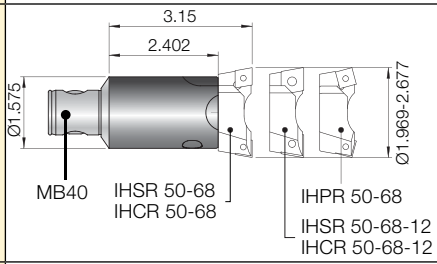
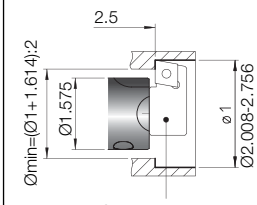
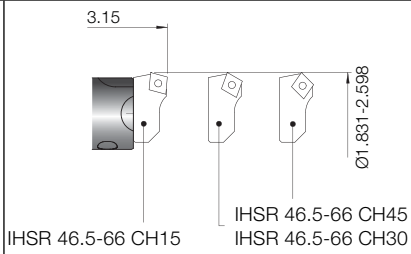
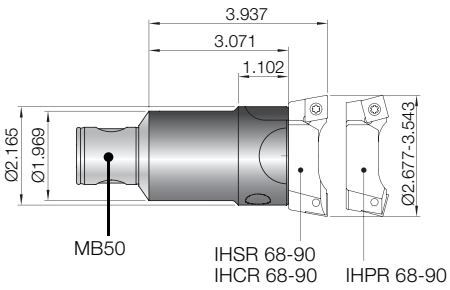
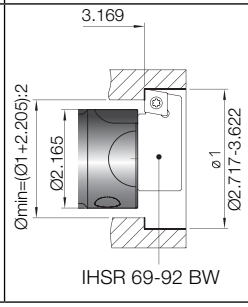
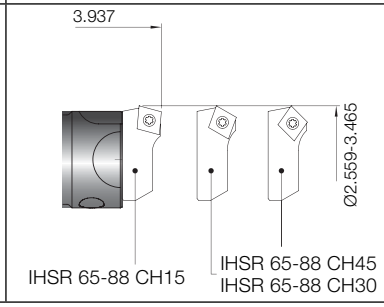
- Verify that the weight of the entire tool assembly does not exceed the machine spindle's carrying capability.

(1) Cutting diameter minimum
(2) Cutting diameter maximum
(3) Insert holders
(4) Maximum RPM

Spare Parts

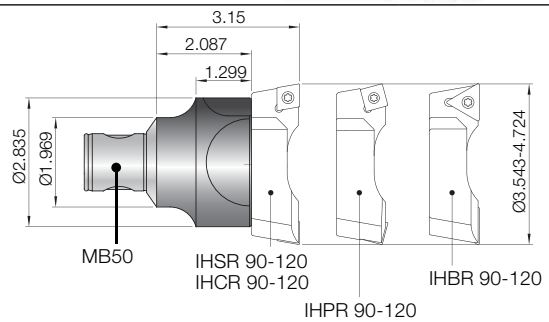
Designation				
BHR MB16-16X34	BH NUT BHR MB16	PLT 16*	SR M3X14 DIN912	SR M3X8 DIN913
BHR MB20-20X40	BH NUT BHR MB20	PLT 20*	SR M4X15DIN912	BH M3X5UNI5923
BHR MB25-25X50	BH NUT BHR MB25	PLT 25*	SR M4X20 DIN912	SR M3X8 DIN913
BHR MB32-32X63	BH NUT BHR MB32	PLT 32*	SR M5X25DIN912	SR M4X12 DIN913
BHR MB40-40X80	BH NUT BHR MB40	PLT 40*	SR M6X30 DIN912	SR M5X14 DIN913
BHR MB50-63X80	BH NUT BHR MB50	PLT 50*	SR M10X40DIN912	SR M5X12 DIN913
BHR MB63-63X125	BH NUT BHR MB63	PLT 63*	SR M10X40DIN912	SR M6X16 DIN913
BHR MB80-80X140	BH NUT BHR MB80	PLT 80*	SR M12X45DIN912	SR M8X25 DIN913

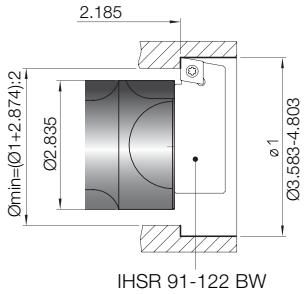
BHR MB - Additional Information

BHR MB16- 16X34 **Ø.709 ~ .866**			
BHR MB20- 20X40 **Ø.866 ~ 1.102**			
BHR MB25- 25X50 **Ø1.102 ~ 1.496**			
BHR MB32- 32X63 **Ø1.398 ~ 1.969**			
BHR MB40- 40X80 **Ø1.969 ~ 2.677**			
BHR MB50- 50X100 **Ø2.677 ~ 3.543**			

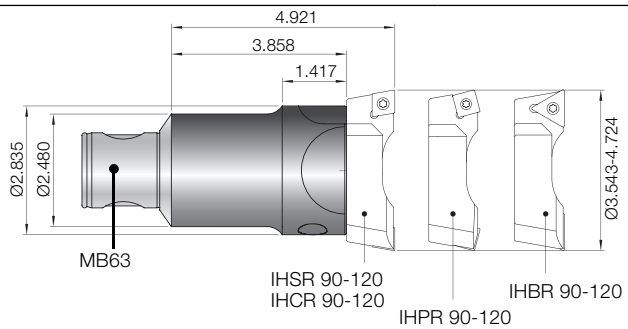
BHR MB - Additional Information

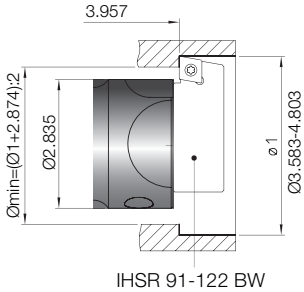
BHR MB50- 63X80
Ø3.543 ~ 4.724



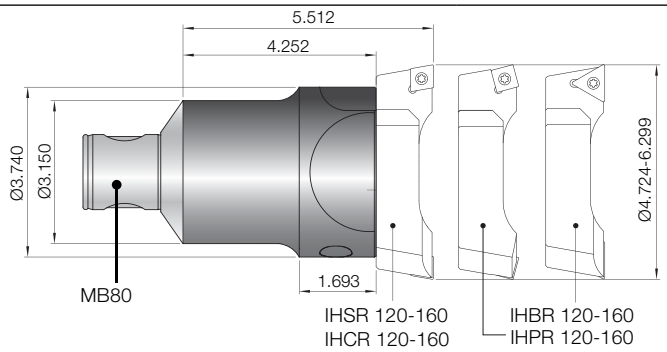


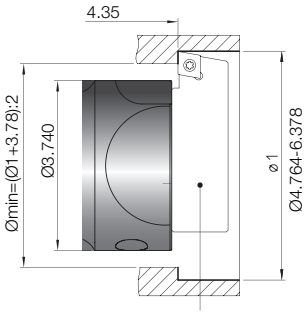
BHR MB63- 63X125
Ø3.543 ~ 4.724

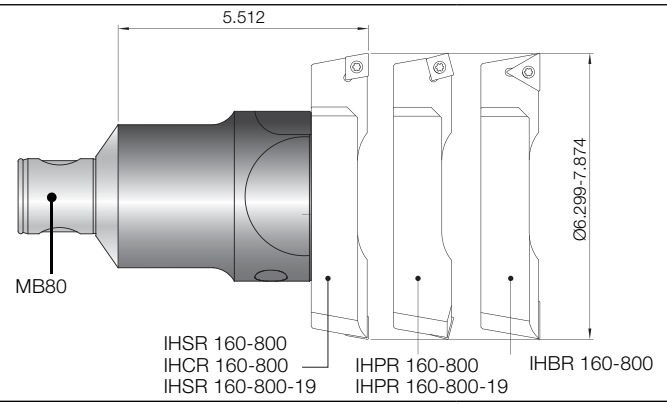


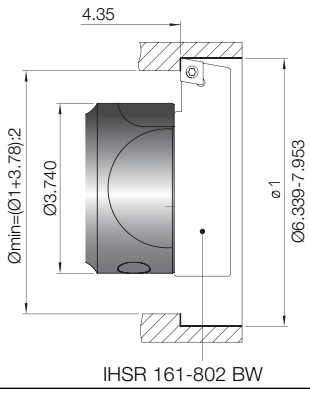


BHR MB80-80X140
Ø4.724 ~ 7.874





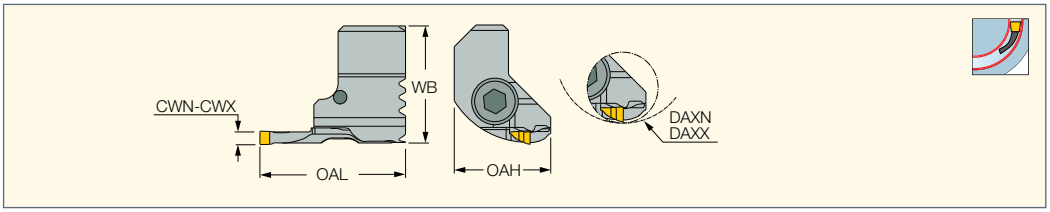




MINCUT MINI FACE LINE

IHSR-MIFR

Trepanning Cartridges Carrying MINCUT Inserts Mounted on the BHR MB32-32X63 Boring Head



Designation	DAXN(1)	DAXX(2)	CWN(3)	CWX(4)	OAL	WB	OAH	Insert		
IHSR 8-21 MIFR8	.31	.83	.059	.087	1.260	.906	.690	MI.R 8	SR 14-297	T-8/5
IHSR 19-34 MIFR10	.75	1.34	.079	.118	1.063	.866	.700	MI.R 10	SR 34-506 M3X0.5	T-9/5

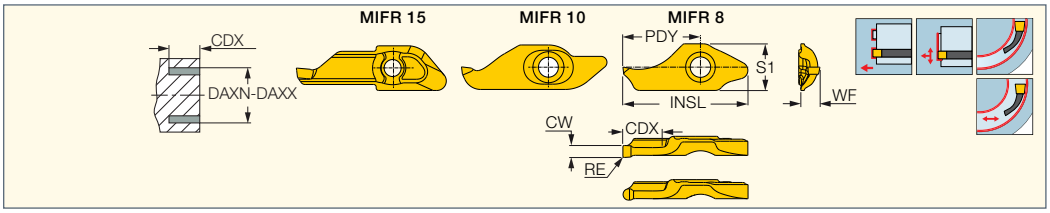
(1) Minimum axial grooving diameter
(2) Maximum axial grooving diameter
(3) Minimum cutting width
(4) Maximum cutting width

For inserts, see pages: MIFR (475)
For holders, see pages: BHR MB (472)

MINCUT MINI FACE LINE

MIFR

Screw-Clamped Inserts for Internal Face Grooving and Turning, Penetration Diameter Range .315-.669"



Designation	Dimensions											IC908	Recommended Machining Data	
	INSL	CW	CWTOL(1)	RE	RETOL(2)	WF	S1	DAXN(3)	DAXX(4)	CDX	PDY		f face-groove (IPR)	f face-turn (IPR)
MIFR 8-1.50-0.20	.697	.059	.00078	.0079	.0008	.102	.256	.31	.45	.217	.433	●	.0008-.0039	.0008-.0024
MIFR 8-1.60-0.80	.697	.063	.00078	.0315	.0008	.102	.256	.31	.48	.217	.433	●	.0008-.0039	.0008-.0024
MIFR 8-2.00-0.20	.697	.079	.00078	.0079	.0008	.110	.256	.31	.63	.217	.433	●	.0008-.0039	.0008-.0024
MIFR 8-2.20-0.20	.697	.087	.00078	.0079	.0008	.114	.256	.31	.83	.217	.433	●	.0008-.0039	.0008-.0024
MIFR 10-2.00-0.20	.988	.079	.00078	.0079	.0008	.118	.299	.39	-	.354	.583	●	.0008-.0039	.0008-.0024
MIFR 10-2.00-1.00	.988	.079	.00078	.0394	.0008	.118	.299	.39	-	.354	.583	●	.0008-.0039	.0008-.0024
MIFR 10-2.50-0.20	.988	.098	.00078	.0079	.0008	.122	.299	.39	1.18	.354	.583	●	.0008-.0039	.0008-.0024
MIFR 10-2.50-1.25	.988	.098	.00078	.0492	.0008	.130	.299	.39	-	.354	.583	●	.0008-.0039	.0008-.0024
MIFR 10-3.00-0.20	.988	.118	.00078	.0079	.0008	.134	.299	.39	1.18	.354	.583	●	.0008-.0039	.0008-.0024
MIFR 10-3.00-1.50	.988	.118	.00078	.0590	.0008	.130	.299	.39	1.34	.354	.583	●	.0008-.0039	.0008-.0024
MIFR 15-2.50-0.20	1.181	.098	.00078	.0079	.0008	.219	.354	.59	2.36	.591	.760	●	.0012-.0020	.0012-.0016
MIFR 15-2.50-1.25	1.181	.098	.00078	.0492	.0008	.219	.354	.47	1.85	.591	.760	●	.0012-.0020	.0012-.0016
MIFR 15-3.00-0.20	1.181	.118	.00078	.0079	.0008	.230	.354	.59	2.36	.591	.760	●	.0012-.0020	.0012-.0016
MIFR 15-3.00-1.50	1.181	.118	.00078	.0590	.0008	.230	.354	.39	-	.591	.760	●	.0012-.0020	.0012-.0016
MIFR 15-3.50-0.20	1.181	.138	.00078	.0079	.0008	.236	.354	.39	-	.591	.760	●	.0012-.0020	.0012-.0016

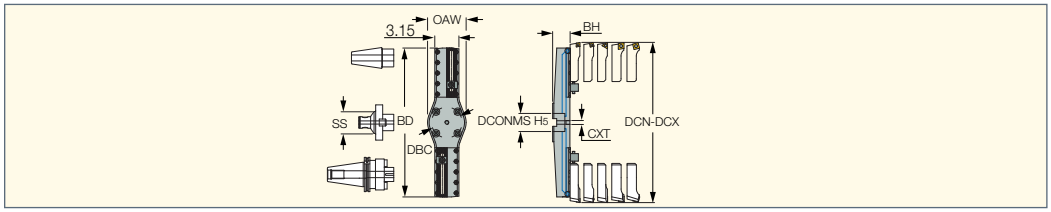
• Recommended cutting speeds and feeds can be increased by 20-30% for aluminim, and reduced by 20-30% for titanium and Inconel
(1) Cutting width tolerance (+/-)
(2) Corner radius tolerance (+/-)
(3) Minimum axial grooving diameter
(4) Maximum axial grooving diameter

For tools, see pages: IHSR-MIFR (475)

ITSBORE

TCH AL

Aluminum Twin Cutter Heads for Rough and Fine Boring Operations, Diameter Range 7.87-47.24"



Designation	DCN(1)	DCX(2)	BD	DCONMS	DBC	SS	OAW	CXT	BH	CSP(3)	RPMX(4)	Lbs
TCH AL200	7.874	23.701	7.638	1.575	2.626	80	-	-	2.126	1	700	7.06
TCH AL300	11.811	27.638	11.339	1.575	2.626	80	-	-	2.126	1	400	8.60
TCH AL400	15.748	31.575	15.512	1.575	2.626	80	-	1/4GAS	2.402	0	300	15.21
TCH AL500	19.685	35.512	19.449	2.362	4.000	80,110	5.039	1/4GAS	2.717	0	200	19.18
TCH AL600	23.622	39.449	23.386	2.362	4.000	80,110	5.039	1/4GAS	2.795	0	200	18.39
TCH AL700	27.559	43.386	27.323	2.362	4.000	80,110	5.039	1/4GAS	2.913	0	200	18.39
TCH AL800	31.496	47.323	31.260	2.362	4.000	80,110	5.039	1/4GAS	3.150	0	150	33.52

• Aluminum body, with steel serrated seats • The "O" position on the counterweight balances the BHF boring head for .787" boring diameter position. For every .394" change in boring diameter, move the counterweight by 1 measurement mark • Verify that the weight of the entire tool assembly does not exceed the machine spindle's carrying capability • For spare parts, see pages 509-510, 546

(1) Cutting diameter minimum

(2) Cutting diameter maximum

(3) 0 - Without coolant supply, 1 - With coolant supply

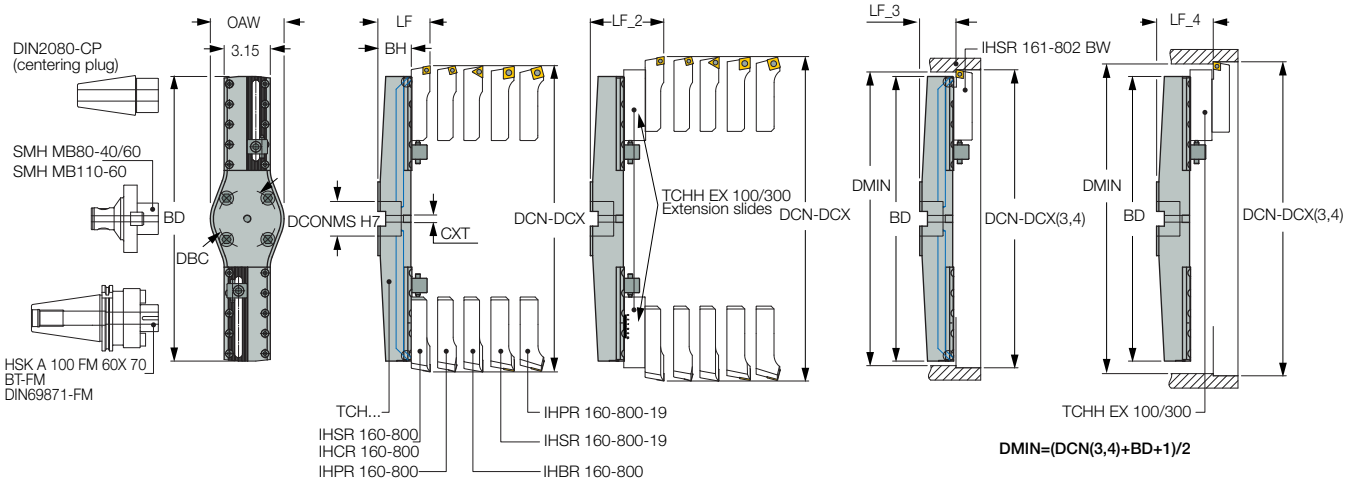
(4) Maximum RPM

For tools, see pages: IHBR (479) • IHCR (478) • IHPR (479) • IHSR (478) • IHSR-BW (480)

Spare Parts

Designation									
TCH AL200	BH TCH NUT A	BH TCH NUT B	BH TCH NUT C	SR M12X40DIN912	SR M12X35DIN912	SR M8X25DIN912			
TCH AL300		SR M8X40 DIN915	BH TCH NUT A	BH TCH NUT B	BH TCH NUT C	SR M12X40DIN912	SR M12X35DIN912	SR M8X25DIN912	
TCH AL400		SR M8X40 DIN915	BH TCH NUT A	BH TCH NUT B	BH TCH NUT C	SR M12X40DIN912	SR M12X35DIN912	BH SERRATED PLATE 400-700	SR M8X40 DIN915
TCH AL500		BH TCH NUT A	BH TCH NUT B	BH TCH NUT C	SR M12X40DIN912	SR M16X50 DIN912	SR M8X25DIN912	BH SERRATED PLATE 400-700	SR M8X40 DIN915
TCH AL600	BH SERRATED PLATE 400-700	SR M8X40 DIN915	BH TCH NUT A	BH TCH NUT B	BH TCH NUT C	SR M12X40DIN912	SR M16X50 DIN912	SR M8X25DIN912	SR M8X40 DIN915
TCH AL700	BH SERRATED PLATE 400-700	SR M8X40 DIN915	BH TCH NUT A	BH TCH NUT B	BH TCH NUT C	SR M12X40DIN912	SR M16X50 DIN912	SR M8X25DIN912	SR M8X40 DIN915
TCH AL800	BH SERRATED PLATE 400-700	SR M8X40 DIN915	BH TCH NUT A	BH TCH NUT B	BH TCH NUT C	SR M12X40DIN912	SR M16X50 DIN912	SR M8X25DIN912	SR M8X40 DIN915

Large Diameter Double Edge Rough Boring Options



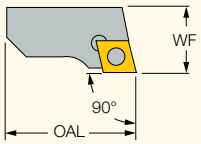
DMIN=(DCN(3,4)+BD+1)/2

			Aluminum Twin Cutter Heads						
Boring Tools	**Extension Slides**	**Dimensions**	**TCH 200**	**TCH 300**	**TCH 400**	**TCH 500**	**TCH 600**	**TCH 700**	**TCH 800**
IH.R 160-800/-19		DCN-DCX	7.9 - 11.8	11.8 - 15.7	15.7 - 19.7	19.7 - 23.6	23.6 - 27.6	27.6 - 31.5	31.5 - 35.4
IH.R 160-800/-19	TCHH EX 100	DCN-DCX	11.8 - 15.7	15.7 - 19.7	19.7 - 23.6	23.6 - 27.6	27.6 - 31.5	31.5 - 35.4	35.4 - 39.4
IH.R 160-800/-19	TCHH EX 300	DCN-DCX	15.7 - 23.6	19.7 - 27.6	23.6 - 31.5	27.6 - 35.4	31.5 - 39.4	35.4 - 43.3	39.4 - 47.2
IHSR 161-802 BW		DCN-DCX(3,4)	8 - 11.9	11.9 - 15.8	15.8 - 19.8	19.8 - 23.7	23.7 - 27.6	27.6 - 31.6	31.6 - 35.5
IHSR 161-802 BW	TCHH EX 100	DCN-DCX(3,4)	11.9 - 15.8	15.8 - 19.8	19.8 - 23.7	23.7 - 27.6	27.6 - 31.6	31.6 - 35.5	35.5 - 39.4
IHSR 161-802 BW	TCHH EX 300	DCN-DCX(3,4)	15.8 - 23.7	19.8 - 27.6	23.7 - 31.6	27.6 - 35.5	31.6 - 39.4	35.5 - 43.4	39.4 - 47.3
IH.R 160-800		LF	3.4	3.4	3.7	4.0	4.1	4.2	4.4
IH.R 160-800-19		LF	3.7	3.7	4.0	4.3	4.4	4.5	4.7
IH.R 160-800	TCHH EX 100	LF_2	4.6	4.6	4.8	5.2	5.2	5.4	5.6
IH.R 160-800	TCHH EX 300	LF_2	5.0	5.0	5.2	5.6	5.6	5.7	6.0
IH.R 160-800-19	TCHH EX 100	LF_2	4.9	4.9	5.2	5.5	5.6	5.7	5.9
IH.R 160-800-19	TCHH EX 300	LF_2	5.3	5.3	5.6	5.9	5.9	6.1	6.3
IHSR 161-802 BW		LF_3	2.2	2.2	2.5	2.8	2.9	3.0	3.2
IHSR 161-802 BW	TCHH EX 100	LF_4	3.4	3.4	3.7	4.0	4.1	4.2	4.4
IHSR 161-802 BW	TCHH EX 300	LF_4	3.8	3.8	4.1	4.4	4.5	4.6	4.8

ITSBORE

IHSR

Rough Boring Tools
For Twin Radial / Axial
Edge Cutters Positioned
Opposite Finishing Tools



Designation	DCN(1)	DCX(2)	WF	OAL	Insert			
IHSR 18-22	.709	.866	.315	.591	CCMT 2...	SR 14-548	T-7/5	
IHSR 22-28	.866	1.102	.374	.748	CCMT 2...	SR 14-548	T-7/5	
IHSR 28-38	1.102	1.496	.492	.906	CCMT 2...	SR 14-548	T-7/5	
IHSR 36-50	1.398	1.968	.591	1.260	CCMT 2...	SR 14-548	T-7/5	
IHSR 36-50-09	1.398	1.968	.591	1.260	CCMT 3...	SR 16-236	T-15/5	
IHSR 50-68	1.968	2.677	.748	1.575	CCMT 3...	SR 16-236	T-15/5	
IHSR 50-68-12	1.968	2.677	.748	1.575	CCMT 43...	SR 16-212	T-20/5	
IHSR 68-90	2.677	3.543	.866	2.126	CCMT 43...	SR 16-212	T-20/5	
IHSR 90-120	3.543	4.724	1.063	2.776	CCMT 43...	SR 16-212	T-20/5	
IHSR 120-160	4.724	6.299	1.260	3.720	CCMT 43...	SR 16-212	T-20/5	
IHSR 160-800	6.299	31.496	1.260	5.118	CCMT 43...	SR 16-212	T-20/5	
IHSR 160-800-19	6.299	31.496	1.575	5.118	CNMG 64..	SR 10402352		HW 4.0

- For user guide, see pages 549-566

(1) Cutting diameter minimum
(2) Cutting diameter maximum

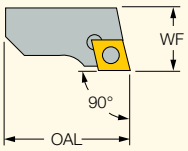
For inserts, see pages: CCET-WF (532) • CCGT-AF (534) • CCGT-AS (534) • CCGW/CCMT (CBN) (533) • CCMT (PCD) (533) • CCMT-14 (531) • CCMT-PF (531) • CCMT-WG (532) • CCMT/CCGT (532) • CCMT/CCGT-SM (531)

For holders, see pages: BHR MB (472) • TCH AL (476) • TCHH EX (513)

ITSBORE

IHCR

Boring Toolholders for the MB
Modular Boring System



Designation	DCN(1)	DCX(2)	WF	OAL	Insert		
IHCR 28-38	1.102	1.496	.484	.906	CCMT 2...	SR 14-548	T-7/5
IHCR 36-50	1.398	1.968	.583	1.260	CCMT 2...	SR 14-548	T-7/5
IHCR 36-50-09	1.417	1.968	.583	1.260	CCMT 3...	SR 16-236	T-15/5
IHCR 50-68	1.968	2.677	.736	1.575	CCMT 3...	SR 16-236	T-15/5
IHCR 50-68-12	1.968	2.677	.736	1.575	CCMT 43...	SR 16-212	T-20/5
IHCR 68-90	2.677	3.543	.854	2.126	CCMT 43...	SR 16-212	T-20/5
IHCR 90-120	3.543	4.724	1.051	2.776	CCMT 43...	SR 16-212	T-20/5
IHCR 120-160	4.724	6.299	1.248	3.720	CCMT 43...	SR 16-212	T-20/5
IHCR 160-800	6.299	31.496	1.248	5.118	CCMT 43...	SR 16-212	T-20/5

- For user guide, see pages 549-566

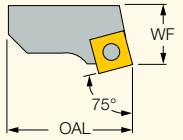
(1) Cutting diameter minimum
(2) Cutting diameter maximum

For inserts, see pages: CCET-WF (532) • CCGT-AF (534) • CCGT-AS (534) • CCGW/CCMT (CBN) (533) • CCMT (PCD) (533) • CCMT-14 (531) • CCMT-PF (531) • CCMT-WG (532) • CCMT/CCGT (532) • CCMT/CCGT-SM (531)

For holders, see pages: BHR MB (472) • TCH AL (476) • TCHH EX (513)

ITSBORE

IHPR
75° Rough Boring Toolholders



Designation	DCN(1)	DCX(2)	WF	OAL	Insert		
IHPR 36-50	1.398	1.968	.591	1.260	SCMT 3...	SR 16-236	T-15/5
IHPR 50-68	1.968	2.677	.748	1.575	SCMT 3...	SR 16-236	T-15/5
IHPR 68-90	2.677	3.543	.866	2.122	SCMT 43...	SR 16-212	T-20/5
IHPR 90-120	3.543	4.724	1.063	2.776	SCMT 43...	SR 16-212	T-20/5
IHPR 120-160	4.724	6.299	1.260	3.720	SCMT 43...	SR 16-212	T-20/5
IHPR 160-800	6.299	31.496	1.260	5.118	SCMT 43...	SR 16-212	T-20/5
IHPR 160-800-19	6.299	31.496	1.575	5.079	SNMG 64..		

- For user guide, see pages 549-566

(1) Cutting diameter minimum

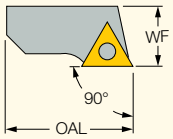
(2) Cutting diameter maximum

For inserts, see pages: SCGT-AS (535) • SCMT-14 (535) • SCMT-19 (535) • SCMT-SM (534)

For holders, see pages: BHR MB (472) • TCH AL (476) • TCHH EX (513)

ITSBORE

IHBR
Rough Boring Toolholders



Designation	DCN(1)	DCX(2)	WF	OAL	Insert		
IHBR 90-120	3.543	4.724	1.063	2.776	TCMT 2205...	SR 16-212	T-20/5
IHBR 120-160	4.724	6.299	1.260	3.720	TCMT 2205...	SR 16-212	T-20/5
IHBR 160-800	6.299	31.496	1.260	5.118	TCMT 2205...	SR 16-212	T-20/5

- For user guide, see pages 549-566

(1) Cutting diameter minimum

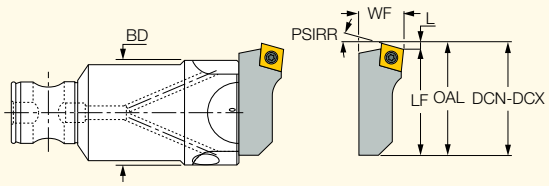
(2) Cutting diameter maximum

For inserts, see pages: TCMT-19 (536) • TCMT-SM (536)

For holders, see pages: BHR MB (472) • TCH AL (476) • TCHH EX (513)

ITSBORE

IHSR-CH
Chamfering Tools for
BHR Boring Heads



Designation	DCN(1)	PSIRR	LF	OAL	WF	L	BD	DCX(2)	Insert		
IHSR 26-38 CH15	1.024	15.0	.843	.906	.492	.063	.984	1.496	CCMT 2...	SR 14-548	T-7/5
IHSR 26-38 CH30	1.024	30.0	.787	.906	.492	.118	.984	1.496	CCMT 2...	SR 14-548	T-7/5
IHSR 26-38 CH45	1.024	45.0	.736	.906	.492	.169	.984	1.496	CCMT 2...	SR 14-548	T-7/5
IHSR 34.5-49 CH15	1.358	15.0	1.157	1.220	.591	.063	1.260	1.929	CCMT 2...	SR 14-548	T-7/5
IHSR 34.5-49 CH30	1.358	30.0	1.102	1.220	.591	.118	1.260	1.929	CCMT 2...	SR 14-548	T-7/5
IHSR 34.5-49 CH45	1.358	45.0	1.051	1.220	.591	.169	1.260	1.929	CCMT 2...	SR 14-548	T-7/5
IHSR 46.5-66 CH15	1.831	15.0	1.441	1.535	.748	.094	1.575	2.598	CCMT 3...	SR 16-236	T-15/5
IHSR 46.5-66 CH30	1.831	30.0	1.354	1.535	.748	.181	1.575	2.598	CCMT 3...	SR 16-236	T-15/5
IHSR 46.5-66 CH45	1.831	45.0	1.280	1.535	.748	.256	1.575	2.598	CCMT 3...	SR 16-236	T-15/5
IHSR 65-88 CH15	2.559	15.0	1.961	2.087	.866	.126	1.968	3.465	CCMT 43...	SR 16-212	T-20/5
IHSR 65-88 CH30	2.559	30.0	1.843	2.087	.866	.244	1.968	3.465	CCMT 43...	SR 16-212	T-20/5
IHSR 65-88 CH45	2.559	45.0	1.740	2.087	.866	.346	1.968	3.465	CCMT 43...	SR 16-212	T-20/5

- For user guide, see pages 549-566

(1) Cutting diameter minimum

(2) Cutting diameter maximum

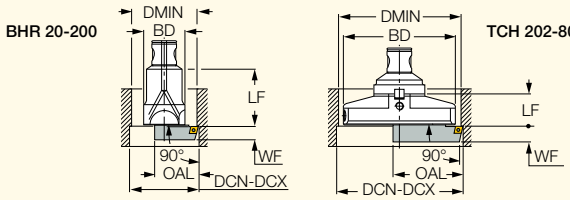
For inserts, see pages: CCET-WF (532) • CCGT-AF (534) • CCGT-AS (534) • CCMT-14 (531) • CCMT-PF (531) • CCMT-WG (532) • CCMT/CCGT (532) • CCMT/CCGT-SM (531)

For holders, see pages: BHR MB (472)

ITSBORE

IHSR-BW

Back Face Turning Tools for BHR and TCH AL Rough Boring Heads



Designation	SS(1)	BD(2)	LF	WF	OAL	Insert	DCN(3)	DCX(4)
IHSR 20-24 BW	BHR MB16-16	.630	1.083	.394	.630	CCMT 2...	.787	.945
IHSR 23.5-30BW	BHR MB20-20	.787	1.280	.433	.768	CCMT 2...	.925	1.181
IHSR 29.5-40BW	BHR MB25-25	.984	1.535	.571	.945	CCMT 2...	1.161	1.575
IHSR 39-52 BW	BHR MB32-32	1.260	1.968	.669	1.260	CCMT 3...	1.535	2.047
IHSR 51-70 BW	BHR MB40-40	1.575	2.500	.827	1.654	CCMT 43...	2.008	2.756
IHSR 69-92 BW	BHR MB50-50	2.165	3.169	.965	2.244	CCMT 43..	2.717	3.622
IHSR 91-122 BW	BHR MB63-63	2.835	3.957	1.122	2.992	CCMT 43...	3.583	4.803
IHSR 121-162 BW	BHR MB80-80	3.740	4.350	1.240	3.976	CCMT 43...	4.764	6.378
IHSR 161-802 BW	BHR MB80-80	3.740	4.350	1.240	4.803	CCMT 43...	6.339	31.575

• DMIN=(min bore diameter)=(DCN+BD+1)/2 • BD=Size of the boring head being used • For user guide, see pages 549-566

(1) Suitable boring heads

(2) Size of the boring head being used

(3) Cutting diameter minimum

(4) Cutting diameter maximum

For inserts, see pages: CCET-WF (532) • CCGT-AF (534) • CCGT-AS (534) • CCGW/CCMT (CBN) (533) • CCMT (PCD) (533) • CCMT-14 (531) • CCMT-PF (531) • CCMT-WG (532) • CCMT/CCGT (532) • CCMT/CCGT-SM (531)

For holders, see pages: BHR MB (472) • TCH AL (476) • TCHH EX (513)

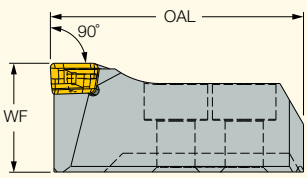
Spare Parts

Designation		
IHSR 20-24 BW	SR 14-548	T-7/5
IHSR 23.5-30BW	SR 14-548	T-7/5
IHSR 29.5-40BW	SR 14-548	T-7/5
IHSR 39-52 BW	SR 16-236	T-15/5
IHSR 51-70 BW	SR 16-212	T-20/5
IHSR 69-92 BW	SR 16-212	T-20/5
IHSR 91-122 BW	SR 16-212	T-20/5
IHSR 121-162 BW	SR 16-212	T-20/5
IHSR 161-802 BW	SR 16-212	T-20/5

ITSBORE

CR LNHT

Boring Cartridge with Tangential Insert for BHR MB50-50X100 Boring Head



Designation	DCN(1)	DCX(2)	WF	OAL	MIID(3)
CR LNHT10 68-90-CP	2.677	3.543	.909	2.117	HTP LN.. 1006

• For user guide, see pages 549-566

(1) Cutting diameter minimum

(2) Cutting diameter maximum

(3) Master insert identification

For inserts, see pages: HTP LN.. 1006 (529)

For holders, see pages: BHR MB (472)

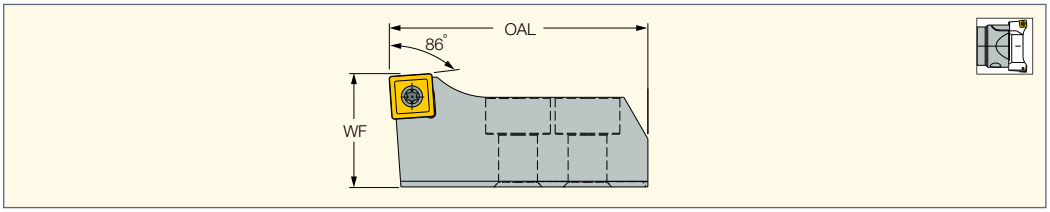
Spare Parts

Designation			
CR LNHT	SR 34-550	BLD T10/S7	SW6-SD

ITSBORE

CR SOMT

Boring Cartridge with Square Insert for BHR MB50-50X100 Boring Head



Designation	DCN(1)	DCX(2)	WF	OAL	MIID(3)
CR SOMT09 68-90-CP	2.677	3.543	.929	2.126	SO.T 09...

- For user guide, see pages 549-566

(1) Cutting diameter minimum
(2) Cutting diameter maximum
(3) Master insert identification

For inserts, see pages: SOGX/T-AL (144) • SOMT-DT (145) • SOMT-GF (144) • SOMT-HD (145)
For holders, see pages: BHR MB (472)

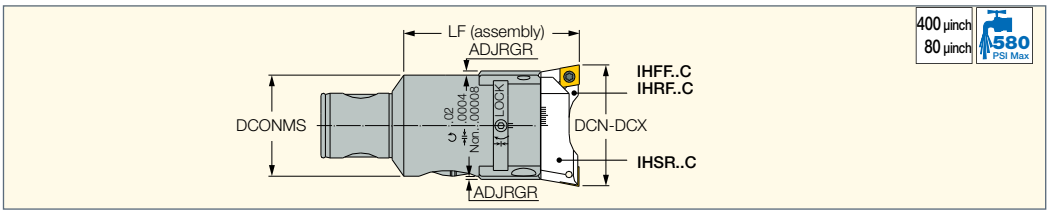
Spare Parts

Designation			
CR SOMT	SR 34-506 M3X0.5	SW4-SD	BLD T09/M7-SW4

ITSBORE

BHCI MB

Combi Rough and Fine Boring Heads with .0004" Direct Dia. Adjustment and .00008" by a Vernier Scale



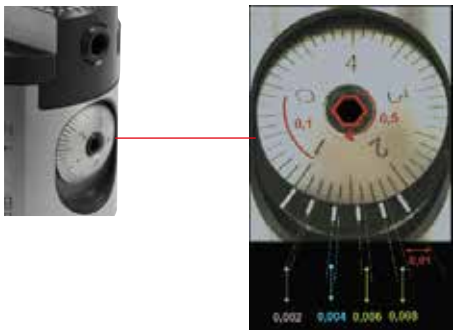
Designation	DCONMS	LF	DCN(1)	DCX(2)	ADJRGR	RPMX(3)	Lbs
BHCI MB25-25-57	.984	2.224	1.102	1.417	.020	10000	.50
BHCI MB32-32-71	1.260	2.795	1.417	1.811	.020	10000	1.01
BHCI MB40-40-90	1.575	3.543	1.811	2.362	.040	8000	1.86
BHCI MB50-50-87	1.969	3.425	2.362	2.953	.040	8000	2.67
BHCI MB63-63-109	2.480	4.291	2.953	3.740	.080	6000	5.43
BHCI MB80-80-130	3.150	5.118	3.740	4.724	.080	5000	9.72

- The roughing head precedes the finishing head by .008" • Each head can be adjusted independently • Insert radius for combi rough and fine boring must be the same size.

(1) Cutting diameter minimum
(2) Cutting diameter maximum
(3) Maximum RPM

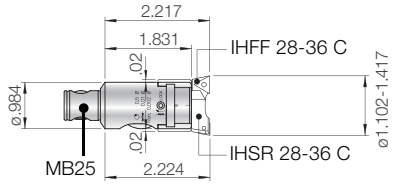
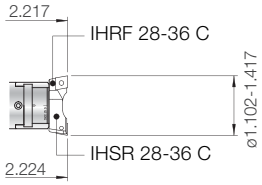
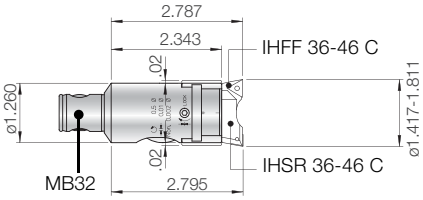
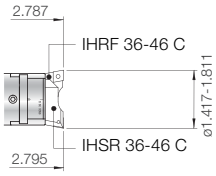
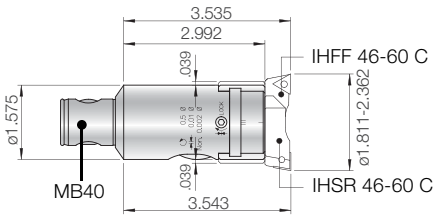
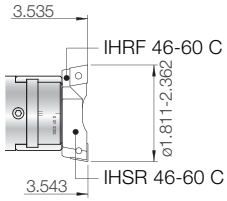
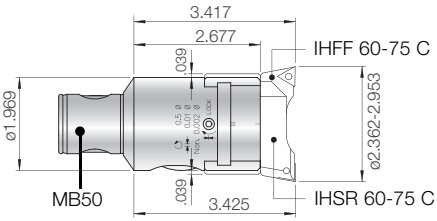
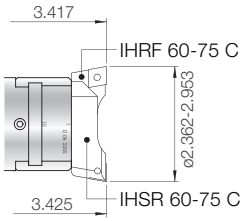
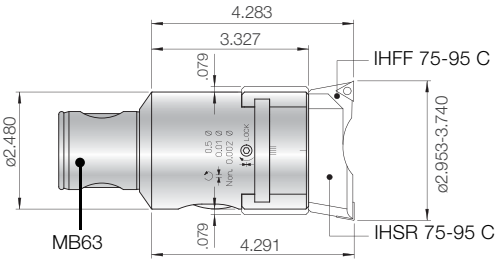
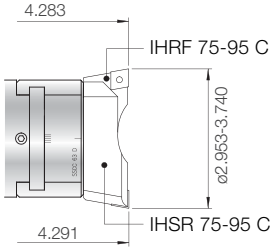
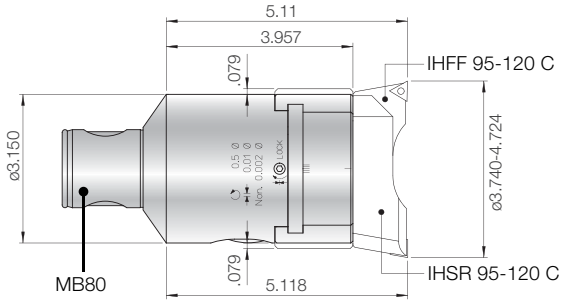
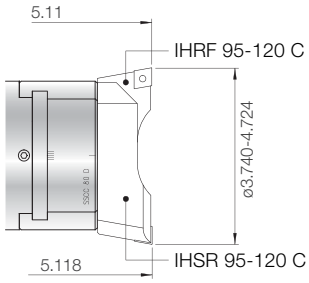
For tools, see pages: IHFF-C (483) • IHRF-C (483) • IHSR-C (483)

BHCI MB...



Graduated dial of .0004″ with circular vernier of .00008″

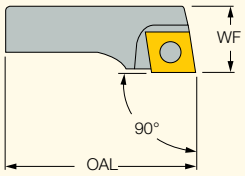
BHCI MB - Additional Information

BHCI MB25-25-57 **Ø1.102 ~ 1.417**		
BHCI MB32-32-71 **Ø1.417 ~ 1.811**		
BHCI MB40-40-90 **Ø1.811 ~ 2.362**		
BHCI MB50-50-87 **Ø2.362 ~ 2.953**		
BHCI MB63-63-109 **Ø2.953 ~ 3.740**		
BHCI MB80-80-130 **Ø3.740 ~ 4.724**		

ITSBORE

IHRF-C

Boring Tools for Twin Cutters Positioned on the Inner side of the Opposite Finishing Tool on MB BHC Combi Boring Heads



Designation	DCN(1)	DCX(2)	WF	OAL	Insert		
IHRF 28-36 C	1.102	1.417	.386	.945	CCGT 2...	SR 14-548	T-7/5
IHRF 36-46 C	1.417	1.811	.445	1.181	CCGT 2...	SR 14-548	T-7/5
IHRF 46-60 C	1.811	2.362	.543	1.575	CCGT 3...	SR 16-236	T-15/5
IHRF 60-75 C	2.362	2.953	.740	2.126	CCGT 3...	SR 16-236	T-15/5
IHRF 75-95 C	2.953	3.740	.957	2.677	CCGT 3...	SR 16-236	T-15/5
IHRF 95-120 C	3.740	4.724	1.154	3.425	CCGT 3...	SR 16-236	T-15/5

- For user guide, see pages 549-566

(1) Cutting diameter minimum

(2) Cutting diameter maximum

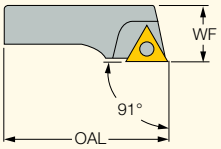
For inserts, see pages: CCGT-AS (534) • CCGW/CCMT (CBN) (533) • CCMT (PCD) (533) • CCMT-14 (531) • CCMT-PF (531) • CCMT-WG (532) • CCMT/CCGT (532) • CCMT/CCGT-SM (531)

For holders, see pages: BHCI MB (481)

ITSBORE

IHFF-C

Triangular Finishing Insert Holders for BHCI Combi Boring Heads



Designation	WF	OAL	DCN(1)	DCX(2)	Insert		
IHFF 28-36 C	.386	.945	1.102	1.417	TPGX 73...	SR 14-298	T-8/5
IHFF 36-46 C	.445	1.181	1.417	1.811	TPGX 73...	SR 14-298	T-8/5
IHFF 46-60 C	.543	1.575	1.811	2.362	TPGX 22...	SR-17979 M3X8	T-8/5
IHFF 60-75 C	.740	2.126	2.362	2.953	TPGX 22...	SR-17979 M3X8	T-8/5
IHFF 75-95 C	.996	2.677	2.953	3.740	TPGX 22...	SR-17979 M3X8	T-8/5
IHFF 95-120 C	1.154	3.425	3.740	4.724	TPGX 22...	SR-17979 M3X8	T-8/5

- For user guide, see pages 549-566

(1) Cutting diameter minimum

(2) Cutting diameter maximum

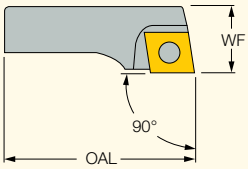
For inserts, see pages: TPGX (537) • TPGX (CBN) (537)

For holders, see pages: BHCI MB (481)

ITSBORE

IHSR-C

Rhombic Roughing Insert Holders for BHCI Combi Boring Heads



Designation	DCN(1)	DCX(2)	WF	OAL	Insert		
IHSR 28-36 C	1.102	1.417	.394	.945	CCMT 2...	SR 14-548	T-7/5
IHSR 36-46 C	1.417	1.811	.453	1.181	CCMT 2...	SR 14-548	T-7/5
IHSR 46-60 C	1.811	2.362	.551	1.575	CCMT 3...	SR 16-236	T-15/5
IHSR 60-75 C	2.362	2.953	.748	2.126	CCMT 3...	SR 16-236	T-15/5
IHSR 75-95 C	2.953	3.740	.965	2.677	CCMT 3...	SR 16-236	T-15/5
IHSR 95-120 C	3.740	4.724	1.161	3.425	CCMT 3...	SR 16-236	T-15/5

- For user guide, see pages 549-566

(1) Cutting diameter minimum

(2) Cutting diameter maximum

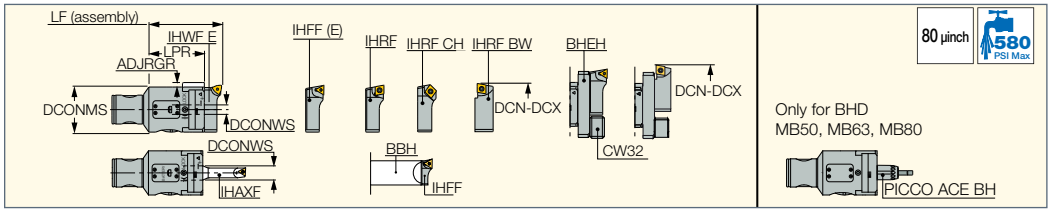
For inserts, see pages: CCET-WF (532) • CCGT-AF (534) • CCGT-AS (534) • CCGW/CCMT (CBN) (533) • CCGW/CCMW-2 (CBN) () • CCMT (PCD) (533) • CCMT-14 (531) • CCMT-PF (531) • CCMT-WG (532) • CCMT/CCGT (532) • CCMT/CCGT-SM (531)

For holders, see pages: BHCI MB (481)

ITSBORE

BHD MB

Fine Boring Heads with Digital .0001" Direct Adjustment Diametric Display



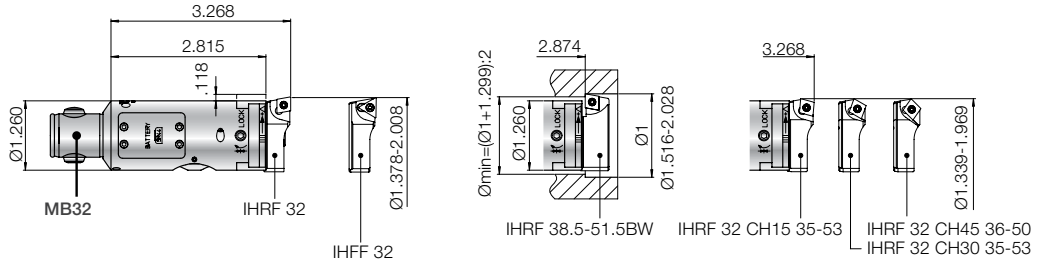
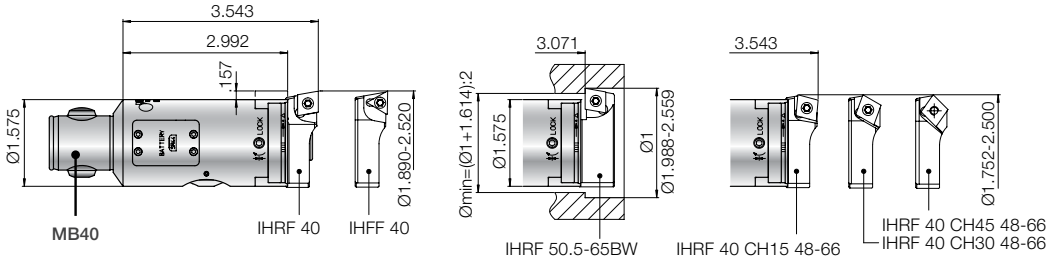
Designation	LF	DCONMS	DCN(1)	DCX(2)	LPR	ADJRGR	DCONWS	RPMX(3)	Lbs
BHD MB32-32-83	3.268	1.260	1.378	2.008	2.815	.118	-	20000	.89
BHD MB40-40-90	3.543	1.575	1.890	2.520	2.992	.157	-	20000	1.61
BHD MB50-50-60	3.150	1.968	.098	4.331	2.402	.197	.630	20000	2.43
BHD MB63-63-89	3.484	2.480	.236	4.921	2.736	.197	-	20000	4.85
BHD MB80-80-104	4.094	3.150	.236	7.874	3.327	.197	-	20000	8.60

- For user guide, see pages 549-566 • For spare parts, see page 508-509
- Note that a protruding reset button dictates the enlargement of the actual DCONMS by .079" in each size respectively. This is important when the tool is being used for back-boring applications where you must clear any obstacles inside the machine/workpiece.

(1) Cutting diameter minimum
(2) Cutting diameter maximum
(3) Maximum RPM

For tools, see pages: IHAXF (505) • IHAXF-AVI (507) • IHAXF-E (507) • IHFF (509) • IHRF (509) • IHRF-BW (513) • IHRF-CH (514) • IHWF (510)

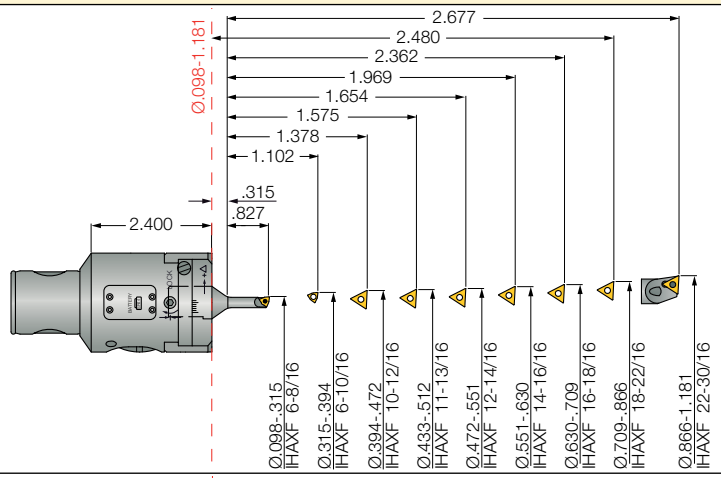
BHD MB - Additional Information

BHD MB32-32-83 **Ø1.378 ~ 2.008**	
BHD MB40-40-90 **Ø1.890 ~ 2.520**	

BHD MB - Additional Information

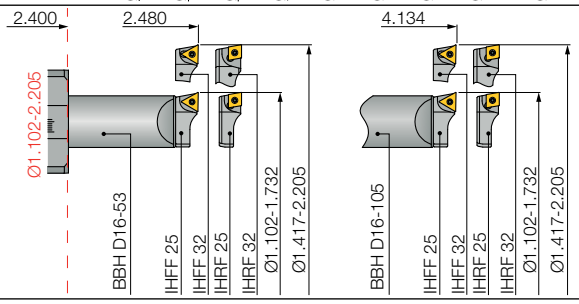
BHD MB50-50X60 Ø.098-4.331

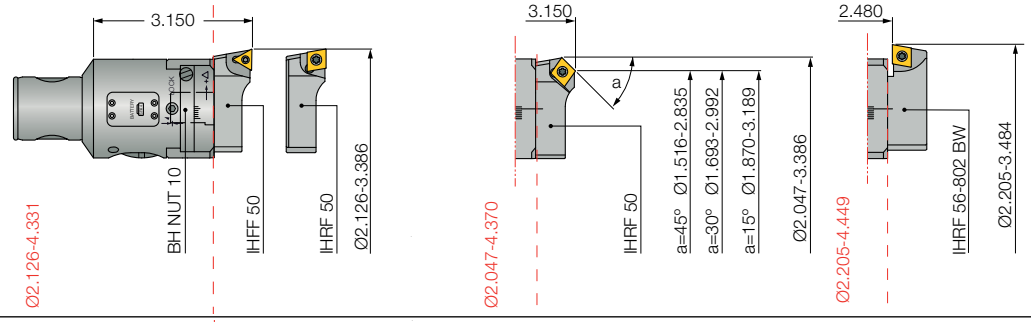
400 µinch
80 µinch

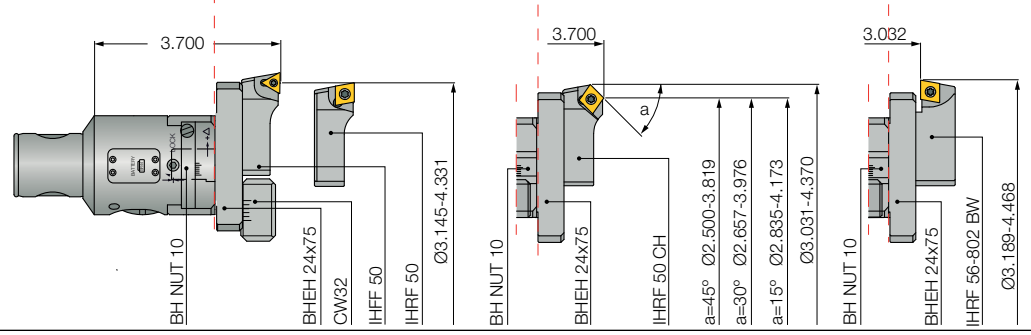


SLEEVE D8-D16

REQUIRED FOR IHAXF.../8



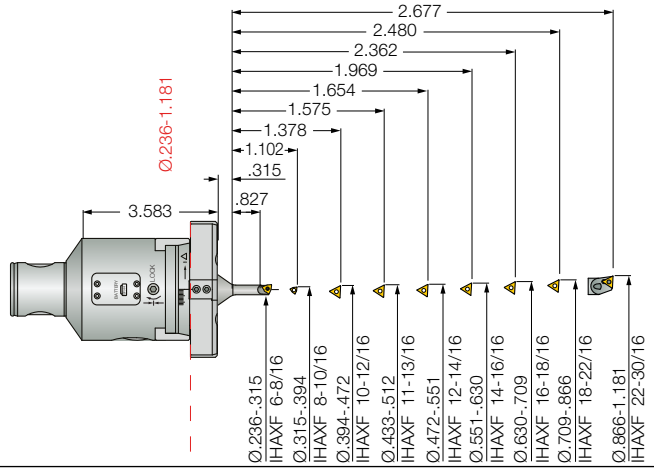


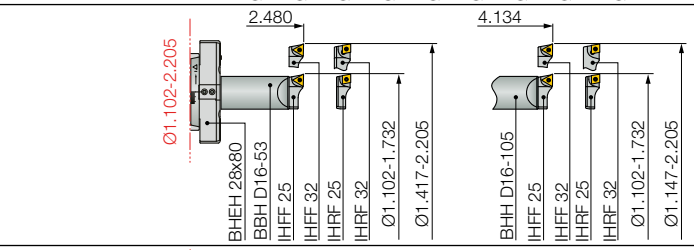


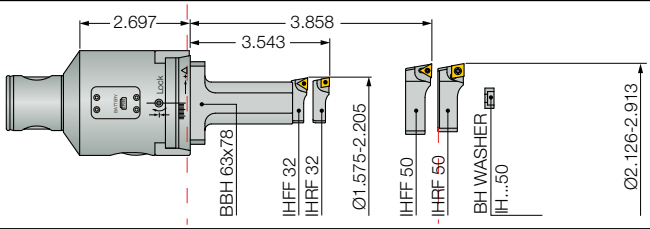
BHD MB - Additional Information

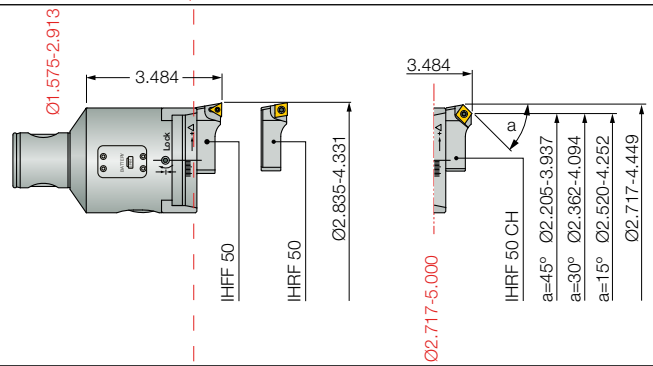
BHD MB63-63X89 ø.236-4.921

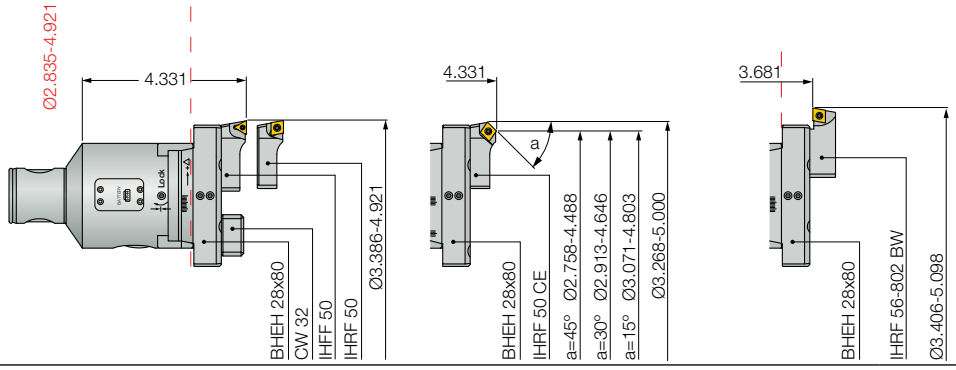
80 µinch







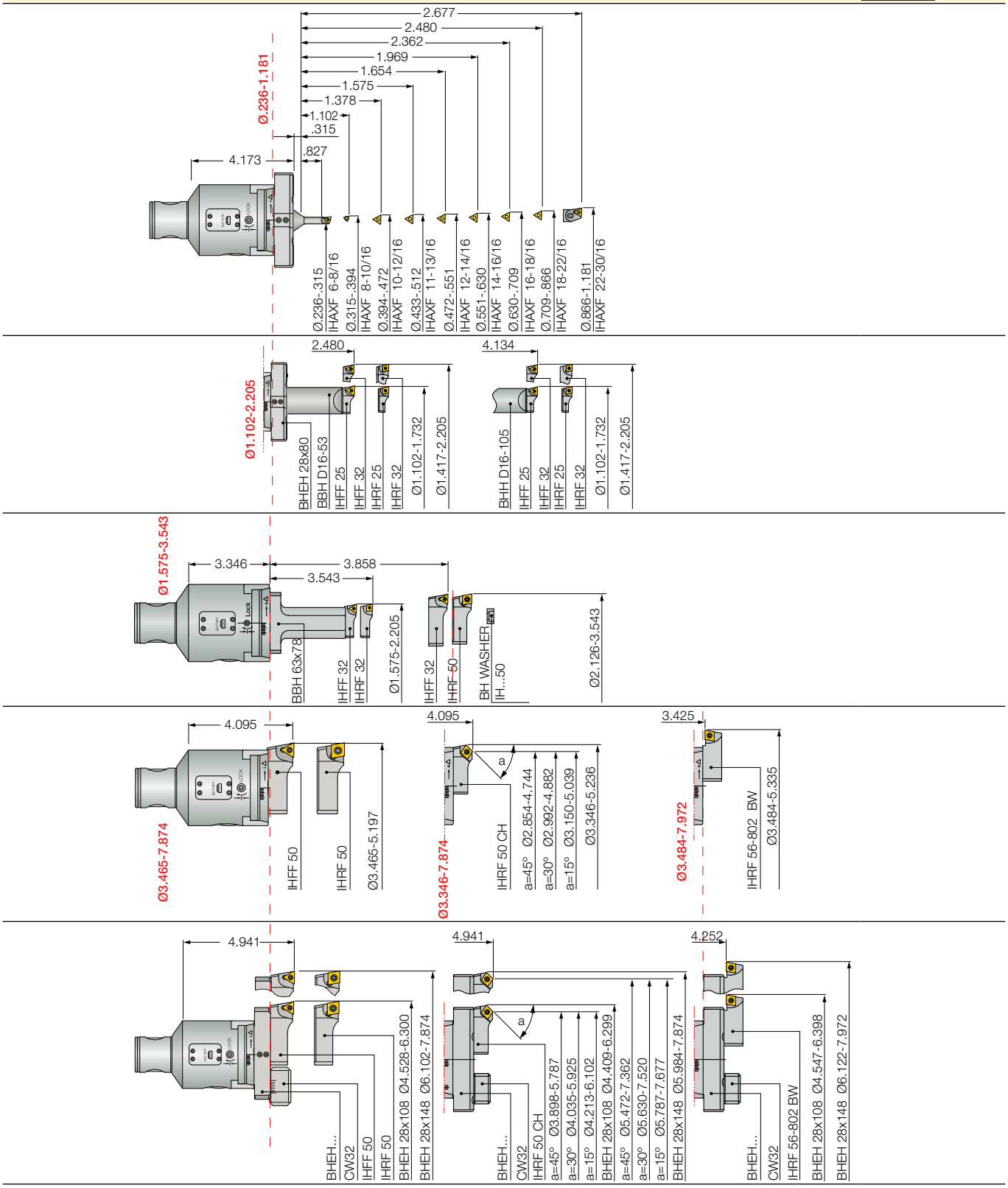




BHD MB - Additional Information

BHD MB80-80X104 ø.236-7.874

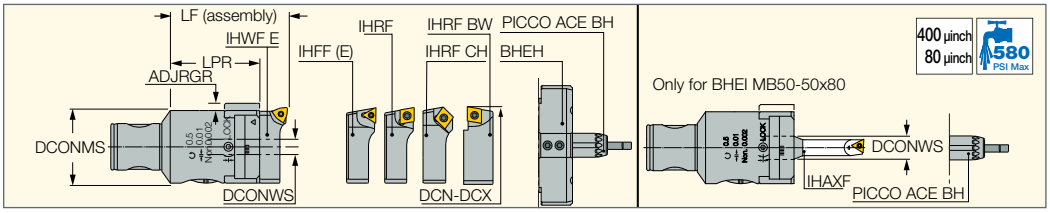
80 µinch



ITSBORE

BHEI MB

Fine Boring Head for the MB Boring System .0004" Direct Dia. Adjustment and .00008" by a Vernier Scale



Designation	DCONMS	LF	DCN(1)	DCX(2)	LPR	ADJRGR	DCONWS	RPMX(3)	Lbs
BHEI MB14-14-30	.551	1.181	.571	.709	.866	.039	-	12000	.22
BHEI MB16-16-34	.630	1.339	.709	.945	1.024	.059	-	12000	.11
BHEI MB20-20-40	.787	1.575	.866	1.181	1.240	.098	-	12000	.28
BHEI MB25-25-50	.984	1.969	1.102	1.575	1.575	.118	-	10000	.46
BHEI MB32-32-63	1.260	2.480	1.378	2.087	2.028	.157	-	10000	.92
BHEI MB40-40-80	1.575	3.150	1.890	2.598	2.598	.197	-	8000	1.76
BHEI MB50-50-80	1.969	3.150	.098	4.331	2.402	.197	.630	8000	2.21
BHEI MB63-63-89	2.480	3.504	.236	4.921	2.736	.394	-	6000	7.06
BHEI MB80-80-104	3.150	4.094	.236	7.874	3.346	.472	-	5000	7.06

- For spare parts, see pages 508-509, 545

(1) Cutting diameter minimum

(2) Cutting diameter maximum

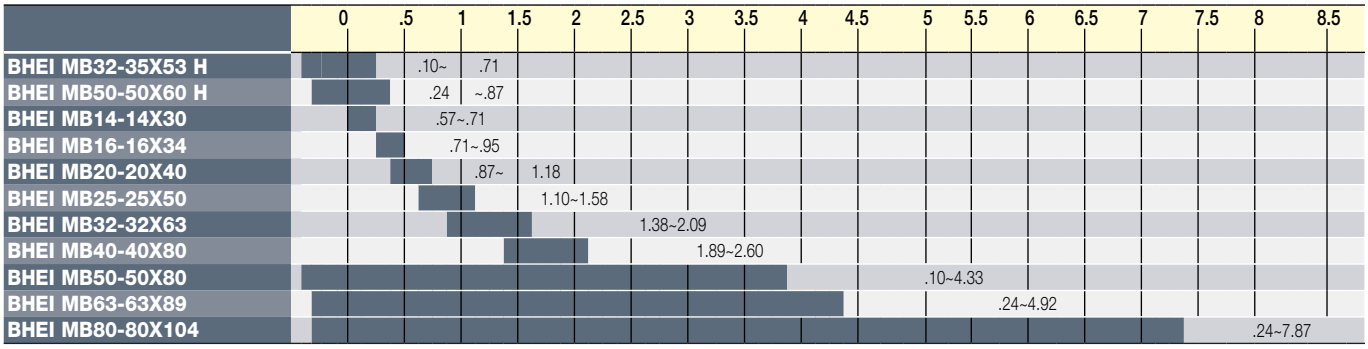
(3) Maximum RPM

For tools, see pages: IHAXF (505) • IHAXF-AVI (507) • IHAXF-E (507) • IHFF (509) • IHRF (509) • IHRF-BW (513) • IHRF-CH (514) • IHWF (510)

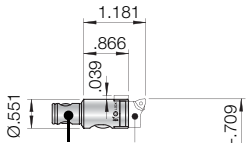
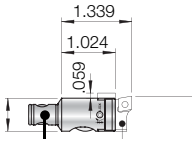
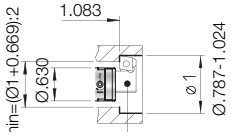
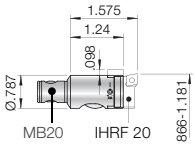
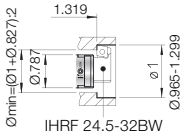
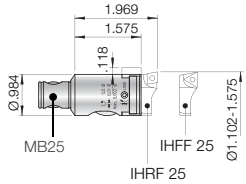
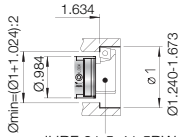
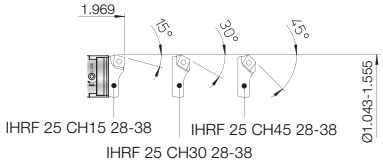
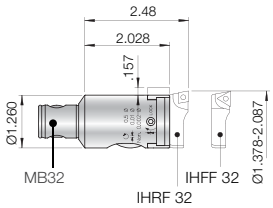
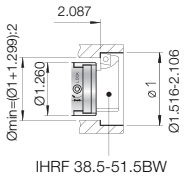
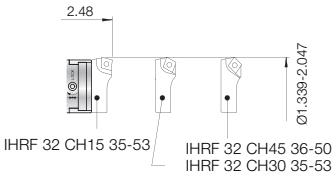
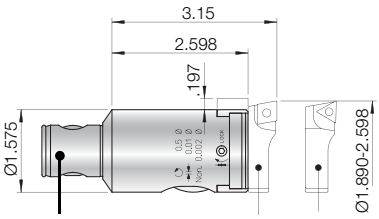
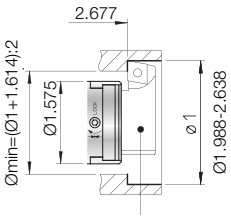
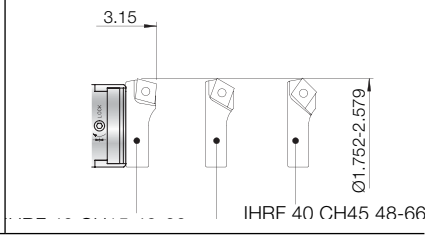
BHEI MB...

Graduated dial of .0004″ with circular vernier of .00008″

Diameter Range for BHEI MB



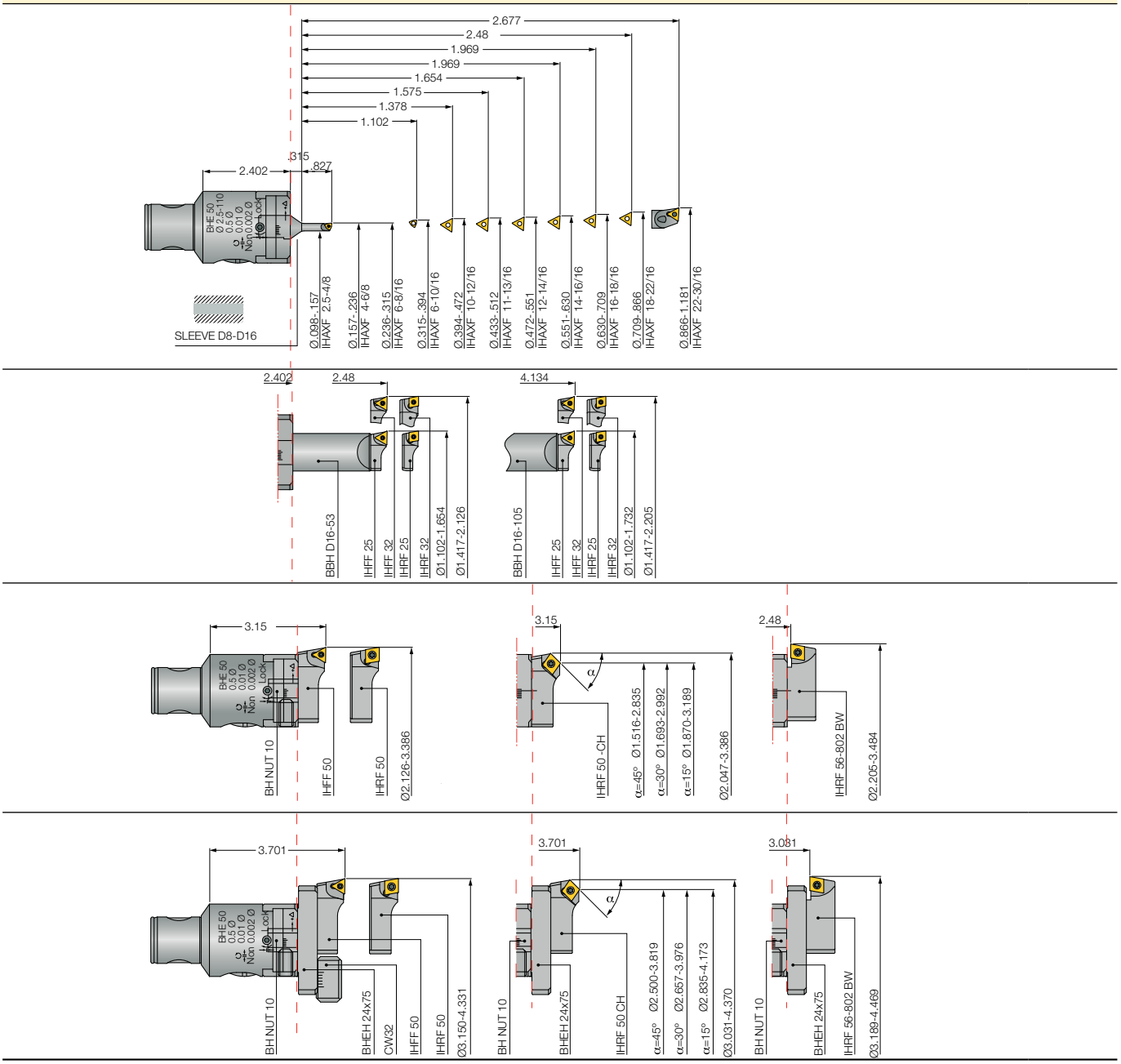
BHEI MB - Additional Information

BHEI MB14-14-30 **Ø.571 ~ .709**			
BHEI MB16-16-34 **Ø.709 ~ .945**			
BHEI MB20-20-40 **Ø.866 ~ 1.181**			
BHEI MB25-25-50 **Ø1.102 ~ 1.575**			
BHEI MB32-32-63 **Ø1.378 ~ 2.087**			
BHEI MB40-40-80 **Ø1.890 ~ 2.598**			

BHEI MB - Additional Information

BHEI MB50-50-80 ø.098-4.469

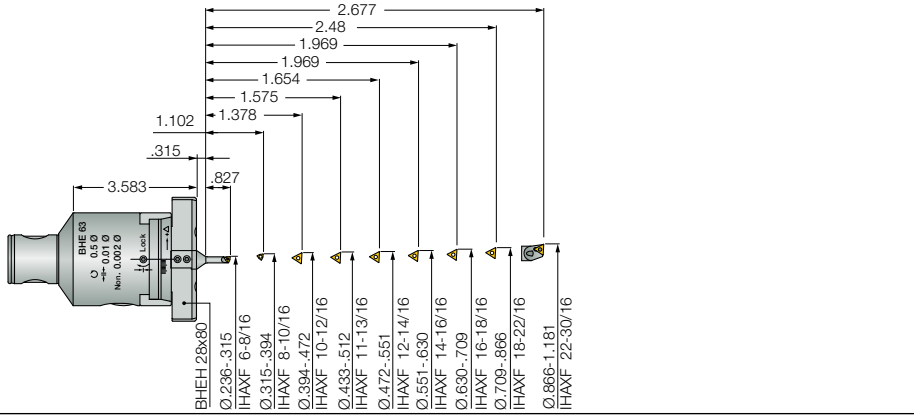
400 µinch
80 µinch

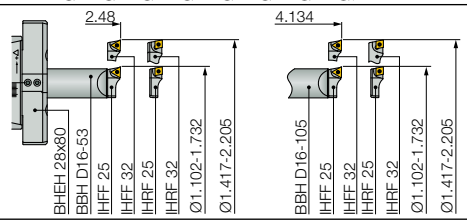


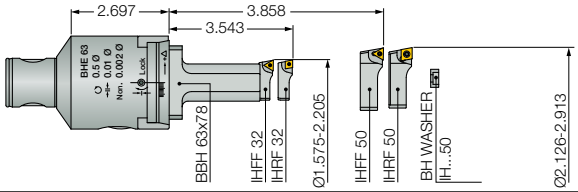
Fine Boring Head Range

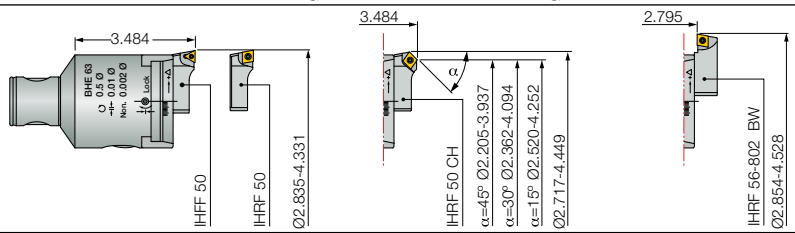
BHEI MB63-63-89 ø.236-5.098

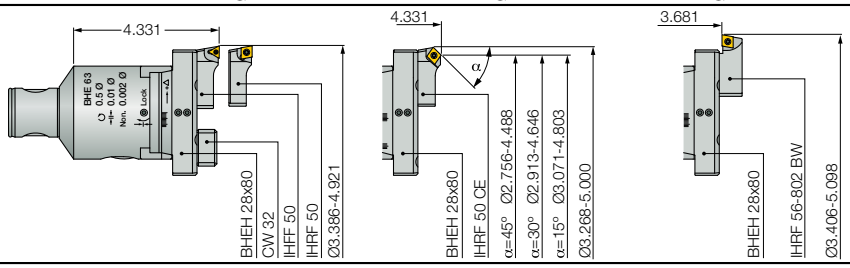
400 µinch
80 µinch







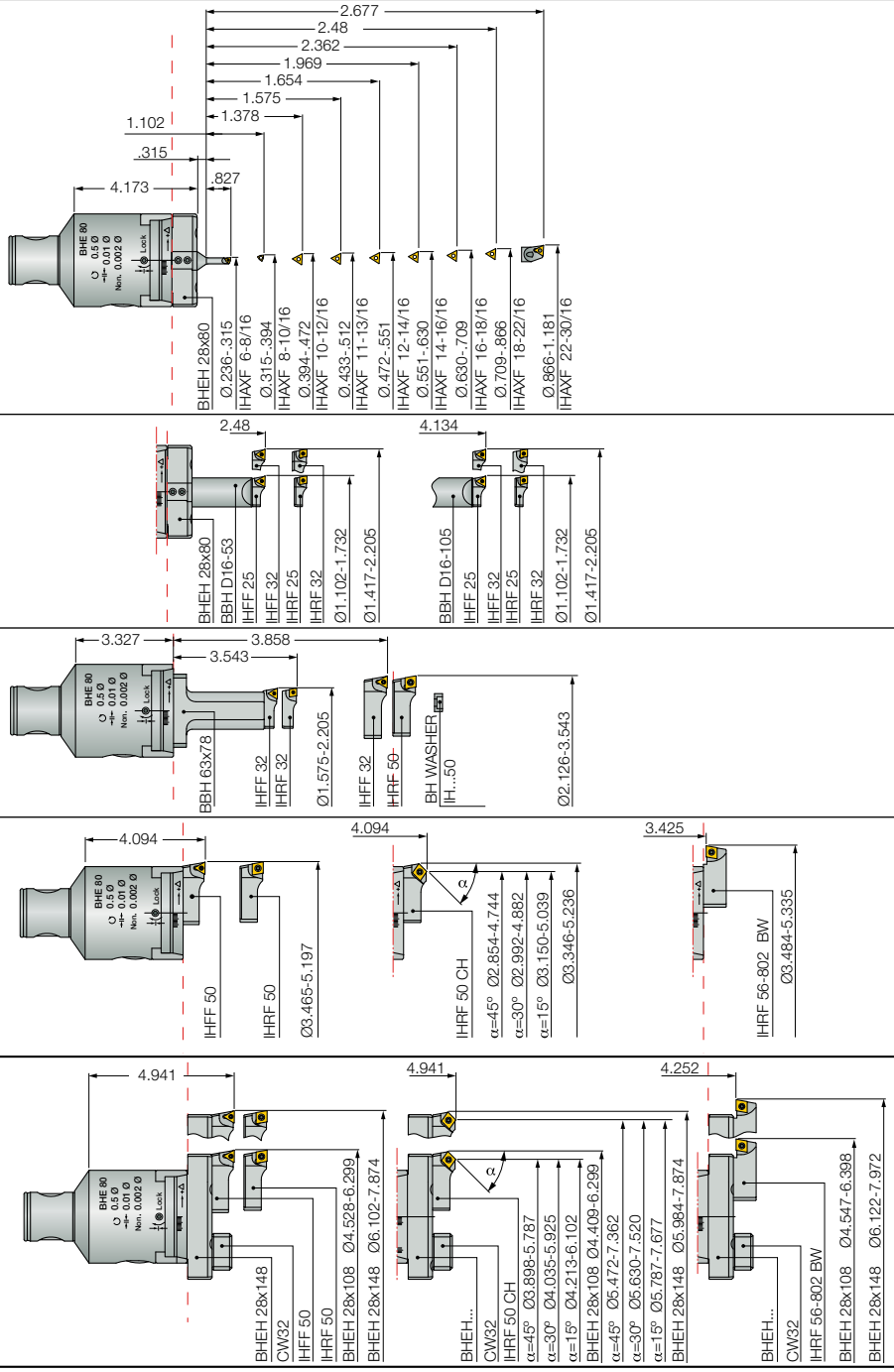




Fine Boring Head Range

BHEI MB80-80-104 ø.236-7.972

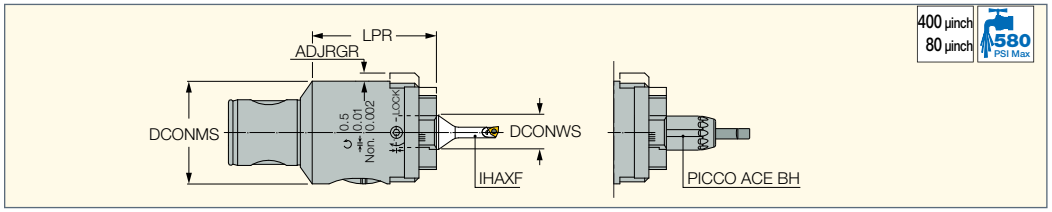
400 µinch
80 µinch



ITSBORE

BHEI-MB-H

Fine Boring Heads for High Rotation Speed with .0004" Direct Dia. Adjustment and .00008" by a Vernier Scale



Designation	DCONMS	LPR	DCN(1)	DCX(2)	DCONWS	ADJRGR	RPMX(3)	Lbs
BHEI MB32-32-53 H	1.260	2.087	.098	.472	.315	.1180	12000	.87
BHEI MB50-50-60 H	1.969	2.362	.236	.866	.630	.1570	12000	2.24

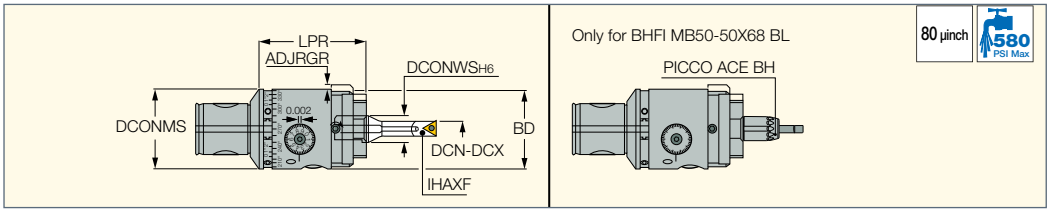
(1) Cutting diameter minimum
(2) Cutting diameter maximum
(3) Maximum RPM

For tools, see pages: IHAXF (505) • IHAXF-AVI (507) • IHAXF-E (507)

ITSBORE

BHFI MB-BL

Fine Boring Heads with a Balancing Mechanism and .00008" Direct Diametric Adjustment



Designation	DCONMS	BD	LPR	DCN(1)	DCX(2)	DCONWS	ADJRGR	RPMX(3)	Lbs
BHFI MB50-50X68 BL	1.969	1.969	2.700	.236	.866	.630	.157	8000	2.52

(1) Cutting diameter minimum
(2) Cutting diameter maximum
(3) Maximum RPM

For tools, see pages: IHAXF (505)

BHFI MB50-50X68 BL, with the simple positioning of the two counterweights into the graduated groove.
The table below displays all tools available for the working range of .098-.787″ diameters.

Balancing Data for Various BHFI...MB...BL Boring Combinations

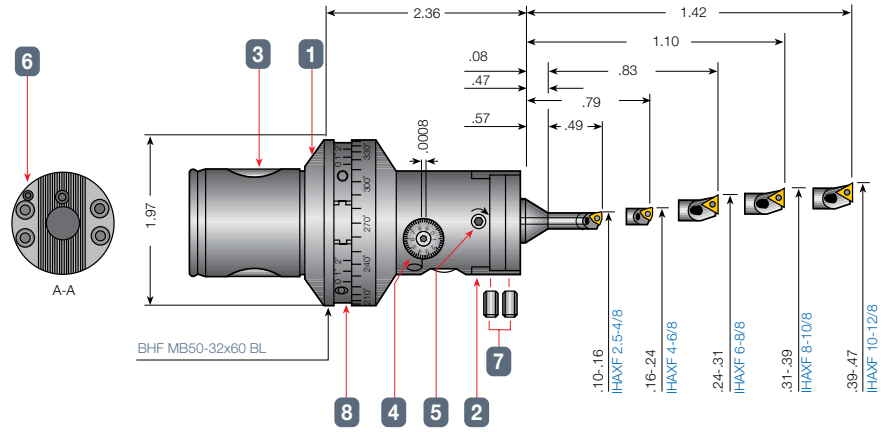
Balance Correction for BHFI MB50-50x68 BL

TOOLS	Ø BORE	SKB 40-MB50		BTB 40 MB50		HSK 63 MB50	
		W1	W2	W1	W2	W1	W2
IHAXF 6- 8/16	.2362	43°	315°	46°	346°	46°	346°
	.2559	63°	326°	44°	326°	59°	336°
	.2756	82°	305°	67°	304°	93°	323°
	.2953	30°	205°	62°	255°	5.5°	163°
	.3150	124°	242°	126°	258°	92°	219°
IHAXF 8-10/16	.3150	42°	312°	36°	336°	48°	348°
	.3346	52°	328°	39°	339°	75°	330°
	.3543	68°	318°	51°	317°	112°	331°
	.3740	104°	283°	73°	268°	56°	212°
	.3937	110°	270°	15°	200°	113°	222°
IHAXF 10-12/16	.3937	35°	336°	30°	330°	44°	344°
	.4134	44°	321°	32°	332°	45°	345°
	.4331	56°	307°	35°	312°	71°	325°
	.4528	153°	328°	21°	223°	327°	121°
	.4724	139°	297°	171°	333°	84°	234°
IHAXF 12-14/16	.4724	30°	330°	26°	326°	40°	340°
	.4921	32°	332°	28°	328°	48°	334°
	.5118	64°	281°	40°	280°	80°	304°
	.5315	38°	236°	42°	261°	38°	208°
	.5512	138°	253°	177°	300°	114°	236°
IHAXF 14-16/16	.5512	22°	324°	18°	318°	39°	339°
	.5709	30°	330°	16°	316°	57°	357°
	.5906	37°	257°	22°	266°	54°	302°
	.6102	184°	340°	35°	270°	130°	297°
	.6299	160°	253°	172°	277°	138°	251°
IHAXF 16-18/16	.6299	26°	326°	24°	324°	58°	358°
	.6496	36°	303°	14°	313°	37°	319°
	.6693	37°	276°	27°	292°	56°	272°
	.6890	151°	287°	187°	324°	128°	288°
	.7087	160°	279°	189°	304°	140°	243°
IHAXF 18-22/16	.7087	10°	310°	6°	305°	28°	328°
	.7283	29°	328°	0°	300°	17°	313°
	.7480	200°	317°	230°	332°	26°	259°
	.7677	190°	295°	208°	307°	169°	303°
	.7874	180°	242°	188°	249°	174°	234°
	.8071	179°	240°	186°	247°	168°	228°
	.8268	176°	236°	174°	236°	169°	229°
	.8465	190°	252°	141°	202°	170°	230°
	.8661	180°	240°	170°	230°	176°	236°

Fine Boring Heads With Balancing Rings

BHFI MB50-32x60 BL ø.10-.47

80 µinch

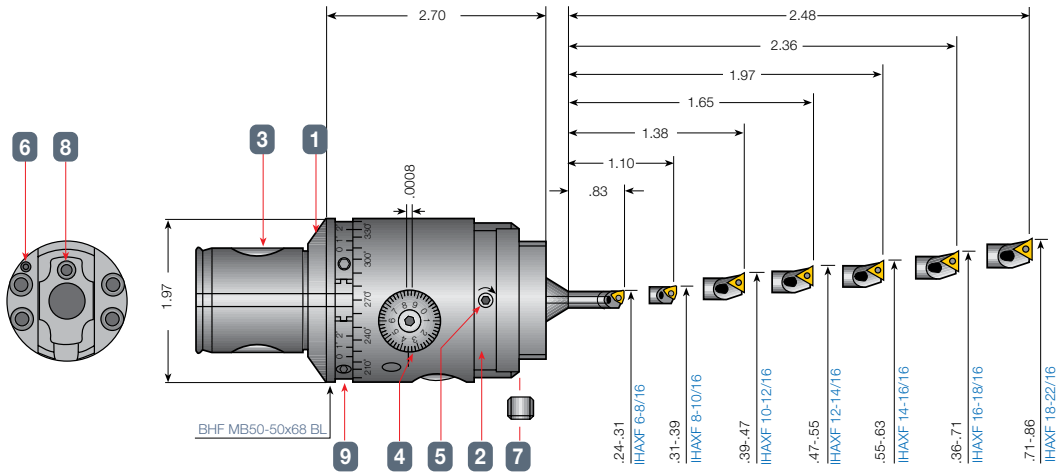


1. Body
2. Tool Slide
3. Expanding Pin
4. Graduated Dial
5. Slide Locking Screw
6. Coolant Nozzle
7. Boring Bar Locking Screws
8. Balancing Rings

See page 560

BHFI MB50-50x68 BL ø.24-.87

80 µinch



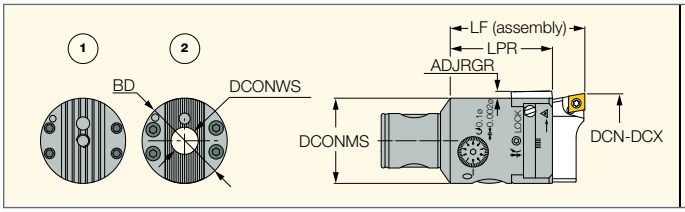
1. Body
2. Tool Slide
3. Expanding Pin
4. Graduated Dial
5. Slide Locking Screw
6. Coolant Nozzle
7. Boring Bar Locking Screws
8. Oiling Nipple
9. Balancing Rings

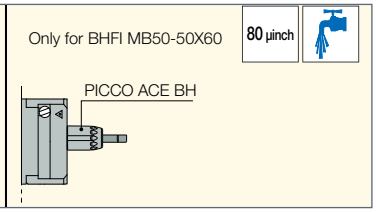
See page 560

ITSBORE

BHFI MB16-MB50

Fine Boring Heads with .00008"
Direct Diametric Adjustment





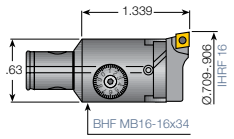
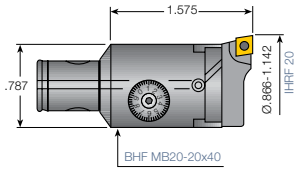
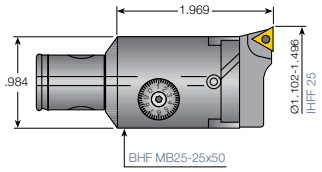
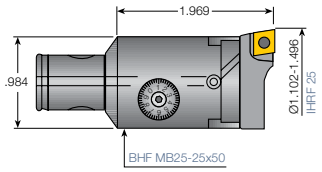
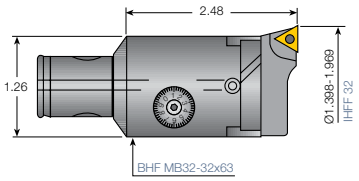
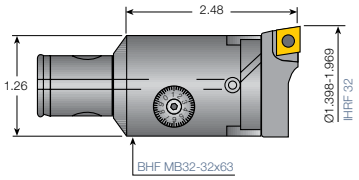
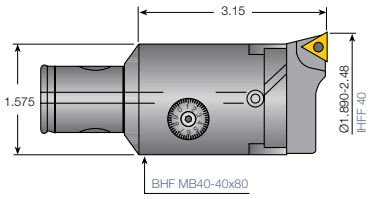
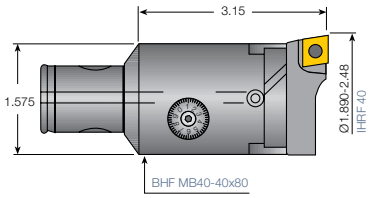
Designation	DCONMS	BD	LF	DCN(1)	DCX(2)	LPR	ADJRGR	DCONWS	Fig.	IH	RPMX(3)	Lbs
BHFI MB16-16X34 RV	.630	.630	1.339	.709	.906	1.024	.040	-	1.	IH.. 16..	12000	.27
BHFI MB20-20X40 RV	.787	.787	1.575	.866	1.142	1.240	.080	-	1.	IH.. 20..	12000	.30
BHFI MB25-25X50	.984	.984	1.968	1.102	1.496	1.575	.080	-	1.	IH.. 25..	10000	.55
BHFI MB32-32X63	1.260	1.260	2.480	1.398	1.968	2.078	.120	-	1.	IH.. 32..	10000	.88
BHFI MB40-40X80	1.575	1.575	3.150	1.890	2.480	2.600	.160	-	1.	IH.. 40..	8000	1.86
BHFI MB50-50X60	1.969	1.969	3.110	.236	4.252	2.362	.160	.630	2.	IH.. 50..	8000	2.77

- For user guide, see pages 549-566
- For spare parts, see page 544

(1) Cutting diameter minimum
(2) Cutting diameter maximum
(3) Maximum RPM

For tools, see pages: IHAXF (505) • IHAXF-AVI (507) • IHAXF-E (507) • IHFF (509) • IHRF (509) • IHRF-BW (513) • IHRF-CH (514)

BHFI Fine Boring Heads high precision machining to a close tolerance with high surface quality.
These heads enable a fine diametric adjustment as small as 80 µinch with a direct reading.

BHFI MB16-MB40 Diameter Range: .709-2.48	
Ø.709-.906 BHFI MB16-16X34 RV	
Ø.866-1.142 BHFI MB20-20X40 RV	
Ø1.102-1.496 BHFI MB25-25x50	 
BHFI MB16-MB40 Diameter Range: .709-2.48	
Ø1.398-1.969 BHFI MB32-32x63	 
Ø1.890-2.48 BHFI MB40-40x80	 

Fine Boring Head Diameter Range .10-35.40″

	0 .5 1 1.5 2 2.5 3 3.5 4 4.5 5 5.5 6 6.5 7 7.5 8 20	Assembly Reference Page
BHFI MB50-32X60 BL	.10-.47	495
BHFI MB50-50X68 BL	.24-.87	495
BHFI MB16-16x34	.71-.91	497
BHFI MB20-20x40	.87-1.14	495
BHFI MB25-25x50	1.10-1.50	495
BHFI MB32-32x63	1.40-1.97	495
BHFI MB40-40x80	1.89-2.48	495
BHFI MB50-50x60	.16-4.25	495
BHFI MB50-63x87	.10-6.30	501
BHFI MB63-63x87	.10-6.30	501
BHFI MB50-80x94	.10-8.66	501
BHFI MB80-80x94		501
BHFI MB80-125x114	1.42-19.69	501
	6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42	
TCH AL200	7.87-11.81	511
TCH AL300	11.81-15.75	511
TCH AL400	15.75-19.69	511
TCH AL500	19.69-23.62	511
TCH AL600	23.62-27.56	511
TCH AL700	27.56-31.50	511
TCH AL800	31.50-35.40	511

Note: TCH AL should be used with BHFI L8.000 or with BHD 50 L200 for fine boring applications.

BHFI Fine Boring Heads

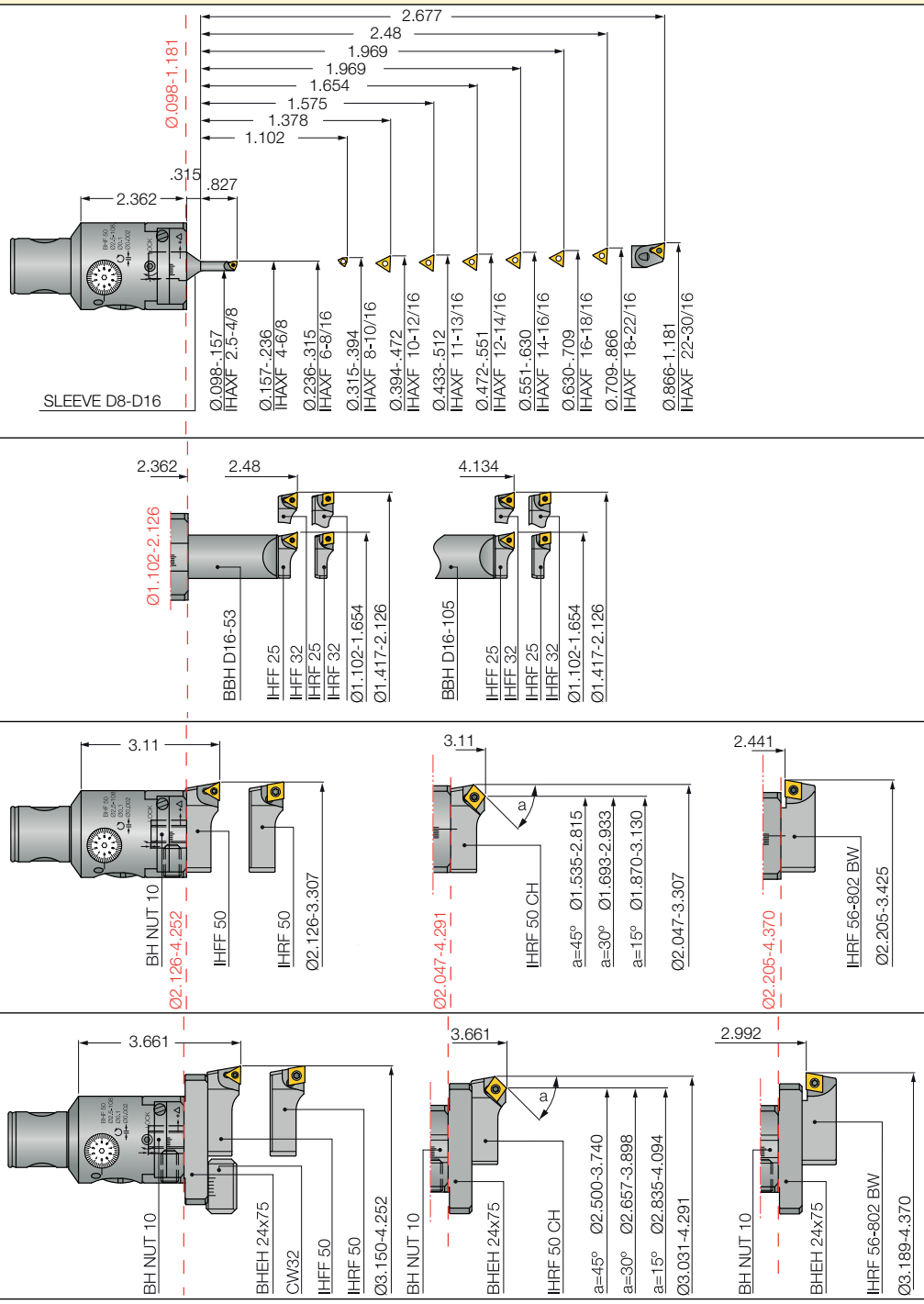
High precision machining to a close tolerance with high surface quality.
These heads enable a fine diametric adjustment as small as **.00008”** with a direct reading.

Fine Boring Head Range

80 µinch Direct Diametric Adjustment

BHFI MB50-50x60 ø.098-4.252

80 µinch



See page 560

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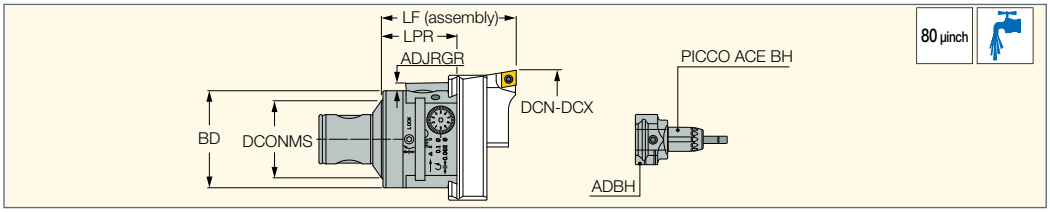
BHFI MB50-MB80

Fine Boring Heads with .00008"
Direct Diametric Adjustment



Designation	DCONMS	BD	LF	DCN(4)	DCX(5)	LPR	ADJRGR	RPMX(6)	Lbs
BHFI MB50-63X87 (1)	1.969	2.480	3.425	.098	4.921	1.929	.200	8000	3.00
BHFI MB50-80X94 (2)	1.969	3.150	3.700	.098	6.299	2.283	.200	8000	4.90
BHFI MB63-63X87 (1)	2.480	2.480	3.425	.098	4.921	1.929	.200	6000	3.67
BHFI MB80-80X94 (2)	3.150	3.150	3.700	.098	6.299	2.283	.200	5000	6.06
BHFI MB80-125X114 (3)	3.150	4.921	4.488	1.417	19.685	2.480	.200	4000	12.91

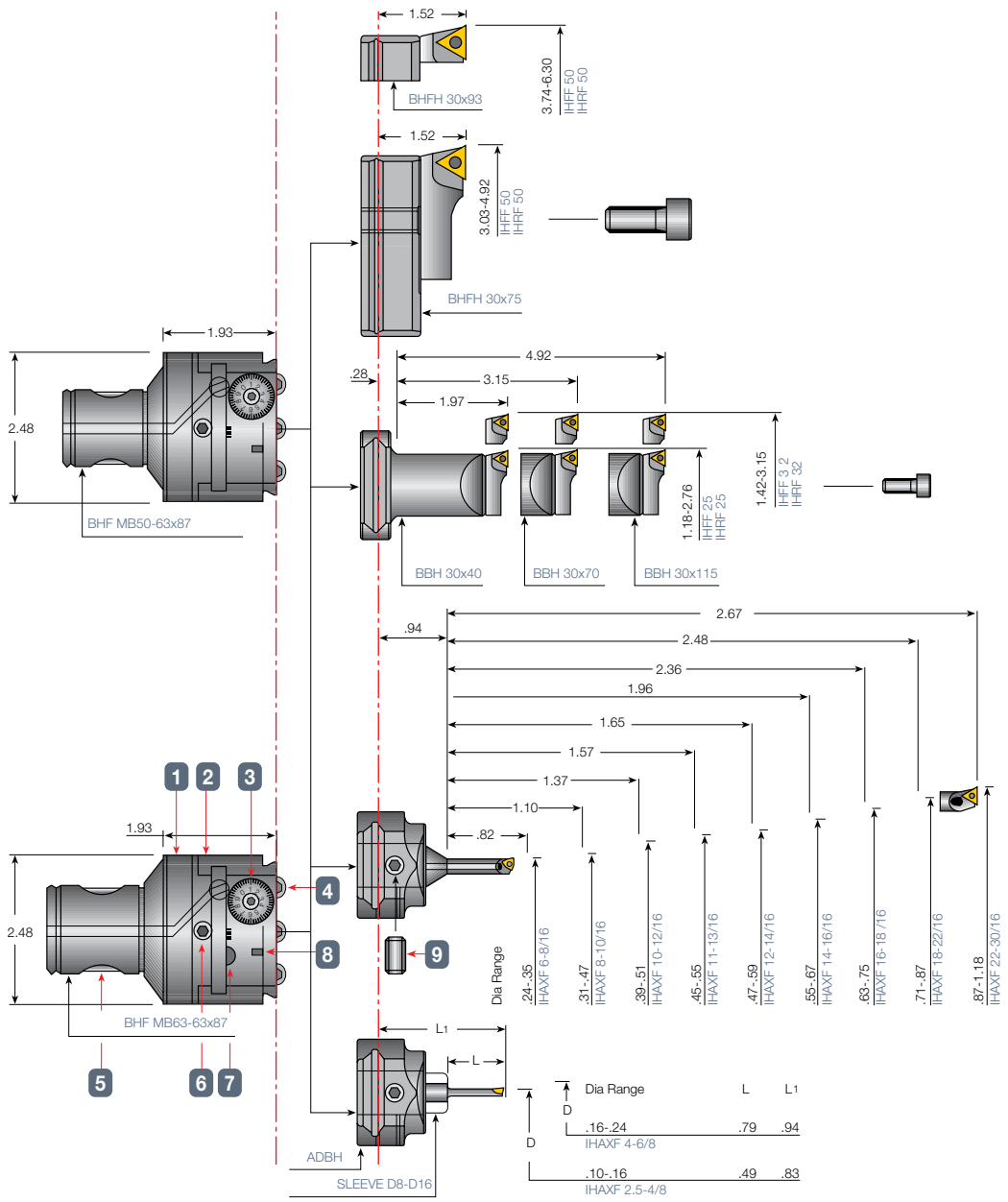
(1) Use with slide BHFH 30X75 or BHFH 30X93.
(2) Use with slide BHFH 30X93 or BHFH 30X135.
(3) Use with slide BHFH 40X...
(4) Cutting diameter minimum
(5) Cutting diameter maximum
(6) Maximum RPM

Fine Boring Head Range

80 µinch Direct Diametric Adjustment

BHFI MB50-63x60 Ø.098-6.299
BHFI MB63-63x87 Ø.098-6.299

80 µinch



1. Body
2. Tool Slide
3. Graduated Dial
4. Toolholder Locking Screw
5. Expanding Pin
6. Slide Locking Screw
7. Coolant Nozzle
8. Oiling Nipple
9. Toolholder Locking Screw

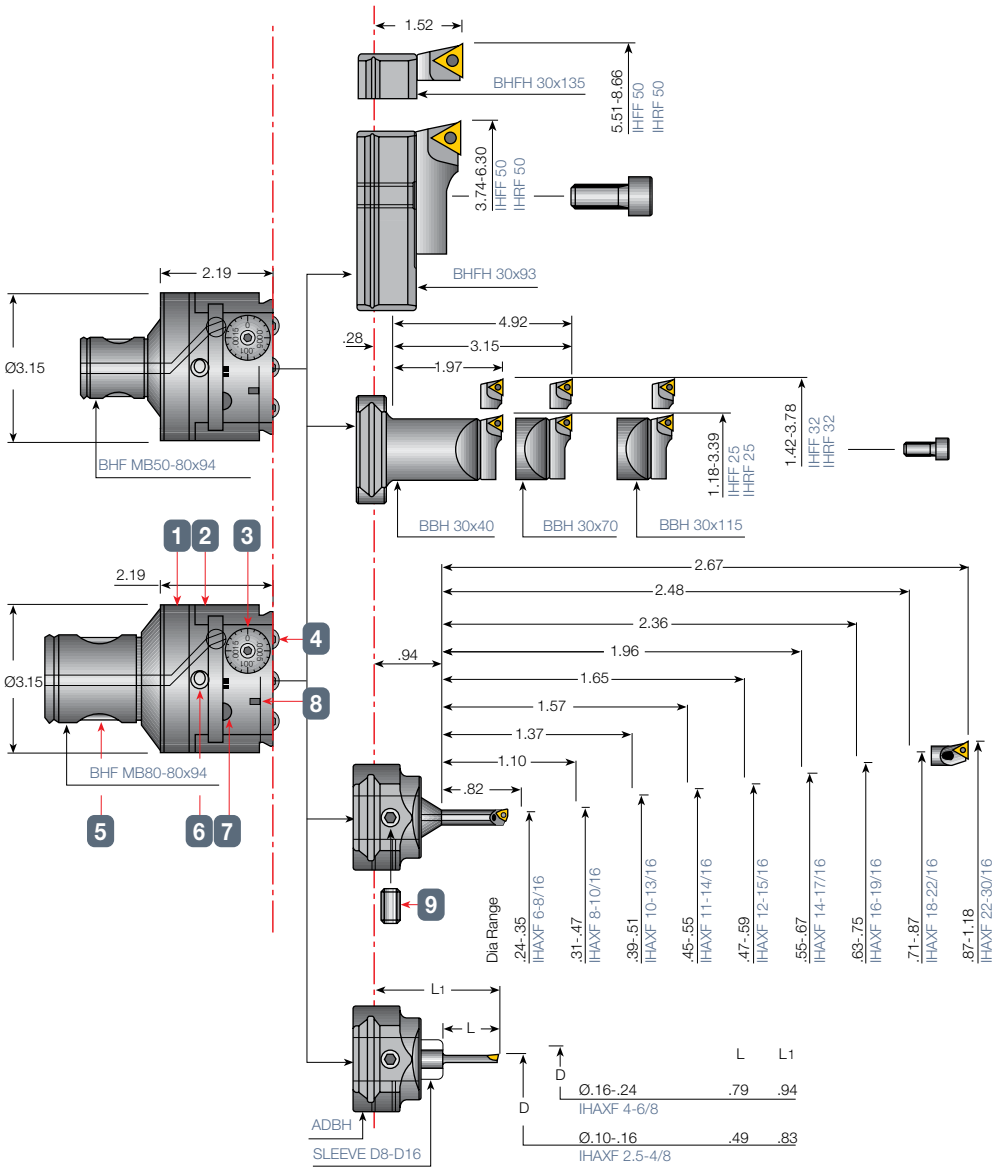
See pages 560-561

Fine Boring Head Range

80 µinch Direct Diametric Adjustment

BHFI MB50-80x94 Ø.10-8.66
BHFI MB80-80x94 Ø.10-8.66

80 µinch



1. Body
2. Tool Slide
3. Graduated Dial
4. Toolholder Locking Screw
5. Expanding Pin
6. Slide Locking Screw
7. Coolant Nozzle
8. Oiling Nipple
9. Toolholder Locking Screw

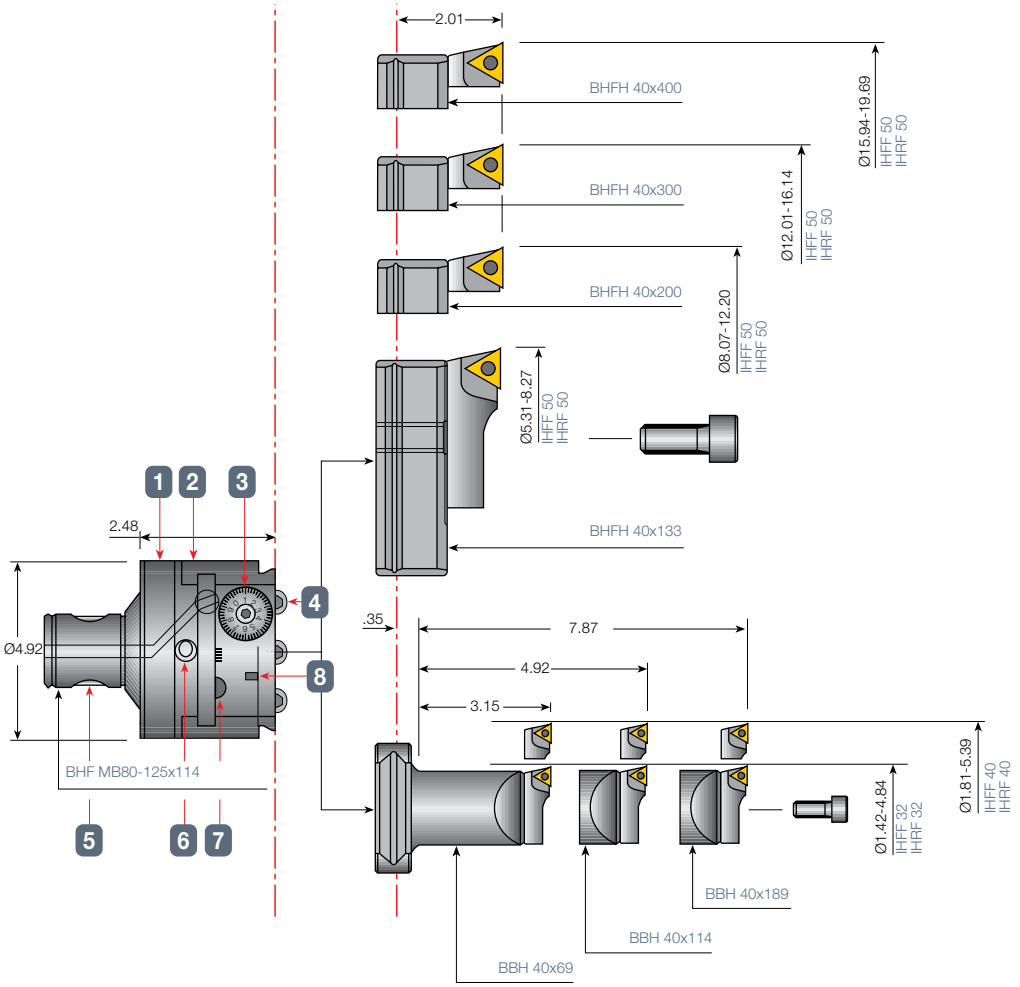
See pages 560-561

Fine Boring Head Range

80 µinch Direct Diametric Adjustment

BHFI MB80-125x114 Ø1.42-19.69

80 µinch



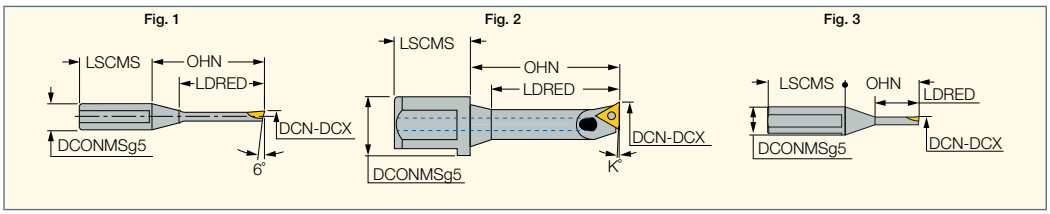
1. Body
2. Tool Slide
3. Graduated Dial
4. Toolholder Locking Screw
5. Expanding Pin
6. Slide Locking Screw
7. Coolant Nozzle
8. Oiling Nipple

See page 561

ITSBORE

IHAXF

Brazed and Indexable Boring Bars for the MB Modular Boring System



Designation	DCN(2)	DCX(3)	LDRED	OHN(4)	LSCMS	DCONMS(5)	Fig.	KAPR(6)	Insert	CSP(7)		
IHAXF 2.5-4/8 (1)	.098	.157	.492	.827	.866	.315	1.	3.0	SOLID	0		
IHAXF 4- 6/8 (1)	.157	.236	.787	.945	.945	.315	1.	3.0	SOLID	0		
IHAXF 6- 8/16	.236	.315	.827	1.142	.866	.630	2.	3.0	WCGT 0201...	1	SR 14-299	T-6/5
IHAXF 6- 8/8	.236	.315	.827	.906	.630	.315	3.	5.0	WCGT 0201...	1	SR 14-299	T-6/5
IHAXF 8-10/16	.315	.394	1.102	1.417	.866	.630	2.	3.0	WCGT 0201...	1	SR 14-299	T-6/5
IHAXF 8-10/8	.315	.394	-	1.102	.630	.315	3.	5.0	WCGT 0201...	1	SR 14-299	T-6/5
IHAXF 10-12/16	.394	.472	1.378	1.693	.866	.630	2.	3.0	TPGX 73...	1	SR 14-298	T-8/5
IHAXF 10-12/8	.394	.472	-	1.417	.630	.315	3.	5.0	TPGX 73...	1	SR 14-298	T-8/5
IHAXF 11-13/16	.433	.512	1.575	1.890	.866	.630	2.	3.0	TPGX 73...	1	SR 14-298	T-8/5
IHAXF 12-14/16	.472	.551	1.654	1.890	.866	.630	2.	3.0	TPGX 73...	1	SR 14-298	T-8/5
IHAXF 12-14/8	.472	.551	-	1.654	.551	.315	3.	3.0	TPGX 73...	1	SR 14-298	T-8/5
IHAXF 14-16/16	.551	.630	1.968	2.047	.866	.630	2.	3.0	TPGX 73...	1	SR 14-298	T-8/5
IHAXF 14-16/8	.551	.630	-	1.890	.551	.315	3.	3.0	TPGX 73...	1	SR 14-298	T-8/5
IHAXF 16-18/16	.630	.709	1.968	2.283	.866	.630	2.	3.0	TPGX 73...	1	SR 14-298	T-8/5
IHAXF 16-18/8	.630	.709	-	2.126	.551	.315	3.	3.0	TPGX 73...	1	SR 14-298	T-8/5
IHAXF 18-22/16	.709	.866	-	2.480	.866	.630	2.	3.0	TPGX 73...	1	SR 14-298	T-8/5
IHAXF 22-30/16	.866	1.181	-	2.677	.866	.630	2.	3.0	TPGX 73...	1	SR 14-298	T-8/5

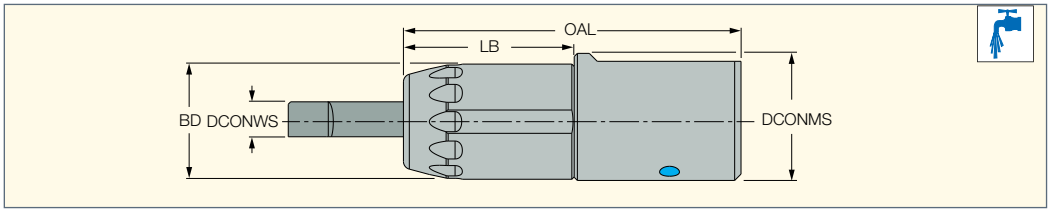
(1) Brazed tool
(2) Cutting diameter minimum
(3) Cutting diameter maximum
(4) Minimum overhang
(5) For DCONMS=.315" , .630" O.D. sleeves should be used
(6) Tool cutting edge angle
(7) 0 - Without coolant supply, 1 - With coolant supply

For inserts, see pages: TPGX (537) • TPGX (CBN) (537) • TPGX (PCD) (537) • WCGT (536)
For holders, see pages: ADBH (509) • BHD MB (484) • BHEI MB (489) • BHEI-MB-H (494) • BHFI MB-BL (495) • BHFI MB16-MB50 (497) • SLEEVE (507)

PICCOACE ITSBORE

PICCO ACE-BH

Holders with Short Shanks for ITS BORE System Carrying PICCOCUT Inserts



M E T R I C

Designation	DCONMS	DCONWS	BD	OAL	LB	
PICCO ACE-BH 16-4	16.00	4.00	14.50	42.50	21.50	WRENCH ACE 4-5
PICCO ACE-BH 16-5	16.00	5.00	14.50	42.50	21.50	WRENCH ACE 4-5
PICCO ACE-BH 16-6	16.00	6.00	19.90	43.50	21.50	WRENCH ACE 6-7
PICCO ACE-BH 16-7	16.00	7.00	19.90	43.50	21.50	WRENCH ACE 6-7

- Holders are suitable for right- and left-hand PICCO inserts

The PICCO-ACE-BH Holders Can Carry a Wide Range of PICCOCUT Insert Geometries

PICCO 050

PICCO 050C

PICCO 051

PICCO 050 IB50 (CBN)

PICCO 520

PICCO 060

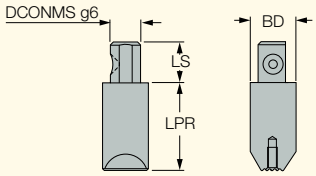
PICCO MF

PICCO 010

PICCO 020

ITSBORE

BBH D16
Extension Slides for MB
Modular Fine Boring Holders



Designation	DCONMS	LPR	BD	LS	Lbs
BBH D16-53	.630	2.087	.984	.846	1.10
BBH D16-105	.630	3.740	.984	.846	1.76

For tools, see pages: IHFF (509) • IHRF (509)

ITSBORE

SLEEVE
Reduction Sleeves for
Boring Bars on the MB
Modular Boring System

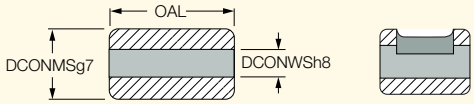


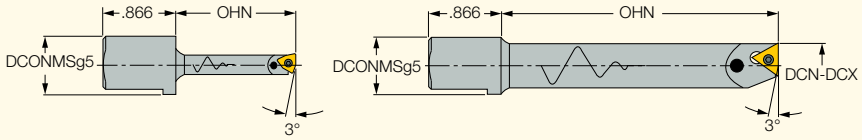
Fig.1 Fig.2

Designation	DCONMS	DCONWS	OAL	Fig.
SLEEVE D 8-D16	.630	.315	.906	2.

For tools, see pages: IHAXF (505)

ITSBORE

IHAXF-AVI
Heavy Metal Vibration
Damping Boring Bars

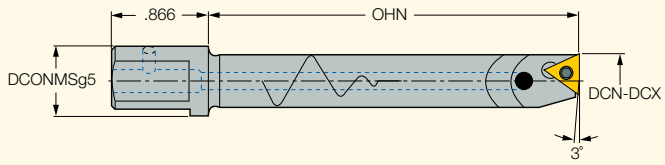


Designation	DCN(1)	DCX(2)	OHN(3)	DCONMS	Insert		
IHAXF 6- 8-AVI	.236	.315	1.417	.630	WCGT 0201...	SR 14-299	T-6/5
IHAXF 8-10-AVI	.315	.394	1.890	.630	WCGT 0201...	SR 14-299	T-6/5
IHAXF 10-12-AVI	.394	.472	2.362	.630	TPGX 73...	SR 14-298	T-8/5
IHAXF 12-14-AVI	.472	.551	2.835	.630	TPGX 73...	SR 14-298	T-8/5
IHAXF 14-16-AVI	.551	.630	3.307	.630	TPGX 73...	SR 14-298	T-8/5
IHAXF 16-18-AVI	.630	.709	3.780	.630	TPGX 73...	SR 14-298	T-8/5

• Note: Not recommended to be used on balanceable BHF-BL fine boring heads.
(1) Cutting diameter minimum
(2) Cutting diameter maximum
(3) Minimum overhang
For inserts, see pages: TPGX (537) • TPGX (CBN) (537) • WCGT (536)
For holders, see pages: ADBH (509) • BHD MB (484) • BHEI MB (489) • BHEI-MB-H (494) • BHFI MB16-MB50 (497)

ITSBORE

IHAXF-E
Carbide Vibration
Dampening Boring Bars



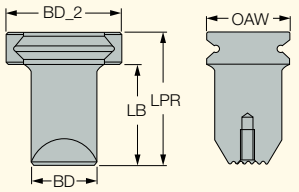
Designation	DCN(1)	DCX(2)	OHN(3)	DCONMS	Insert		
IHAXF 6- 8-E	.236	.315	1.772	.630	WCGT 0201...	SR 14-299	T-6/5
IHAXF 8-10-E	.315	.394	2.362	.630	WCGT 0201...	SR 14-299	T-6/5
IHAXF 10-12-E	.394	.472	2.953	.630	TPGX 73...	SR 14-298	T-8/5
IHAXF 12-14-E	.472	.551	3.543	.630	TPGX 73...	SR 14-298	T-8/5
IHAXF 14-16-E	.551	.630	4.134	.630	TPGX 73...	SR 14-298	T-8/5
IHAXF 16-18-E	.630	.709	4.724	.630	TPGX 73...	SR 14-298	T-8/5

• Note: Not recommended to be used on balanceable BHF-BL fine boring heads.
(1) Cutting diameter minimum
(2) Cutting diameter maximum
(3) Minimum overhang
For inserts, see pages: TPGX (537) • TPGX (CBN) (537) • WCGT (536)
For holders, see pages: ADBH (509) • BHD MB (484) • BHEI MB (489) • BHEI-MB-H (494) • BHFI MB16-MB50 (497)

ITSBORE

BBH 30/40

Extension Slides for MB Modular Fine Boring Holders



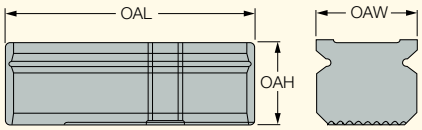
Designation	OAW	LB	BD	LPR	BD_2	Lbs
BBH 30X40	1.201	1.575	.984	2.067	1.693	.60
BBH 30X70	1.201	2.756	.984	3.248	1.693	.83
BBH 30X115	1.201	4.528	1.063	5.020	1.693	1.40
BBH 40X69	1.575	2.717	1.260	3.386	2.205	1.51
BBH 40X114	1.575	4.488	1.260	5.157	2.205	2.17
BBH 40X189	1.575	7.441	1.496	8.110	2.205	4.28

For tools, see pages: IHFF (509) • IHRF (509)

ITSBORE

BHFH

Counter Weight Slides for MB Modular Fine Boring Holders



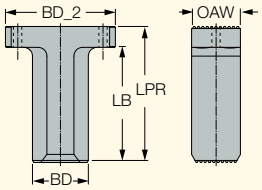
Designation	OAW	OAL	OAH	Lbs	
BHFH 30X75	1.201	2.953	.984	.97	SR M10X25 DIN912
BHFH 30X93	1.201	3.661	.984	1.20	SR M10X25 DIN912
BHFH 30X135	1.201	5.315	.984	1.66	SR M10X25 DIN912
BHFH 40X133	1.575	5.236	1.575	3.36	SR M10X25 DIN912
BHFH 40X200	1.575	7.874	1.575	5.07	SR M10X25 DIN912
BHFH 40X300	1.575	11.811	1.575	7.65	SR M10X25 DIN912
BHFH 40X400	1.575	15.748	1.575	10.05	SR M10X25 DIN912

For tools, see pages: IHFF (509) • IHRF (509) • IHRF-BW (513) • IHRF-CH (514)

ITSBORE

BBH 63

Extension Slides for MB Modular BHE Fine Boring Holders



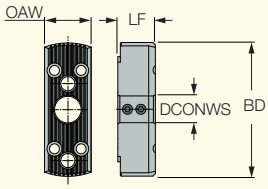
Designation	BD_2	LPR	BD	LB	OAW	Lbs
BBH 63X78	2.480	3.071	1.260	2.598	1.102	1.14

For tools, see pages: IHFF (509) • IHRF (509)

ITSBORE

BHEH

Slides for MB Modular BHE Fine Boring Holders



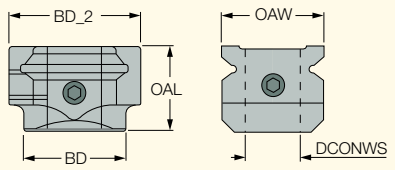
Designation	OAW	BD	LF	DCONWS	Lbs				
BHEH 24X75	.945	2.953	.571	-	.44				
BHEH 28X80	1.102	3.150	.886	.630	.74	SR M6X6 DIN913*	SR M5X25DIN912*	HW 4.0*	HW 3.0*
BHEH 28X108	1.102	4.252	.886	-	1.16				
BHEH 28X148	1.102	5.827	.886	-	1.53				

* Optional, to be ordered separately

For tools, see pages: IHFF (509) • IHRF (509) • IHRF-BW (513) • IHRF-CH (514)

ITSBORE

ADBH
Sleeve for MB Modular Fine Boring Holders

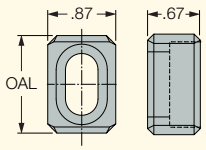


Designation	BD	DCONWS	OAL	BD_2	OAW	Lbs
ADBH 30XD16	1.181	.630	.984	1.535	1.201	.33

For tools, see pages: IHAXF (505) • IHAXF-AVI (507) • IHAXF-E (507)

ITSBORE

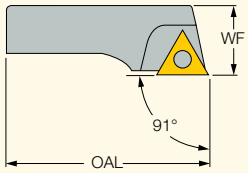
CW32
Counter Balancing Weight Used on BHEH Slide for Fine Boring Holders



Designation	OAL	Lbs
CW32	1.240	.12

ITSBORE

IHFF
Triangular Insert Holders for Mounting on MB Fine Boring Heads

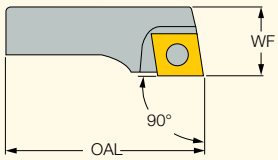


Designation	WF	OAL	DCN(1)	DCX(2)	Insert		
IHFF 25	.394	1.043	1.102	1.575	TPGX 73...	SR 14-298	T-8/5
IHFF 32	.453	1.358	1.378	2.087	TPGX 73...	SR 14-298	T-8/5
IHFF 40	.551	1.756	1.890	2.598	TPGX 22...	SR-17979 M3X8	T-8/5
IHFF 50	.748	2.047	2.126	3.386	TPGX 22...	SR-17979 M3X8	T-8/5

(1) Cutting diameter minimum
(2) Cutting diameter maximum
For inserts, see pages: TPGX (537) • TPGX (CBN) (537)
For holders, see pages: BBH 30/40 (508) • BBH 63 (508) • BBH D16 (507) • BHD 50 L200 (510) • BHD MB (484) • BHEH (508) • BHEI MB (489) • BHFH (508) • BHFI L8.000 (510) • BHFI MB16-MB50 (497)

ITSBORE

IHRF
80° Rhombic Insert Holders for Mounting on MB Fine Boring Heads

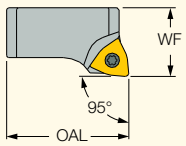


Designation	WF	OAL	DCN(1)	DCX(2)	Insert		
IHRF 16	.315	.669	.709	.945	CCGT 2...	SR 14-548	T-7/5
IHRF 20	.335	.827	.866	1.181	CCGT 2...	SR 14-548	T-7/5
IHRF 25	.394	1.043	1.102	1.575	CCGT 2...	SR 14-548	T-7/5
IHRF 32	.453	1.358	1.378	2.087	CCGT 2...	SR 14-548	T-7/5
IHRF 40	.551	1.732	1.890	2.598	CCGT 3...	SR 16-236	T-15/5
IHRF 50	.748	2.047	2.126	3.386	CCGT 3...	SR 16-236	T-15/5

(1) Cutting diameter minimum
(2) Cutting diameter maximum
For inserts, see pages: CCET-WF (532) • CCGT-AF (534) • CCGT-AS (534) • CCGW/CCMT (CBN) (533) • CCMT (PCD) (533) • CCMT-14 (531) • CCMT-PF (531) • CCMT-WG (532) • CCMT/CCGT (532) • CCMT/CCGT-SM (531)
For holders, see pages: BBH 30/40 (508) • BBH 63 (508) • BBH D16 (507) • BHD 50 L200 (510) • BHD MB (484) • BHEH (508) • BHEI MB (489) • BHFH (508) • BHFI L8.000 (510) • BHFI MB16-MB50 (497)

ITSBORE

IHWF
Trigon Insert Holders for Mounting on MB Fine Boring Heads

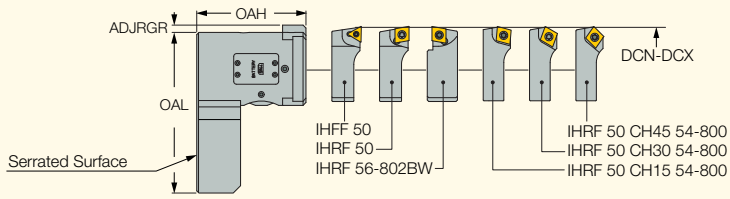


Designation	WF	OAL	DCN(1)	DCX(2)	Insert
IHWF 14 E	.315	.551	.571	.709	WCGT 0201...

(1) Cutting diameter minimum
(2) Cutting diameter maximum
For inserts, see pages: WCGT (536)
For holders, see pages: BHD MB (484) • BHEI MB (489)

ITSBORE

BHD 50 L200
Digital Fine Boring Slide Head for TCH AL Large Diameter Holders

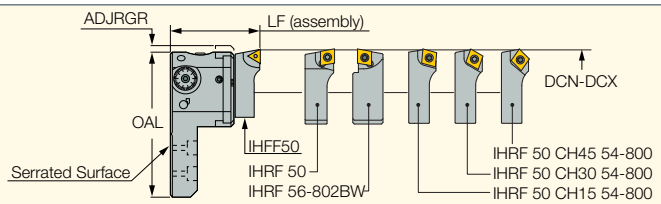


Designation	DCN(1)	DCX(2)	OAL	OAH	ADJRGR	RPMX(3)	Lbs
BHD 50 L200	7.874	47.323	4.331	2.91	.197	20000	3.75

(1) Cutting diameter minimum
(2) Cutting diameter maximum
(3) Maximum RPM
For tools, see pages: IHFF (509) • IHRF (509) • IHRF-BW (513) • IHRF-CH (514)

ITSBORE

BHFI L8.000
Fine Boring Slide Head Used on TCH AL Large Diameter Holders

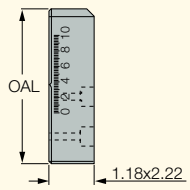


Designation	DCN(1)	DCX(2)	OAL	ADJRGR	LF	Lbs
BHFI L8.000"	8.000	47.323	4.330	.160	2.64	.22

(1) Cutting diameter minimum
(2) Cutting diameter maximum
For tools, see pages: IHFF (509) • IHRF (509) • IHRF-BW (513)

ITSBORE

CW200
Counter Balancing Weight for TCH AL Rough and Fine Boring Holders

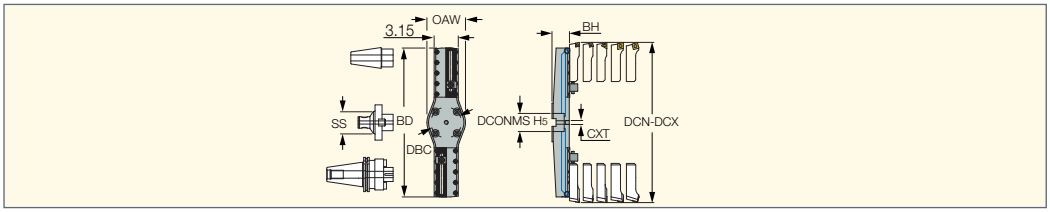


Designation	OAL	Lbs
CW200	4.134	2.46

ITSBORE

TCH AL

Aluminum Twin Cutter Heads for Rough and Fine Boring Operations, Diameter Range 7.87-47.24"



Designation	DCN(1)	DCX(2)	BD	DCONMS	DBC	SS	OAW	CXT	BH	CSP(3)	RPMX(4)	Lbs
TCH AL200	7.874	23.701	7.638	1.575	2.626	80	-	-	2.126	1	700	7.06
TCH AL300	11.811	27.638	11.339	1.575	2.626	80	-	-	2.126	1	400	8.60
TCH AL400	15.748	31.575	15.512	1.575	2.626	80	-	1/4GAS	2.402	0	300	15.21
TCH AL500	19.685	35.512	19.449	2.362	4.000	80,110	5.039	1/4GAS	2.717	0	200	19.18
TCH AL600	23.622	39.449	23.386	2.362	4.000	80,110	5.039	1/4GAS	2.795	0	200	18.39
TCH AL700	27.559	43.386	27.323	2.362	4.000	80,110	5.039	1/4GAS	2.913	0	200	18.39
TCH AL800	31.496	47.323	31.260	2.362	4.000	80,110	5.039	1/4GAS	3.150	0	150	33.52

• Aluminum body, with steel serrated seats • The "O" position on the counterweight balances the BHF boring head for .787" boring diameter position. For every .394" change in boring diameter, move the counterweight by 1 measurement mark • Verify that the weight of the entire tool assembly does not exceed the machine spindle's carrying capability • For spare parts, see pages 509-510, 547

(1) Cutting diameter minimum

(2) Cutting diameter maximum

(3) 0 - Without coolant supply, 1 - With coolant supply

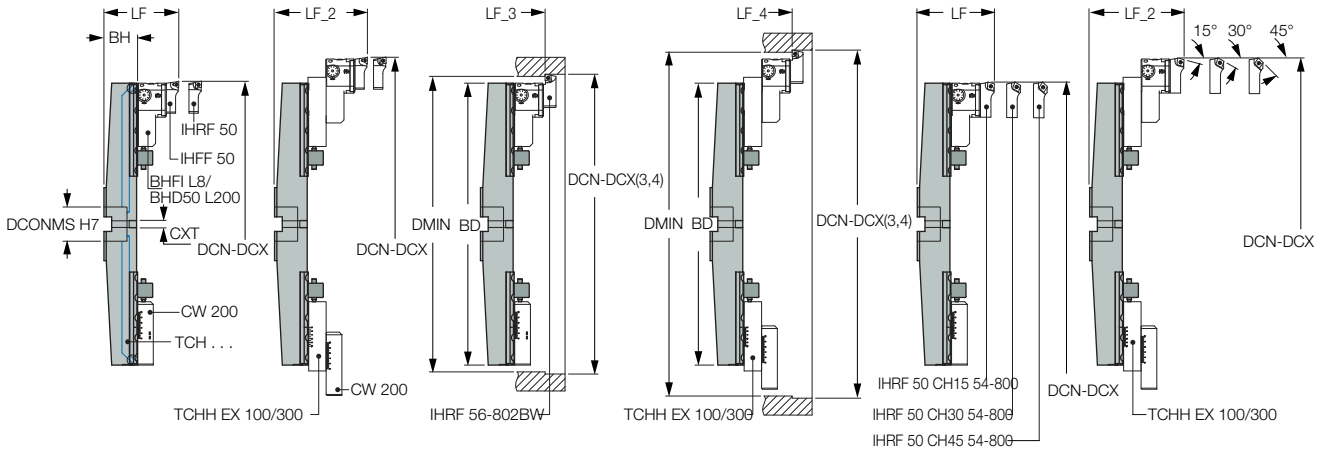
(4) Maximum RPM

For tools, see pages: IHBR (479) • IHCR (478) • IHPR (479) • IHSR (478) • IHSR-BW (480)

Spare Parts

Designation									
TCH AL200	BH TCH NUT A	BH TCH NUT B	BH TCH NUT C	SR M12X40DIN912	SR M12X35DIN912	SR M8X25DIN912			
TCH AL300		SR M8X40 DIN915	BH TCH NUT A	BH TCH NUT B	BH TCH NUT C	SR M12X40DIN912	SR M12X35DIN912	SR M8X25DIN912	
TCH AL400		SR M8X40 DIN915	BH TCH NUT A	BH TCH NUT B	BH TCH NUT C	SR M12X40DIN912	SR M12X35DIN912	BH SERRATED PLATE 400-700	SR M8X40 DIN915
TCH AL500		BH TCH NUT A	BH TCH NUT B	BH TCH NUT C	SR M12X40DIN912	SR M16X50 DIN912	SR M8X25DIN912	BH SERRATED PLATE 400-700	SR M8X40 DIN915
TCH AL600	BH SERRATED PLATE 400-700	SR M8X40 DIN915	BH TCH NUT A	BH TCH NUT B	BH TCH NUT C	SR M12X40DIN912	SR M16X50 DIN912	SR M8X25DIN912	SR M8X40 DIN915
TCH AL700	BH SERRATED PLATE 400-700	SR M8X40 DIN915	BH TCH NUT A	BH TCH NUT B	BH TCH NUT C	SR M12X40DIN912	SR M16X50 DIN912	SR M8X25DIN912	SR M8X40 DIN915
TCH AL800	BH SERRATED PLATE 400-700	SR M8X40 DIN915	BH TCH NUT A	BH TCH NUT B	BH TCH NUT C	SR M12X40DIN912	SR M16X50 DIN912	SR M8X25DIN912	SR M8X40 DIN915

Large Diameter Double Edge Fine Boring Options



				Aluminum Twin Cutter Heads						
Boring Tools	Fine boring slide head	Extension Slides	Dimensions	TCH 200	TCH 300	TCH 400	TCH 500	TCH 600	TCH 700	TCH 800
IH.F 50	BHFI L8/BHD50 L200		DCN-DCX	7.9 - 11.8	11.8 - 15.7	15.7 - 19.7	19.7 - 23.6	23.6 - 27.6	27.6 - 31.5	31.5 - 35.4
IH.F 50	BHFI L8/BHD50 L200	TCHH EX 100	DCN-DCX	11.8 - 15.7	15.7 - 19.7	19.7 - 23.6	23.6 - 27.6	27.6 - 31.5	31.5 - 35.4	35.4 - 39.4
IH.F 50	BHFI L8/BHD50 L200	TCHH EX 300	DCN-DCX	15.7 - 23.6	19.7 - 27.6	23.6 - 31.5	27.6 - 35.4	31.5 - 39.4	35.4 - 43.3	39.4 - 47.2
IHRF 56-802BW	BHFI L8/BHD50 L200		DCN-DCX(3,4)	8 - 11.9	11.9 - 15.8	15.8 - 19.8	19.8 - 23.7	23.7 - 27.6	27.6 - 31.6	31.6 - 35.5
IHRF 56-802BW	BHFI L8/BHD50 L200	TCHH EX 100	DCN-DCX(3,4)	11.9 - 15.8	15.8 - 19.8	19.8 - 23.7	23.7 - 27.6	27.6 - 31.6	31.6 - 35.5	35.5 - 39.4
IHRF 56-802BW	BHFI L8/BHD50 L200	TCHH EX 300	DCN-DCX(3,4)	15.8 - 23.7	19.8 - 27.6	23.7 - 31.6	27.6 - 35.5	31.6 - 39.4	35.5 - 43.4	39.4 - 47.3
IH.F 50	BHFI L8/BHD50 L200		LF	4.7	4.7	5.0	5.3	5.4	5.5	5.7
IH.F 50	BHFI L8	TCHH EX 100	LF_2	5.9	5.9	6.2	6.5	6.6	6.7	6.9
IH.F 50	BHD50 L200	TCHH EX 100	LF_2	7.0	7.0	7.2	7.6	7.6	7.8	8.0
IH.F 50	BHFI L8	TCHH EX 300	LF_2	6.3	6.3	6.6	6.9	7.0	7.1	7.3
IH.F 50	BHD50 L200	TCHH EX 300	LF_2	7.4	7.4	7.6	8.0	8.0	8.2	8.4
IHRF 56-802BW	BHFI L8		LF_3	4.1	4.1	4.3	4.6	4.7	4.8	5.1
IHRF 56-802BW	BHD50 L200		LF_3	5.1	5.1	5.4	5.7	5.8	5.9	6.1
IHRF 56-802BW	BHFI L8	TCHH EX 100	LF_4	5.2	5.2	5.5	5.8	5.9	6.0	6.3
IHRF 56-802BW	BHD50 L200	TCHH EX 100	LF_4	6.3	6.3	6.6	6.9	7.0	7.1	7.3
IHRF 56-802BW	BHFI L8	TCHH EX 300	LF_4	5.6	5.6	5.9	6.2	6.3	6.4	6.7
IHRF 56-802BW	BHD50 L200	TCHH EX 300	LF_4	6.7	6.7	7.0	7.3	7.4	7.5	7.7

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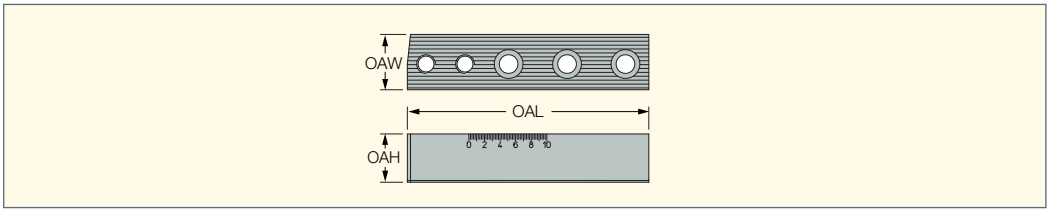
TCHH EX

Boring Tools Extension Slides
for TCH AL Boring Heads



Designation	OAH	OAW	OAL	Lbs
TCHH EX100	1.220	1.398	6.102	3.30
TCHH EX300	1.614	1.398	10.039	6.17

For tools, see pages: IHBR (479) • IHCR (478) • IHPR (479) • IHSR (478) • IHSR-BW (480)

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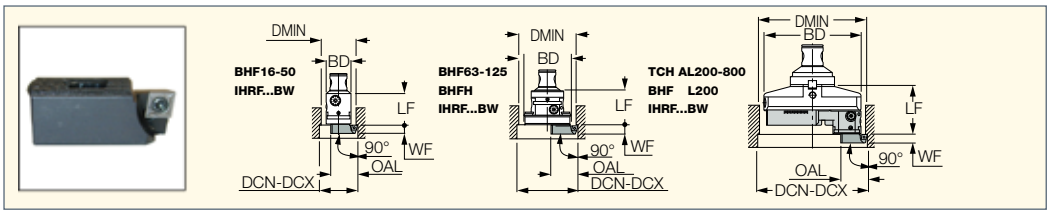
IHRF-BW

Back Face Turning Toolholders
for BHF and TCH AL
Fine Boring Heads



Designation	SS [1]	DCN	DCX	BD	LF	WF	OAL	Insert
IHRF 20-25BW	BHFI MB16-16X34	.79	.98	.63	1.08	.31	.71	CCMT 2..
IHRF 24.5-32BW	BHFI MB20-20X40	1.00	1.26	.79	1.32	.33	.89	CCMT 2..
IHRF 31.5-41.5BW	BHFI MB25-25X50	1.24	1.63	.98	1.63	.37	1.12	CCMT 2..
IHRF 38.5-51.5BW	BHFI MB32-32X63	1.52	2.03	1.26	2.09	.43	1.40	CCMT 2..
IHRF 50.5-65BW	BHFI40-40	1.99	2.56	1.57	2.68	.53	1.81	CCMT 3..
IHRF 56-802BW	BHFI50-50	2.20	3.42	1.97	2.44	.69	2.09	CCMT 3..
	BHFI63+BHFH30X75	3.23	4.01	2.95	2.76	.69	2.09	
	BHFI80+BHFH30X93	3.94	5.59	3.66	3.13	.69	2.09	
	BHFI125+BHFH40X133	5.51	8.35	5.31	3.86	.69	2.09	
	TCH AL200+BHFI L8.000	7.95	11.89	7.80	4.06	.69	2.09	
	TCH AL300+BHFI L8.000	11.89	15.83	11.73	4.06	.69	2.09	
	TCH AL400+BHFI L8.000	15.83	19.76	15.67	4.06	.69	2.09	
	TCH AL500+BHFI L8.000	19.76	23.70	19.45	4.25	.69	2.09	
	TCH AL600+BHFI L8.000	23.70	27.64	23.39	4.25	.69	2.09	
	TCH AL700+BHFI L8.000	27.64	31.57	27.32	4.25	.69	2.09	
	TCH AL800+BHFI L8.000	31.57	35.51	31.25	5.07	.69	2.09	

• DMIM=(min bore diameter)=(DCN+BD+1)/2 • BD=Size of the boring head being used

[1] Cutting diameter minimum

[2] Cutting diameter maximum

For inserts, see pages: CCGT-AS (534) • CCGW/CCMT (CBN) (533) • CCMT (PCD) (533) • CCMT-14 (531) • CCMT-PF (531) • CCMT-WG (532) • CCMT/CCGT (532) • CCMT/CCGT-SM (531)

For holders, see pages: BHD 50 L200 (510) • BHD MB (484) • BHEH (508) • BHEI MB (489) • BHFH (508) • BHFI L8.000 (510) • BHFI MB16-MB50 (497)

Spare Parts

Designation		
IHRF-BW	SR 16-236	T-15/5

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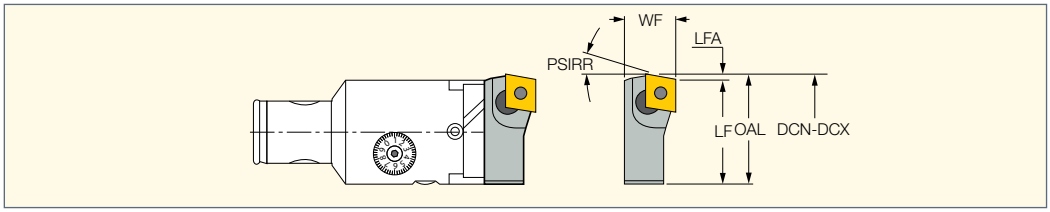
IHRF-CH

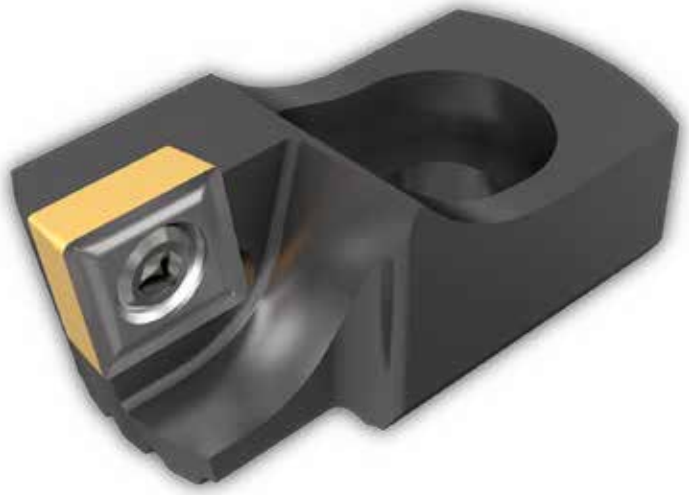
Chamfering Tools for
BHF Boring Heads



Designation	DCN(1)	DCX(2)	LF	OAL	WF	LFA	PSIRR	Insert
IHRF 16 CH20 18-23	.709	.906	.701	.787	.433	.087	20.0	CCGT 2...
IHRF 16 CH30 18-23	.709	.906	.661	.787	.354	.126	30.0	CCGT 2...
IHRF 16 CH45 18-23	.709	.906	.612	.791	.374	.181	45.0	CCGT 2...
IHRF 16 CH60 18-23	.709	.906	.571	.787	.374	.220	60.0	CCGT 2...
IHRF 20 CH15 22-29	.866	1.142	.878	.945	.433	.067	15.0	CCGT 2...
IHRF 20 CH20 22-29*	.866	1.142	.854	.945	.433	.087	20.0	CCGT 2...
IHRF 20 CH30 22-29	.866	1.142	.819	.945	.354	.126	30.0	CCGT 2...
IHRF 25 CH15 28-38	1.102	1.496	.945	1.012	.409	.067	15.0	CCGT 2...
IHRF 25 CH30 28-38	1.102	1.496	.890	1.008	.409	.126	30.0	CCGT 2...
IHRF 25 CH45 28-38	1.102	1.496	.843	1.020	.409	.173	45.0	CCGT 2...
IHRF 32 CH15 35-53	1.378	2.087	1.260	1.327	.496	.067	15.0	CCGT 2...
IHRF 32 CH30 35-53	1.378	2.087	1.201	1.327	.476	.126	30.0	CCGT 2...
IHRF 32 CH45 36-50	1.417	1.968	1.150	1.327	.476	.181	45.0	CCGT 2...
IHRF 32 CH60 36-50	1.417	1.968	1.154	1.370	.472	.220	60.0	CCGT 2...
IHRF 40 CH60 48-63	1.890	2.480	1.539	1.870	.650	.331	60.0	CCGT 3...
IHRF 40 CH15 48-66	1.890	2.598	1.768	1.866	.689	.098	15.0	CCGT 3...
IHRF 40 CH30 48-66	1.890	2.598	1.504	1.689	.567	.185	30.0	CCGT 3...
IHRF 40 CH45 48-66	1.890	2.598	1.433	1.693	.567	.264	45.0	CCGT 3...
IHRF 50 CH15 54-800	2.126	31.496	1.894	1.992	.748	.098	15.0	CCGT 3...
IHRF 50 CH20 54-800	2.126	31.496	2.055	2.185	.709	.130	20.0	CCGT 3...
IHRF 50 CH30 54-800	2.126	31.496	1.967	2.000	.748	.185	30.0	CCGT 3...
IHRF 50 CH45 54-800	2.126	31.496	1.732	1.992	.748	.264	45.0	CCGT 3...
IHRF 50 CH60 54-800	2.126	31.496	1.854	2.185	.650	.331	60.0	CCGT 3...

(1) Cutting diameter minimum
(2) Cutting diameter maximum

For inserts, see pages: CCGT-AS (534) • CCGW/CCMT (CBN) (533) • CCMT (PCD) (533) • CCMT-14 (531) • CCMT-PF (531) • CCMT-WG (532) • CCMT/CCGT (532) • CCMT/CCGT-SM (531)
For holders, see pages: BHD 50 L200 (510) • BHD MB (484) • BHEH (508) • BHEI MB (489) • BHFH (508) • BHFI MB16-MB50 (497)



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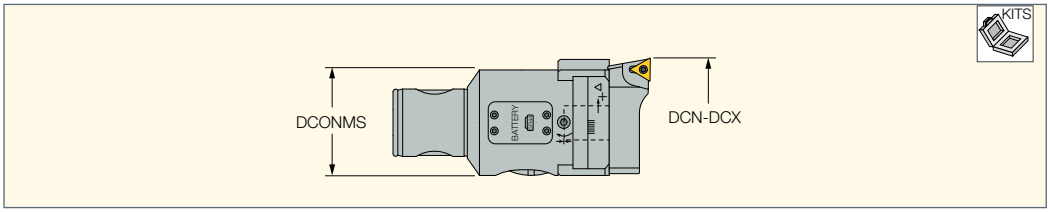
KIT BHD-MB

Digital Display Fine Boring Head and Various Boring Tools and Inserts



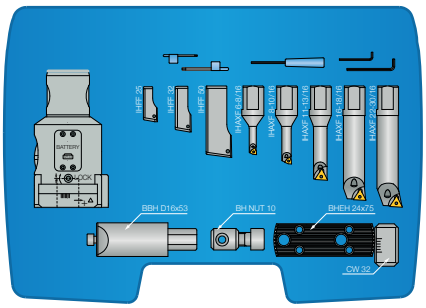
Designation	DCN(1)	DCONMS	DCX(2)
KIT BHD MB50-50 6-110	.236	1.968	4.331
KIT BHD MB63-63 6-125	.236	2.480	4.921
KIT BHD MB80-80 6-200	.236	3.150	7.874

(1) Cutting diameter minimum
(2) Cutting diameter maximum

Boring Kit BHD MB50-50 6-110 Metric/inch (ø.2362-4.330″)

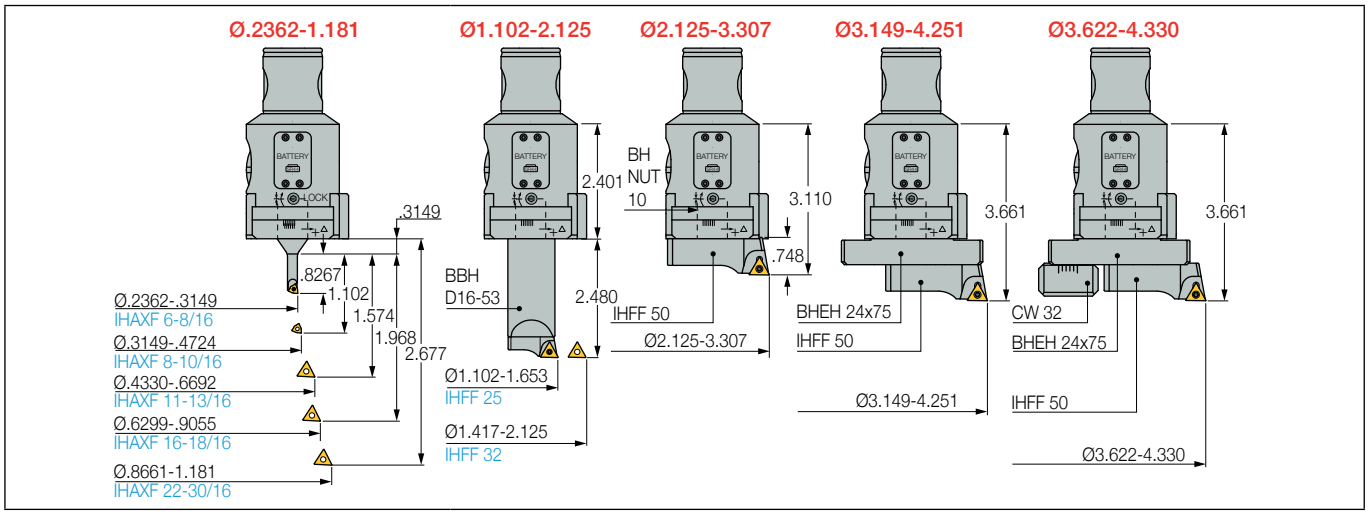
Fine Boring Head with .0001″ Direct Diametric Adjustment Resolution and a Built-in Digital Display

80 µinch



Tools	Inserts
1 BHD MB50-50 6-110	2 WCGT 020102L
1 IHFF 25	5 TPGX 730-L
1 IHFF 32	1 TPGX 220-L
1 IHFF 50	
1 IHAXF 6-8/16	
1 IHAXF 8-10/16	
1 IHAXF 11-13/16	
1 IHAXF 16-18/16	
1 IHAXF 22-30/16	
1 BBH D16-53	
1 BHEH 24x75	
1 BH NUT 10	
1 CW 32	

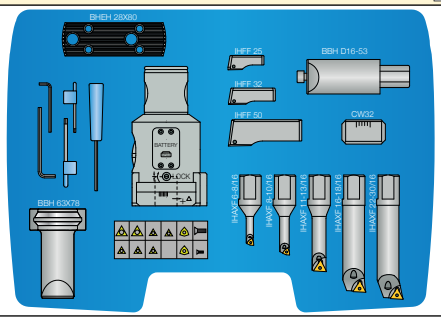
Designation	MB d1	Boring Range
KIT BHD MB50-50 6-110	1.968	.2362-4.330



Boring Kit BHD MB63-63 6-125 Metric/inch (ø.2362-4.92″)

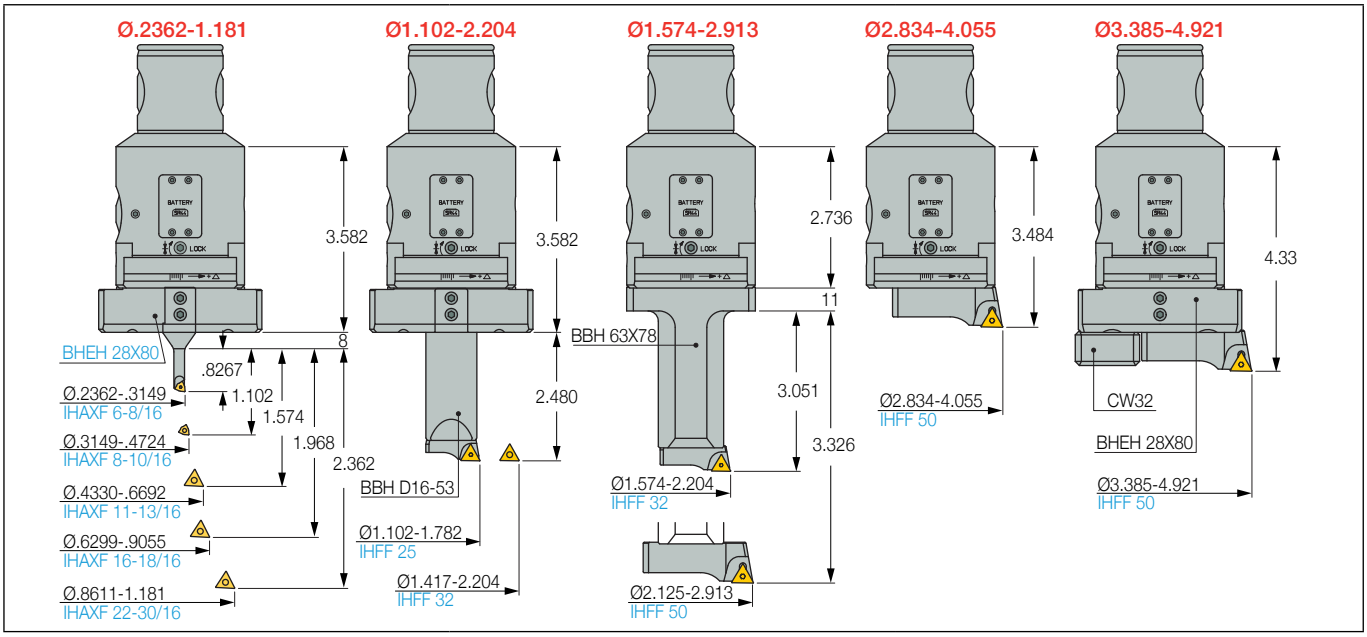
Fine Boring Head with .0001″ Direct Diametric Adjustment Resolution and a Built-in Digital Display

80 µinch



Tools	Inserts
1 BHD MB63-63 6-125	2 WCGT 020102L
1 BBH 63X78	5 TPGX 730-L
1 BHEH 28X80	1 TPGX 220-L
1 BBH 16-53	
1 CW32	
1 IHAXF 6- 8/16	
1 IHAXF 8-10/16	
1 IHAXF 11-13/16	
1 IHAXF 16-18/16	
1 IHAXF 22-30/16	
1 IHFF 25	
1 IHFF 32	
1 IHFF 50	

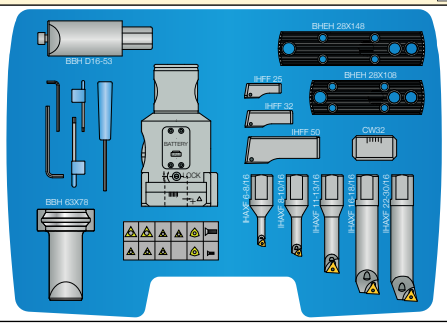
Designation	MB d1	Boring Range
KIT BHD MB63-63 6-125	2.480	.2362-4.921



Boring Kit BHD MB80-80 6-200 Metric/inch (ø.2362-7.874")

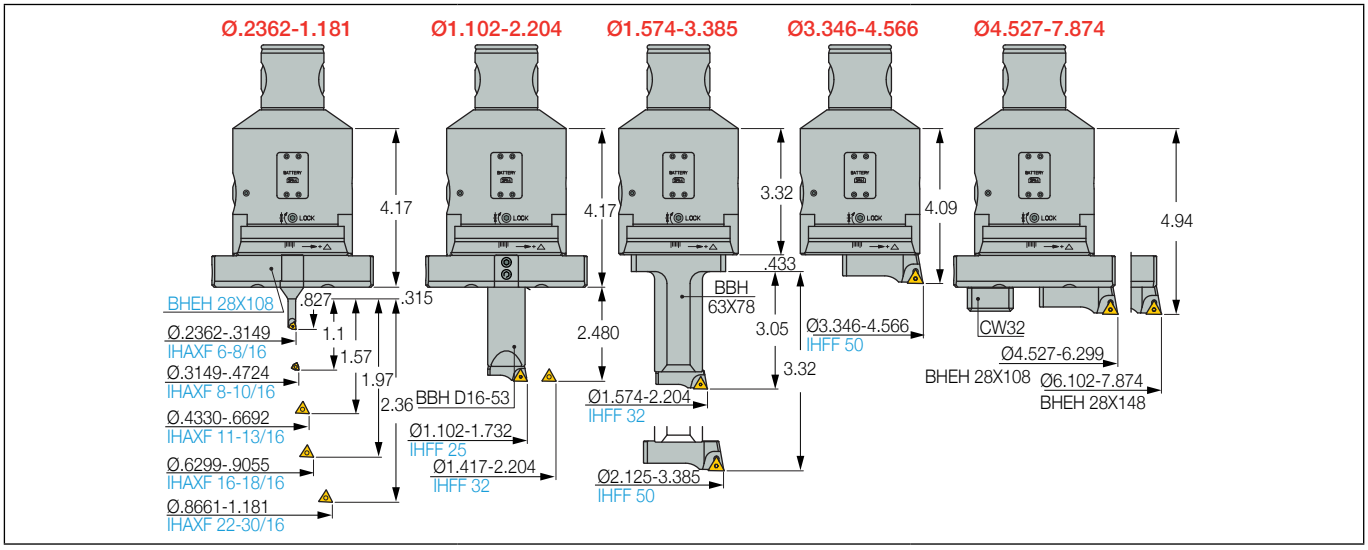
Fine Boring Head with .0001" Direct Diametric Adjustment Resolution and a Built-in Digital Display

80 µinch



Tools	Inserts
1 BHD MB80-80 6-200	2 WCGT 020102L
1 BBH D16-53	5 TPGX 730-L
1 BBH 63X78	1 TPGX 220-L
1 BHEH 28X108	
1 BHEH 28X148	
1 CW32	
1 IHAXF 6- 8/16	
1 IHAXF 8-10/16	
1 IHAXF 11-13/16	
1 IHAXF 16-18/16	
1 IHAXF 22-30/16	
1 IHFF 25	
1 IHFF 32	
1 IHFF 50	

Designation	MB	Boring Range
KIT BHD MB80-80 6-200	2.480	.2362-7.874



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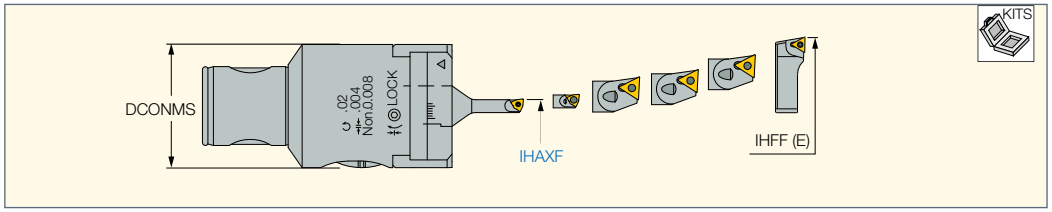
KITI BHEI MB

Contains a Fine Boring Head and Various Boring Toolholders and Inserts



Designation	DCONMS	DCN(2)	DCX(3)	RPMX(4)
KITI BHEI MB32-32-53 H (1)	32.000	.098	.472	10000
KITI BHEI MB50-50-60 H (1)	50.000	.236	.866	8000
KITI BHEI MB50-50-80	50.000	.236	4.331	8000
KITI BHEI MB63-63-89	63.000	.236	4.921	6000
KITI BHEI MB80-80-104	80.000	.236	7.874	5000

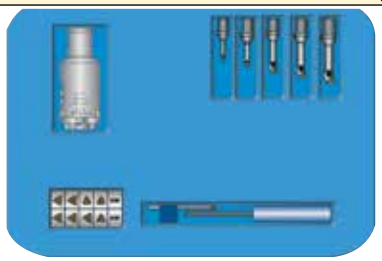
- For kit contents and boring options, see following pages
- 400 µinch direct diametric adjustment and 80 µinch by a Vernier scale.

(1) Balanced to G2.5/12,000 RPM
(2) Cutting diameter minimum
(3) Cutting diameter maximum
(4) Maximum RPM

Boring Kit BHEI MB32-32-53 H (ø.098-.472")

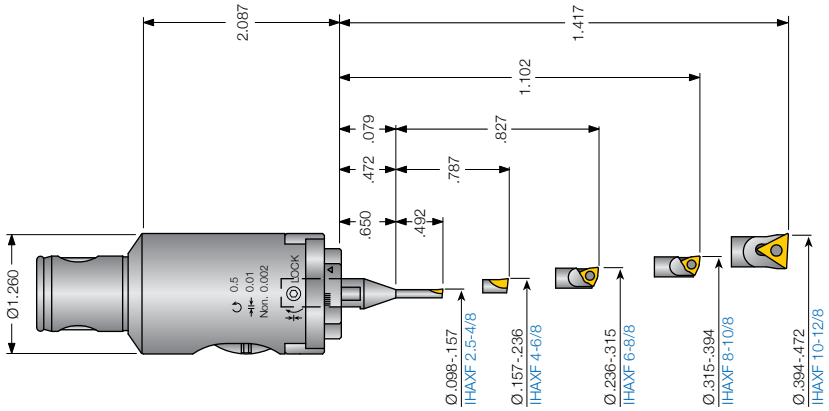
Fine Boring Head 10 mm Direct Diametric Adjustment and 80 µinch by a Vernier Scale

400 µinch
80 µinch



Boring Tools	Inserts
1 BHEI MB32-32-53 H	5 TPGX 090202L
1 IHAXF 2.5-4/8	2 WCGT 020102L
1 IHAXF 4-6/8	
1 IHAXF 6-8/8	
1 IHAXF 8-10/8	
1 IHAXF 10-12/8	

Designation	MB	Boring Range
KITI BHEI MB32-32-53 H	32	.098-.472



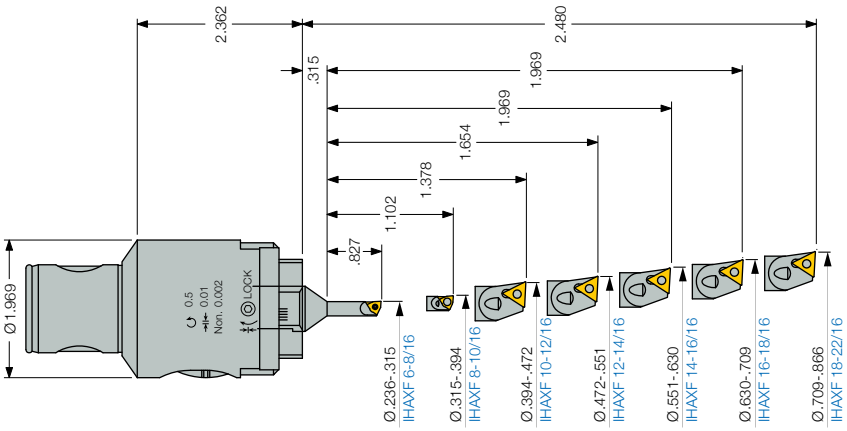
Boring KITI BHEI MB50-50-60 H (ø.236-.866")

Fine Boring Head 400 µinch Direct Diametric Adjustment and 80 µinch by a Vernier Scale

400 µinch 80 µinch	Boring Tools	Inserts
	1 BHEI MB50-50-60 H	5 TPGX 090202L
	1 IHAXF 6-8/16	2 WCGT 020102L
	1 IHAXF 8-10/16	
	1 IHAXF 10-12/16	
	1 IHAXF 12-14/16	
	1 IHAXF 14-16/16	
	1 IHAXF 16-18/16	
	1 IHAXF 18-22/16	

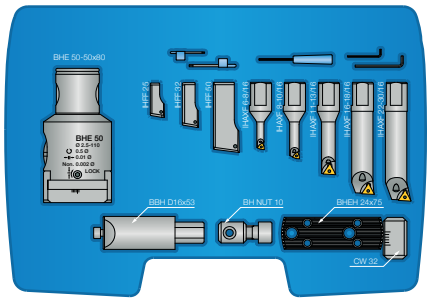
Designation	MB	Boring Range
KITI BHEI MB50-50-60 H	50	.236-.866

400 µinch direct diametric adjustment and 80 µinch by a Vernier scale



Boring Kit BHEI MB50-50-80 (ø.236-4.331")

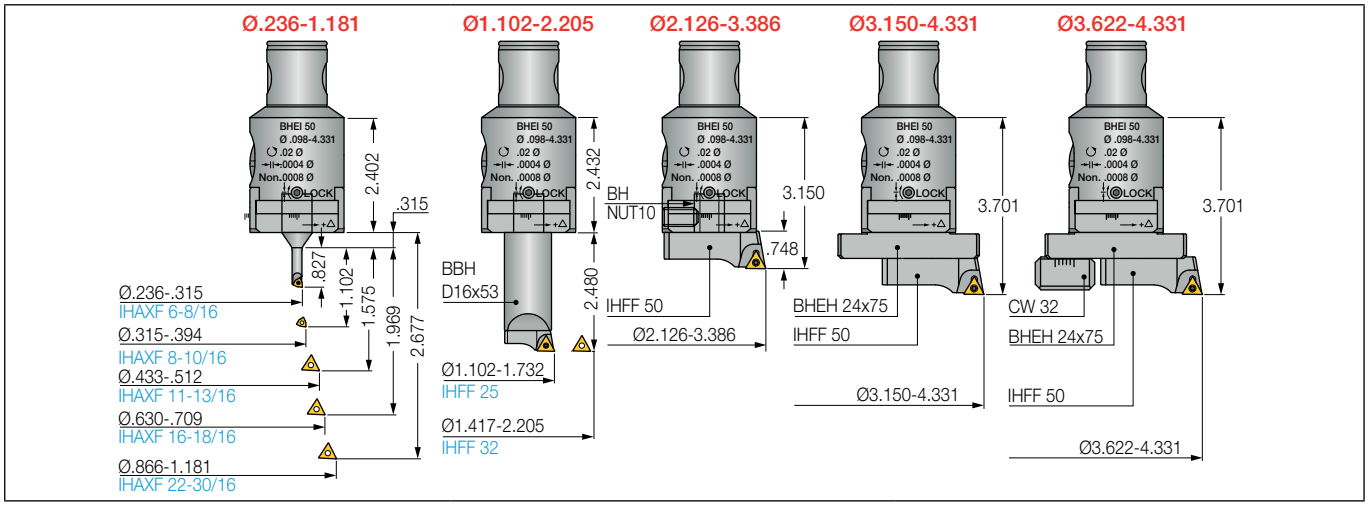
Fine Boring Head 400 µinch Direct Diametric Adjustment and 80 µinch by a Vernier Scale



400 µinch 80 µinch	Boring Tools
	1 BHEI MB50-50-80
	1 IHFF 25
	1 IHFF 32
	1 IHFF 50
	1 IHAXF 6-8/16
	1 IHAXF 8-10/16
	1 IHAXF 11-13/16
	1 IHAXF 16-18/16
	1 IHAXF 22-30/16
	1 BBH D16x53
	1 BHEH 24x75
	1 BH NUT 10
	1 CW 32

Designation	MBd1	Boring Range
KITI BHEI MB50-50-80	50	.236-4.331

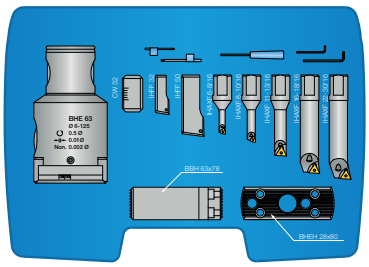
400 µinch direct diametric adjustment and 80 µinch by a Vernier scale



Boring Kit BHEI MB63-63-89 (ø.236-5.098")

Fine Boring Head 400 µinch Direct Diametric Adjustment and 80 µinch by a Vernier Scale

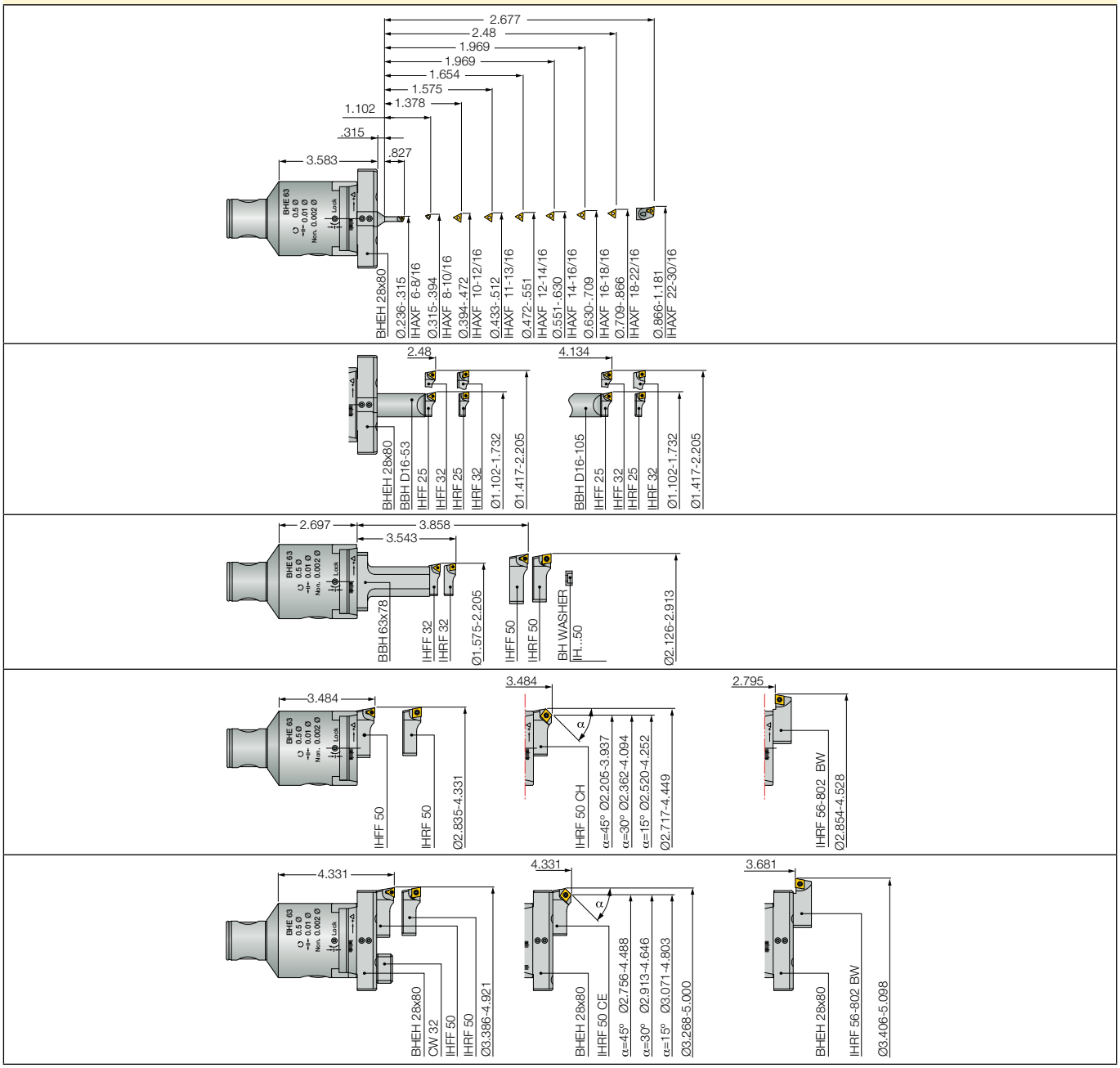
400 µinch
80 µinch



Boring Tools
1 BHEI MB63-63-89
1 IHFF 32
1 IHFF 50
1 IHFF 6-8/16
1 IHAXF 8-10/16
1 IHAXF 11-13/16
1 IHAXF 16-18/16
1 IHAXF 22-30/16
1 BBH 63x78
1 BHEH 28x80
1 BH WASHER IH..50
1 CW 32

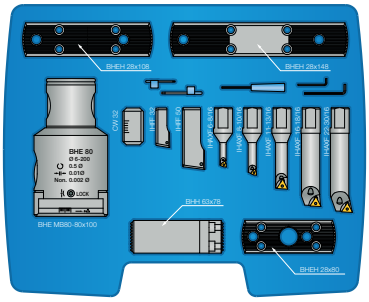
Designation	MB d1	Boring Range
KITI BHEI MB63-63-89	63	.236-5.098

BHEI MB63-63-89 ø.236-5.098



Boring Kit BHEI MB80-80-104 (ø.236-7.874")

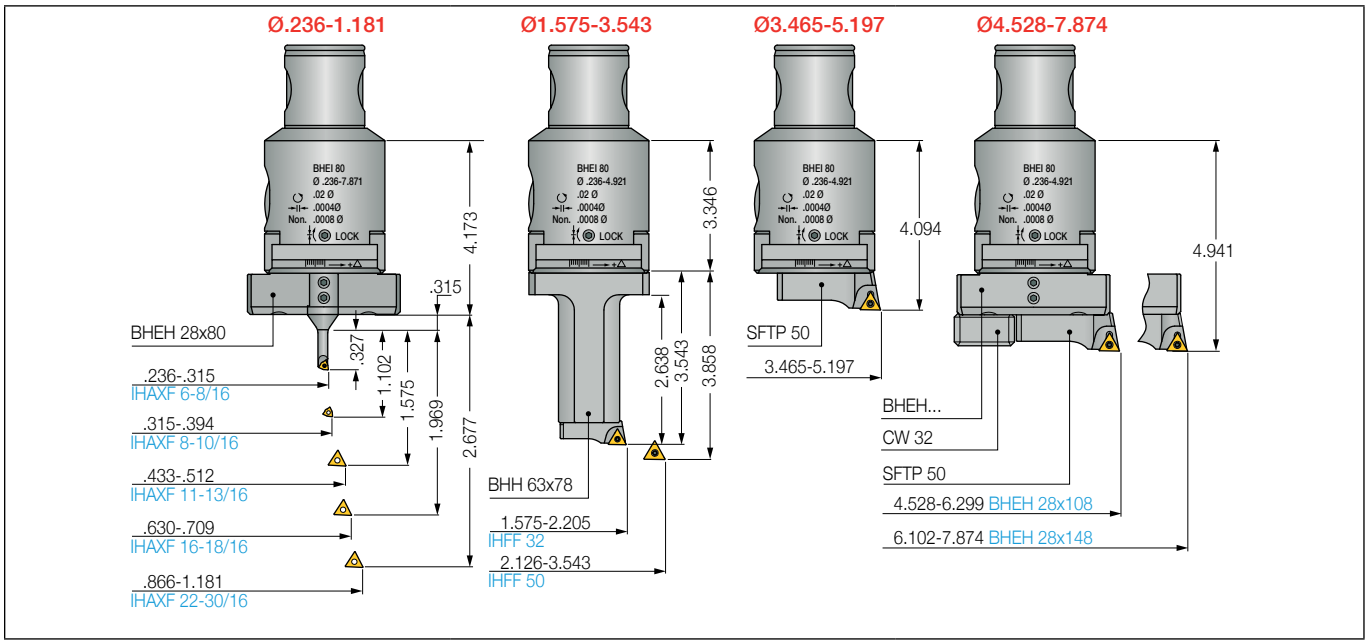
Fine Boring Head 400 µinch Direct Diametric Adjustment and 80 µinch by a Vernier Scale



400 µinch 80 µinch	Boring Tools
	1 BHEI MB80-80-104
	1 IHFF 32
	1 IHFF 50
	1 IHFF 6-8/16
	1 IHAXF 8-10/16
	1 IHAXF 11-13/16
	1 IHAXF 16-18/16
	1 IHAXF 22-30/16
	1 BBH 63x78
	1 BHEH 28x80
	1 BHEH 28x108
	1 BHEH 28x148
	1 BH WASHER IH..50
	1 CW 32

Designation	MB d1	Boring Range
KITI BHEI MB80-80-104	80	.236-7.874

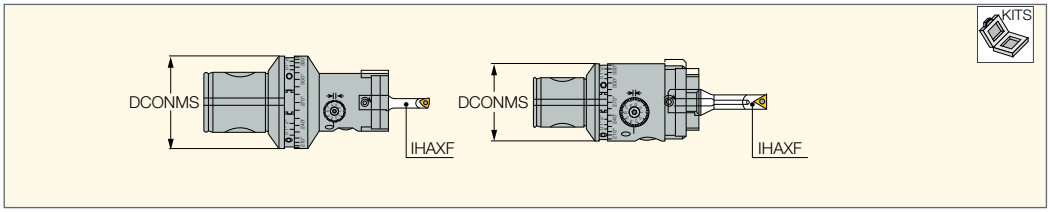
(1) The specified boring range differs from the one specified for the boring bar. The extra range is not recommended for high rotational speeds.



ITSBORE

KITI BHFI MB-BL

Contains a Balanceable Fine Boring Head and Various Boring Bars and Inserts



Designation	DCONMS	DCN(1)	DCX(2)	RPMX(3)
KITI BHFI MB50-32 BL	50.000	.100	.470	8000
KITI BHFI MB50-50 BL	50.000	.240	.870	8000

(1) Cutting diameter minimum
(2) Cutting diameter maximum
(3) Maximum RPM

Boring Kit BHFI MB50-32 BL (.10-.47")

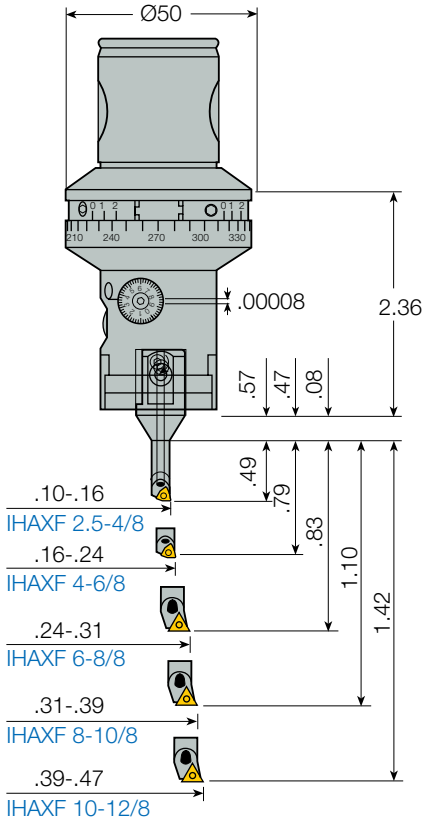
with BHFI Fine Boring Balanceable Head

80 µinch

Boring Tools
1 BHFI MB50-32 BL
1 IHAXF 2.5-4/8
1 IHAXF 4-6/8
1 IHAXF 6-8/8
1 IHAXF 8-10/8
1 IHAXF 10-12/8
5 TPGX 730-L...
2 WCGT 020102L...

Designation	MB d1	Boring Range
BHFI MB50-32 BL	50	.10-.47

(1) The specified boring range differs from the one specified for the boring bar. The extra range is not recommended for high rotational speeds.



Boring Kit BHFI MB50-50 BL (.24-.87")

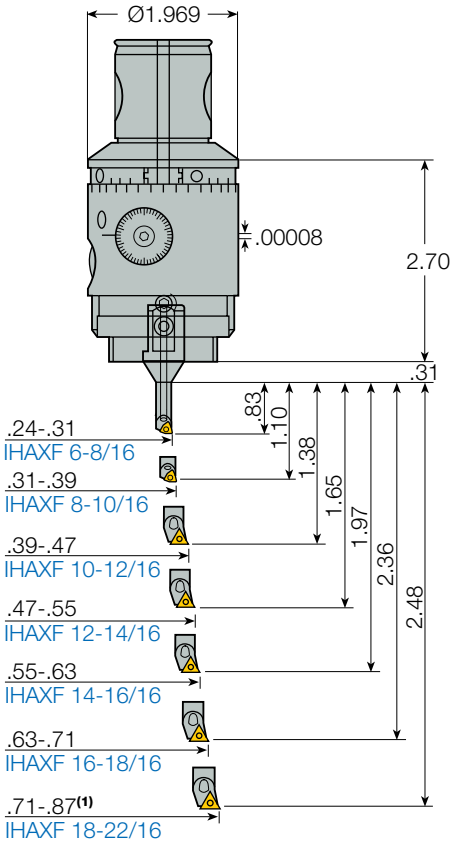
with BHFI BL Fine Boring Balanceable Head

80 µinch

Tools	Inserts
1 BHFI MB50-50 BL	5 TPGX 090202L
1 IHAXF 6-8/16	2 WCGT 020102L
1 IHAXF 8-10/16	
1 IHAXF 10-12/16	
1 IHAXF 12-14/16	
1 IHAXF 14-16/16	
1 IHAXF 16-18/16	
1 IHAXF 18-22/16	

Designation	MB d1	Boring Range
KITI BHFI MB50-50 BL	50	.24-.87

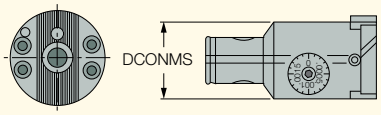
(1) On BHFI BL max. balanceable dia. is .787".



ITSBORE

KITI BHFI-MB

Contains a Fine Boring Head, Adapters, Extensions and Various Boring Bars and Inserts

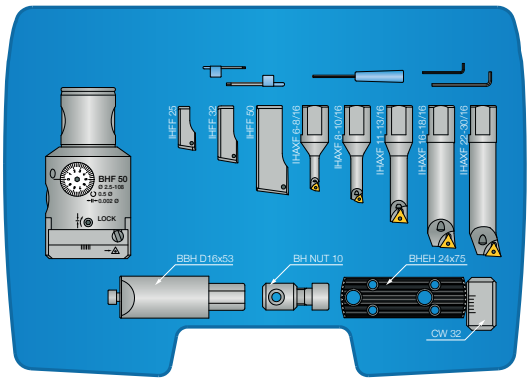


Designation	DCONMS	DCN(1)	DCX(2)	RPMX(3)
KITI BHFI MB50-50 6-108	50.000	.236	4.250	8000
KITI BHFI MB50-63	50.000	.240	4.920	8000
KITI BHFI MB50-80	50.000	.240	8.660	8000
KITI BHFI MB63-63	63.000	.240	4.920	6000
KITI BHFI MB80-80	80.000	.240	8.660	5000

(1) Cutting diameter minimum
(2) Cutting diameter maximum
(3) Maximum RPM

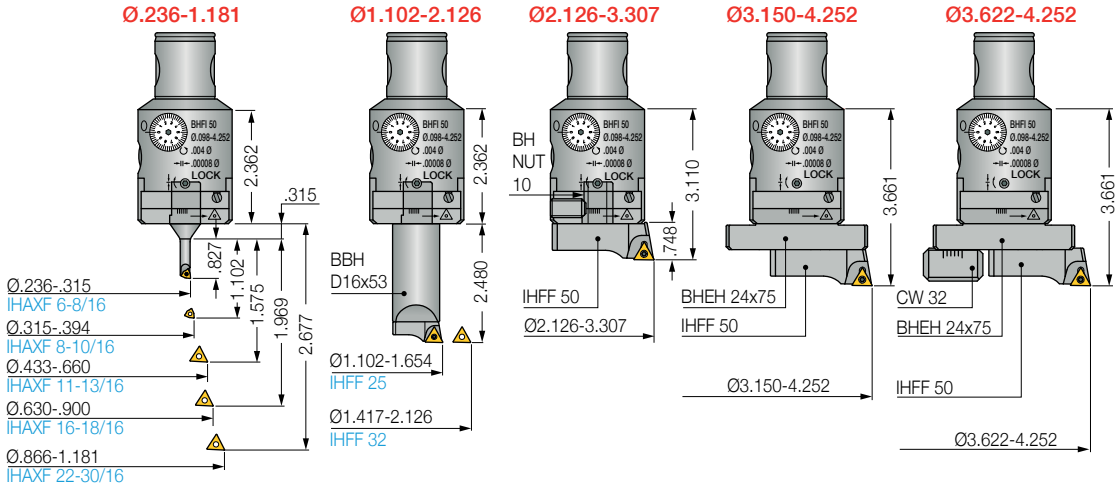
Boring Kit BHFI MB50-50 6-108 (.236-4.25")

with Fine Boring Head 400 µinch Direct Diametric Adjustment and 80 µinch by a Vernier Scale



80 µinch	Tools	Inserts
	1 BHFI MB50-50 6-108	2 WCGT 020102L
	1 IHFF 25	5 TPGX 730-L
	1 IHFF 32	1 TPGX 220-L
	1 IHFF 50	
	1 IHAXF 6-8/16	
	1 IHAXF 8-10/16	
	1 IHAXF 11-13/16	
	1 IHAXF 16-18/16	
	1 IHAXF 22-30/16	
	1 BBH D16x53	
	1 BHEH 24x75	
	1 BH NUT 10	
	1 CW 32	

Designation	MB	Boring Range
KITI BHFI MB50-50 6-108	50	.236-4.25

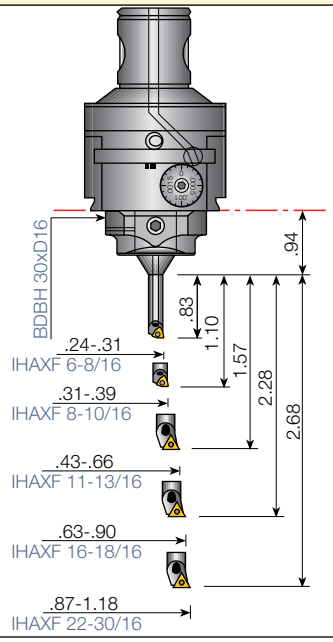
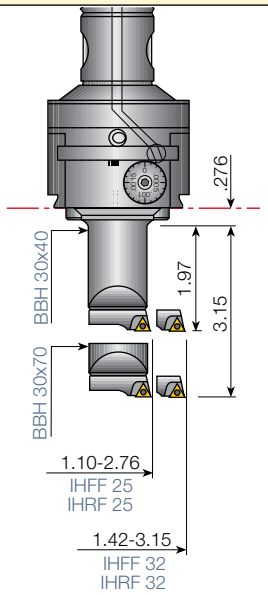
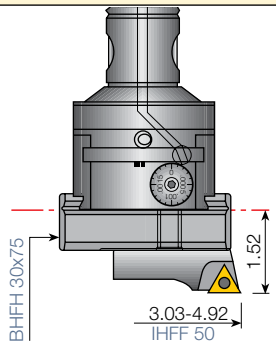


Boring Kit BHFI MB50-63/ Boring Kit BHFI MB63-63 (.24-4.92")

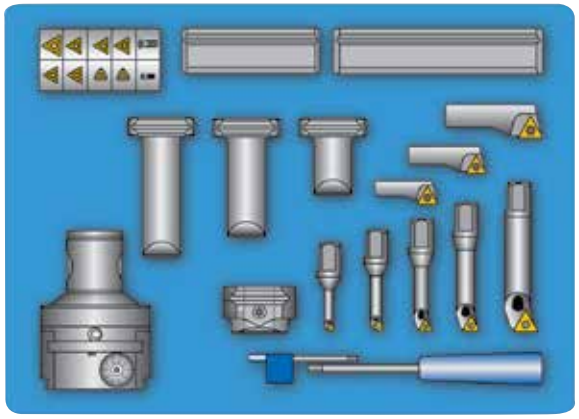
80 µinch	Tools	Inserts
	1 BHFI MB...-63x87	5 TPGX 090202L
	1 IHAXF 6-8/16	1 TPGX 110302L
	1 IHAXF 8-10/16	2 WCGT 020102L
	1 IHAXF 11-13/16	
	1 IHAXF 16-18/16	
	1 IHAXF 22-30/16	
	1 ADBH 30xD16	
	1 BBH 30x40	
	1 BBH 30x70	
	1 BHFH 30x75	
	1 IHFF 25	
	1 IHFF 32	
	1 IHFF 50	

Designation	MB d1	Boring Range
KITI BHFI MB50-63	1.97	.24-4.92
KITI BHFI MB63-63	2.48	.24-4.92

(1) The specified boring range differs from the one specified for the boring bar. The extra range is not recommended for high rotational speeds.

ø.24-1.18	ø1.10-3.15	ø3.03-4.92
		

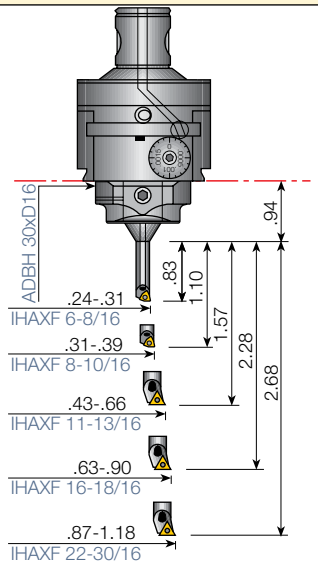
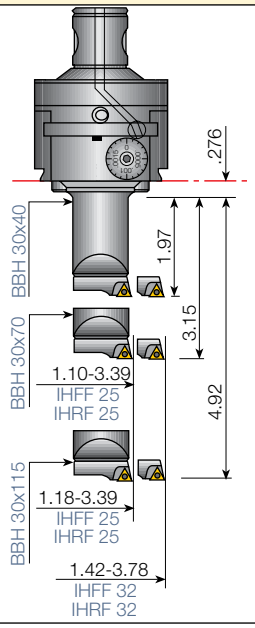
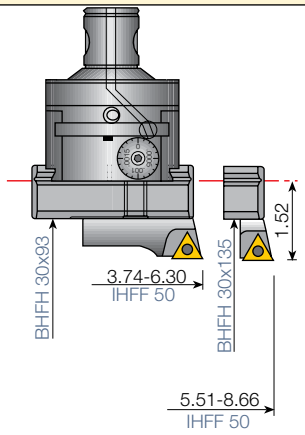
Boring Kit BHFI MB50-80 / Boring Kit BHFI MB80-80 (ø.24-8.66")



80 µinch	Tools	Inserts
	1 BHFI MB..-80x94	5 TPGX 090202L
	1 IHAXF 6-8/16	1 TPGX 110302L
	1 IHAXF 8-10/16	2 WCGT 020102L
	1 IHAXF 11-13/16	
	1 IHAXF 16-18/16	
	1 IHAXF 22-30/16	
	1 ADBH 30xD16	
	1 BBH 30x40	
	1 BBH 30x70	
	1 BBH 30x115	
	1 BHFH 30x93	
	1 BHFH 30x135	
	1 IHFF 25	
	1 IHFF 32	
	1 IHFF 50	

Designation	MB	Boring Range
KITI BHFI MB50-80	1.97	.24-8.66
KITI BHFI MB80-80	3.15	.24-8.66

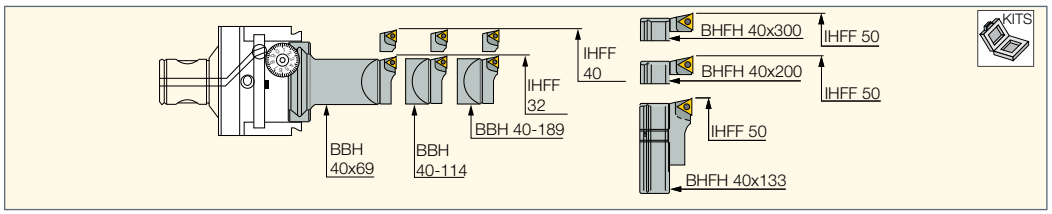
(1) The specified boring range differs from the one specified for the boring bar. The extra range is not recommended for high rotational speeds.

ø.24-1.18	ø1.10-3.78	ø3.74-8.66
		

ITSBORE

KIT BHFH-MB

Contains Adapters, Extensions and Boring Bars for 1.42 to 16.14" Boring Range

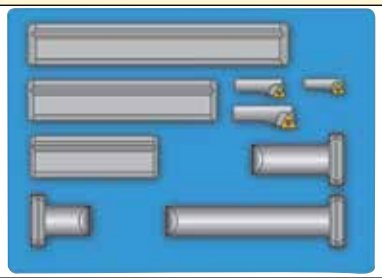


Designation	DCONMS	DCN(1)	DCX(2)
KIT BHFH MB80-125	3.150	1.417	16.142

(1) Cutting diameter minimum
(2) Cutting diameter maximum

KIT BHFH MB80-125 (1.42-16.14")

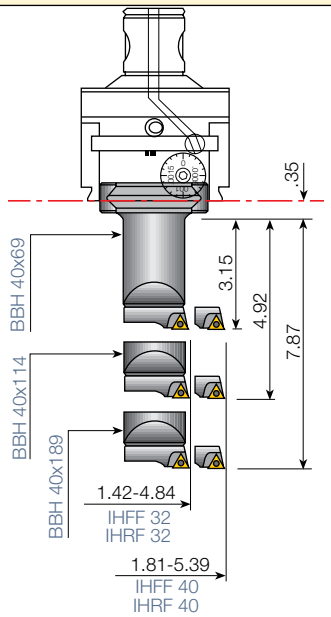
Holder for BHF MB80-125x114



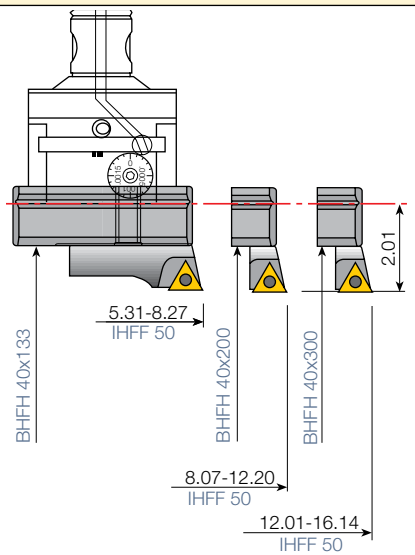
ACCESSORIES
1 BBH 40x69
1 BBH 40x114
1 BBH 40x189
1 BHFH 40x133
1 BHFH 40x200
1 BHFH 40x300
1 IHFF 25
1 IHFF 40
1 IHFF 50

Designation	MB	Boring Range
KIT BHFH MB80-125	3.15	1.42-16.14

ø1.42-5.39



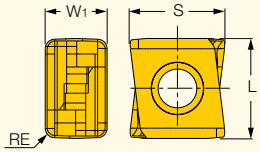
ø5.31-16.14

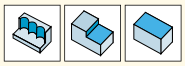


TANGPLUNGE
PLUNGING LINE

HTP LN.. 1006

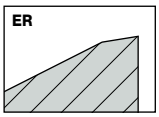
Tangentially Clamped Inserts with 4 Cutting Edges for Plungers



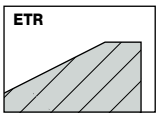


Designation	Dimensions W1	L	S	RE	Tough ↔ Hard IC330	IC830	IC808	IC810	IC07	Recommended Machining Data f_z (inch/t)
HTP LNAR 1006 FR [1]	.256	.413	.399	.0394			•			.0020-.0059
HTP LNAR 1006 FR-P	.256	.413	.399	.0394					•	.0020-.0059
HTP LNHT 1006 ER	.256	.413	.391	.0394	•	•	•	•		.0039-.0059
HTP LNHT 1006 ETR	.256	.413	.391	.0394	•	•	•			.0047-.0079
HTP LNMT 1006 ER [2]	.256	.413	.392	.0394	•	•	•			.0031-.0059

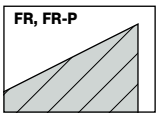
• FR-P - For machining aluminum, ER- For general applications, ETR- First priority for hardened steel
[1] FR - Sharp cutting edge for unstable conditions and for ISO S material
[2] Mounting this insert increases tool diameter by .004"
For tools, see pages: CR LNHT (480)



ER- For general applications



ETR- First priority for hardened steel

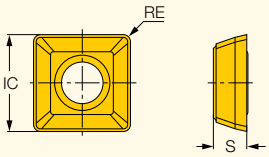


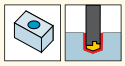
FR-P- For machining aluminum

DR-TWIST
INDEXABLE DRILL LINE

SOMT-DT

DR Drill Inserts for General Applications at Medium-to-High Feeds





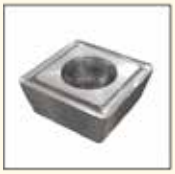
Designation	Dimensions IC	S	RE	Tough ↔ Hard IC328	IC5500	IC808	IC908	IC8080	IC9080
SOMT 060204-DT	.236	.077	.0157	•		•	•		
SOMT 09T306-DT	.354	.150	.0236		•	•	•	•	•
SOMT 100408-DT	.386	.169	.0310			•	•	•	
SOMT 110408-DT	.453	.189	.0310			•	•		
SOMT 120408-DT	.500	.187	.0310			•	•	•	•
SOMT 140512-DT	.563	.205	.0472			•	•	•	
SOMT 160512-DT	.630	.219	.0470			•	•		•

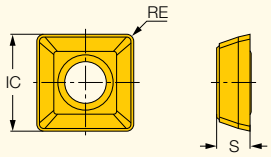
For tools, see pages: CR SOMT (481) • DR-2D-N (131) • DR-3D-N (132) • DR-4D-N (133) • DR-5D-N (134) • DR-CA (135) • DRM-1D (130)

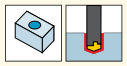
DR-TWIST INDEXABLE DRILL LINE

SOMT-GF

DR Drill Inserts for Soft Materials at Low-to-Medium Feeds







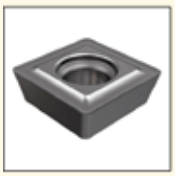
Designation	Dimensions IC	S	RE	Tough ↔ Hard IC328	IC908
SOMT 09T306-GF	.354	.150	.0240	●	●
SOMT 120408-GF	.500	.187	.0310		●
SOMT 160512-GF	.630	.219	.0470		●

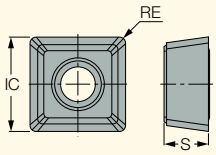
For tools, see pages: CR SOMT (481) • DR-2D-N (131) • DR-3D-N (132) • DR-4D-N (133) • DR-5D-N (134) • DR-CA (135) • DRM-1D (130)

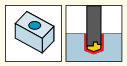
DR-TWIST INDEXABLE DRILL LINE

SOGX/T-AL

DR Drill Inserts for Aluminum







Designation	Dimensions IC	S	RE	IC08
SOGX 050204-AL	.213	.094	.0157	●
SOGX 060304-AL	.244	.126	.0157	●
SOGX 070305-AL	.303	.142	.0197	●
SOGT 09T306-AL	.354	.150	.0236	●
SOGT 120408-AL	.500	.187	.0315	●

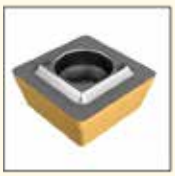
• Sharp cutting edge with polished rake for aluminum

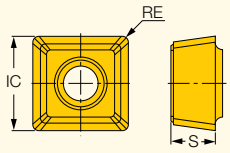
For tools, see pages: CR SOMT (481) • DR-2D-N (131) • DR-3D-N (132) • DR-4D-N (133) • DR-5D-N (134) • DRM-1D (130)

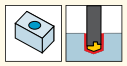
DR-TWIST INDEXABLE DRILL LINE

SOMT-HD

DR Drill Inserts for Carbon Steel and Soft Materials







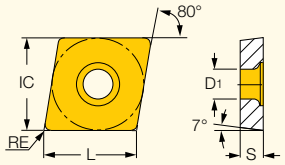
Designation	Dimensions IC	S	RE	IC808
SOMT 09T306-HD	.354	.150	.0240	●
SOMT 100408-HD	.386	.169	.0310	●
SOMT 110408-HD	.453	.189	.0310	●
SOMT 120408-HD	.500	.187	.0310	●
SOMT 160512-HD	.630	.219	.0470	●

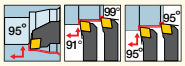
For tools, see pages: CR SOMT (481) • DR-2D-N (131) • DR-3D-N (132) • DR-4D-N (133) • DR-5D-N (134) • DR-CA (135) • DRM-1D (130)

ISOTURN

CCMT/CCGT-SM

Single-Sided Turning Inserts for Semi-Finish and Finishing on Soft Materials and Exotic Alloys





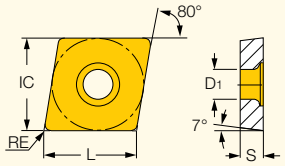
Designation	Dimensions L	IC	S	RE	D1	Tough ↔ Hard IC6025	IC8250	IC6015	IC8150	IC20	IC5010	IC428	IC5005	IC806	IC807	IC907	Recommended Machining Data a_p (inch)	f (IPR)
CCGT 2-.004-SM	.254	.250	.094	.0039	.110											●	.010-.079	.0020-.0079
CCGT 2-0-SM	.254	.250	.094	.0079	.110											●	.010-.079	.0020-.0098
CCMT 2-0-SM	.254	.250	.094	.0079	.110		●		●					●			.010-.079	.0020-.0098
CCMT 2-1-SM	.254	.250	.094	.0157	.110	●	●	●	●					●	●	●	.020-.098	.0027-.0098
CCMT 2-2-SM	.254	.250	.094	.0315	.110	●		●							●	●	.020-.098	.0027-.0098
CCMT 3-0-SM	.382	.375	.156	.0079	.173	●	●	●						●	●	●	.020-.098	.0024-.0098
CCMT 3-1-SM	.382	.375	.156	.0157	.173	●	●		●	●	●	●	●	●	●	●	.020-.098	.0024-.0098
CCMT 3-2-SM	.382	.375	.156	.0315	.173	●	●	●	●		●		●	●	●	●	.020-.118	.0027-.0098
CCMT 431-SM	.508	.500	.187	.0157	.217		●		●					●	●	●	.028-.138	.0027-.0098
CCMT 432-SM	.508	.500	.187	.0315	.217	●	●	●	●						●	●	.028-.138	.0027-.0118

For tools, see pages: IHCR (478) • IHRF (509) • IHRF-BW (513) • IHRF-C (483) • IHRF-CH (514) • IHSR (478) • IHSR-BW (480) • IHSR-C (483) • IHSR-CH (479)

ISOTURN

CCMT-PF

80° Rhombic Inserts with a Positive Flank for Semi-Finishing and Finishing on Soft Materials and Exotic Alloys



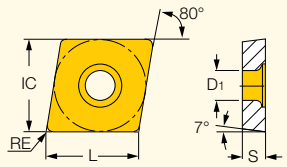
Designation	Dimensions L	IC	S	RE	D1	Tough ↔ Hard IC830	IC6025	IC6015	IC806	IC807	IC907	IC804	Recommended Machining Data a_p (inch)	f (IPR)
CCMT 2-0-PF	.248	.250	.094	.0079	.110	●	●	●		●	●	●	.008-.098	.0016-.0098
CCMT 2-1-PF	.248	.250	.094	.0157	.110	●	●	●	●	●	●		.016-.098	.0016-.0118
CCMT 3-0-PF	.382	.375	.156	.0079	.173	●			●	●	●	●	.020-.118	.0020-.0118
CCMT 3-1-PF	.382	.375	.156	.0157	.173	●	●	●	●	●	●	●	.020-.138	.0020-.0138

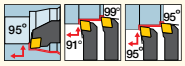
For tools, see pages: IHCR (478) • IHRF (509) • IHRF-BW (513) • IHRF-C (483) • IHRF-CH (514) • IHSR (478) • IHSR-BW (480) • IHSR-C (483) • IHSR-CH (479)

ISOTURN

CCMT-14

80° Rhombic Inserts with a 7° Positive Flank for Semi-Finishing and Finish Turning





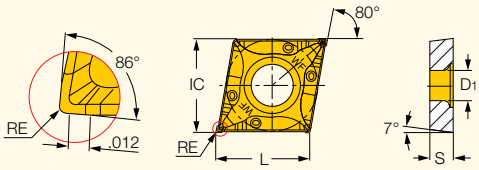
Designation	Dimensions L	IC	S	RE	D1	Tough ↔ Hard IC830	IC8250	IC20	IC428	IC5005	IC807	IC907	Recommended Machining Data a_p (inch)	f (IPR)
CCMT 2-1-14	.248	.250	.094	.0157	.110	●		●	●	●	●	●	.020-.098	.0055-.0098
CCMT 3-1-14	.382	.375	.156	.0157	.173		●				●	●	.020-.118	.0055-.0098
CCMT 3-2-14	.382	.375	.156	.0315	.173	●	●	●	●	●			.031-.118	.0055-.0118
CCMT 432-14	.508	.500	.187	.0315	.217	●		●					.031-.118	.0055-.0118

For tools, see pages: IHCR (478) • IHRF (509) • IHRF-BW (513) • IHRF-C (483) • IHRF-CH (514) • IHSR (478) • IHSR-BW (480) • IHSR-C (483) • IHSR-CH (479)

ISOTURN

CCET-WF

80° Rhombic Inserts
with a 7° Positive Flank and
a Wiper Near the Corner
for High Feed Finishing



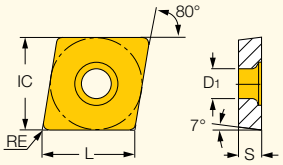
Designation	Dimensions L	IC	S	RE	D1	IC907	Recommended Machining Data a_p (inch)	f (IPR)
CCET 2-.002-WF	.248	.250	.094	.0020	.110	●	.002-.079	.0004-.0079
CCET 3-.002-WF	.374	.375	.156	.0020	.173	●	.002-.079	.0004-.0079

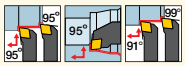
For tools, see pages: IHCR (478) • IHRF (509) • IHSR (478) • IHSR-BW (480) • IHSR-C (483) • IHSR-CH (479)

ISOTURN

CCMT/CCGT

80° Rhombic Inserts
with a 7° Positive Flank for
Semi-Finishing and Finish Turning





Designation	Dimensions L	IC	S	RE	D1	Tough ↔ Hard IC8250	IC30N	IC20	IC20N	IC520N	Recommended Machining Data a_p (inch)	f (IPR)
CCGT 2-0	.254	.250	.094	.0079	.110		●				.020-.079	.0039-.0079
CCGT 2-0L [1]	.254	.250	.094	.0079	.110		●	●			.020-.079	.0039-.0079
CCGT 2-1	.254	.250	.094	.0157	.110		●				.020-.079	.0039-.0079
CCGT 2-1L [1]	.254	.250	.094	.0157	.110		●				.020-.079	.0039-.0079
CCMT 2-0	.254	.250	.094	.0079	.110	●			●		.020-.079	.0039-.0079
CCMT 2-1	.254	.250	.094	.0157	.110		●		●	●	.020-.079	.0047-.0087
CCMT 3-0	.382	.375	.156	.0079	.173				●	●	.020-.098	.0047-.0098
CCMT 3-1	.382	.375	.156	.0157	.173				●	●	.020-.098	.0047-.0098
CCMT 3-2	.382	.375	.156	.0315	.173				●	●	.031-.118	.0055-.0098

• Use left-hand inserts for left-hand external tools and for right-hand internal tools

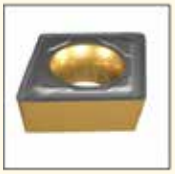
[1] Left-hand insert

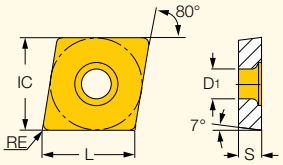
For tools, see pages: IHCR (478) • IHRF (509) • IHRF-BW (513) • IHRF-C (483) • IHRF-CH (514) • IHSR (478) • IHSR-BW (480) • IHSR-C (483) • IHSR-CH (479)

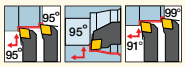
ISOTURN

CCMT-WG

80° Rhombic Inserts
with a 7° Positive Flank and
a Wiper Near the Corner
for High Feed Finishing







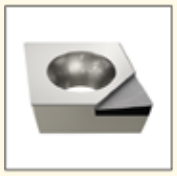
Designation	Dimensions L	IC	S	RE	D1	Tough ↔ Hard IC8250	IC807	IC907	Recommended Machining Data a_p (inch)	f (IPR)
CCMT 2-1-WG	.248	.250	.094	.0157	.110		●	●	.016-.079	.0039-.0138
CCMT 3-1-WG	.382	.375	.156	.0160	.173	●			.016-.079	.0055-.0118
CCMT 3-2-WG	.382	.375	.156	.0315	.173	●			.020-.098	.0079-.0150
CCMT 432-WG	.508	.500	.187	.0315	.217	●			.020-.118	.0079-.0142

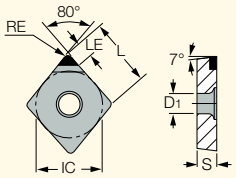
For tools, see pages: IHCR (478) • IHRF (509) • IHRF-BW (513) • IHRF-C (483) • IHRF-CH (514) • IHSR (478) • IHSR-BW (480) • IHSR-C (483) • IHSR-CH (479)

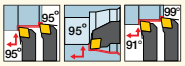
ISOTURN

CCMT (PCD)

Inserts with a Single PCD Top Corner Tip, 7° Clearance and Positive Rake Angle for Finishing Aluminum







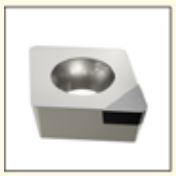
Designation	Dimensions L	IC	S	RE	LE	D1	ID5	Recommended Machining Data a_p (inch)	f (IPR)
CCMT 2-0D	.248	.250	.094	.0080	.12	.110	●	.003-.118	.0020-.0118
CCMT 2-1D	.248	.250	.094	.0157	.12	.110	●	.004-.118	.0020-.0118
CCMT 3-1D	.382	.375	.156	.0157	.15	.173	●	.004-.118	.0020-.0118

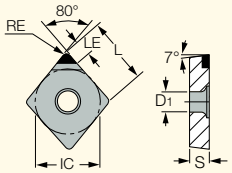
For tools, see pages: IHCR (478) • IHRF (509) • IHRF-BW (513) • IHRF-C (483) • IHRF-CH (514) • IHSR (478) • IHSR-BW (480) • IHSR-C (483)

ISOTURN

CCGW/CCMT (CBN)

80° Rhombic Inserts with a Single CBN Top Corner Tip and 7° Clearance for Machining Hardened Steel





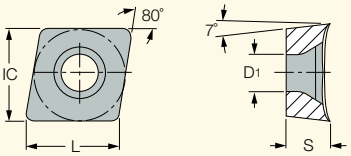
Designation	Dimensions L	IC	S	RE	LE	D1	Tough ↔ Hard IB05H	IB55	IB10H	Recommended Machining Data a_p (inch)	f (IPR)
CCGW 03X102T01015-1	.143	.141	.055	.0079	.08	.075	●		●	.002-.020	.0020-.0079
CCGW 03X104T01015-1	.143	.141	.055	.0157	.09	.075	●		●	.002-.020	.0020-.0079
CCGW 04T102T01015-1	.175	.172	.070	.0079	.08	.091	●		●	.002-.020	.0020-.0079
CCGW 04T104T01015-1	.175	.172	.070	.0157	.09	.091	●		●	.002-.020	.0020-.0079
CCMT 2-0T	.248	.250	.094	.0079	.10	.110		●		.002-.020	.0020-.0079
CCMT 2-1T	.248	.250	.094	.0157	.11	.110		●		.002-.020	.0020-.0079
CCMT 3-1T	.382	.375	.156	.0157	.11	.173		●		.002-.020	.0020-.0079
CCMT 3-2T	.382	.375	.156	.0315	.14	.173		●		.002-.020	.0020-.0079

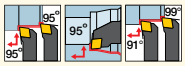
For tools, see pages: IHCR (478) • IHRF (509) • IHRF-BW (513) • IHRF-C (483) • IHRF-CH (514) • IHSR (478) • IHSR-BW (480) • IHSR-C (483)

ISOTURN

CCGT-AS

80° Rhombic Inserts with a 7° Positive Flank, Very Positive Rake Angle and Sharp Cutting Edge for Machining Aluminum





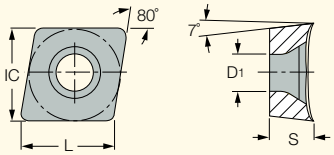
Designation	Dimensions L	IC	S	RE	D1	IC20	Recommended Machining Data a_p (inch)	f (IPR)
CCGT 2-.004-AS	.252	.250	.094	.0039	.110	●	.020-.079	.0039-.0079
CCGT 2-0-AS	.252	.250	.094	.0079	.110	●	.020-.079	.0039-.0079
CCGT 2-1-AS	.252	.250	.094	.0157	.110	●	.020-.079	.0039-.0098
CCGT 3-.004-AS	.382	.375	.156	.0039	.173	●	.020-.098	.0039-.0098
CCGT 3-0-AS	.382	.375	.156	.0079	.173	●	.020-.098	.0039-.0098
CCGT 3-1-AS	.382	.375	.156	.0157	.173	●	.020-.098	.0039-.0098
CCGT 3-2-AS	.382	.375	.156	.0315	.173	●	.031-.118	.0039-.0118
CCGT 430-AS	.508	.500	.187	.0079	.217	●	.020-.098	.0039-.0098
CCGT 431-AS	.508	.500	.187	.0157	.217	●	.020-.098	.0039-.0098
CCGT 432-AS	.508	.500	.187	.0315	.217	●	.039-.138	.0039-.0118

For tools, see pages: IHCR (478) • IHRF (509) • IHRF-BW (513) • IHRF-C (483) • IHRF-CH (514) • IHSR (478) • IHSR-BW (480) • IHSR-C (483) • IHSR-CH (479)

ISOTURN

CCGT-AF

80° Rhombic Inserts with a 7° Positive Flank, Very Positive Rake Angle and Sharp Cutting Edge for Machining Aluminum



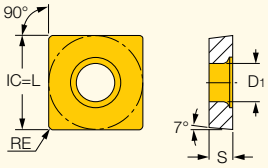
Designation	Dimensions L	IC	S	RE	D1	IC20	Recommended Machining Data a_p (inch)	f (IPR)
CCGT 3-2-AF	.382	.375	.156	.0315	.173	●	.031-.118	.0059-.0098
CCGT 432-AF	.508	.500	.187	.0315	.217	●	.039-.138	.0059-.0118

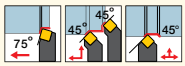
For tools, see pages: IHCR (478) • IHRF (509) • IHSR (478) • IHSR-BW (480) • IHSR-C (483) • IHSR-CH (479)

ISOTURN

SCMT-SM

Square Inserts with a 7° Positive Flank for Semi-Finishing and Finish Turning on Soft Materials and Exotic Alloys





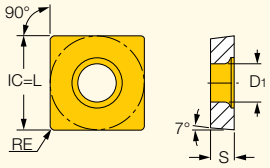
Designation	Dimensions L	S	RE	D1	Tough ↔ Hard IC830	IC6025	IC8250	IC8150	IC5005	IC807	IC907	Recommended Machining Data a_p (inch)	f (IPR)
SCMT 3-1-SM	.375	.156	.0157	.173			●	●		●	●	.020-.118	.0027-.0098
SCMT 3-2-SM	.375	.156	.0315	.173	●	●	●	●	●	●	●	.020-.118	.0039-.0118
SCMT 431-SM	.500	.187	.0160	.217				●				.020-.138	.0039-.0098
SCMT 432-SM	.500	.187	.0315	.217			●	●		●	●	.039-.157	.0039-.0118

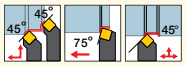
For tools, see pages: IHPR (479)

ISOTURN

SCMT-14

Square Inserts with a 7° Positive Flank for Semi-Finishing and Finish Turning on Soft Materials and Exotic Alloys





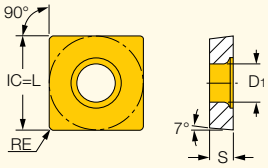
Designation	Dimensions L	S	RE	D1	Tough ↔ Hard IC8250	IC807	IC907	Recommended Machining Data a_p (inch)	f (IPR)
SCMT 3-1-14	.375	.156	.0157	.173		●	●	.039-.138	.0047-.0118
SCMT 431-14	.500	.187	.0160	.217	●			.039-.157	.0047-.0118

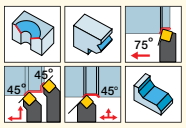
For tools, see pages: IHPR (479)

ISOTURN

SCMT-19

Square Inserts with a 7° Positive Flank for Semi-Roughing at Medium to High Feeds





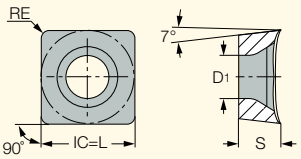
Designation	Dimensions L	S	RE	D1	Tough ↔ Hard IC830	IC20	IC5005	IC807	IC907	Recommended Machining Data a_p (inch)	f_z (IPR)
SCMT 432-19	.500	.187	.0315	.217	●	●	●	●	●	.118-.315	.0031-.0059
SCMT 433-19	.500	.187	.0472	.217		●				.118-.315	.0031-.0059

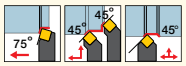
For tools, see pages: IHPR (479)

ISOTURN

SCGT-AS

Square Inserts with a 7° Positive Flank, Very Positive Rake Angle and Sharp Cutting Edge for Machining Aluminum





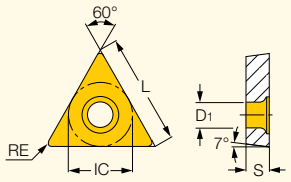
Designation	Dimensions IC	S	RE	D1	IC20	Recommended Machining Data a_p (inch)	f (IPR)
SCGT 3-2-AS	.375	.156	.0315	.173	●	.020-.118	.0039-.0118
SCGT 431-AS	.500	.187	.0157	.217	●	.039-.157	.0039-.0118
SCGT 432-AS	.500	.187	.0315	.217	●	.039-.157	.0039-.0118

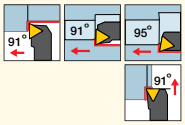
For tools, see pages: IHPR (479)

ISOTURN

TCMT-19

Triangular Inserts
with a 7° Positive Flat Rake
for Semi-Roughing Applications
at Medium to High Feeds





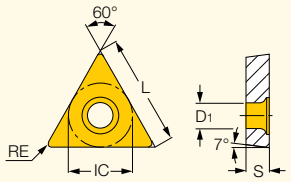
Designation	Dimensions L	IC	S	RE	D1	Tough ↔ Hard IC830	IC50M	IC8150	IC20	Recommended Machining Data a_p (inch)	f (IPR)
TCMT 2-1-19	.433	.250	.094	.0157	.110		●	●	●	.020-.118	.0039-.0118
TCMT 3-2-19	.650	.375	.156	.0315	.173	●	●		●	.039-.157	.0079-.0138
TCMT 220508-19	.866	.500	.197	.0315	.217		●			.039-.157	.0079-.0138

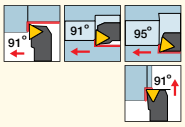
For tools, see pages: IHBR (479)

ISOTURN

TCMT-SM

Triangular Inserts with a 7°
Positive Flank for Semi-Finishing
and Finish Turning on Soft
Materials and Exotic Alloys





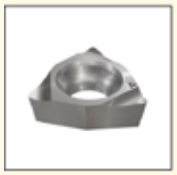
Designation	Dimensions L	IC	S	RE	D1	Tough ↔ Hard IC830	IC8350	IC8250	IC908	IC8150	IC5010	IC428	IC5005	IC807	IC907	Recommended Machining Data a_p (inch)	f (IPR)
TCMT 2-1-SM	.433	.250	.094	.0157	.110		●	●	●	●	●		●	●	●	.008-.118	.0020-.0098
TCMT 2-2-SM	.433	.250	.094	.0315	.110									●	●	.020-.098	.0027-.0098
TCMT 3-1-SM	.650	.375	.156	.0157	.173	●		●		●		●	●	●	●	.020-.118	.0024-.0098
TCMT 3-2-SM	.650	.375	.156	.0315	.173	●		●		●			●	●	●	.020-.118	.0031-.0110
TCMT 3-2-SM*	.650	.375	.156	.0315	.173		●									.020-.118	.0031-.0110

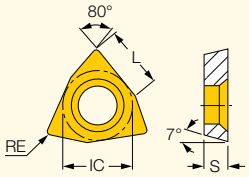
For tools, see pages: IHBR (479)

ISOTURN

WCGT

Trigon Inserts with a 7°
Positive Flank and Chipformer
for Finish Turning





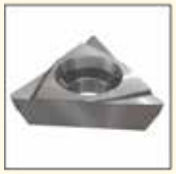
Designation	Dimensions L	IC	S	RE	Tough ↔ Hard IC908	IC30N	Recommended Machining Data a_p (inch)	f (IPR)
WCGT 020102L	.086	.156	.063	.0079	●	●	.016-.079	.0020-.0039
WCGT 020104L	.086	.156	.063	.0157	●	●	.016-.079	.0039-.0059

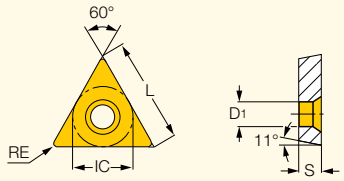
For tools, see pages: IHAXF (505) • IHAXF-AVI (507) • IHAXF-E (507) • IHWF (510)

ISOTURN

TPGX

Triangular Inserts with an 11° Positive Flank and Ground Chipformer for Finish Turning





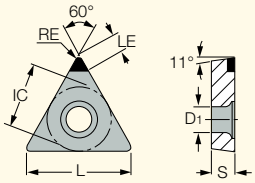
Designation	Dimensions L	IC	S	RE	D1	Tough ↔ Hard IC54	IC908	IC20	IC20N	IC520N	Recommended Machining Data a_p (inch)	f (IPR)
TPGX 730-L	.375	.219	.094	.0079	.118		●	●	●	●	.039-.079	.0039-.0079
TPGX 731-L	.375	.219	.094	.0157	.118	●	●	●	●	●	.039-.098	.0059-.0079
TPGX 220-L	.433	.250	.125	.0079	.138		●	●	●	●	.039-.098	.0039-.0079
TPGX 221-L	.433	.250	.125	.0157	.138	●	●	●	●	●	.039-.118	.0059-.0079
TPGX 222-L	.433	.250	.125	.0315	.138			●			.039-.138	.0059-.0098

For tools, see pages: IHAXF (505) • IHAXF-AVI (507) • IHAXF-E (507) • IHFF (509) • IHFF-C (483)

ISOTURN

TPGX (CBN)

Triangular Inserts with CBN Single Top Corner Brazed Tip, 11° Clearance for Machining Cast Iron and Hardened Steel



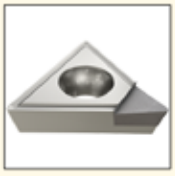
Designation	Dimensions L	IC	S	RE	LE	D1	Tough ↔ Hard IB90	IB50	Recommended Machining Data a_p (inch)	f (IPR)
TPGX 730T	.375	.219	.094	.0079	.10	.098	●	●	.002-.020	.0012-.0079
TPGX 731T	.375	.219	.094	.0157	.10	.098	●	●	.002-.020	.0012-.0079
TPGX 220T	.433	.250	.125	.0079	.13	.138	●	●	.002-.020	.0012-.0079
TPGX 221T	.433	.250	.125	.0157	.12	.138	●	●	.002-.020	.0012-.0079

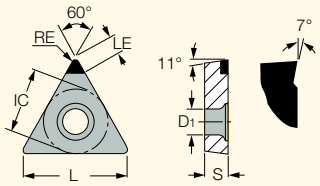
For tools, see pages: IHAXF (505) • IHAXF-AVI (507) • IHAXF-E (507) • IHFF (509) • IHFF-C (483)

ISOTURN

TPGX (PCD)

Triangular Inserts with PCD Single Top Corner Brazed Tip, 11° Clearance and Positive Rake Angle for Finishing Aluminum





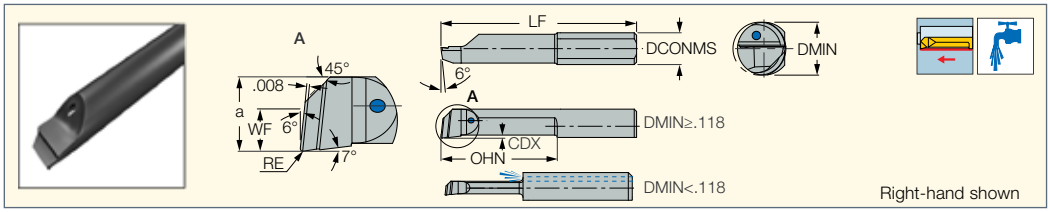
Designation	Dimensions L	IC	S	RE	LE	D1	ID5	Recommended Machining Data a_p (inch)	f (IPR)
TPGX 730	.375	.219	.094	.0079	.12	.098	●	.004-.118	.0020-.0118
TPGX 731	.375	.219	.094	.0157	.12	.098	●	.004-.118	.0020-.0118
TPGX 220	.433	.250	.125	.0079	.13	.138	●	.004-.118	.0020-.0118
TPGX 221	.433	.250	.125	.0157	.15	.138	●	.004-.118	.0020-.0118

For tools, see pages: IHAXF (505)

PICCOCUT

PICCO R/LX050

Reinforced Boring Inserts with Internal Coolant Holes



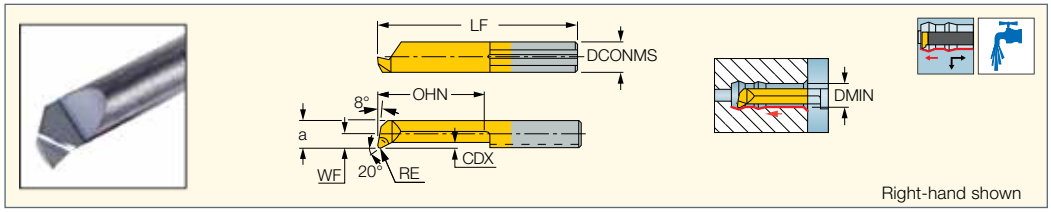
Designation	Dimensions								IC908
	DCONMS	WF	a	RE	LF	OHN(1)	CDX(2)	DMIN	
PICCO R/LX050.2-5R15	.157	-	.071	.006	.748	.197	.004	.079	•
PICCO R/LX050.2-10R05	.157	-	.071	.002	.945	.394	.004	.079	•
PICCO R/LX050.2-10R15	.157	-	.071	.006	.945	.394	.004	.079	•
PICCO R/LX050.3-16R10	.157	.028	.106	.004	1.181	.630	.006	.118	•
PICCO R/LX050.3-16R20	.157	.028	.106	.008	1.181	.630	.006	.118	•
PICCO R/LX050.4-10R10	.157	.063	.142	.004	.945	.394	.008	.157	•
PICCO R/LX050.4-10R20	.157	.063	.142	.008	.945	.394	.008	.157	•
PICCO R/LX050.4-16R10	.157	.063	.142	.004	1.181	.630	.008	.157	•
PICCO R/LX050.4-16R20	.157	.063	.142	.008	1.181	.630	.008	.157	•
PICCO R/LX050.5-15R10	.197	.083	.181	.004	1.181	.591	.012	.197	•
PICCO R/LX050.5-15R20	.197	.083	.181	.008	1.181	.591	.012	.197	•
PICCO R/LX050.5-25R10	.197	.083	.181	.004	1.575	.984	.012	.197	•
PICCO R/LX050.5-25R20	.197	.083	.181	.008	1.575	.984	.012	.197	•
PICCO R/LX050.6-15R10	.236	.098	.217	.004	1.181	.591	.016	.236	•
PICCO R/LX050.6-15R20	.236	.098	.217	.008	1.181	.591	.016	.236	•
PICCO R/LX050.6-22R20	.236	.098	.217	.008	1.457	.866	.016	.236	•
PICCO R/LX050.6-35R20	.236	.098	.217	.008	1.968	1.378	.016	.236	•

• Left-hand inserts on request
(1) Minimum overhang
(2) Cutting depth maximum

PICCOCUT

PICCO R/L 050, 053, 055

Inserts for Internal Turning and Chamfering



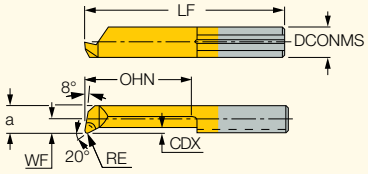
Designation	Dimensions								Tough ↔ Hard	
	DCONMS	WF	a	LF	OHN(2)	RE	CDX(3)	DMIN	IC228	IC908
PICCO R 050.06-2 (1)	.157	-	.020	.787	.079	.002	.003	.024	•	•
PICCO R 050.06-3 (1)	.157	-	.020	.787	.118	.002	.003	.024	•	•
PICCO R 050.08-4	.157	-	.028	.787	.157	.002	.003	.031		•
PICCO R/L 050.1-5	.157	-	.035	.787	.177	.002	.004	.039	•	•
PICCO R/L 050.1-7	.157	-	.035	.866	.256	.002	.004	.039	•	•
PICCO R 050.15-5	.157	-	.051	.748	.197	.002	.004	.059		•
PICCO R 050.15-10	.157	-	.051	.945	.394	.002	.004	.059		•
PICCO R/L 050.2-5	.157	-	.067	.748	.157	.002	.004	.079	•	•
PICCO R 055.2-5	.157	-	.067	.748	.197	.002	.004	.079		•
PICCO R/L 050.2-10	.157	-	.067	.945	.354	.002	.004	.079	•	•
PICCO R 055.2-10	.157	-	.067	.945	.394	.002	.004	.079		•
PICCO L 050.2-15	.157	-	.067	1.142	.591	.002	.004	.079	•	•
PICCO R 050.2-15	.157	-	.067	1.142	.551	.002	.004	.079	•	•
PICCO R 055.2-15	.157	-	.067	1.142	.591	.002	.004	.079		•
PICCO R 050.25-5	.157	.008	.087	.748	.197	.002	.006	.098		•
PICCO R 050.25-10	.157	.008	.087	.945	.394	.003	.006	.098		•

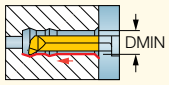
• Specify right- or left-hand bars
(1) Maximum D.O.C.=.0004-.0012", maximum feed=.0004 IPR.
(2) Minimum overhang
(3) Cutting depth maximum

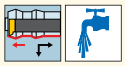
PICCOCUT

PICCO R/L 050, 053, 055 (continued)

Inserts for Internal Turning and Chamfering







Right-hand shown

Designation	Dimensions								Tough ↔ Hard	
	DCONMS	WF	a	LF	OHN(2)	RE	CDX(3)	DMIN	IC228	IC908
PICCO R 050.25-16	.157	.008	.087	1.181	.630	.003	.006	.098		•
PICCO R 053.3-10	.157	.024	.102	.945	.354	.001	.008	.110		•
PICCO R 055.3-10	.157	.024	.102	.945	.394	.002	.008	.110		•
PICCO R/L 050.3-10	.157	.024	.102	.945	.354	.004	.008	.110	•	•
PICCO R 053.3-16	.157	.024	.102	1.181	.591	.001	.008	.110		•
PICCO R 055.3-16	.157	.024	.102	1.181	.630	.002	.008	.110		•
PICCO R/L 050.3-16	.157	.024	.102	1.181	.591	.004	.008	.110	•	•
PICCO R 053.3-20	.157	.024	.102	1.339	.748	.001	.008	.110		•
PICCO R/L 050.3-20	.157	.024	.102	1.339	.748	.004	.008	.110	•	•
PICCO R 050.35-10	.157	.043	.122	.945	.394	.004	.010	.138		•
PICCO R 050.35-16	.157	.043	.122	1.181	.630	.004	.010	.138		•
PICCO R 050.35-20	.157	.043	.122	1.339	.787	.004	.010	.138		•
PICCO R 050.35-24	.157	.043	.122	1.496	.945	.004	.010	.138		•
PICCO R 053.4-10	.157	.059	.138	.945	.354	.001	.012	.157		•
PICCO R 055.4-10	.157	.059	.138	.945	.394	.002	.012	.157		•
PICCO R/L 050.4-10	.157	.059	.138	.945	.354	.004	.012	.157	•	•
PICCO R 053.4-16	.157	.059	.138	1.181	.591	.001	.012	.157		•
PICCO R 055.4-16	.157	.059	.138	1.181	.630	.002	.012	.157		•
PICCO R/L 050.4-16	.157	.059	.138	1.181	.591	.004	.012	.157	•	•
PICCO R 053.4-20	.157	.059	.138	1.339	.748	.001	.012	.157		•
PICCO R 055.4-20	.157	.059	.138	1.339	.787	.002	.012	.157		•
PICCO R/L 050.4-20	.157	.059	.138	1.339	.748	.004	.012	.157	•	•
PICCO R/L 050.4-24	.157	.059	.138	1.496	.906	.004	.012	.157	•	•
PICCO R/L 050.4-28	.157	.059	.138	1.654	1.063	.004	.012	.157	•	•
PICCO R 055.4-28	.157	.059	.138	1.654	1.102	.002	.020	.157		•
PICCO R 055.5-10	.197	.075	.173	.984	.354	.002	.020	.197		•
PICCO R/L 050.5-10	.197	.075	.173	.984	.354	.006	.020	.197	•	•
PICCO R 055.5-15	.197	.075	.173	1.181	.551	.002	.020	.197		•
PICCO R/L 050.5-15	.197	.075	.173	1.181	.551	.006	.020	.197	•	•
PICCO R 055.5-20	.197	.075	.173	1.378	.748	.002	.020	.197		•
PICCO R/L 050.5-20	.197	.075	.173	1.378	.748	.006	.020	.197	•	•
PICCO R 055.5-25	.197	.075	.173	1.575	.945	.002	.020	.197		•
PICCO R/L 050.5-25	.197	.075	.173	1.575	.945	.006	.020	.197	•	•
PICCO R 055.5-30	.197	.075	.173	1.772	1.142	.002	.020	.197		•
PICCO R/L 050.5-30	.197	.075	.173	1.772	1.142	.006	.020	.197	•	•
PICCO R/L 050.5-35	.197	.075	.173	1.968	1.339	.006	.020	.197	•	•
PICCO R 055.6-15	.236	.091	.209	1.181	.551	.002	.020	.236		•
PICCO R/L 050.6-15	.236	.091	.209	1.181	.551	.006	.020	.236	•	•
PICCO R 055.6-22	.236	.091	.209	1.457	.827	.002	.020	.236		•
PICCO R/L 050.6-22	.236	.091	.209	1.457	.827	.006	.020	.236	•	•
PICCO R 055.6-25	.236	.091	.209	1.575	.945	.002	.020	.236		•
PICCO R/L 050.6-25	.236	.091	.209	1.575	.945	.006	.020	.236	•	•
PICCO R 055.6-30	.236	.091	.209	1.772	1.142	.002	.020	.236		•
PICCO R/L 050.6-30	.236	.091	.209	1.772	1.142	.006	.020	.236	•	•
PICCO R/L 050.6-35	.236	.091	.209	1.968	1.339	.006	.020	.236	•	•
PICCO R/L 050.6-42	.236	.091	.209	2.244	1.614	.006	.020	.236	•	•
PICCO R/L 050.7-20	.276	.110	.248	1.378	.748	.006	.024	.268	•	•
PICCO R/L 050.7-25	.276	.110	.248	1.575	.945	.006	.024	.268	•	•
PICCO R/L 050.7-30	.276	.110	.248	1.772	1.142	.006	.024	.268	•	•
PICCO R/L 050.7-35	.276	.110	.248	1.968	1.339	.006	.024	.268	•	•
PICCO R/L 050.7-40	.276	.110	.248	2.165	1.535	.006	.024	.268	•	•
PICCO R/L 050.7-45	.276	.110	.248	2.362	1.732	.006	.024	.268	•	•
PICCO R/L 050.7-50	.276	.110	.248	2.559	1.929	.006	.024	.268	•	•

• Specify right- or left-hand bars

(1) Maximum D.O.C.=.0004-.0012", maximum feed=.0004 IPR.

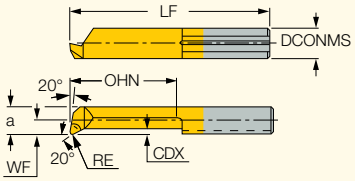
(2) Minimum overhang

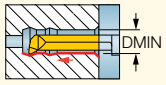
(3) Cutting depth maximum

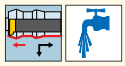
PICCOCUT

PICCO R 050.20

Inserts for Internal Turning and Chamfering Next to the Bottom of Blind Holes





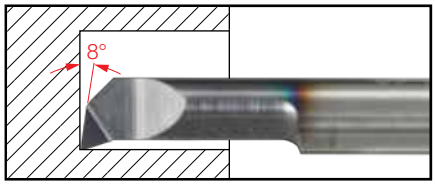


Right-hand shown

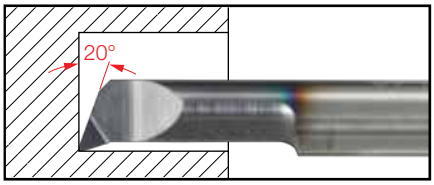
Designation	Dimensions								IC908
	DCONMS	WF	a	LF	OHN(1)	RE	CDX(2)	DMIN	
PICCO R 050.20.2-10	.157	-	.067	.945	.394	.002	.004	.079	•
PICCO R 050.20.3-10	.157	.024	.102	.945	.394	.004	.008	.110	•
PICCO R 050.20.4-16	.157	.059	.138	1.181	.630	.004	.012	.157	•
PICCO R 050.20.5-20	.197	.075	.173	1.378	.748	.006	.020	.197	•

• Specify right- or left-hand bars
(1) Minimum overhang
(2) Cutting depth maximum

PICCO 050...



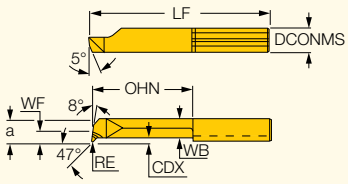
PICCO 050.20...



PICCOCUT

PICCO R/L 047

Inserts for Internal Deep Profiling



Right-hand shown

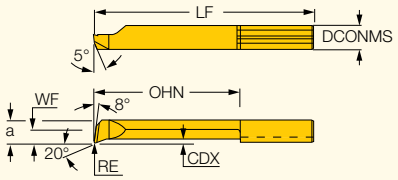
Designation	Dimensions									IC908
	DCONMS	WF	a	LF	OHN(1)	WB	CDX(2)	DMIN	RE	
PICCO R/L 047.4-20	.157	.059	.138	1.339	.787	.118	.012	.157	.006	•
PICCO R/L 047.5-25	.197	.075	.173	1.575	.984	.150	.020	.197	.006	•
PICCO R/L 047.6-30	.236	.091	.209	1.772	1.181	.177	.020	.236	.006	•
PICCO R 047.T6-22	.236	.091	.209	1.457	.866	.134	.071	.236	.006	•
PICCO R 047.T6-30	.236	.091	.209	1.772	1.181	.134	.071	.236	.006	•

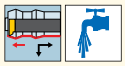
• Left hand inserts on request
(1) Minimum overhang
(2) Cutting depth maximum

PICCOCUT

PICCO R/L 050-C

Inserts with Chipformers for Internal Boring and Profiling





Right-hand shown

Designation	Dimensions								IC908
	DCONMS	WF	a	LF	OHN(1)	CDX(2)	DMIN	RE	
PICCO R/L 050.4-10C	.157	.059	.138	.945	.394	.012	.157	.004	•
PICCO R/L 050.4-20C	.157	.059	.138	1.339	.787	.012	.157	.004	•
PICCO R/L 050.4-24C	.157	.059	.138	1.496	.945	.012	.157	.004	•
PICCO R/L 050.4-28C	.157	.059	.138	1.654	1.102	.012	.157	.004	•
PICCO R 050.4-16C	.157	.059	.138	1.181	.630	.012	.157	.004	•
PICCO R/L 050.5-10C	.197	.075	.173	.984	.394	.020	.197	.006	•
PICCO R/L 050.5-15C	.197	.075	.173	1.181	.591	.020	.197	.006	•
PICCO R/L 050.5-20C	.197	.075	.173	1.378	.787	.020	.197	.006	•
PICCO R/L 050.5-25C	.197	.075	.173	1.575	.984	.020	.197	.006	•
PICCO R/L 050.5-30C	.197	.075	.173	1.772	1.181	.020	.197	.006	•
PICCO R/L 050.5-35C	.197	.075	.173	1.968	1.378	.020	.197	.006	•
PICCO R/L 050.6-15C	.236	.091	.209	1.181	.591	.020	.236	.006	•
PICCO R/L 050.6-22C	.236	.091	.209	1.457	.866	.020	.236	.006	•
PICCO R/L 050.6-25C	.236	.091	.209	1.575	.984	.020	.236	.006	•
PICCO R/L 050.6-30C	.236	.091	.209	1.772	1.181	.020	.236	.006	•
PICCO R/L 050.6-35C	.236	.091	.209	1.968	1.378	.020	.236	.006	•
PICCO R/L 050.6-42C	.236	.091	.209	2.244	1.654	.020	.236	.006	•
PICCO R/L 050.7-20C	.276	.110	.248	1.378	.787	.024	.268	.006	•
PICCO R/L 050.7-25C	.276	.110	.248	1.575	.984	.024	.268	.006	•
PICCO R/L 050.7-30C	.276	.110	.248	1.772	1.181	.024	.268	.006	•
PICCO R/L 050.7-35C	.276	.110	.248	1.968	1.378	.024	.268	.006	•
PICCO R/L 050.7-40C	.276	.110	.248	2.165	1.575	.024	.268	.006	•
PICCO L 050.7-50C	.276	.110	.248	2.559	1.968	.024	.268	.006	•

• All left-hand inserts on request

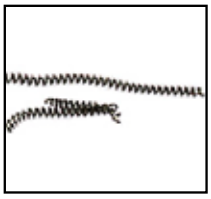
(1) Minimum overhang

(2) Cutting depth maximum

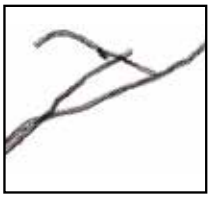
Stainless Steel 316L

PICCO R 050.6-35C with Chipbreaker

f= .0012 ipr



f= .0020 ipr



PICCO R 050.6-35 Standard

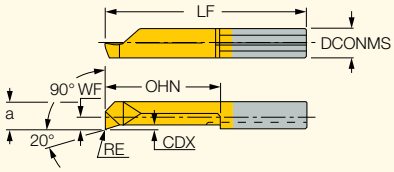
f= .0012 ipr

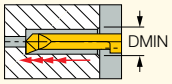
f= .0020 ipr

PICCOCUT

PICCO R/L 090

Inserts for Internal Turning and Profiling





Right-hand shown

Designation	Dimensions								IC228
	DCONMS	WF	a	LF	OHN(1)	RE	CDX(2)	DMIN	
PICCO R/L 090.3-10	.157	.024	.102	.945	.354	.004	.008	.110	•
PICCO R/L 090.3-16	.157	.024	.102	1.181	.591	.004	.008	.110	•
PICCO R/L 090.4-10	.157	.059	.138	.945	.354	.004	.012	.157	•
PICCO R/L 090.4-16	.157	.059	.138	1.181	.591	.004	.012	.157	•
PICCO R/L 090.5-10	.197	.075	.173	.984	.354	.006	.020	.197	•
PICCO R/L 090.5-15	.197	.075	.173	1.181	.551	.006	.020	.197	•
PICCO R/L 090.5-20	.197	.075	.173	1.378	.748	.006	.020	.197	•

• Specify right- or left-hand bars

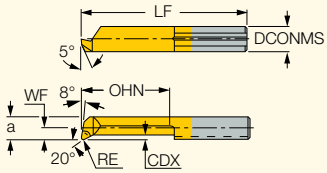
(1) Minimum overhang

(2) Cutting depth maximum

PICCOCUT

PICCO R 050 (CBN)

CBN Tipped Inserts for Internal Turning, Profiling and Chamfering Hard Steel



Right-hand shown • Hard Materials

Designation	Dimensions								IB55
	DCONMS	WF	a	LF	OHN(1)	CDX(2)	DMIN	RE	
PICCO R 050.3-10B	.157	.024	.102	1.004	.394	.008	.110	.004	•
PICCO R 050.4-10B	.157	.059	.138	1.004	.394	.012	.157	.004	•
PICCO R 050.5-15B	.197	.075	.173	1.240	.591	.020	.197	.006	•
PICCO R 050.6-15B	.236	.091	.209	1.240	.591	.020	.236	.006	•
PICCO R 050.7-20B	.276	.110	.248	1.437	.787	.024	.268	.006	•

• It is not recommended to use coolant when machining with CBN tipped tools • Available on request only

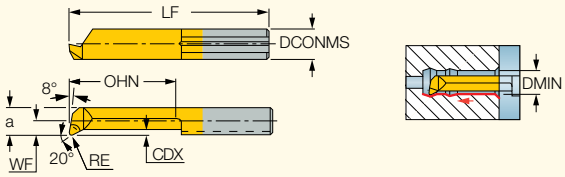
(1) Minimum overhang

(2) Cutting depth maximum

PICCOCUT

PICCO R/LHD 050

Inserts for Internal Turning and Chamfering Hard Steel - Up to 65 HRC



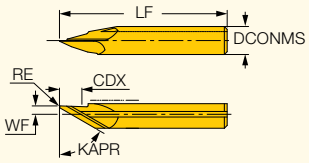
Designation	Dimensions								IC902
	DCONMS	WF	a	LF	OHN(1)	RE	CDX(2)	DMIN	
PICCO R/LHD 050.2-5	.157	-	.067	.748	.157	.002	.004	.079	•
PICCO R/LHD 050.3-10	.157	.024	.102	.945	.354	.004	.008	.110	•
PICCO R/LHD 050.3-16	.157	.024	.102	1.181	.591	.004	.008	.110	•
PICCO R/LHD 050.4-10	.157	.059	.138	.945	.354	.004	.012	.157	•
PICCO R/LHD 050.4-20	.157	.059	.138	1.339	.748	.004	.012	.157	•
PICCO R/LHD 050.5-10	.197	.075	.173	.984	.354	.006	.020	.197	•
PICCO R/LHD 050.5-15	.197	.075	.173	1.181	.551	.006	.020	.197	•
PICCO R/LHD 050.6-15	.236	.091	.209	1.181	.551	.006	.020	.236	•
PICCO R/LHD 050.7-20	.276	.110	.248	1.378	.748	.006	.024	.268	•
PICCO R/LHD 050.7-25	.276	.110	.248	1.575	.945	.006	.024	.268	•
PICCO R/LHD 050.7-35	.276	.110	.248	1.968	1.339	.006	.024	.268	•

• Specify right- or left-hand bars
(1) Minimum overhang
(2) Cutting depth maximum

PICCOCUT

PICCO R/L 520

Inserts for Internal Chamfering



Right-hand shown

Designation	Dimensions							IC908
	DCONMS	WF	KAPR(1)	LF	RE	CDX	DMIN	
PICCO R/L 520.0045-15	.197	.059	45.0	1.181	.008	.138	.039	•
PICCO R/L 520.0060-15	.197	.059	60.0	1.181	.008	.157	.039	•

• Left hand inserts on request
(1) Tool cutting edge angle

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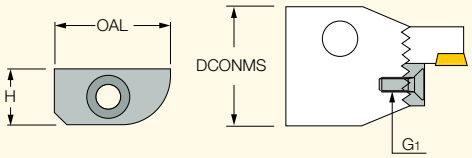
Accessories

PLT

Cover Plate Protects the Serrated Faces When a Single Toolholder is Used



Designation	DCONMS	H	OAL	G1
PLT 16	.630	.276	.551	SR M3x12 DIN912
PLT 20	.787	.335	.669	SR M4x14 DIN912
PLT 25	.984	.402	.827	SR M4x16 DIN7991
PLT 32	1.260	.547	1.102	SR M5x20 DIN7991
PLT 40	1.575	.685	1.378	SR M6x25 DIN7991
PLT 50	1.968	.843	1.870	SR M8x25 DIN7991
PLT 63	2.480	1.039	2.441	SR M10x30 DIN7991
PLT 80	3.150	1.335	3.248	SR M12x35 DIN7991

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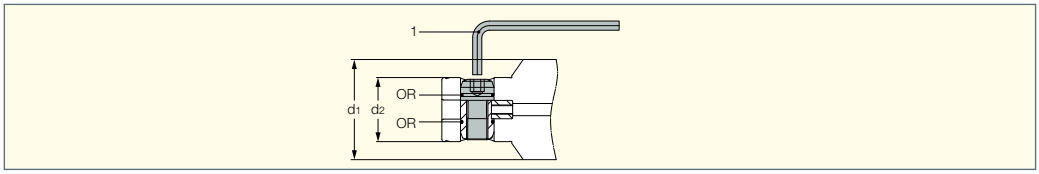
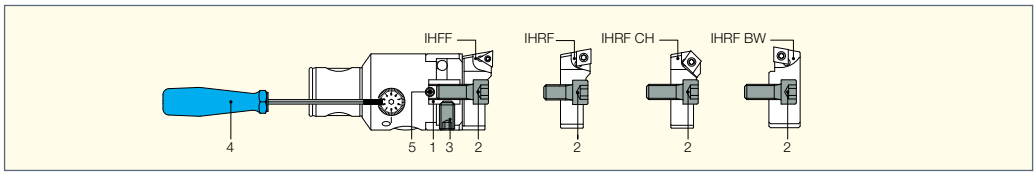
BH MB COUPLING SET



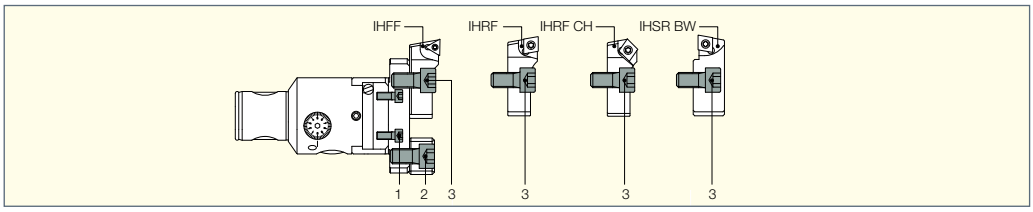
Designation	d1	d2	1 (mm)	OR
BH MB14/16 COUPLING SET	.55-.63	.39	2.5	-
BH MB20 COUPLING SET	.79	.51	3	-
BH MB25 COUPLING SET	.98	.63	3	-
BH MB32 COUPLING SET	1.26	.79	4	OR 7.5X1N
BH MB40 COUPLING SET	1.57	.98	5	OR 10X1N
BH MB50 COUPLING SET	1.97	1.26	6	OR 13X1N
BH MB50 COUPLING SET M5	1.97	1.26	6	OR 13X1N
BH MB63/80 COUPLING SET	2.48-3.15	1.65	8	OR 18.77X1.78N
BH MB110/140 COUPLING SET	4.33-5.51	2.99	14	-

BHFI - SPARE PARTS



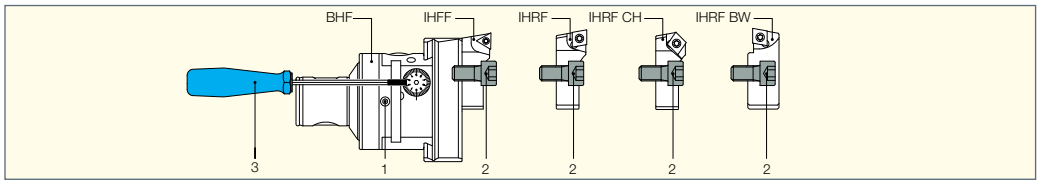
Designation	1	2	3	4	5
BHFI...-16...	-	SR M3X6 DIN 912	-	BH HW 1.5 HANDLE	SR M3X4.5 DIN 913
BHFI...-20...	-	SR M4X8 DIN 912	-	BH HW 1.5 HANDLE	SR M3X4.5 DIN 913
BHFI...-25...	-	SR M5X1O DIN 912	-	BH HW 2.0 HANDLE	SR M4X4 DIN 913
BHFI...-32...	-	SR M6X12 DIN 912	-	BH HW 2.0 HANDLE	SR M4X5 DIN 913
BHFI...-40...	-	SR M8X14 DIN 912	-	BH HW 2.5 HANDLE	SR M5X6 DIN 913 SR
BHFI...-50-60	BH NUT 10	SR M1OX25 DIN 912	SR M10X16 DIN 913	BH HW 2.5 HANDLE	SR M5X8 DIN 913

BHFI - SPARE PARTS



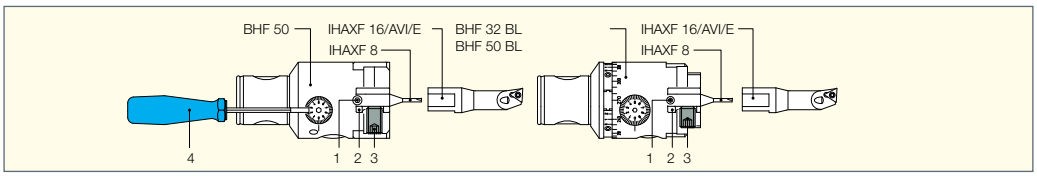
Designation	1	2	3
BHFI...-50...	SR M5X12 DIN 912	SR M1OX20 DIN 912	SR M1OX25 DIN 912

BHFI - SPARE PARTS



Designation	1	2	3
BHFI...-63...	SR M6X10 DIN 915		
BHFI...-80...	SR M6X14 DIN 915	SR M1OX25 DIN 912	BH HW 3.0 HANDLE
BHFI...-125...	SR M6X22 DIN 915		

BHFI - SPARE PARTS



Designation	1	2	3	4
BHFI...-50...	SR M5X8 DIN 913	SLEEVE D 8-D16	SR M10X10 DIN 913	BH HW 2.5 HANDLE
BHFI...-32... BL	SR M4X5 DIN 913	-	SR M5X8 DIN 913 SR M5X12 DIN 913	BH HW 2.0 HANDLE
BHFI...-50... BL	SR M5X8 DIN 913	SLEEVE D 8-D16	SR M10X10 DIN 913	BH HW 2.5 HANDLE

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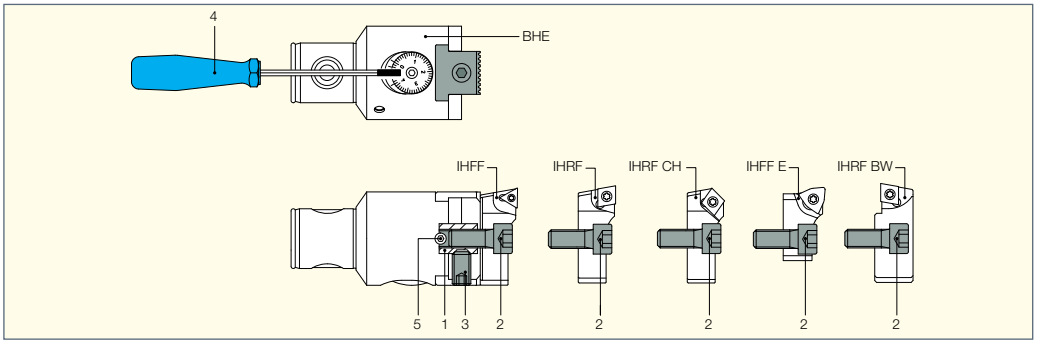
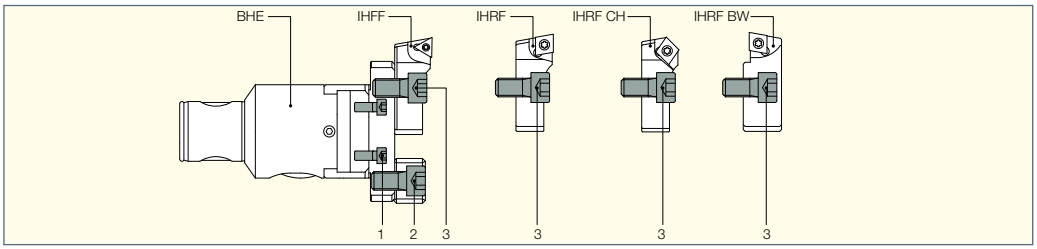
BHEI MB - SPARE PARTS



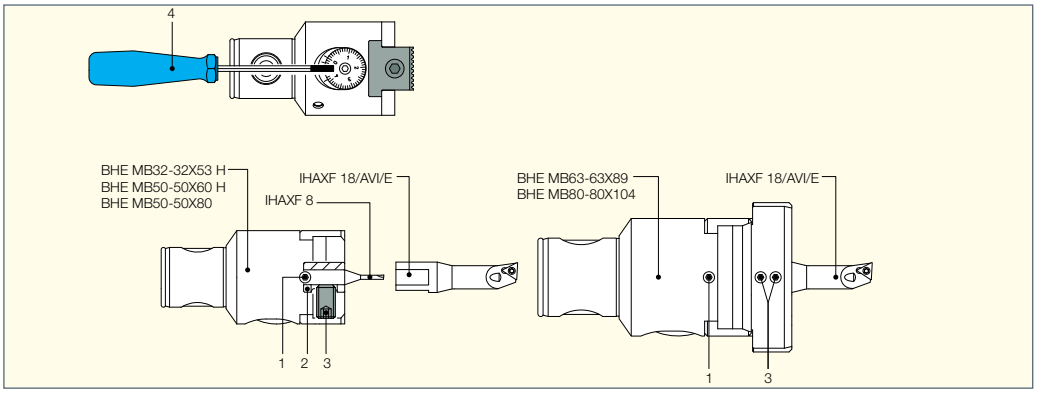
Designation	1	2	3	4	5
BHEI MB14-14X30	-	SR M3X6 DIN 912	-	BH HW 1.5 HANDLE	SR M3X3.5 DIN 913
BHEI MB16-16X34	-	SR M3X6 DIN 912	-	BH HW 1.5 HANDLE	SR M3X4.5 DIN 913
BHEI MB20-20X40	-	SR M4X8 DIN 912	-	BH HW 1.5 HANDLE	SR M3X4.5 DIN 913
BHEI MB25-25X50	-	SR M5X1O DIN 912	-	BH HW 1.5 HANDLE	SR M4X4 DIN 913
BHEI MB32-32X63	-	SR M6X12 DIN 912	-	BH HW 2.5 HANDLE	SR M5X5 DIN 913
BHEI MB40-40X80	-	SR M8X14 DIN 912	-	BH HW 3.0 HANDLE	SR M6X6 DIN 913
BHEI MB50-50X80	BH NUT 10	SR M1OX25 DIN 912	SR M10X16 DIN 913	BH HW 3.0 HANDLE	SR M6X8 DIN 913
BHEI MB63-63X89	-	SR M1OX20 DIN 912	-	BH HW 3.0 HANDLE	SR M6X8 DIN 913
BHEI MB80-80X104	-	SR M1OX25 DIN 912	-	BH HW 3.0 HANDLE	SR M6X12 DIN 913

BHEI - SPARE PARTS



Designation	1	2	3
BHEI MB50-50X80	SR M5X12 DIN 912	SR M1OX20 DIN 912	SR M1OX25 DIN 912
BHEI MB63-63X89	SR M5X25 DIN 912		
BHEI MB80-80X104			

BHEI - SPARE PARTS



Designation	1	2	3	4
BHEI MB32-32X53 H	SR M5X5 DIN 913	-	SR M5X8 DIN 913	BH HW 2.5 HANDLE
	SR M5X5 DIN 913	-	SR M5X12 DIN 913	
BHEI MB50-50X60 H	SR M6X8 DIN 913	SLEEVE D 8-D16	SR M10X10 DIN 913	BH HW 3.0 HANDLE
BHEI MB50-50X80	SR M6X8 DIN 913	SLEEVE D 8-D16	SR M10X10 DIN 913	
BHEI MB63-63X89	SR M6X8 DIN 913	-	SR M6X6 DIN 913	
BHEI MB80-80X104	SR M6X12 DIN 913	-	SR M6X6 DIN 913	

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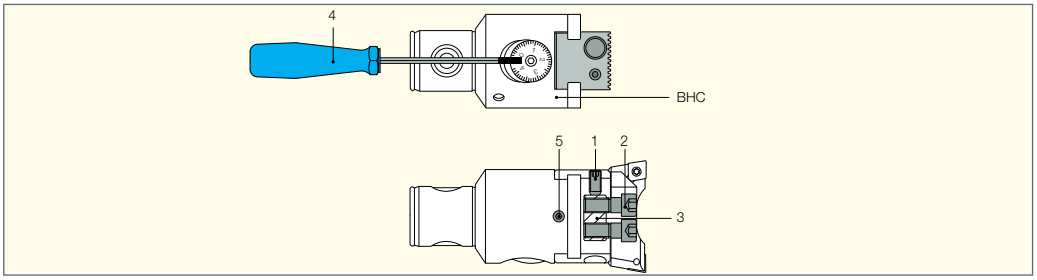
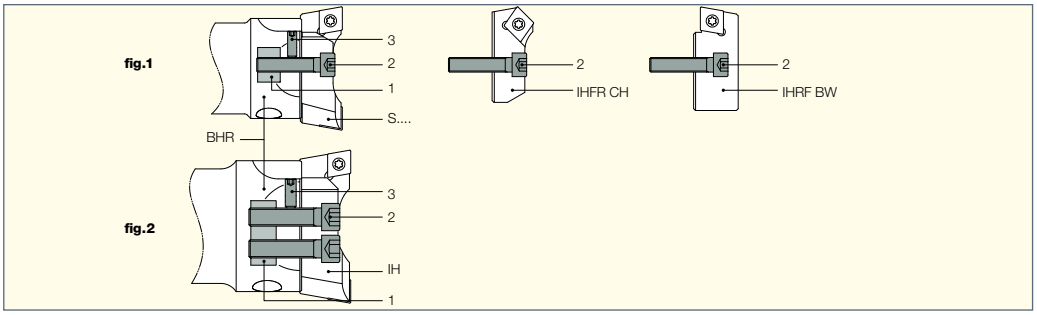
BHCI - SPARE PARTS



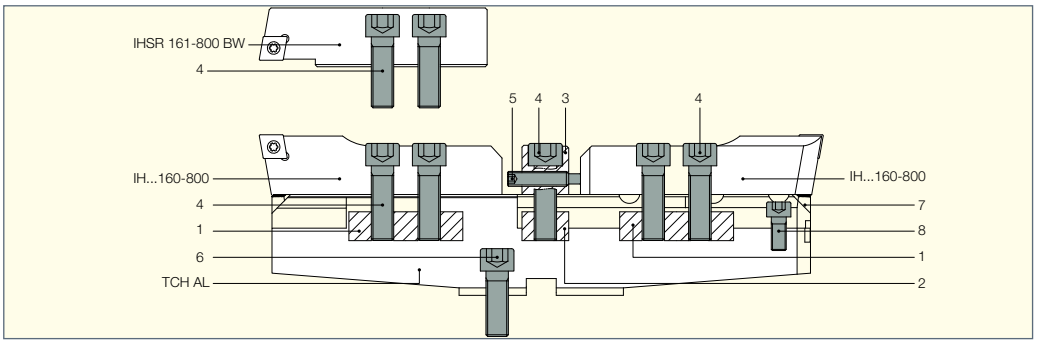
Designation	1	2	3	4	5
BHCI MB25-25X57	SR M4X8 DIN 913	BH SR M4X11 DIN 912 PT	BH NUT-BHCI MB25	BH HW 2.0 HANDLE	SR M4X5 DIN 913
BHCI MB32-32X71	SR M5X10 DIN 913	BH SR M5X12.5 DIN 912 PT	BH NUT-BHCI MB32	BH HW 2.5 HANDLE	SR M5X5 DIN 913
BHCI MB40-40X90	SR M6X12 DIN 913	BH SR M6X16 DIN 912 PT	BH NUT-BHCI MB40	BH HW 3.0 HANDLE	SR M6X6 DIN 913
BHCI MB50-50X87	SR M6X14 DIN 913	BH SR M8X20 DIN 912 PT	BH NUT-BHCI MB50	BH HW 3.0 HANDLE	SR M6X8 DIN 913
BHCI MB63-63X109	SR M6X16 DIN 913	BH SR M10X26 DIN 912 PT	BH NUT-BHCI MB63	BH HW 3.0 HANDLE	SR M6X8 DIN 913
BHCI MB80-80X130	SR M6X20 DIN 913	BH SR M12X30 DIN 912 PT	BH NUT-BHCI MB80	BH HW 3.0 HANDLE	SR M6X12 DIN 913

BHR - SPARE PARTS



Designation	1	2	3
BHR MB16...16	BH NUT BHR MB16	SR M3X14 DIN912	SR M3X4 DIN913
BHR MB20...20	BH NUT BHR MB20	SR M4X15 DIN912	SR M3X5 DIN913
BHR MB25...25	BH NUT BHR MB25	SR M4X20 DIN912	SR M3X8 DIN913
BHR MB32...32	BH NUT BHR MB32	SR M5X25 DIN912	SR M4X12 DIN913
BHR MB40...50	BH NUT BHR MB40	SR M6X30 DIN912	SR M5X14 DIN913
BHR MB50...50	BH NUT BHR MB50	SR M8X35 DIN912	SR M5X12 DIN913
BHR MB50...63	BH NUT BHR MB63	SR M10X40 DIN912	SR M6X16 DIN913
BHR MB63...63	BH NUT BHR MB63	SR M10X40 DIN912	SR M6X16 DIN913
BHR MB80...80	BH NUT BHR MB80	SR M12X45 DIN912	SR M8X25 DIN913

TCH AL - SPARE PARTS (Rough Boring)



Designation	1	2	3	4
TCH AL 200-300-400 TCH AL 500-600-700-800	BH TCH NUT A	BH TCH NUT B	BH TCH NUT C	SR M12X40 DIN 912

Designation	5	6	7	8
TCH AL 200	SR M8X40 DIN 915	SR M12X35 DIN 912	BH SERRATED PLATE 200	SR M8X25 DIN 912
TCH AL 300	SR M8X40 DIN 915	SR M12X35 DIN 912	BH SERRATED PLATE 300	SR M8X25 DIN 912
TCH AL 400	SR M8X40 DIN 915	SR M12X35 DIN 912	BH SERRATED PLATE 400-700	SR M8X20 DIN 912
TCH AL 500-600-700-800	SR M8X40 DIN 915	SR M16X50 DIN 912	BH SERRATED PLATE 400-700	SR M8X25 DIN 912

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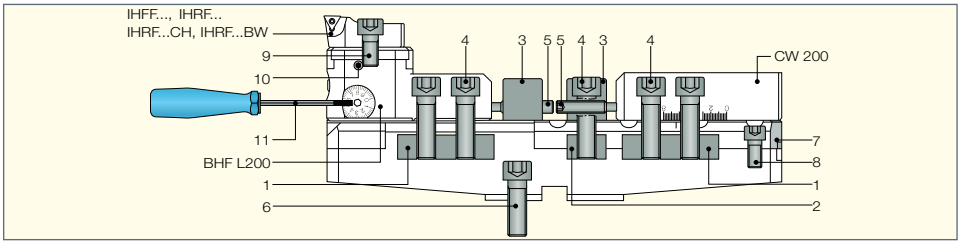
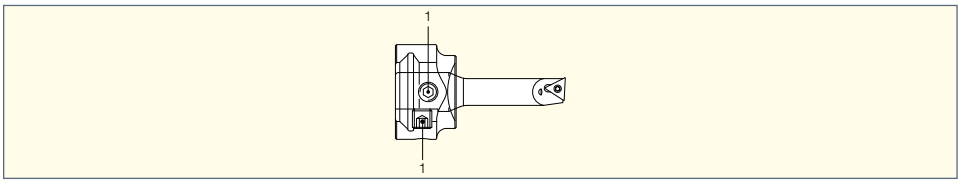
TCH AL - SPARE PARTS (Fine Boring)



Designation	1	2	3	4	5
TCH AL 200-300-400 TCH AL 500-600-700-800	BH TCH NUT A	BH TCH NUT B	BH TCH NUT C	SR M12X40 DIN 912	SR M8X40 DIN 915

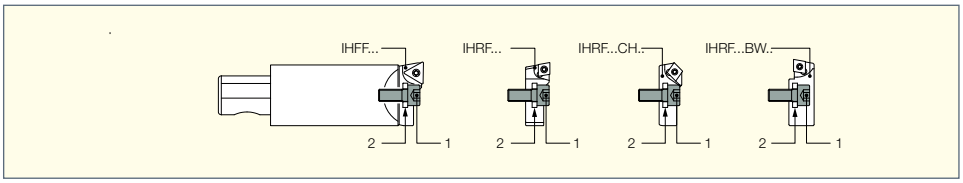
Designation	6	7	8	9	10	11
TCH AL 200	SR M12X35 DIN 912	BH SERRATED PLATE 200	SR M8X25 DIN 912	SR M1OX20 DIN 912	SR M6X8 DIN 915	BH HW 3.0 HANDLE
TCH AL 300	SR M12X35 DIN 912	BH SERRATED PLATE 300	SR M8X25 DIN 912	SR M1OX20 DIN 912	SR M6X8 DIN 915	BH HW 3.0 HANDLE
TCH AL 400	SR M12X35 DIN 912	BH SERRATED PLATE 400-700	SR M8X20 DIN 912	SR M1OX20 DIN 912	SR M6X8 DIN 915	BH HW 3.0 HANDLE
TCH AL 500-600-700-800	SR M16X50 DIN 912	BH SERRATED PLATE 400-700	SR M8X25 DIN 912	SR M1OX20 DIN 912	SR M6X8 DIN 915	BH HW 3.0 HANDLE

ADBH - SPARE PARTS



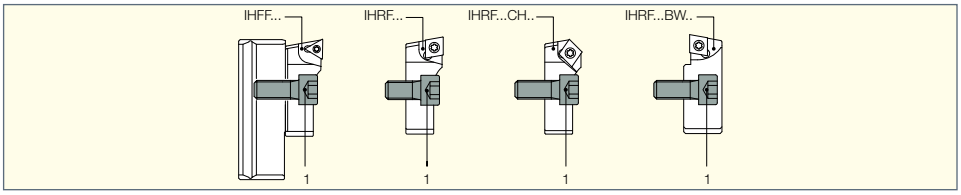
Designation	1
ADBH 30XD16	TSR M8X8 DIN 915

BBH-D - SPARE PARTS



Designation	1	2
BBH D16-53	SR M5X12 DIN 912	WASHER DIN 125A M5
BBH D16-105	SR M5X12 DIN 912	WASHER DIN 125A M5

BHFH - SPARE PARTS



Designation	1
BHFH 30X75 BHFH 40X133 BHFH 30X93	SR M1OX18 DIN 912
BHFH 40X200 BHFH 30X135 BHFH 40X300 BHFH 40X400	SR M1OX25 DIN 912

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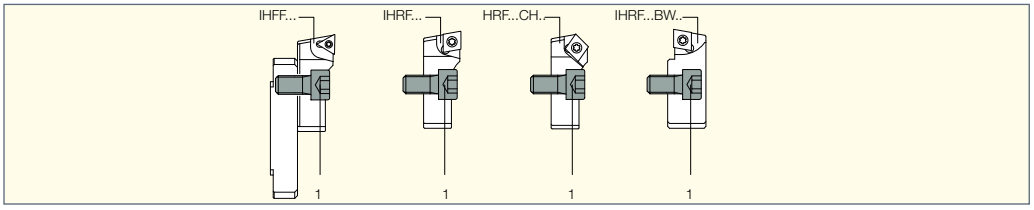
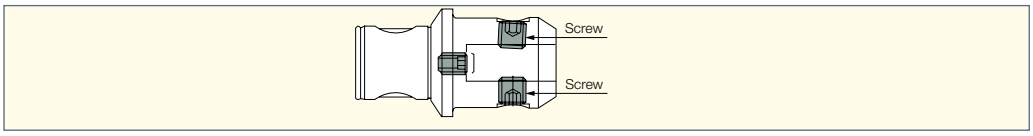
BHEH - SPARE PARTS



Designation	1
BHEH 24x75	SR M1OX20 DIN 912
BHEH 28x80	SR M1OX25 DIN 912
BHEH 28x108	
BHEH 28x148	

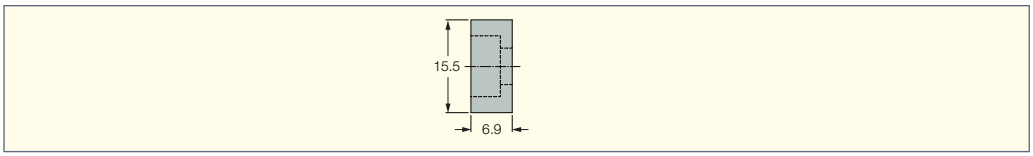
EMH - SPARE PARTS



Designation	Screw #1	Screw # 2
EMH MB 50-6	EMH 50-6 SCREW	M6x10 EM SCREW
EMH MB 50-8	EMH 50-8 SCREW	M8x10 EM SCREW
EMH MB 50-10	EMH 50-10 SCREW	M10x12 EM SCREW
EMH MB 50-12	EMH 50-12 SCREW	M12x16 EM SCREW
EMH MB 50-14	EMH 50-14 SCREW	M14x16 EM SCREW
EMH MB 50-16	EMH 50-16 SCREW	M14x16 EM SCREW
EMH MB 50-20	EMH 50-20 SCREW	M16x16 EM SCREW
EMH MB 63-16	EMH 63-16 SCREW	M14x16 EM SCREW
EMH MB 63-20	EMH 63-20 SCREW	M16x16 EM SCREW
EMH MB 63-25	EMH 63-25 SCREW	M18x20 EM SCREW
EMH MB 63-32	EME 63-32 SCREW	M18x20 EM SCREW
EMH MB 80-40	EMH 80-40 SCREW	M20x20 EM SCREW

BH WASHER - SPARE PARTS

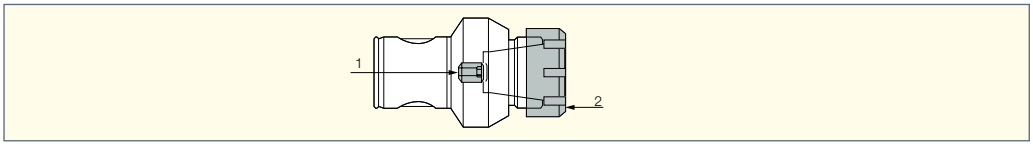
Kit BHE



Designation	For Kit BHE
BH WASHER IH..50	KIT BHEI MB50-50X80
	KIT BHEI MB63-63X89
	KIT BHEI MB80-80X104
	KIT BHFI MB50-50X80 6-108

CC - SPARE PARTS

Components for CC MB



Designation	1	2	Wrench
CC MB16-ER11M	CC MB16 SCREW	NUT ER11 MINI	WRENCH ER11 MINI
CC MB20-ER16M	CC MB20 SCREW	NUT ER16 MINI	WRENCH ER16 MINI
CC MB25-ER20M	CC MB25 SCREW	NUT ER20 MINI	WRENCH ER20 MINI
CC MB32-ER25M	CC MB32 SCREW	NUT ER25 MINI	WRENCH ER25 MINI
CC MB40-ER25	CC MB40 SCREW	NUT ER25 TOP	WRENCH ER25
CC MB50-ER25	CC MB50 SCREW	NUT ER25 TOP	WRENCH ER25
CC MB50-ER32	CC MB50 SCREW	NUT ER32 TOP	WRENCH ER32
CC MB63-ER32	CC MB63 SCREW	NUT ER32 TOP	WRENCH ER32
CC MB63-ER40	CC MB63 SCREW	NUT ER40 TOP	WRENCH ER40

BHR Rough Boring Cutting Data

ISO	Workpiece Material	Hardness HB	Overhang LDRED/BDRED	a_p (inch) RE (Radius)	Boring Range .7-1.1		Boring Range 1.1-2.0		Boring Range 20.-2.7	
					.02-.05	.05-.10	.03-.06	.06-.10	.03-.06	.06-.012
					.008	.016	.008-.016	.016	.008-.016	.016
P	Carbon Steel	HB<200	2.5	V_c (SFM)	490-590	395-490	525-655	460-560	525-655	460-590
			●●●	f (IPR)	.004-.008	.003-.008	.006-.008	.004-.007	.006-.010	.003-.008
			4	V_c (SFM)	460-525	330-460	525-590	395-490	525-590	395-490
			●●	f (IPR)	.004-.007	.003-.006	.004-.0052	.003-.004	.004-.005	.003-.004
			6.3	V_c (SFM)	195-260	130-195	195-295	165-195	230-295	165-230
			●	f (IPR)	.002-.005	.002-.004	.002-.005	.002-.004	.002-.004	.002-.004
	Carbon Steel	HB>200	2.5	V_c (SFM)	425-525	330-425	460-590	395-525	460-590	395-525
			●●●	f (IPR)	.003-.006	.003-.005	.003-.008	.002-.005	.003-.010	.003-.007
			4	V_c (SFM)	360-460	260-360	330-460	260-395	330-460	260-395
			●●	f (IPR)	.003-.005	.003-.004	.003-.006	.002-.006	.003-.008	.002-.006
			6.3	V_c (SFM)	230-295	195-230	260-330	195-260	260-330	195-260
			●	f (IPR)	.003-.004	.002-.003	.002-.004	.002-.003	.003-.006	.002-.001

ISO	Workpiece Material	Hardness HB	Overhang LDRED/BDRED	a_p (inch) RE (Radius)	Boring Range 2.7-4.7		Boring Range 4.7-7.9		Boring Range 7.9-19.7	
					.03-.06	.06-.014	.03-.08	.08-.14	.03-.08	.08-.16
					.008-.016	.016-.031	.008-.016	.016-.031	.008-.016	.016-.031
P	Carbon Steel	HB<200	2.5	V_c (SFM)	525-720	490-590	590-820	525-655	720-920	655-720
			●●●	f (IPR)	.006-.010	.003-.008	.006-.012	.004-.008	.006-.012	.004-.006
			4	V_c (SFM)	460-590	395-490	525-655	460-590	N.R.	N.R.
			●●	f (IPR)	.003-.008	.003-.006	.004-.008	.003-.006		
			6.3	V_c (SFM)	230-330	165-230	N.R.	N.R.	N.R.	N.R.
			●	f (IPR)	.002-.004	.002-.004				
	Carbon Steel	HB>200	2.5	V_c (SFM)	460-590	395-525	490-560	330-460	330-460	260-395
			●●●	f (IPR)	.006-.012	.005-.008	.006-.010	.004-.008	.006-.012	.004-.008
			4	V_c (SFM)	395-490	330-460	330-425	260-360	N.R.	N.R.
			●●	f (IPR)	.004-.008	.004-.007	.003-.008	.003-.005		
			6.3	V_c (SFM)	260-330	195-260	N.R.	N.R.	N.R.	N.R.
			●	f (IPR)	.003-.005	.003-.005				

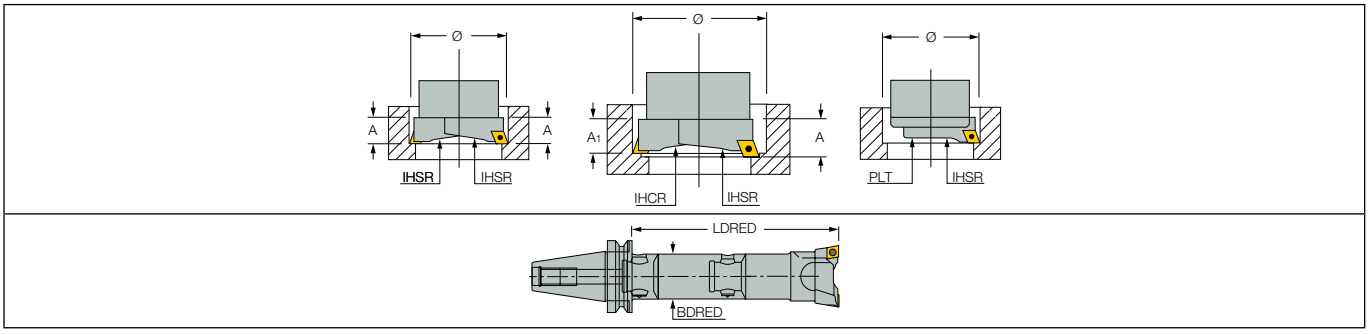
N.R. = Not Recommended

Stability

●●● Good

●● Normal

● Poor



In case of a single or a stepped boring cutter configuration, only half the feed should be applied.

BHR Rough Boring Cutting Data

ISO	Workpiece Material	Hardness HB	Overhang LDRED/BDRED	a_p (inch) RE (Radius)	Boring Range .7-1.1		Boring Range 1.1-2.0		Boring Range 2.0-2.7	
					.02-.04	.04-.07	.02-.04	.04-.07	.02-.05	.05-.08
					.008	.016	.008-.016	.016	.008-.016	.016-.031
P	Carbon Steel	HB<200	2.5	V_c (SFM)	460-525	295-395	490-590	330-425	525-655	460-590
			●●●	f (IPR)	.003-.007	.003-.006	.003-.008	.003-.007	.004-.010	.004-.006
			4	V_c (SFM)	330-425	230-330	360-490	295-395	460-590	330-425
			●●	f (IPR)	.003-.006	.002-.005	.003-.007	.002-.005	.002-.006	.003-.004
			6.3	V_c (SFM)	260-330	195-295	260-330	230-395	330-460	260-395
			●	f (IPR)	.003-.006	.002-.004	.002-.005	.002-.005	.002-.006	.003-.004
	Carbon Steel	HB>200	2.5	V_c (SFM)	425-490	395-460	395-490	395-460	460-560	395-490
			●●●	f (IPR)	.003-.007	.002-.006	.003-.007	.002-.006	.003-.008	.003-.007
			4	V_c (SFM)	330-425	330-395	330-425	330-395	395-490	330-395
			●●	f (IPR)	.003-.006	.002-.005	.003-.006	.002-.005	.003-.007	.003-.006
			6.3	V_c (SFM)	260-330	230-295	260-330	230-295	330-395	230-295
			●	f (IPR)	.003-.005	.002-.004	.003-.005	.002-.004	.003-.005	.002-.004

ISO	Workpiece Material	Hardness HB	Overhang LDRED/BDRED	a_p (inch) RE (Radius)	Boring Range 2.7-4.7		Boring Range 4.7-7.9		Boring Range 7.9-19.7	
					.07	0.1	.03-.08	.08-.14	.03-.08	.08-.16
					.008-.016	.016-.031	.008-.016	.016-.031	.008-.016	.016-.031
P	Carbon Steel	HB<200	2.5	V_c (SFM)	525-720	460-590	525-720	460-590	525-720	460-590
			●●●	f (IPR)	.004-.012	.004-.010	.004-.012	.004-.010	.004-.014	.004-.012
			4	V_c (SFM)	490-655	395-525	395-525	395-525	N.R.	N.R.
			●●	f (IPR)	.004-.008	.003-.007	.004-.008	.003-.007		
			6.3	V_c (SFM)	330-460	330-460	N.R.	N.R.	N.R.	N.R.
			●	f (IPR)	.003-.007	.003-.006				
	Carbon Steel	HB>200	2.5	V_c (SFM)	525-655	460-590	460-655	460-590	460-655	460-590
			●●●	f (IPR)	.004-.012	.004-.010	.004-.014	.004.012	.004-.014	.004-.012
			4	V_c (SFM)	460-525	395-460	490-590	395-460	N.R.	N.R.
			●●	f (IPR)	.003-.008	.003-.006	.003-.005	.003-.005		
			6.3	V_c (SFM)	330-395	230-295	N.R.	N.R.	N.R.	N.R.
			●	f (IPR)	.003-.003	.003-.005				

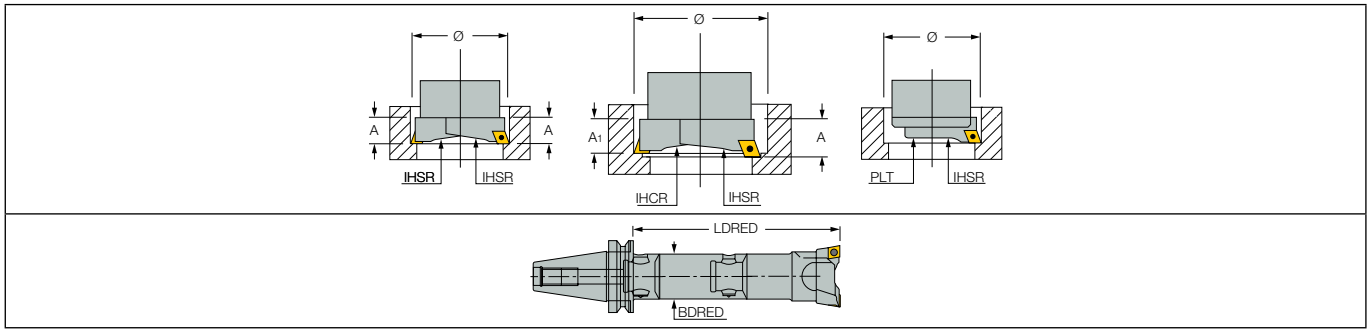
N.R. = Not Recommended

Stability

●●● Good

●● Normal

● Poor



In case of a single or a stepped boring cutter configuration, only half the feed should be applied.

BHR Rough Boring Cutting Data

ISO	Workpiece Material	Hardness HB	Overhang LDRED/BDRED	a_p (inch) RE (Radius)	Boring Range .7-1.1		Boring Range 1.1-2.0		Boring Range 2.0-2.7	
					.02-.04	.04-.07	.02-.04	.04-.07	.02-.06	.05-.08
					.008	.016	.008-.016	.016	.008-.016	.016-.031
M	Stainless Steel	Ferritic & Martensitic	2.5	V_c (SFM)	330-490	360-425	395-525	330-490	395-525	360-525
			●●●	f (IPR)	.003-.006	.002-.005	.003-.007	.002-.005	.003-.010	.003-.007
			4	V_c (SFM)	295-425	295-395	330-460	295-460	330-490	260-395
			●●	f (IPR)	.003-.005	.002-.004	.003-.005	.002-.004	.003-.007	.003-.005
			6.3	V_c (SFM)	195-295	165-230	195-230	165-230	230-330	165-230
			●	f (IPR)	.002-.004	.002-.004	.002-.005	.002-.004	.002-.006	.003-.006
	Stainless Steel	Austenitic	2.5	V_c (SFM)	360-425	330-425	395-490	360-460	360-525	330-490
			●●●	f (IPR)	.003-.006	.002-.005	.003-.007	.002-.005	.003-.010	.002-.005
			4	V_c (SFM)	260-360	260-360	295-425	295-395	330-490	295-425
			●●	f (IPR)	.003-.005	.002-.004	.003-.005	.002-.004	.003-.007	.002-.004
			6.3	V_c (SFM)	195-295	165-230	195-295	165-230	230-330	165-230
			●	f (IPR)	.002-.004	.002-.004	.002-.005	.002-.004	.002-.006	.002-.004
	Cast Stainless Steel	Ferritic & Martensitic	2.5	V_c (SFM)	295-425	330-425	395-490	360-460	395-525	330-490
			●●●	f (IPR)	.003-.006	.002-.005	.003-.007	.002-.005	.003-.010	.002-.005
			4	V_c (SFM)	230-360	260-360	295-425	295-395	330-490	295-425
			●●	f (IPR)	.003-.005	.002-.004	.003-.005	.002-.004	.003-.007	.002-.004
			6.3	V_c (SFM)	195-295	165-230	195-295	165-230	230-330	165-230
			●	f (IPR)	.002-.004	.002-.004	.002-.005	.002-.004	.002-.006	.002-.004
	Cast Stainless Steel	Austenitic	2.5	V_c (SFM)	260-395	230-360	330-490	295-460	360-490	330-490
			●●●	f (IPR)	.003-.006	230-330	.003-.007	.002-.005	.003-.010	.002-.005
			4	V_c (SFM)	230-330	230-330	260-425	230-395	295-460	295-425
			●●	f (IPR)	.003-.005	.002-.004	.003-.005	.002-.004	.003-.005	.002-.004
			6.3	V_c (SFM)	195-295	165-230	195-295	165-230	230-330	165-230
			●	f (IPR)	.002-.004	.002-.004	.002-.005	.002-.004	.002-.006	.002-.004

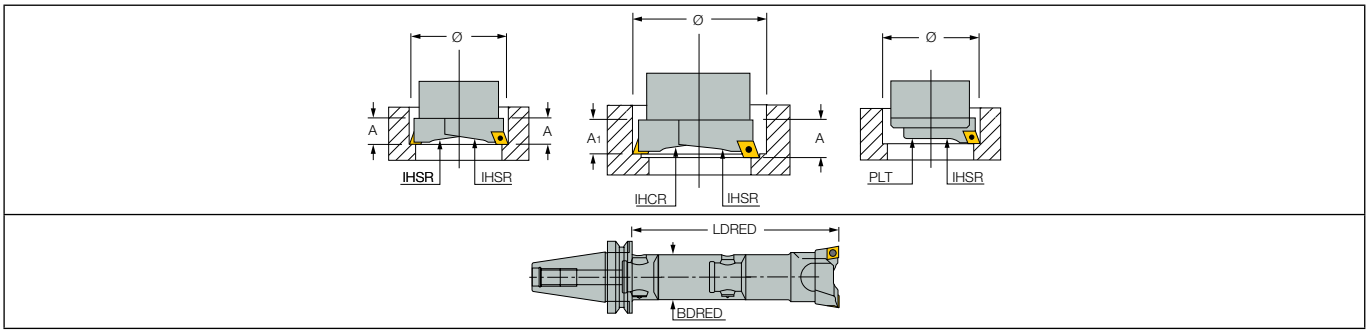
N.R. = Not Recommended

Stability

●●● Good

●● Normal

● Poor



In case of a single or a stepped boring cutter configuration, only half the feed should be applied.

BHR Rough Boring Cutting Data

ISO	Workpiece Material	Hardness HB	Overhang LDRED/BDRED	a_p (inch) RE (Radius)	Boring Range 2.7-4.7		Boring Range 4.7-7.9		Boring Range 7.9-19.7	
					.03-.07	.07-.10	.03-.08	.08-.12	.03-.08	.08-.14
					.008-.016	.016-.031	.008-.016	.016-.031	.008-.016	.016-.031
M	Stainless Steel	Ferritic & Martensitic	2.5	V_c (SFM)	425-720	395-655	460-720	395-590	490-720	395-655
			●●●	f (IPR)	.003-.012	.003-.010	.003-.012	.003-.010	.003-.012	.003-.010
			4	V_c (SFM)	330-525	295-460	395-590	295-460	N.R.	N.R.
			●●	f (IPR)	.003-.010	.003-.007	.003-.010	.003-.007		
			6.3	V_c (SFM)	230-330	165-230	N.R.	N.R.	N.R.	N.R
			●	f (IPR)	.003-.008	.003-.007				
	Stainless Steel	Austenitic	2.5	V_c (SFM)	395-655	330-525	395-655	330-525	395-655	330-590
			●●●	f (IPR)	.003-.012	.003-.010	.003-.012	.003-.010	.003-.012	.003-.010
			4	V_c (SFM)	330-490	295-460	330-525	295-460	N.R.	N.R.
			●●	f (IPR)	.003-.010	.003-.007	.003-.010	.003-.007		
			6.3	V_c (SFM)	230-330	165-230	N.R.	N.R.	N.R.	N.R.
			●	f (IPR)	.003-.008	.003-.006				
	Cast Stainless Steel	Ferritic & Martensitic	2.5	V_c (SFM)	425-655	395-590	460-655	395-525	460-655	395-590
			●●●	f (IPR)	.003-.012	.003-.010	.003-.012	.003-.010	.003-.012	.003-.010
			4	V_c (SFM)	360-490	295-490	330-525	295-460	N.R.	N.R.
			●●	f (IPR)	.003-.010	.003-.007	.003-.010	.003-.007		
			6.3	V_c (SFM)	230-330	165-230	N.R.	N.R.	N.R.	N.R.
			●	f (IPR)	.003-.008	.003-.006				
	Cast Stainless Steel	Austenitic	2.5	V_c (SFM)	425-590	395-590	395-655	330-525	395-655	330-590
			●●●	f (IPR)	.003-.012	.003-.010	.003-.012	.003-.010	.003-.012	.003-.010
			4	V_c (SFM)	330-460	295-460	330-525	295-460	N.R.	N.R.
			●●	f (IPR)	.003-.010	.003-.007	.003-.010	.003-.007		
			6.3	V_c (SFM)	230-625	165-230	N.R.	N.R.	N.R.	N.R.
			●	f (IPR)	.003-.008	.003-.006				

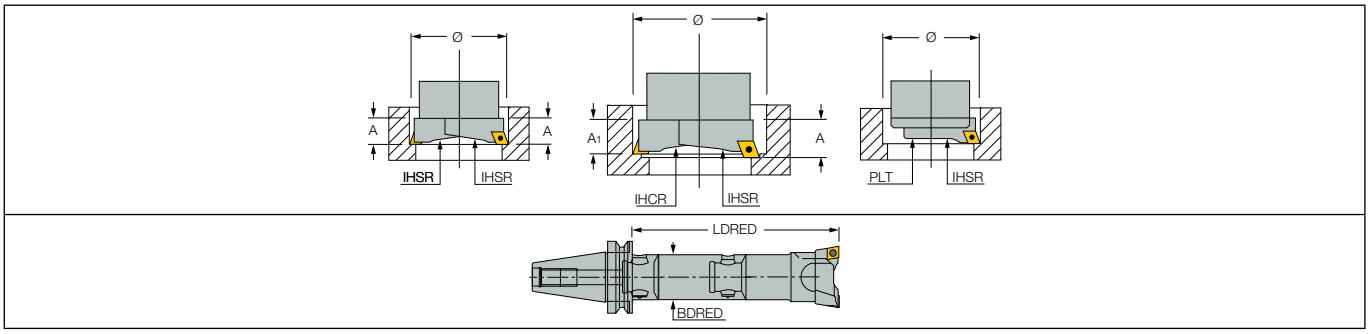
N.R. = Not Recommended

Stability

●●● Good

●● Normal

● Poor



In case of a single or a stepped boring cutter configuration, only half the feed should be applied.

BHR Rough Boring Cutting Data

ISO	Workpiece Material	Hardness HB	Overhang LDRED/BDRED	a_p (inch) RE (Radius)	Boring Range .7-1.1		Boring Range 1.1-2.0		Boring Range 2.0-2.7	
					.02-.04	.04-.07	.02-.04	.04-.07	.02-.05	.05-.08
					.008-.016	.016	.008-.016	.016	.008-.016	.016-.031
K	Gray Cast Iron GG 10-25	HB<200	2.5	V_c (SFM)	395-525	330-460	395-590	360-490	395-590	360-490
			●●●	f (IPR)	.002-.006	.002-.007	.002-.006	.004-.007	.003-.008	.003-.005
			4	V_c (SFM)	330-460	260-395	330-490	260-395	330-490	260-395
			●●	f (IPR)	.002-.005	.002-.004	.002-.005	.002-.004	.003-.005	.003-.004
			6.3	V_c (SFM)	230-330	195-295	230-330	195-295	230-330	195-395
			●	f (IPR)	.002-.004	.002-.004	.002-.004	.002-.004	.003-.005	.003-.004
	Gray Cast Iron GG 25-40		2.5	V_c (SFM)	460-655	460-655	460-720	525-820	590-720	655-920
			●●●	f (IPR)	.002-.006	.002-.007	.002-.006	.002-.007	.003-.008	.004-.010
			4	V_c (SFM)	395-525	395-525	395-590	460-655	460-590	590-720
			●●	f (IPR)	.002-.005	.002-.006	.002-.005	.002-.006	.003-.005	.003-.008
			6.3	V_c (SFM)	230-330	195-295	230-330	195-295	195-330	195-395
			●	f (IPR)	.002-.004	.002-.004	.002-.004	.002-.004	.003-.004	.002-.004
	Cast Iron GGG	Spheroidal & Graphite	2.5	V_c (SFM)	395-590	395-590	395-655	460-720	590-720	590-720
			●●●	f (IPR)	.002-.006	.002-.007	.002-.006	.002-.007	.003-.007	.004-.008
			4	V_c (SFM)	395-525	395-525	395-590	460-655	460-655	525-720
			●●	f (IPR)	.002-.005	.002-.006	.002-.005	.002-.006	.003-.005	.003-.007
			6.3	V_c (SFM)	195-330	195-295	195-330	195-295	195-295	195-330
			●	f (IPR)	.002-.004	.002-.004	.002-.004	.002-.004	.003-.004	.003-.004

ISO	Workpiece Material	Hardness HB	Overhang LDRED/BDRED	a_p (inch) RE (Radius)	Boring Range 2.7-4.7		Boring Range 4.7-7.9		Boring Range 7.9-19.7	
					.03-.07	.07-.10	.03-.08	.08-.12	.03-.08	.08-.14
					.008-.016	.016-.031	.008-.016	.016-.031	.008-.016	.016-.031
K	Gray Cast Iron GG 10-25	HB<200	2.5	V_c (SFM)	395-655	360-490	490-820	590-920	490-820	590-920
			●●●	f (IPR)	.003-.010	.003-.012	.003-.010	.003-.014	.003-.010	.003-.014
			4	V_c (SFM)	330-490	260-395	395-560	395-560	N.R.	N.R.
			●●	f (IPR)	.003-.007	.003-.008	.003-.007	.003-.010		
			6.3	V_c (SFM)	230-330	195-295	N.R.	N.R.	N.R.	N.R.
			●	f (IPR)	.003-.006	.003-.005				
	Gray Cast Iron GG 25-40		2.5	V_c (SFM)	820-985	820-1150	820-1150	820-1150	820-1150	820-1150
			●●●	f (IPR)	.005-.014	.005-.014	.006-.012	.006-.016	.006-.012	.006-.016
			4	V_c (SFM)	655-885	755-985	655-985	655-885	N.R.	N.R.
			●●	f (IPR)	.004-.010	.005-.014	.006-.012	.006-.014		
			6.3	V_c (SFM)	230-490	195-395	N.R.	N.R.	N.R.	N.R.
			●	f (IPR)	.004-.006	.005-.010				
	Cast Iron GGG	Spheroidal & Graphite	2.5	V_c (SFM)	655-785	655-920	655-920	720-985	720-985	720-985
			●●●	f (IPR)	.005-.012	.005-.012	.006-.012	.006-.014	.006-.012	.006-.014
			4	V_c (SFM)	525-720	590-785	590-820	655-885	N.R.	N.R.
			●●	f (IPR)	.004-.008	.005-.010	.006-.010	.006-.014		
			6.3	V_c (SFM)	195-330	195-330	N.R.	N.R.	N.R.	N.R.
			●	f (IPR)	.004-.006	.005-.008				

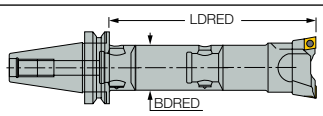
N.R. = Not Recommended

Stability

●●● Good

●● Normal

● Poor



In case of a single or a stepped boring cutter configuration, only half the feed should be applied.

BHR Rough Boring Cutting Data

ISO	Workpiece Material	Hardness HB	Overhang LDRED/BDRED	a_p (inch) RE (Radius)	Boring Range .7-1.1		Boring Range 1.1-2.0		Boring Range 2.0-2.7	
					.02-.06	.06-.10	.02-.06	.06-.10	.02-.08	.05-.12
					.008-.016	.016	.008-.016	.016	.008-.016	.016-.031
N	Aluminum / Cast	>12si	2.5	V_c (SFM)	655-985	785-1150	655-985	785-1150	655-985	782-1150
			●●●	f (IPR)	.002-.008	.002-.010	.002-.008	.002-.010	.002-.010	.002-.012
			4	V_c (SFM)	490-720	490-720	490-720	490-720	490-720	490-720
			●●	f (IPR)	.002-.008	.002-.008	.002-.008	.002-.008	.002-.008	.002-.008
			6.3	V_c (SFM)	195-330	195-330	195-330	195-330	195-330	195-330
			●	f (IPR)	.002-.004	.002-.004	.002-.004	.002-.004	.002-.004	.002-.004
	Aluminum / Cast	<12si	2.5	V_c (SFM)	590-820	720-920	590-820	720-920	590-820	720-920
			●●●	f (IPR)	.002-.008	.002-.010	.002-.010	.002-.010	.002-.010	.002-.012
			4	V_c (SFM)	395-720	395-720	395-720	395-720	395-720	395-720
			●●	f (IPR)	.002-.004	.002-.004	.002-.004	.002-.004	.002-.004	.002-.004
			6.3	V_c (SFM)	195-330	195-330	195-330	195-330	195-330	195-330
			●	f (IPR)	.002-.004	.002-.004	.002-.004	.002-.004	.002-.004	.002-.004

ISO	Workpiece Material	Hardness HB	Overhang LDRED/BDRED	a_p (inch) RE (Radius)	Boring Range 2.7-4.7		Boring Range 4.7-7.9		Boring Range 7.9-19.7	
					.03-.12	.07-.16	.03-.12	.08-.16	.03-.12	.08-.18
					.008-.016	.016-.031	.008-.016	.016-.031	.008-.016	.016-.031
N	Aluminum / Cast	>12si	2.5	V_c (SFM)	655-985	785-1150	655-985	785-1150	655-985	785-1150
			●●●	f (IPR)	.002-.010	.002-.012	.002-.010	.002-.016	.002-.010	.002-.016
			4	V_c (SFM)	490-720	490-720	490-720	490-720	N.R.	N.R.
			●●	f (IPR)	.002-.008	.002-.008	.002-.008	.002-.008		
			6.3	V_c (SFM)	195-330	195-330	N.R.	N.R.	N.R.	N.R.
			●	f (IPR)	.002-.004	.002-.004				
	Aluminum / Cast	<12si	2.5	V_c (SFM)	590-820	720-920	590-820	790-920	590-820	720-920
			●●●	f (IPR)	.002-.010	.002-.012	.002-.012	.002-.016	.002-.012	.002-.016
			4	V_c (SFM)	395-720	395-720	395-720	395-720	N.R.	N.R.
			●●	f (IPR)	.002-.008	.002-.010	.002-.008	.002-.010		
			6.3	V_c (SFM)	195-330	195-330	N.R.	N.R.	N.R.	N.R.
			●	f (IPR)	.002-.004	.002-.004				

N.R. = Not Recommended

Stability

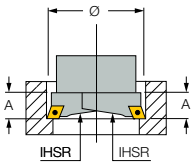
●●● Good

●● Normal

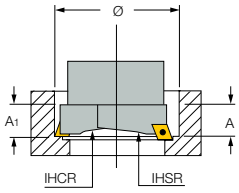
● Poor

Cutting Conditions

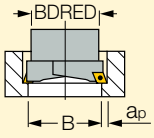
Cutting Conditions for BHR Rough Boring Heads



Twin boring cutters with the same cutting diameter



Twin boring cutters with different cutting diameters and heights (Z=1)



B Working Range	a_p Steel	a_p Cast Iron, Aluminum
.71-1.10	.06-.08	.08-.10
1.10-1.97	.08-.12	.10-.14
1.97-2.68	.12-.16	.14-.20
2.68-7.87	.16-.20	.20-.28
7.87-19.69	.20-.24	.24-.31

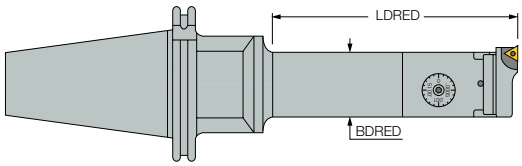
It's advisable to start with B hole≥boring bar diameter d

Cutting Conditions for Boring Operations With BHCI Combi Rough and Fine

ISO	Material	Boring Depth to Diameter Ratio	Working Conditions	Cutting Speed V_c=SFM	Feed fn= IPR		Carbide Grade	Cutting Depth (inch)			
					RE=.008	RE=.016		Finishing	Roughing		
									Ø1.10- 1.81	Ø1.81- 2.95	Ø2.95- 4.72
P	Carbon Steel HB < 200	LDRED/BDRED = 2.5	good	525-820	.004-.008	.004-.008	IC807, IC908, IC520N, IC20N, IC30N, IC8150, IC8250, IC3028	.008-.012	.06	.08	.09
		LDRED/BDRED = 4	normal	393-590	.004-.008	.004-.008					
		LDRED/BDRED = 6.3	difficult	230-328	*.004-.006	.004-.008					
	Carbon Steel HB > 200	LDRED/BDRED = 2.5	good	460-655	.004-.008	.004-.008		.008-.012	.06	.08	.09
		LDRED/BDRED = 4	normal	328-525	.004-.008	.004-.008					
		LDRED/BDRED = 6.3	difficult	230-328	*.004-.006	.004-.008					
M	Stainless Steel AISI 304-316	LDRED/BDRED = 2.5	good	328-490	.004-.008	.004-.008	IC807, IC30N, IC3028	.008-.012	.06	.08	.09
		LDRED/BDRED = 4	normal	260-360	.004-.008	.004-.008					
		LDRED/BDRED = 6.3	difficult	196-295	*.004-.006	.004-.008					
K	Cast Iron	LDRED/BDRED = 2.5	good	393-525	.004-.008	.004-.008	IB55, IC908, IC5005, IC428	.008-.012	.08	.09	.12
		LDRED/BDRED = 4	normal	295-393	.004-.008	.004-.008					
		LDRED/BDRED = 6.3	difficult	196-295	*.004-.006	.004-.008					
N	Aluminum	LDRED/BDRED = 2.5	good	820-1148	.004-.008	.004-.008	ID5, IC20	.008-.012	.08	.09	.12
		LDRED/BDRED = 4	normal	525-820	.004-.008	.004-.008					
		LDRED/BDRED = 6.3	difficult	328-492	*.004-.006	.004-.008					

* Only for finishing Inserts.
** Use inserts with the same corner radii for both roughing and finishing

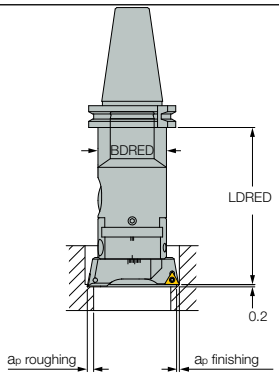
V_c Cutting speed (SFM)
D Diameter of workpiece (inch)
n Number of revolutions / min (rev./min)
V_f Feed rate (inch/min)
fn Feed / rev (IPR)
∏ 3.14



$$Vc = \frac{\Pi \cdot D \cdot n}{1000}$$

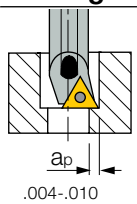
$$n = \frac{Vc\ 1000}{\Pi \cdot D}$$

$$Vf = n \cdot fn$$



In case of a single or a stepped boring cutter configuration, only half the feed should be applied.

Cutting Conditions for BHD / BHFI / BHEI Fine Boring Heads



ISO	Material	LDRED/BDRED	Stability	Cutting Speed Vc=SFM	Feed f=IPR Insert Radius RE=.008	Feed f=IPR Insert Radius RE=.016	Insert Grade
P	Carbon Steel HB<200	LDRED/BDRED=2.5	good	655-985	.002-.003	.003-.004	IC20N
		LDRED/BDRED=4	normal	525-820	.002-.003	.003-.004	IC30N
		LDRED/BDRED=6.3	difficult	230-330	.002-.003	-	IC54
	Carbon Steel HB<200	LDRED/BDRED=2.5	good	525-820	.002-.003	.003-.004	IC20N
		LDRED/BDRED=4	normal	490-655	.002-.003	.003-.004	IC30N
		LDRED/BDRED=6.3	difficult	230-330	.002-.003	-	
	Alloyed Steel[1] HB 480-550	LDRED/BDRED=2.5	good	330-460	.002-.003	.003-.004	IC54
		LDRED/BDRED=4	normal	330-460	.002-.003	.003-.004	
		LDRED/BDRED=6.3	difficult	230-330	.002-.003	-	
M	Stainless Steel AISI 304-316	LDRED/BDRED=2.5	good	490-655	.002-.003	.003-.004	IC20N/30N
		LDRED/BDRED=4	normal	330-460	.002-.003	.003-.004	IC54
		LDRED/BDRED=6.3	difficult	230-330	.002-.003	.003-.004	IC908
K	Cast Iron	LDRED/BDRED=2.5	good	330-460	.002-.003	.003-.004	IC20
		LDRED/BDRED=4	normal	330-460	.002-.003	.003-.004	
		LDRED/BDRED=6.3	difficult	230-330	.002-.003	-	
N	Aluminum	LDRED/BDRED=2.5	good	300-400	.002-.003	.003-.004	IC20
		LDRED/BDRED=4	normal	250-350	.002-.003	.003-.004	
		LDRED/BDRED=6.3	difficult	330-490	.002-.003	-	

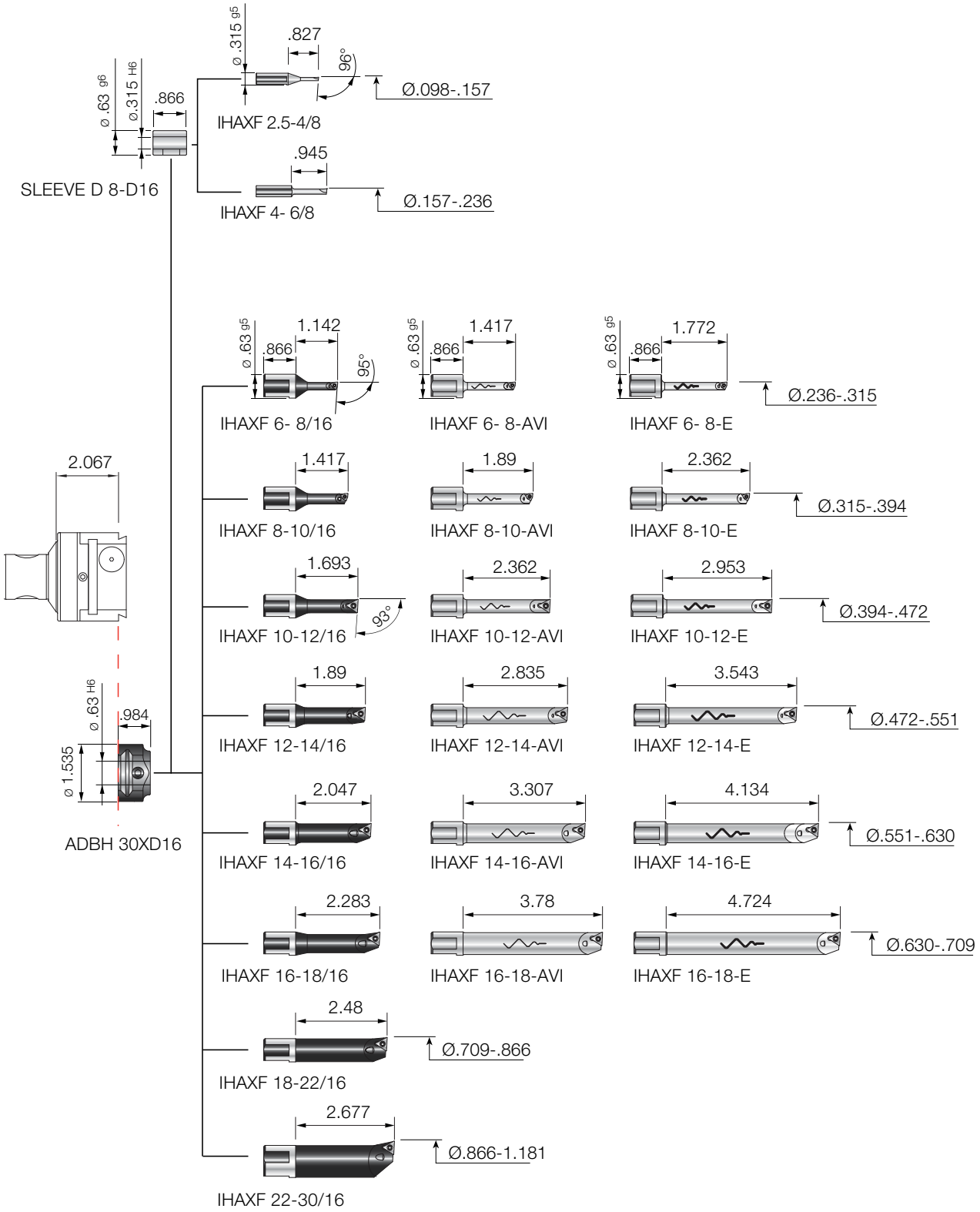
(1) a_p= .004 min

Fine Boring Head Range

80 µinch Direct Diametric Adjustment

BHFI MB50-80x94
BHFI MB80-80x94
Ø.098-6.299

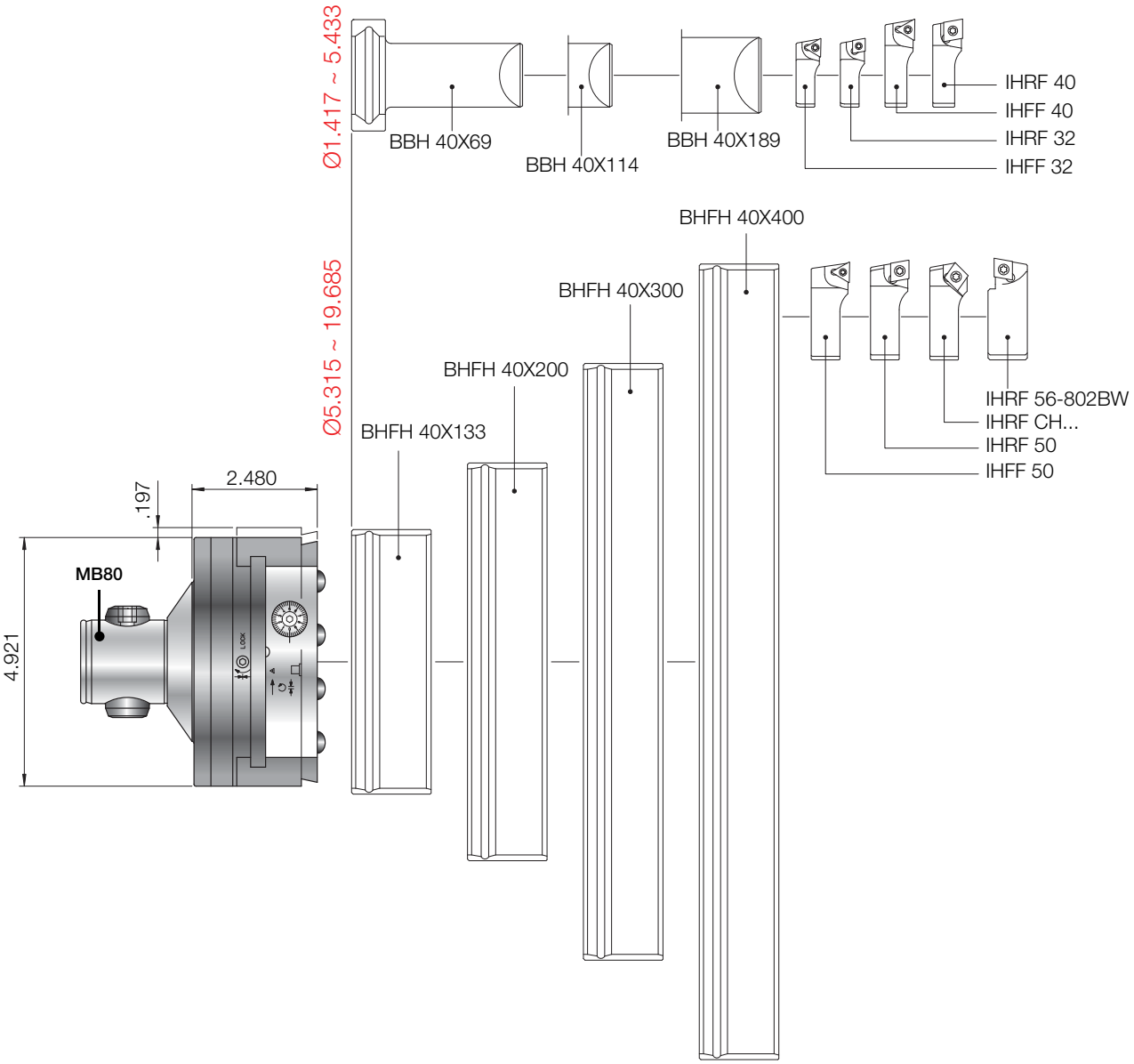
80 µinch



Fine Boring Head Range

80 µinch Direct Diametric Adjustment

BHFI MB80-125x114
Ø1.417 ~ 19.685

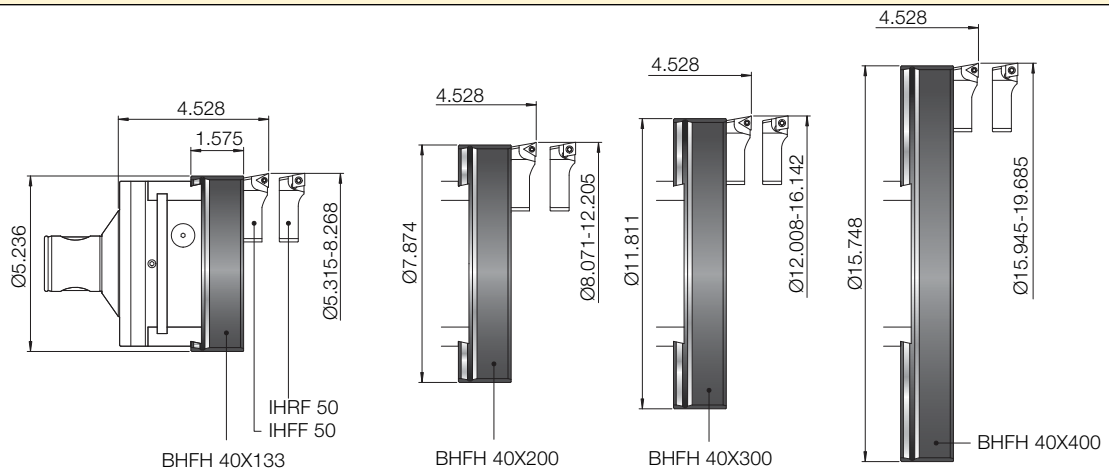


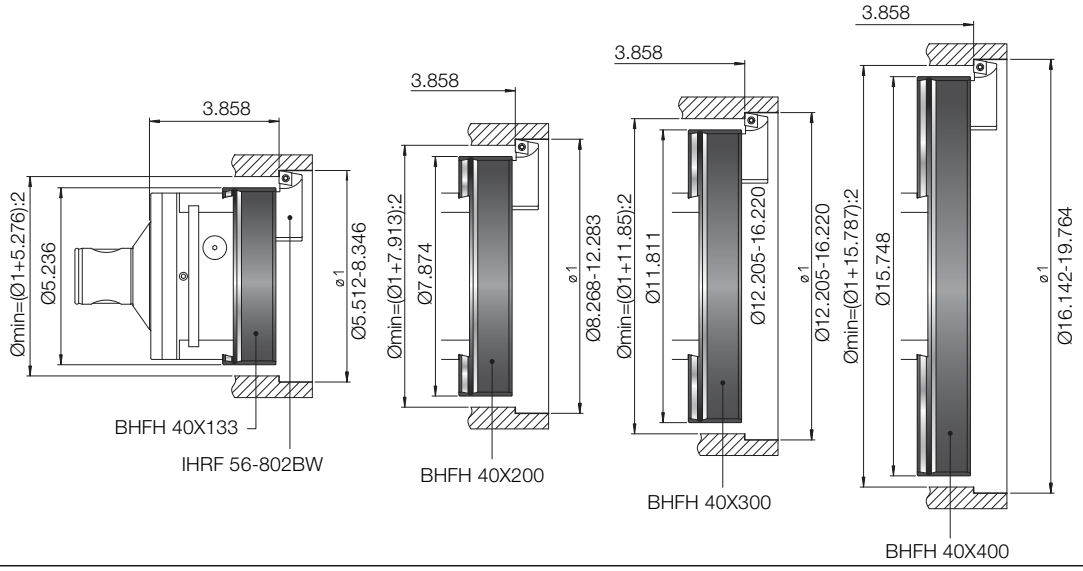
BHFI MB50-MB80 - Additional Information

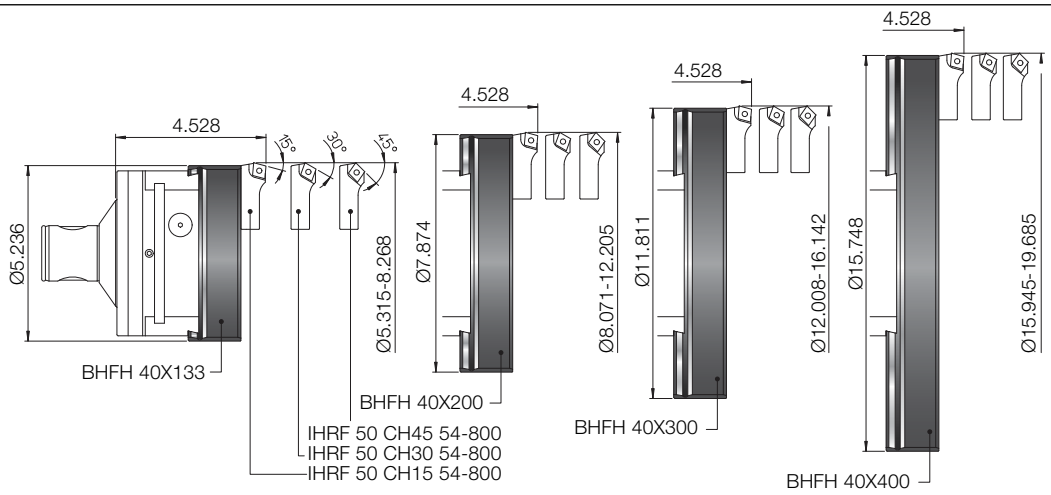
80 µinch Direct Diametric Adjustment

BHFI MB80-125X114
Ø.098-6.299

80 µinch



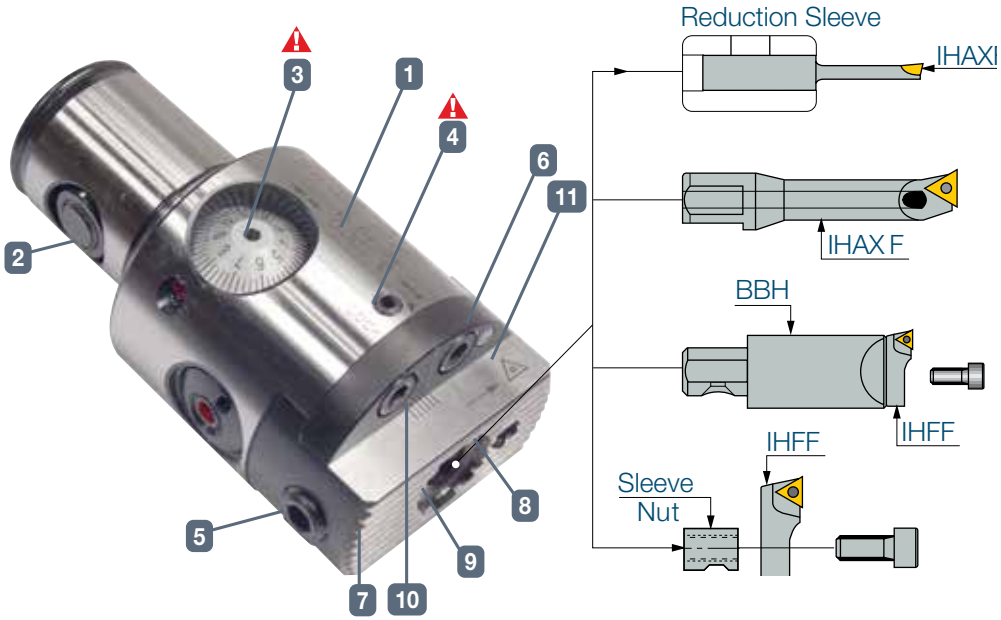




Fine Boring Head BHFI 16-50

Operating Instructions

BHFI 50 Shown



1. Body
2. Expanding pin
3. Graduated dial
4. Slide locking screw
5. Toolholder locking screw
6. Coolant nozzle
7. Serrated face
8. Oiling nipple
9. Tool bore 16H7
10. Slide adjustment range
    Do not exceed the range marks!!
11. Cutting edge position mark

Assembly

- Before mounting the BHFI boring head, make sure the expanding pin **[2]** does not protrude from the cylindrical body part.
- Insert BHFI into the shank.
- Tighten pin [**2**] by turning clockwise following the recommended tightening torque guidelines below:

Recommended torque:	(Lbf · ft)
BHFI MB16-16x34	1.48-1.84
BHFI MB20-20x40	2.95-3.82
BHFI MB25-25x50	4.79-5.33
BHFI MB32-32x63	5.16-5.90
BHFI MB40-40x80	11.80-13.28
BHFI MB50-50x60	22.13-28.81

- Insert the screw **[5]**. If it protrudes, the sleeve should be rotated until the screw can enter the recess in the sleeve nut, reduction sleeve or boring bar.

Disassembly

In order to separate the BHFI from the shank, loosen the expanding pin **[2]** by turning counterclockwise.

Positioning

- The tool slide **[7]** allows for a .157″ adjustment by turning the graduated dial **[3]** counterclockwise.
- When changing the direction of the dial rotation, backlash must be compensated for.
- After positioning, lock the tool slide by means of the screw **[4]**.
- Loosen screw [**4**] before making any slide adjustment.

Maintenance

Weekly:

- Lubricate through the nipple **[8]** with ISO UN G220 oil.

Periodically:

- Clean and lubricate the conical and cylindrical matching surfaces.
- Treat expanding pin **[2]** with an anti-friction lubricant.
- Clean and lubricate the tool slide guideway.

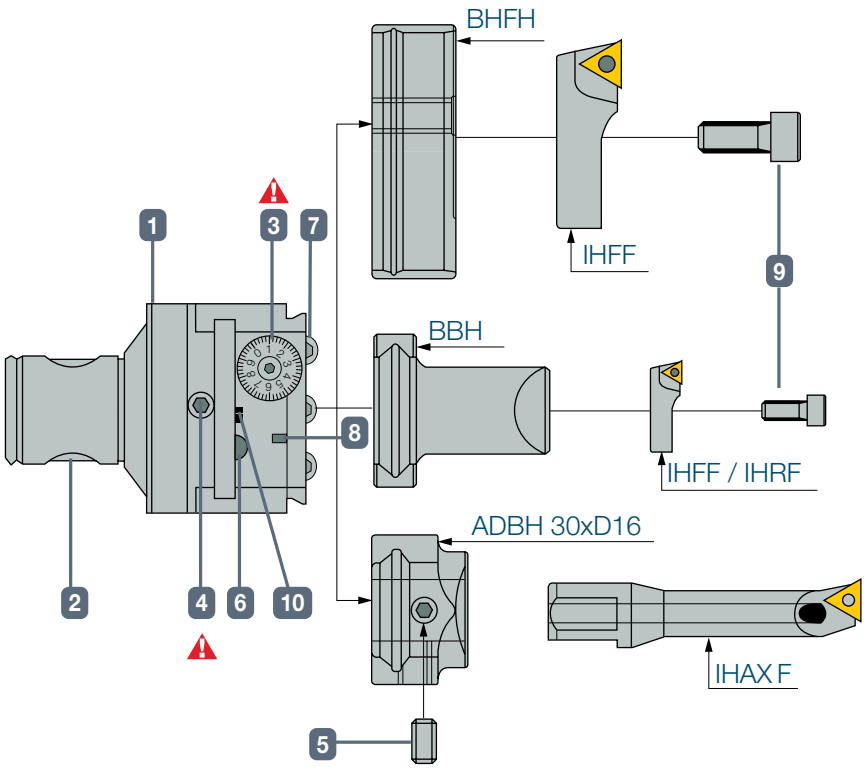
Important Note:

Toolholder should be firmly affixed to the slide.

Fine Boring Head BHFI 63-125

Operating Instructions

BHFI 50 Shown



1. Body
2. Expanding pin
3. Graduated dial
4. Slide locking screw
5. Toolholder locking screw
6. Coolant nozzle
7. Slide holder
8. Oiling nipple
9. Toolholder locking screws
10. Slide adjustment range
    Do not exceed the range marks

Assembly

- Before mounting the BHFI boring head, make sure the expanding pin **[2]** does not protrude from the cylindrical body part.
- Insert BHFI into the shank.
- Tighten pin [**2**] by turning clockwise following the recommended tightening torque guidelines below:

Recommended torque:	(Lbf · ft)
BHFI MB50- 63x87	22.13-25.82
BHFI MB50- 80x94	22.13-25.85
BHFI MB63- 63x87	59.0-66.38
BHFI MB80- 80x94	59.0-66.38
BHFI MB80-125x94	59.0-66.8

- Insert the screw **[5]**. If it protrudes, the sleeve should be rotated until the screw can enter the recess in the sleeve nut or boring bar.

Disassembly

In order to separate the BHFI from the shank, loosen the expanding pin **[2]** by turning counterclockwise.

Positioning

- The tool slide **[7]** allows for a .197″ adjustment by turning graduated dial **[3]** counterclockwise.
- When changing the direction of the dial rotation, backlash must be compensated for.
- After positioning, lock the tool slide by means of the screw **[4]**.
- Loosen screw [**4**] before making any slide adjustment.

Maintenance

Weekly:

- Lubricate through the nipple **[8]** with ISO UN G220 oil.

Periodically:

- Clean and lubricate the conical and cylindrical matching surfaces.
- Treat expanding pin **[2]** with an anti-friction lubricant.
- Clean and lubricate the tool slide guideway.

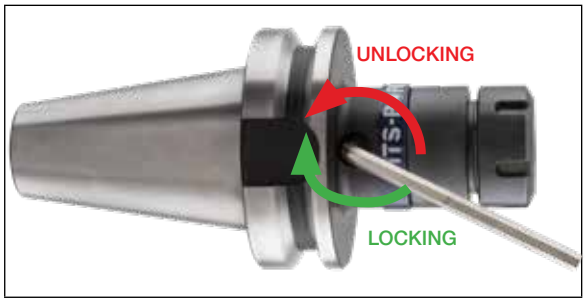
Important Note:
Toolholder should be firmly affixed to the slide.

Operation and Maintenance

MB Connection

To LOCK, rotate the radial pin clockwise

To UNLOCK, rotate the radial pin counter-clockwise
Table shows the recommended tightening torques:



Before assembling the MB connection elements, make sure the radial pin does not project from the cylindrical parts.

CORRECT ✔	WRONG ✗

Stages for adjusting boring heads with dial:

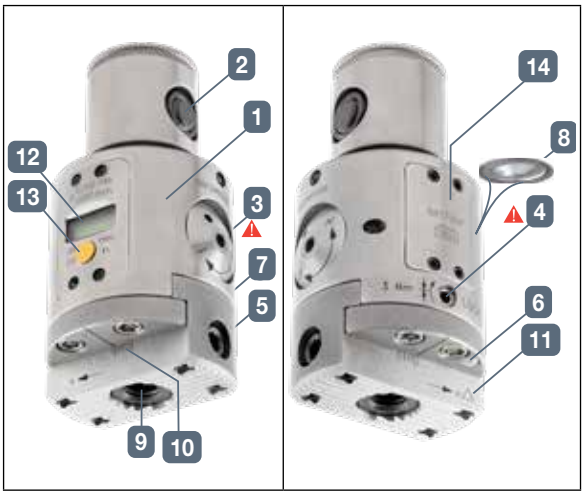
1. Loosen slide adjustment screw
2. Adjust the dial screw
3. Tighten slide adjustment screw

1	2	3

Driving Torque	
MB	**(Lbf · ft)**
MB14	1.48-1.84
MB16	1.48-1.84
MB20	2.95-3.82
MB25	4.79-5.53
MB32	5.16-5.90
MB40	11.8-13.28
MB50	22.13-25.81
MB63	51.6-59
MB80	51.6-59
MB110	147.5-162.2

BHD Digital Fine Boring Head Metric/Inch Operating Instructions

BHD MB 80-32



Tighten pin (2) by turning clockwise
Following the recommended tightening torque guidelines below:

Designation	(Nm)	(Lbf.ft)	Allen Key (mm)
BHD MB32-32-83	7.0-8.0	5.16-5.90	4
BHD MB40-40-90	16.0-18.0	11.80-13.28	5
BHD MB50-50-60	30.0-35.0	22.13-25.81	6
BHD MB63-63-89	70.0-80.0	51.63-59.0	8
BHD MB80-80-104	70.0-80.0	51.63-59.0	8

1 Body
2 Expanding pin
3 Dial
4 Slide locking screw
5 Toolholder locking screw
6 Coolant nozzle
7 Slide holder
8 Oiling nipple
9 Tool bore 16H7
10 Slide adjustment range
11 Cutting edge position mark
12 Digital display
13 Selection button
14 Battery cover

Assembly
- Before mounting the BHD boring head, make sure the expanding pin **[2]** does not protrude from the cylindrical body part.
- Insert BHD boring head into the shank.

⚠ Tighten pin [2] by turning clockwise.
- Tighten screw **[5]**. If it protrudes, the sleeve should be rotated until the screw can enter the recess in the sleeve nut or boring bar.

Disassembly
To separate the BHD from the shank, loosen the expanding pin **[2]** by turning counterclockwise.

Positioning
The display **[12]** shows the value of the adjustment diameter with a 2µm screen resolution.
- Switch on the BHD boring head by pushing the selection button **[13]**. The display **[12]** will show the value of the previous adjustment.
  To reset the value displayed, press and hold the button **[13]**. After 2 seconds, the display will show. Release the button. The display will show the value 0.000.

⚠ Loosen screw [4] before making any slide adjustment to the dial [3].
- Adjust the required diameter by turning the dial **[3]** counterclockwise. The tool slide **[7]** allows a 5mm radial adjustment. The display **[12]** will show the new value in diameter. The absolute value CANNOT be viewed, only the relative value.
- After positioning, lock the tool slide by means of the screw **[4]**
  see torque recommendation. If unused for more than 30 seconds, the display switches off automatically.

WARNING
⚠ DO NOT perform any slide movement when the display is switched off.
⚠ DO NOT exceed the range marks [10].

Before carrying out a fine adjustment (described in FIG.3):
1 Loosen screw **[4]** of slide adjustment.
2 Adjust dial **[3]** to required diameter.
3 Tighten screw **[4]**.

Setting metric/inch
To change unit readout from metric to inch:
- Press and hold the button **[13]**. The display shows "----", after 10 sec the new unit readout appears on the left of the display.
- Release the button.

BHD Digital Fine Boring Head Metric/Inch Operating Instructions

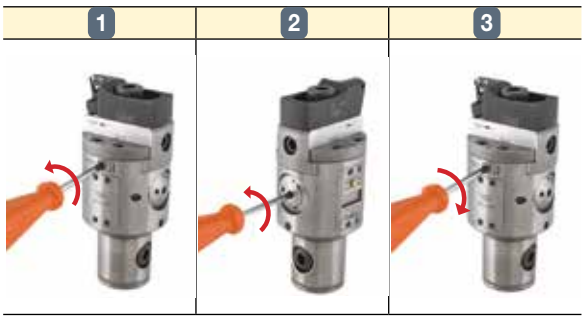


Fig. 3

Locking Screw Tightening Torques (Lbf · Ft)

Designation:	(Lbf · ft)
BHD MB32-32-83	1.475
BHD MB40-40-90	1.843
BHD MB50-50-60	2.212
BHD MB63-63-89	2.581
BHD MB80-80-104	2.95

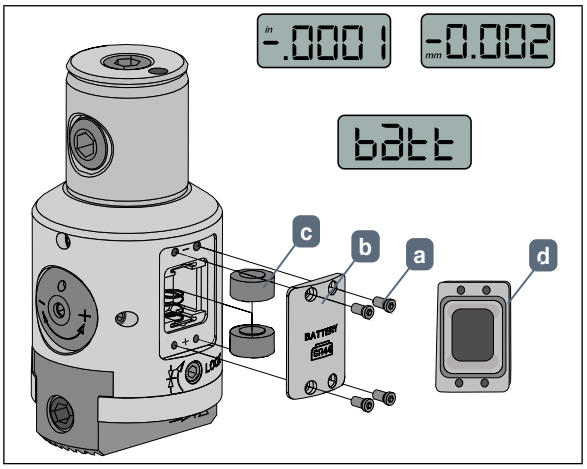


Fig. 4

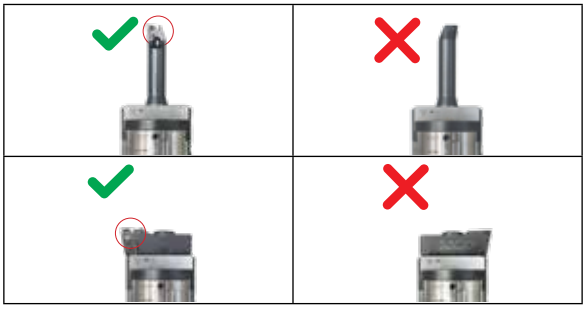


Fig. 5

Battery Replacement

When the batteries are low the display will show a warning sign "batt" for a few seconds (FIG.4). It is recommended to replace the batteries as soon as possible.

To replace the batteries (**FIG.5**):

- Remove the battery compartment cover **[b]** by unscrewing the 4 screws **[a]**.
- Replace the two batteries using type SR44 1.55V and position them in the correct direction.
- Tighten the 4 screws **[a]**.
- The integrated seal **[d]** is now secured on the battery cover.

Maintenance Weekly:

- Lubricate through the nipple **[8]** with ISO UN G220 oil.

Periodically:

Clean and lubricate the conical and cylindrical matching surfaces.

Treat the expanding pin **[2]** with an anti-friction lubricant.

Clean and lubricate the tool slide guide way.

WARNING

- The only maneuvering and adjustment screws to be used are those listed in the components section.
- The screws not listed in the components section should not be touched so as to avoid malfunction of the boring bars and heads.
- Bit holders and boring bars should be assembled with the insert turned in the same direction as the screw **[4]**.
- The use of coolant on the BHD boring head double-bit heads should be 40 BAR max.
- The machine tool must be equipped with all of the active and passive safety devices that will assure safe use of the BHD boring head.
- ISCAR requires that the machine tools where the BHD boring head is mounted comply with the provisions of the 2006/42/CE directive.

Inserts

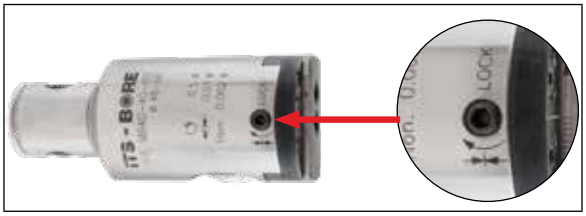
It is recommended to use **ISCAR** inserts. The use of different inserts can affect ultimate machining results.

Cartridge Should Be Mounted According to the Insert Symbol Direction

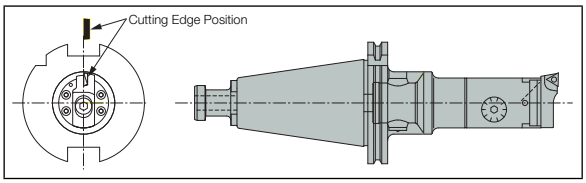
CORRECT ✔	WRONG ✗

CORRECT ✔	WRONG ✗

Warning: slide position must be adjusted within the indicated limits. Excess movements damage internal kinematics



When BHFI is assembled, the cutting edge should be positioned in relation to the arbor key slots.



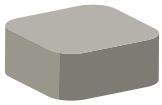
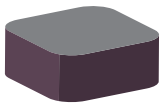
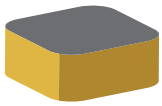
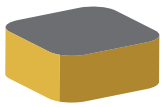
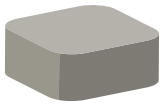
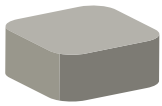
Maintenance

Boring heads should be lubricated with ISO UN G220 oil

MATERIALS AND GRADES

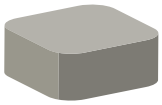
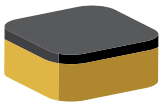
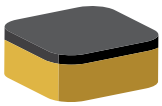
Member IMC Group

ISCAR Hole Making Grades Chart

	Grade	ISO	Grade Description	Coating Layers	Coating Color*
PVD COATED	IC328	P25-P40 M30-M40 S20-S30	A tough substrate with PVD coating, suitable for wide range of applications on steel and stainless steel at low to medium speeds and medium to high feeds. The grade is recommended for interrupted cuts and machining under unstable conditions.	TiCN Base	
	IC508	P20-P40 M20-M30 K20-K30 N10-N30 S10-S25 H20-H30	A broad-spectrum grade with a tough-submicron fine grain substrate and PVD coating. Designed for machining main types of engineering materials at various cutting speeds. Features excellent notch wear and built-up edge resistance. Suitable for interrupted cutting and machining under unfavorable conditions.	TiN TiCN Base	
	IC520	M10-M20 N10-N15 S10-S20	A hard substrate PVD coated grade. Intended mainly for machining austenitic stainless steel, high-temperature alloys and Titanium.	TiN TiCN Base	
	IC806	P10-P20 M10-M20 K10-K25	A hard submicron fine grain substrate, PVD coated grade followed by a SUMOTEC surface treatment. Applied mainly to machining heat- resistant superalloys at moderate cutting speeds.	TiAlN AlTiN Base	
	IC808	P15-P30 M20-M30 K20-K30 S10-S25 H20-H30	A tough, submicron fine grain size substrate with excellent chipping resistance, combined with a SUMOTEC PVD coating. Provides high wear resistance. Recommended for a very wide range of materials.	TiN TiAlN Base	
	IC808G	P15-P30 M20-M30 K15-K25 S10-S25 H10-H20	A tough, submicron fine grain size substrate with PVD coating. Features high resistance to chipping and abrasive wear. Designed for machining a wide variety of engineering materials.	TiN TiAlN Base	
	IC830	P20-P40 M25-M35 S15-S30	A tough substrate with PVD coating and a special SUMOTEC surface treatment. Suitable for machining steel and stainless steel at low to medium cutting speeds and moderate to high feeds. The grade features high toughness and recommended for interrupted cuts and machining under unstable conditions. May be used on high temperature alloys at low cutting speeds.	TiN TiAlN Base	
	IC903	P10-P20 M15-M25 K10-K20 S10-S20 H10-H20	Ultra-fine grain size, PVD coated. High wear resistance and toughness. High speed, medium feed. Used for up to 62 HRC hardened steel, Titanium, nickel-based alloys and stainless steel.	AlTiN Base	
	IC907	P10-P20 M05-M15 K15-K30 S10-S20 H05-H15	A hard submicron grain size substrate with a PVD coating, suitable for a wide range of a materials such as steels, alloy steels, hard steels, austenitic stainless steel and heat resistant alloys at moderate to relatively high cutting speeds under stable conditions. Features high wear resistance and plastic deformation durability.	TiAlN Base	

* For coated grades

ISCAR Hole Making Grades Chart

	Grade	ISO	Grade Description	Coating Layers	Coating Color*
PVD COATED	IC908	P15-P30 M20-M30 K20-K30 S10-S25 H20-H30	A tough submicron grain size substrate with a PVD coating, recommended for general use for diverse operations on materials such as steels, alloy steels, austenitic stainless steel and high temperature alloys at a wide range of cutting speeds. Features high wear resistance and chipping durability.	TiAlN Base	
	IC920	 K10-K20 N10-N25 	A PVD coated carbide grade that features good fracture toughness and high wear resistance. Used mostly for machining nodular cast iron at medium cutting speed.	TiAlN Base	
	IC928	P20-P40 M25-M35 S15-S30 	A tough substrate with PVD coating, suitable for machining steel and stainless steel at low to medium cutting speeds and moderate to high feeds. The grade is recommended for interrupted cuts and machining under unstable conditions.	TiAlN Base	
	IC950	P15-P35 K15-K35 	A PVD coated grade with excellent wear resistance. Generally used for heavy machining alloy steel and cast iron.	TiAlN Base	
	IC1008	P10-P20 M05-M15 K15-K30 S10-S20 H05-H15	A tough submicron grain size substrate with coating. Recommended for general use on a wide range of applications and materials as steels, alloy steels, austenitic stainless steel and high temperature alloys at moderate cutting speeds.	TiN TiAlN Base	
CVD COATED	IC5500	P20-P35 	A tough substrate with SUMOTEC CVD coating. Recommended for high speed drilling of steel. Provides excellent tool life.	TiN Al_2O_3 TiCN Base	
	IC8080	P10-P20 K10-K20 	A submicron grain size substrate with SUMOTEC MTCVD coating. Features excellent chipping and wear resistance. Recommended for high speed drilling of cast iron and steel, to be used for the peripheral insert on DR drills.	TiN Al_2O_3 TiCN Base	
	IC9025	P20-P30 M15-M30 	A tough substrate with a cobalt enriched layer combined with a multi-layer CVD coating. Recommended for general use machining of steel in a wide range of conditions, featuring high toughness and wear resistance.	TiN Al_2O_3 TiCN Base	
	IC9080	P10-P20 K10-K20 	A submicron grain size substrate with a CVD coating. Features excellent chipping and wear resistance. Recommended for high speed drilling of cast iron and steel, to be used for the peripheral insert on DR drills.	TiN Al_2O_3 TiCN Base	

* For coated grades

ISCAR Hole Making Grades Chart

	Grade	ISO	Grade Description	Uncoated Layers	Uncoated
UNCOATED	IC03	S10-S20 H15-H25	An uncoated, ultra-fine carbide grain size, which is characterized by high wear resistance and toughness. Used mainly for machining high-temperature superalloys and Titanium, may be applied to cutting hardened steel and cast iron.	Base	
	IC07	M10-M20 N05-N20 S10-S30	A hard-uncoated submicron grain size carbide grade, suitable for machining aluminum alloys and other non-ferrous materials at high cutting speeds.	Base	
	IC08	M10-M30 N10-N25 S10-S30	A tough uncoated submicron grain size carbide grade, suitable for steels, stainless steel and high temperature alloys at low cutting speeds. Good choice for non-ferrous materials.	Base	

MATERIAL GROUPS

Based on ISO 513 and VDI 3323 standards

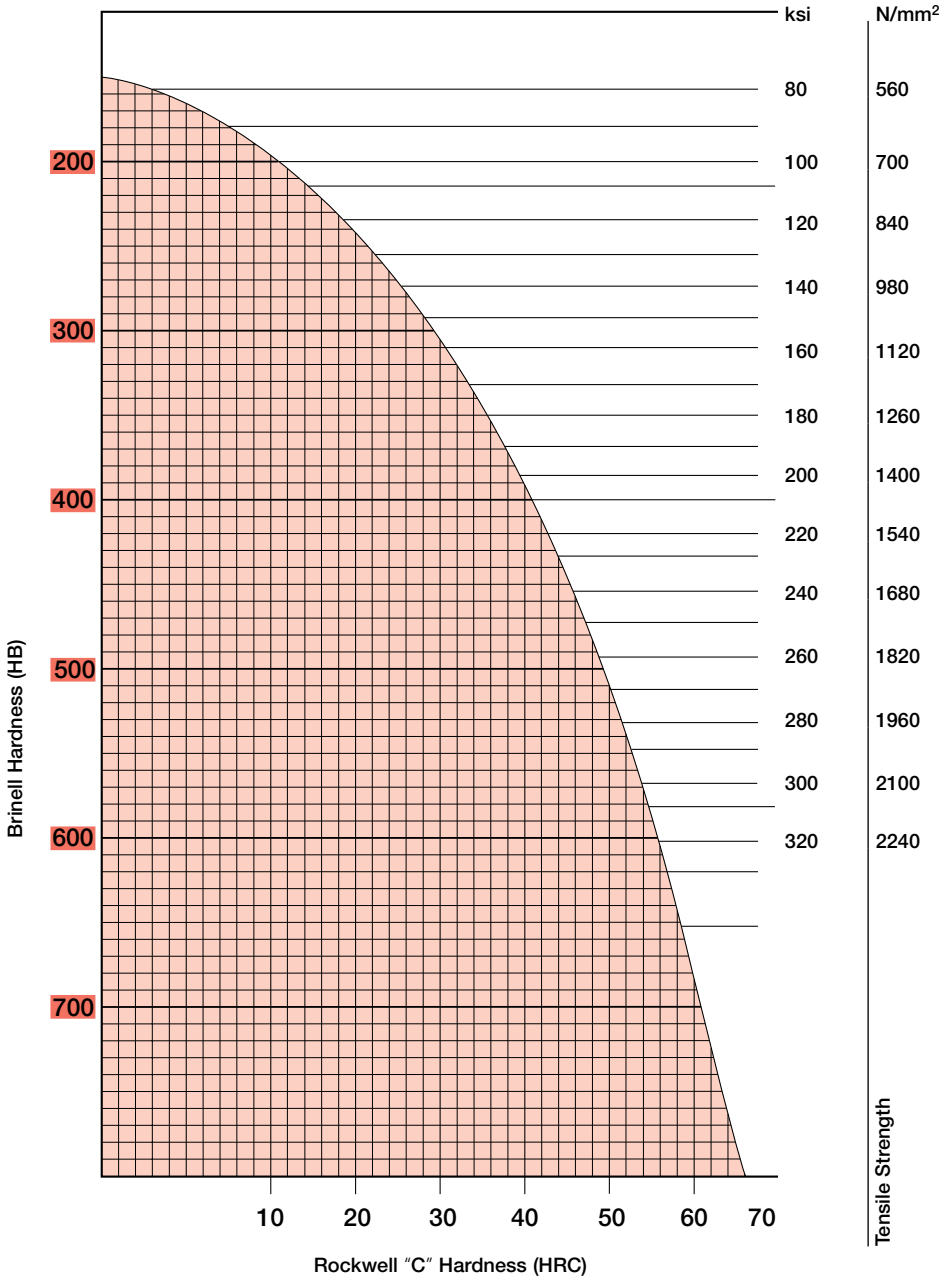
ISO	Material		Condition	Tensile Strength [ksi]	Kc1[1] [ksi]	mc[2]	Hardness HB	Material Group No.
P	Non-alloy steel and cast steel, free cutting steel	<0.25% C	Annealed	61	196	0.21	125	1
		≥0.25% C	Annealed	94	218	0.22	190	2
		<0.55% C	Quenched and tempered	123	243	0.24	250	3
		≥0.55% C	Annealed	109	247	0.24	220	4
			Quenched and tempered	145	276	0.24	300	5
	Low alloy and cast steel (less than 5% of alloying elements)		Annealed	87	257	0.24	200	6
			Quenched and tempered	135	243	0.24	275	7
				145	250	0.24	300	8
				174	261	0.24	350	9
	High alloyed steel, cast steel and tool steel		Annealed	99	355	0.23	200	10
			Quenched and tempered	160	363	0.23	325	11
	Stainless steel and cast steel		Ferritic/martensitic	99	272	0.21	200	12
			Martensitic	119	272	0.21	240	13
M	Stainless steel and cast steel		Austenitic, duplex	87	312	0.20	180	14
K	Gray cast iron (GG)		Ferritic / pearlitic		167	0.20	180	15
			Pearlitic / martensitic		196	0.28	260	16
	Nodular cast iron (GGG)		Ferritic		178	0.25	160	17
			Pearlitic		196	0.28	250	18
	Malleable cast iron		Ferritic		178	0.25	130	19
			Pearlitic		206	0.3	230	20
N	Aluminum-wrought alloys		Not hardenable		102	0.25	60	21
			Hardenable		116	0.25	100	22
	Aluminum-cast alloys	≤12% Si	Not hardenable		102	0.25	75	23
			Hardenable		102	0.25	90	24
		>12% Si	High temperature		109	0.25	130	25
	Copper alloys	>1% Pb	Free cutting		102	0.27	110	26
			Brass		102	0.27	90	27
			Electrolytic copper		102	0.27	100	28
	Non metallic		Duroplastics, fiber plastics					29
			Hard rubber					30
S	High temperature alloys	Fe based	Annealed		377	0.24	200	31
			Hardened		450	0.24	280	32
		Ni or Co based	Annealed		479	0.24	250	33
			Hardened		479	0.24	350	34
			Cast		479	0.24	320	35
	Titanium alloys		Pure	58	247	0.24	190	36
			Alpha+Beta alloys, hardened	152	306	0.24	310	37
H	Hardened steel		Hardened		667		55 HRC	38
			Hardened		682		60 HRC	39
	Chilled cast iron		Cast		667		400	40
	Cast iron		Hardened		653		55 HRC	41

- Steel
- Stainless Steel
- Cast Iron
- Non-Ferrous Metals
- Superalloys and Titanium
- Hard Materials

(1) Specific cutting force for .0016 in^2 chip section.
(2) Chip thickness factor.

MATERIAL GROUPS

Hardness Conversion Table



ISCAR MATERIAL GROUPS

Based on VDI 3323 Standard

Material Group No.	USA	Germany		U.K.	France	Sweden	Italy	Spain	Japan	Russia	EURONORM
	AISI/SAE/ UNS/ ASTM/AA	Werkstoff	DIN	BS	AFNOR	SS	UNI	UNE	JIS	GOST	EN
1	1020; G10200; K02301; K02595; K02596; K02597; K02598; K02599; K02702; K0300	1.0044	S275JR; St 44-2; Fe 430 B	EN 43 B; Fe 430 B FN; 43/25 HR; 43/25HS; 43 B; HFW4; HFS4; ERW 3	E 28-2	1411; 1412	Fe 430 B FN; Fe 430 B	AE 275 B; Fe 430 B FN	SN 400 B; SN 400 C; SN 490 B; SN 490 C; SS 400; STK 400; STKM 19 C; STKR 400; 19 C; SS 41; STK 41	St4ps; St4sp	S275JR
1		1.0050	E295; St 50-2; Fe 490-2; ST 50-2 G (E295+CR)	Fe 490-2 FN; 50 B	A 50-2	1550; 2172	Fe 490	A 490-2; Fe 490-2 FN	SS 490; SS 50	St5ps; St5sp	
1	K02404; K02702	1.0045	S355JR; Fe 510 B	50 B; 4360-50 B	E 36-2		Fe 510 B FN	AE 355 B	SN 400 B; SN 400 C; SN 490 B; SN 490 C; SS 490; SS 50		S355JR
1	K02702	1.0143	S275J0; St 44-3 U; Fe 430 C	43C; 4360-43C	E 28-3	1414-01	Fe 430 C FN	AE 275 D			S275J0
1		1.0130	P265S; SPH 265	164-400B LT 20	SPH 265; A 42 AP			SPH 265			P265S
1	A 619	1.0333	DC03G1; USt 3; USt 13	2 CR; 3 CR	E		FeP 02	AP 02	SPCD		DC03G1
1	K02601; K03000; A 573 Gr. 70; A 611 Gr.D	1.0144	S275J2G3 (S275J2); St 44-3 (Fe 430 D 1)	Fe 430 D1 FF; 4360-43 C; 4360-43 D	E 28-3; E 28-4	1411; 1412; 1414	Fe 430 B; Fe 430 C (FN); Fe 430 D (FF)	AE 275 D; Fe 430 D1 FF	SM 400 A; SM 400 B; SM 400 C; SS 400; STK 400; STKR 400; SM 41 A; SM 41 B; SM 41 C	St4kp; St4ps; St4sp	
1	1008; G10080; A 621	1.0330	DC01; DC 01; St 2; St 12	CR 4; CS 4	C; TC	1142	FeP 01; FeP 00	AP 11; FeP 01; AP 00	SPCC; CR 1		DC01 (FeP 05)
1	1015; G10150; K02401	1.0037	S235JR (Fe 360 B); St 37-2	Fe 360 B; 4360-40 B; ERW 3; CEW 3; 37/23 HR; 37/23 HS; 37/23 CR; 37/23 CS	E 24-2	1311	Fe 360 B; 1449 37/23 HR	AE 235 B; Fe 360 B	STKM 12 A; STKM 12 AC		
1		1.0035	S185 (Fe 310-0); St 33	Fe 310-0; 15 HR; 15 HS; 1449 15 HR; 1449 15 HS	A 33	1300	Fe 320	Fe 310-0; A 310-0	SGP; SS 330; SS 34	St0	S185
1	K02502	1.0034	E195; RSt 34-2	CEW 2; 34/20 HR; 34/20 HS; 34/20 CR; 1449 34/20CS	A 34-2 NE		Fe 330 BFN			St2ps; St2sp	E195
1		1.0334	DD12G1; UStW 23		2 C		FeP 12	AP 12	SPHD	10kp	

Material Group No.	USA	Germany		U.K.	France	Sweden	Italy	Spain	Japan	Russia	EURONORM
	AISI/SAE/ UNS/ ASTM/AA	Werkstoff	DIN	BS	AFNOR	SS	UNI	UNE	JIS	GOST	EN
1	1006; G10060	1.0335	DD13; StW 24	1 CR; 1 CS; 1 HR; 2 HR; 2 HS; 2 CR; 2 CS	3 C		FeP 13	AP13	SPHE	08kp	DD13
1	A 620	1.0338	DC04; St 4; St 14	CR 1; CR 2	ES	1147	FeP 04	AP 04; FeP 04	SPCE; HR 4	08JuA	DC04 (FeP 04)
1	K01700; K02001; K02200; K02201; K02203; K02503; K02601; K02801	1.0345	P235GH; HI; H I	141-360; 151-360; 154-360; 161-360; 164-360	A 37 CP	1330; 1331	FeE 235; Fe 360 1 KW; Fe 360 1 KG; Fe 360 2 KW; Fe 360 2 KG	A 37 Grado RA II; A 37 Grado RC I	SGV 410; SGV 450; SGV 480; SPV 235; SPV 450; SPV 490; SGV 42; SGV 46; SGV 49; SPV 24; SPV 46; SPV 50		P235GH
1	1010; G10100	1.0301	C10; C 10	040 A 10; 045 M 10; En 2 A; En 2 A/1; En 2 B; En 32 A; 10 CS	C10RR; XC 10; C 10; AF 34 C 10		1 C 10; C 10	F.151; F.151.A	S 10C	10	C10
1		1.0149	S275JOH; St 44-3 U; RoSt 44-2	43 C; 4360-43C	E 28-3	1412-04	Fe 430 C	Fe 430 C; AE 275 C			S275JOH
1		1.0226	DX51D; St 02 Z	Z2	GC	1151 10	FeP 02 G	FeP 02 G	SGC C		
1	A 1011 (SS Grade 36 (230) Type 2); A1011 (SS Grade 36 (250) Type 1)	1.0114	S235JO; St 37-3 U; Fe 360 C	40 C; 4360-40C	E 24-3		Fe 360 C FN	AE 235 C	SS 330; SS 34		S235JO
1	A572-60	1.8900	S380N; StE 380	4360 55 E		2145	FeE 390 KG		S 25 C		S380N
1	A 572 Gr. 65	1.0060	E335; St 60-2 (Fe 590-2 B)	En 55 C; Fe 590-2-FN; 55 E; 4360-55 E	A 60-2	1650	Fe 590; Fe 60-2	A 590; Fe 590-2 FN	SM 570; SM 58	St6ps; St6sp	E335
1		1.0028	S250G1T; USt 34-2		A 34-2		Fe 330; Fe 330 B FU		SS 330; SS 34		
1	K01700; K02200; K02801	1.0112	P235S; SPH 235	164-360B LT20; 1501-164-360B LT20	A 37 AP; SPH 235		Fe 360 C	AE 235 C			P235S
1		1.0722	10SPb20; 10 SPb 20		10 PbF 2		CF 10 SPb 20	10 SPb 20; F.2122			10SPb20
1	1108; 1109; 1111; B1111; B 1111; G11080; G11090	1.0721	10S20; 10 S 20		10 F 2		CF 10 S 20	10 S 20; F. 2121			10S20
1	12L13; 12L14; 12 L 13; 12 L 14; G12134; G12144	1.0718	11SMnPb30; 9 SMnPb 28	230 M 07 Pb; En 1A Pb	S 250 Pb	1914	CF 9 SMnPb 28	F.210.C; F.210.M; 11 SMnPb 28; F.2112	SUM 22 L; SUM 23 L; SUM 24 L		11SMnPb30

Material Group No.	USA	Germany		U.K.	France	Sweden	Italy	Spain	Japan	Russia	EURONORM
	AISI/SAE/ UNS/ ASTM/AA	Werkstoff	DIN	BS	AFNOR	SS	UNI	UNE	JIS	GOST	EN
1	1213; 1215; G12130; G12150	1.0715	11SMn30; 9 SMn 28	230 M 07; En 1 A	S 250	1912	CF 9 S 22	F.210.A; F.210.L; 11 SMn 28; F.2111	SUM 22		11SMn30
1	1020; 1023; G10200; G10230	1.1151	C22E; Ck 22	055 M 15; 070 M 20; En 3 A; En 3 C; En 2	XC 25; XC 18; 2 C 22	1450	C 20; C 25	F.1120; C 25 K	S 20 C; S 20 CK; S 22 C	20	C22E
1	A 1008 (HSLAS-F Grade 80 [550]); A 1011 (HLAS-F Grade 80 [550])	1.0986	S500MC; QStE 500 TM	60F55 HR; 60F55 HS; 60F55 CS	E 560 D; S 560 MC		FeE 560 TM				S500MC
1	A 1008 (HSLAS-F Grade 70 [480]); A 1008 (HSLAS Grade 70 [480] Class 1)	1.0984	S500MC; QStE 500 TM		E 490 D; S 490 MC	2662	FeE 490 TM				S500MC
1	A 1008 (HSLAS Grade 65 [450] Class 1); A 1008 (HSLAS Grade 65 [450] Class 2)	1.0982	S460MC; QStE 460 TM	1501-50F45; 50F45 HR; 50F45 HS; 50F45 CS							S460MC
1	A 1008 (HSLAS Grade 50 [340] Class 1); A 1008 (HSLAS Grade 50 [340] Class 2)	1.0976	S355MC; QStE 360 TM	46F40 HR; 46F40 HS; 46F40 CS	E 355 D	2642	FeE 355 TM				S355MC
1	A 1008 (HSLAS Grade 50 [340]); A 1008 (HSLAS Grade45 [310] Class 2); A 1011 (HSLAS-F Grade 50 [340])	1.0972	S315MC; QStE 300 TM	1501-40F30; 43F35 HR; 43F35 HS; 43F35 CS	E 315 D						
1	K01600; K02007; K02700; K02701; K02803; K02900; K03009; K03300; K11803; K12000; K12001; K12037	1.0562	P355N; StE 355	225-490A	FeE 355 KG N; E 355 R/FP; A 510 AP	2106	FeE 355; FeE 355 KG; FeE 355 KW	AE 355 KG; AE 355 DD	SM 490 A; SM 490 B; SM 490 C; SM 490 YA; SM 490YB STK 490 YB; STK 490; STK 500; SM 50 A; SM 50 B	15GF	P355N
1	1024; K03011; K03014; K12037; K12709	1.0570	S355J2G3 (S355J2); St 52-3 N (Fe 510 D1)			2132; 2134	fE 510	AE 355 D; Fe 510 D1 FF	SM 490 A; SM 490 B; SM 490 C; SM 490 YA; SM 490 YB; SM 520 B; SM 520 C; STK 490; STK 500; STKM 16 C	17GS; 17G1S	S355J2G3

Material Group No.	USA	Germany		U.K.	France	Sweden	Italy	Spain	Japan	Russia	EURONORM
	AISI/SAE/ UNS/ ASTM/AA	Werkstoff	DIN	BS	AFNOR	SS	UNI	UNE	JIS	GOST	EN
1	K01600; K02302; K02700; K02701; K02803; K03301; K11803; K12037; K12609; A 299 (A); A 299 (B)	1.0566	P355NL1; TStE 355	225-490 A	A 510 FP	2107	Fe E 355 KT		SLA 365; STK 490; STK 500; SLA 37; STK 50; STK 51		P355NL1
1	K01600; K02007; K02701; K02803; K117803; K12001; K12037; K12609	1.0565	P355NH; WStE 355	225/490; 225-490 A; 500 Nb	A 510 AP	2106	FeE 355-2; FeE 355 KW				P355NH
1	K12037	1.0549	S355 NLH; TStE 355	50 EE		2135	Fe 510 D	FeE 355 KTM			S355 NLH
1	K12000	1.0553	S355JO; St 52-3 U; Fe 510 C	50 C; 4360-50C	E 36-3		Fe 510 C FN	AE 355 C	SCC 3		S355JO
1	A 252 (1); A 252 (2); A 252 (3)	1.0547	S355JOH; St 52-3 U	50 C; 4360-50C	TSE 355-3; E 36-3		Fe 510 C	AE 355 C; Fe 510 C			S355JOH
1	K02502	1.0036	S235JRG1; S235JR; Fe 360 B; USt 37-2	Fe 360 B FU; Fe 360 B FN		1311; 1312	Fe 360 B; Fe 360 C; Fe 360 D	AE 235 B; Fe 360 B		16D; St3Kp	
1	1020; 1022; 1023; G10200; G10220; G10230	1.0402	C22	055 M 15; 070 M 20; En 3 A; En 3 B; En 3 C; En 2; 22 HS; 22 CS	AF 42 C 20; XC 25; 1 C 22	1450	C 20; C 21	F.112; 1 C 22	S 20 C; S 22 C	20	C22; 2C/2D
1	K01701; K02505; K02704; K02801	1.0425	P265GH; H II	151-400; 154-400; 161-400; 164-400	A 42 CP; A 42 AP	1431; 1430; 1432	Fe 410 1 KW; Fe 410 1 KG; Fe 410 1 KT; Fe 410 2 KW; Fe 410 2 KG	A 42 Grado RC I; A 42 Grado RC II; F.6306; F.6307	SG 295; SGV 410; SGV 450; SGV 480; SPV 315; SPV 355; SG 30; SGV 42; SGV 46; SGV 49; SPV 32; SPV 36	16K; 20K	P265GH
1	A27 65-35	1.0443	HX300PD; H300PD; H 300 PD		E 23-45 M	1305					HX300PD
1	K12000; K12037	1.0546	S355NL; TStE 355	50 EE; 4360-50EE	E 355 FP	2135; 2135-01	FeE 355 KT	AE 355 Grado KT			
1	K12709	1.0545	S355N; StE 355	50 E; 4360-50E	E 355 R	2134	FeE 355 KG	AE 355 Grado KG	SM 490 A; SM 490 B; SM 490 C; SM 490 YA; SM 490 YB; SM 50 A; SM 50 B; SM 50 C; SM 50 YA; SM 50 YB		S355N

Material Group No.	USA	Germany		U.K.	France	Sweden	Italy	Spain	Japan	Russia	EURONORM
	AISI/SAE/ UNS/ ASTM/AA	Werkstoff	DIN	BS	AFNOR	SS	UNI	UNE	JIS	GOST	EN
1	K02705; K02305; K12709	1.0539	S355NH; StE 335 N	S355NH	S355NH; TSE 355-4	2134-04	Fe 510 B	Fe 355 KGN			S355NH
1	1213; 1215; G12130; G12150	1.0715	11SMn30; 9 SMn 28	230 M 07; 220 M 07	S 250	1912	CF 9 S 22	F.210.A; F.210.L; 11 SMn 28; F.2111	SUM 22		11SMn30
1		1.0722	10SPb20; 10 SPb 20		10 PbF 2		CF 10 SPb 20	10 SPb 20; F.2122			10SPb20
1	1215; G12150; A 29 (1215); A 108 (1215); A 510 (1215); A 510 (1215); A 519 (1215); A 521 (1215)	1.0736	11SMn37; 9 SMn 36		S 300		CF 9 Mn 36	12 SMn 35; F.2113	SUM 25		11SMn37
1	12L14; 12 L 14; G12144	1.0737	11SMnPb37; 9 SMnPb 36		S 300 Pb	1926	CF 9 SMnPb 36	12 SMnPb 35; F.2114			11SMnPb37
1	1010; G10100	1.1121	C10E; Ck 10	040 A 10; 045 M 10; En 2 A; En 2 A/1; En 2 B; En 32 A	C10RR; XC 10	1265	2 C 10; 2 C 15; 1 C 10; C 10	C 10 k; F.1510	S 09 CK; S 10 C	08; 10	C10E
1	1015; 1017; G10150; G10170	1.1141	C15E; Ck 15	080 A 15; 080 M 15; En 32 C	XC 12; XC 15; XC 18	1370	1 C 15; C 15	C 16 k; F.1511; F.1110; C 15 k	S 15 C; S 15 CK	15	C15E
1	1020; G10200; K02301; K02595; K02596; K02597; K02598; K02599; K02702; K03000	1.0044	S275JR; St 44-2; Fe 430 B	En 43 B; Fe 430 B; 43/25 HR; 43/25 HS; 43 B; HFW 4; HFS 4; ERW 3; CEW 4; SAW 4	E 28 A; NFA 35-501 E 28	1411; 1412	Fe 430 B FN	AE 275 B; Fe 430 B FN	SN 400 B; SN 400 C; SN 490 B; SN 490 C; SS 400; STK 400; STKM 19 C; STKR 400; 19 C; SS 41; STK 41	St4ps; St4sp	S275JR
1		1.0250	S320GD; StE 320-3 Z		S 320 GD				SGC 440; SZAC 440; SZAH 440; SGLH 440		S320GD
1		1.0453	P265NL; P 265 NL								P265NL
1		1.0338	DC04; St 4; St 14	CR 1; CS 2	ES	1147	FeP 04	AP 04; FeP 04	SPCE; HR 4	08JuA	DC04
1											
1	K02001; K02601; K02701	1.0116	S235J2G3 (S235J2); St 37-3 N; Fe 360 D 1	Fe 360 D1 FF; 37/23 CR; 37/23 CS; 37/23 HR; 37/23 HS; 40 D; HFW 4; HFS 4	E 24-3; E 24-4; E 24-U	1312; 1313	Fe 360 C; D; Fe 360 C FN; Fe 360 D FF; Fe 37-2		SS 330; SS 34	16D; St3sp	S235J2G3
1	1015; 1017; G10150; G10170	1.0401	C15; C 15	080 A 15; 080 M 15; En32 C; 17 CS; 17 HS	C18RR; XC 18; C 18; AF 37 C 12	1350	1 C 15; C15; C16	F.111	S 15 C		C15

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	AISI/SAE/ UNS/ ASTM/AA	Werkstoff	DIN	BS	AFNOR	SS	UNI	UNE	JIS	GOST	EN
1		1.0347	DC03; RRSt; RRSt 13	CR2; CR3; CS3; 1449 3 CR; 1449 2 CR	E	1146	FeP 02; FeP 03	AP 02; AP02; FeP03	SPCD; CR 3	08Ju	DC03
1	K01500; K01702; K02401; K02502; K03000; A570.36	1.0038	S235JR; S235JRG2; RSt 37-2; Fe 360 B	Fe 360 B FU; 37/23 CR; 37/23 CS; 37/23 HR; 37/23 HS; HFW 3; HFS 3; 40 B	E 24-2 NE	1312	Fe 360 B FN	AE 235 B FN; AE 235 B FU; Fe 360 B FN; Fe 360 B FU	SS 330; SS 34	St3ps; St3sp	S235JR
1	J03001	1.0446	GE240; GS-45	A 1					230-450; 230-450 W	25L-3	GE240
2	1035; G10350	1.0501	C35G; C 35 G	080 M 30; En 5; 080 M 36	C 35; AF 55; 1 C 35; XC 38	1572; 1550	C 35; 1 C 35	F.113	S 35 C; S 35 CM		C35G
2	1035; G10350	1.1183	C35G; C 35 G; Cf 35	080 A 35	XC 38 TS	1572	C 36; C 38	F.1130; C 35 k	S 35 C; S 35 CM	35	C35G
2	1039; G10390	1.1157	40Mn4; 40 Mn 4		35 M 5					40G	
2	1040; G10400	1.0511	C40; C 40	En 8; 080 M 40	AF 60; C 40; 1 C 40		C 40; 1 C 40	F.114.A			C40
2	1045; 1045 H; 1042; G10450; H10450; G10420	1.1191	C45E; Ck 45	080 H 46; 080 M 46	C45RR; XC 45; XC 48 H-1	1672	C 45	F.1140; F.1142; C 45 k; C48 k	S 45 C; S 45 CM; S 48 C	45	C45E
2	1025; G10250	1.1158	C25E; Ck 25	070 M 26	2 C 25; XC 25		C 25	F.1120; C 25 k	S 25 C; S 28 C	25	C25E
2	1043; 1045; G10430; G10450	1.0503	C45; C 45	080 M 46	C 45; AF 65; C 45; 1 C 45	1650	C 45; 1 C 45	F.114	S 45 C; S 45 CM	45	C45
2	1050; 1055; G10500; G10550	1.1213	C53G; C53E; Cf 53		XC 48 TS		C 53		S 50 C; S 50 CM	50	
2	1140; G11400	1.0726	35S20; 35 S 20	212 M 36	35 MF 4	1957		F.210.G; 35 MnS 6; F.2131			35S20; 8M
2	1139; 1146; G11390; G11460	1.0727	46S20; 45 S 20		45 MF 4						46S20
2	K12000	1.0553	S355J0; St 52-3 U; Fe 510-C	50 C	E 36-3		Fe 510 C FN	AE 355 C	SCC 3		S355J0
2		1.0551	S355JRC								S355JRC
2	K02700; K02803; K03103; K03300; K12437	1.0473	P355GH; 19 Mn 6		A 52 CP	2101; 2102	Fe E 355-2	A 52 RC I, RA II	SGV 410; SGV 450; SGV 480		P355GH
2		1.0416	C18D; GS-38		20-400 M	1306					C18D
2	K12447	1.0577	S355J2; S355J2G4; Fe 510 D2		A 52 FP	2107		A 52 RB II; AE 355 D			

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	AISI/SAE/ UNS/ ASTM/AA	Werkstoff	DIN	BS	AFNOR	SS	UNI	UNE	JIS	GOST	EN
2	1049; 1050; G10490; G10500	1.1206	C50E; Ck 50	080 M 50	XC 50; 2 C 50	1674	C 50			50	C50E
2	1330; 1527; G13300; G15270	1.1170	28Mn6	150 M 19; En 14 A; En 14 B	20 M 5		C 28 Mn		SCMn 1	30G	28Mn6
2	1034; 1035; 1038; G10340; G10350; G10380; C 1034	1.1181	C35E; Ck 35	080 M 30; En 5; 080 M 36	XC35RR; XC32; XC 35; XC 38 H 2; XC 38 H 1; 2 C 35	1572	C 35	F.1130; C 35 k	S 35 C; S 35 CM; S 38 C	35	C35E
2		1.1180	C35R; Cm 35	080 A 35	XC 38 H 1 u; Cm 35		C 35	F.1135; C 35 k-1			C35R
2	1030; G10300	1.1178	C30E; Ck 30	080 M 30; En 5	XC 32		C 30	2 C 30	S 30 C; S 30 CM		C30E
2	1049; 1050; G10490; G10500	1.0540	C50	En 43 A; 080 M 50	C50	1674	C 50	1 C 50	S 50 C		C50
2	1536; G15360	1.1166	34Mn5					TO.B	SMn 433 H; SMn 433 HRCH; SMn 433 RCH; SMn 1 H		
2	1025; G10250	1.0406	C25	070 M 26	1 C 25		C 25; 1 C 25				
2		1.0723	15S22; 15 S 20	210 A 15; 210 M 15		1922		F.210F; F.210.F	SUM 32		
2		1.1730	C45U; C45W; C 45 U; C 45 U								C45U
3	1045; 1049; G10450; G10490	1.1201	C45R; Cm 45	080 M 46	3 C 45; XC 42 H 1; XC 48 H 1 u	1660	C 45	F.1145; F.1147; C 45 k-1; C 48 k-1	S 45 C; S 45 CM	45	C45R
3	1040; G10400	1.1186	C40E; Ck 40	080 M 40; En 8	2 C 40; XC 42 H 1		C 40		S 40 C	40	C40E
3	1074; 1075; G10740; G10750	1.0614	C76D; C 76 D; D 75-2		XC 75		3 CD 75			75	C76D
3	1095; G10950	1.0618	C92D; C 92 D; D 95-2	95 HS; 95 CS	XC 90		3 CD 95				C92D
3	1086; G10860	1.0616	C86D; C 86 D; D 85-2	80 HS; 80 CS	XC 80		C 85; 3 CD 85				C86D
3		1.1165	G28Mn6; GS-30 Mn 5	A 5; A 6				30 Mn 5; AM 30 Mn 5; F.120.D; F.8211; F.8311	SCMn 2	27ChGSNMDTL; 30GSL	G28Mn6
3	K01700; K02001; K02200; K02201; A 516 Gr.70; A 515 Gr. 70; A 414 Gr.F; A 414 Gr.G	1.0481	P295GH; 17Mn4; 17 Mn 4	224-469 B	A 48 CP; A 48 AP	2102	Fe 295	A 47 RC I; RA II	SG 365; SGV 410; SGV 450; SGV 480; SPV 315; SG 37; SGV 42; SGV 46; SGV 49; SPV 32	14G2	P295GH

Material Group No.	USA	Germany		U.K.	France	Sweden	Italy	Spain	Japan	Russia	EURONORM
	AISI/SAE/ UNS/ ASTM/AA	Werkstoff	DIN	BS	AFNOR	SS	UNI	UNE	JIS	GOST	EN
3	1043; 1045; G10430; G10450	1.0503	C45; C 45	080 M 46	C 45; AF 65; C 45; 1 C 45	1650	C 45; 1 C 45	F.114	S 45 C; S 45 CM		C45
3	1335; 1335 H; 1541; 1541 H; G13350; G15410; H13350; H15410	1.1167	36Mn5; 36 Mn 5	150 M 36	40 M 5; 35 Mn 5	2120		F. 1203-36 Mn 6; F. 8212-36 Mn 5	SMn 438; SMn 438H; SCMn 3	35G2; 35GL	36Mn5
3	1045; 1045 H; 1042; G10450; H10450; G10420	1.1191	C45E; Ck 45	089 H 46; 080 M 46	C45RR; XC 45; XC 48 H 1	1672	C 45	F.1140; F.1142; C 45 k; C 48 k	S 45 C; S 45 CM; S 48 C	45	C45E
3		1.1303	38MnVS6; 38 MnVS 6								38MnVS6
4	1055; G10550	1.0535	C55	070 M 55; En 9	C54; 1 C 55; AF 70; C 55	1655	C 55; 1 C 55	F.115	S 55 C; S 55 C-CSP; S 55 CM	55	C55
4	1055; G10550	1.1203	C55E; Ck 55	070 M 55; En 9	C50RR; XC 54; XC 50; 2 C 55; XC 55 H 1	1655	C 55	F.1150; C 55 K	S 55 C; S 55 C-CSP; S 55 CM	55	C55E
4	1060; G10600	1.0601	C60	060 A 62; En 43 D	C60; 1 C 60		C 60; 1 C 60		S 58 C; S 60-C-CSP; S 60 CM; S 65 C-CSP; S 65 CM	60; 60G	C60; 43D
4	1070; G10700	1.1231	C67S; Ck 67	060 A 67; 080 A 67; En 43 E	C68RR; XC 68	1770	C 67		S 70 C-CSP; S 70 CM	65GA; 68GA	C67S
4	1074; 1075; 1078; G10700; G10750; G10780	1.1248	C75S; Ck 75	060 A 78; 80	C75RR; XC 75	1774	C 75		S 75 CM	75A	C75S
4	1095; G10950	1.1274	C100S; Ck 101	95	C100RR; XC 100	1870	C 100		SK 95 -CSP		C100S
4	W112; W1; T72301	1.1563	C125U; C 125 W		Y2 120; C120E3U		C 120 KU	F.5123; C 120	SK 120; SK 120 M; SK 2; SK 2 M; TC 120	U12-1	C125U
4	1086; G10860	1.1269	C80S; Ck 85; C 85 E		C90RR; XC 90		C 85		SK 85-CP	85A	C80S
4	1055; G10550	1.1209	C55R; Cm 55	070 M 55; En 9	3 C 55; XC 55 H 1		C 55	F.1155; C 55 k-1			C55R
4	1074; 1075; G10740; G10750	1.0605	C75	060 A 78	C 75		C 75			75	
4	1070; G10700	1.0603	C67	060 A 67; 080 A 67; En 43 E; 1449 70 HS	C68; XC 65		C 67		S 70 C-CSP; S 70 CM		C67
4		1.1219	C56E2; Cf 54						C56E2; S55C		C56E2

Material Group No.	USA	Germany		U.K.	France	Sweden	Italy	Spain	Japan	Russia	EURONORM
	AISI/SAE/ UNS/ ASTM/AA	Werkstoff	DIN	BS	AFNOR	SS	UNI	UNE	JIS	GOST	EN
5	1055; G10550	1.1220	C56D2; C 56 D 2		C 56 D 2						C56D2
5		1.1217	C90S; C 90 S	CS95	C90RR; XC 90; XC90; C90E2U				SK 95		C90S
5	1060; 1064; G10600; G10640	1.1221	C60E; Ck 60	060 A 62; 070 M 60; En 43 D	C60RR; XC 60; X 65; 2 C 60	1678	C 60		S 58 C; S 60 C-CSP; S 60 CM; C 65 C-CSP; C 60 CM	60GA	C60E
5	1055; G10550	1.1203	C55E; Ck 55	070 M 55; En 9	C50RR; XC 54; XC 50; XC 55 H 1; 2 C 55	1655	C 55	F.1150; C 55 k	S 55 C; S 55 C-CSP; S 55 CM	55	C55E
6	9260; G92600	1.5028	65Si7; 65 Si 7		60 S 7				50 P 7; SUP 6; SUP 6 M; SUP 7; SWOSM	60S2G	
6	9260 H; H92600; 9260; G92600	1.5027	60Si7	251 A 60; 251 H 60	60 S 7		60 Si 7	F.144.B; F.1441		60S2	
6	9255; G92550	1.5026	56Si7; 56 Si 7; 55Si7; 55 Si 7	251 A 58; En 45 A	55 S 7	2085; 2090	55 Si 7	F.144; F.144.A; 56 Si 7; F.1440		55S2; 60S2	565Si7; 55Si7
6	9255; G22550	1.5025	51Si7; 51 S 7		50S7; 51 Si 7		48 Si 7; 50 Si 7	F.145.B			51Si7
6		1.5024	46Si7		45 S 7; Y 46 S 7; 46 Si 7			F.1451			46Si7
6	G50986; ASTM Grade E50100; ASTM Grade G15116; SAE E50100	1.3501	100Cr2; 100 Cr 2	GCr6; B00040; GCr4	100C2					SchCh4	
6	K21390; K21590; ASTM A 182 F22	1.7380	10CrMo9-10; 10 CrMo 9 10	622; 622-490; 622/515; 622/690	12 CD 9-10; 10 CD 9.10	2218	12 CrMo 9 10	TU.H	SCMQ4E; SCMV 4; SFVA F 22.A; SFVA F 22.B; SFVCM F22B; STBA 24; STFA 24; STPA 24	12Ch8	10CrMo9-10
6	O2; T31502	1.2842	90MnCrV8; 90 MnCrV 8	BO 2; BO2	90 MnV 8; 90 MV 8		90 MnVCr 8 KU	90 MnCrV 8; F.5229			90MnCrV8
6		1.2550	60WCrV7; 60 WCrV 7	BS1; BS 1	55 WC 20	2710	55 WCrV 8 KU; 58 WCr 9 KU	60 WCrSiV 8; F.5242			60WCrV7
6		1.2241	51CrMnV4; 51 CrV 4; 50 CrV 4								
6	L2; T61202	1.2210	115CrV3; 115 CrV 3		100 C 3		107 CrV 3 KU	F.520.L; F.5125			115CrV3
6		1.2419	105WCr6; 105 WCr 6	105WC 13	105 WCr 5; 105 WC 13	2140	107 WCr 5 KU	F.5233; 105 WCr 5	SKS 2; SKS 2 M; SKS 3; SKS 31	ChW1G; ChWG	105WCr6
6	4820; 5120; 5120H; G48200; G51200; H51200	1.7147	20MnCr5; 20 MnCr 5	150 M 19	20 MC 5	2172	20 MnCr 5; Fe52	F.150.D	SMnC 420 H; SMnC 420 RCH; SMnC 21 H	18ChG	20MnCr5

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6	9255; G92550	1.0904	55Si7; 55 Si 7	250A53	55 S 7	2085	55 Si 8	56 Si 7			
6	9254; G92550	1.0904	55Si7; 55 Si 7	250 A 53	55 S 7	2090					
6	9262; G95620	1.0961	HDT 450 F; S340 MGC		60 SC 6		60 SiCr 8	60 SiCr 8; F.1442		60S2; 55S2; 50ChFA	
6	4135; 4137; 4135H; 4137H; G41350; G41370; H41350; H41370	1.7220	34CrMo4; GS34 CrMo 4; G34 CrMo 4	708 A 30	34 CD 4; 34CrMo4RR; 35 CD 4;	2234	34 CrMo 4 KB; 35 CrMo 4	35 CrMo 4 DF; F.125.A; F.125.B; F.1254; F.1250	SCM 435 H; SCM 435 HRCH; SCM 435 M; SCM 435 RCH; SCM 435TK; SCM 3 H; STKS 3	35ChM; AS38ChGM	34CrMo4
6		1.5120	38MnSi4; 38 MnSi 4								
6	L3; T61203	1.2067	102Cr6; 102 Cr 6; 100Cr6	BL 3; BL3	100Cr6RR; 100 C 6; 100Cr6; Y 100 C 6		102 Cr 6 KU	F.5230; 100 Cr 6	SUJ 2	Ch	102Cr6
6	L1	1.2108	90CrSi5; 90 CrSi 5			2092	105 WCr 5				90CrSi5
6	P20; T51620	1.2330	35CrMo4; 35 CrMo 4	708 A 37	34 CD 4	2234	35 CrMo 4				35CrMo4
6	O1; T31501	1.2510	100MnCrW4; 100 MnCrW 4	BO1; BO0; BO 1; BO 0	90MnWCrV5; 90 MWCV 5; 8 MO 8	2140	95 MnWCr 5 KU; 10 WCr 6	F.522.A; F.5220; 95 MnCrW5; 105 WCr 5	SKS 31		100MnCrW4
6	S1; T41901	1.2542	45WCrV7; 45 WCrV 7	BS1; BS 1	45 WCrV 8; 45 WCrV 20	2710	45 WCrV 8 KU	F.524; F.5241; 45 WCrSi 8		5ChW25F	45WCrV7
6	L6; T61206	1.2713	55NiCrMoV6; 56NiCrMoV6; 55 NiCrMoV 6; 56 NiCrMoV 6	BH 224; BH 225	55 NCDV 7			F.520.S	SKT 4	5ChNM	55NiCrMoV6
6		1.2721	50NiCr13		55 NCV 6	2550		F.528			
6	E52100; G52986	1.3505	100Cr6; 100 Cr 6	2 S.135; 535 A 99	100Cr6RR; 100 C 6; 100Cr6	2258	100 Cr 6	F.131; 100 Cr 6; F.1310	SUJ 2; SUJ 4	SchCh 15	100Cr6
6	K11820; K12020; K12320; A204 Grade A; A182 Grade F1	1.5415	16Mo3; 15 Mo 3	1503-243 B	15 D 3	2912; 16Mo3	16 Mo 3 KG; 16 Mo 3 KW; 16 Mo 5 KG; 16 Mo 5 KW	F. 2601; 16 Mo 3	STBA 12; STFA 12; STPA 12		
6	4422; G44220; J12522	1.5419	G20Mo5; 20Mo4; GS-22 Mo 4	245; B 1; B1					SCPH 11		G20Mo5
6	A 350-LF 5; K13050; K21703; K22103	1.5622	14Ni6; 14 Ni 6		16 N 6		14 Ni 6 KG; 14 Ni 6 KT	F.2641; 15 Ni 6			14Ni6
6	3415	1.5732	14NiCr10; 14 NiCr 10		14 NC 11		16 NiCr 11	15 NiCr 11	SNC 415; SNC 415 H; SNC 415 M	12ChN3A	14NiCr10
6	3310; 3310 RH; 3312; 3316; 9315; E 3310; E 3316; E9315; G33106	1.5752	15NiCr13; 14NiCr14; 15 NiCr 13; 14NiCr14	655 M 13; 655 H 13; En 36 A	10 NC 12; 12 NC 15; 14 NC 12; 16 NC 12; 16 NCD 13			15 NiCr 11; F.1540	SNC 815 H; SNC 815 HRCH; SNC 815 RCH; SNC 22 H		15NiCr13

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	AISI/SAE/ UNS/ ASTM/AA	Werkstoff	DIN	BS	AFNOR	SS	UNI	UNE	JIS	GOST	EN
6		1.7262	15CrMo5; 15 CrMo 5		12 CD 4			12 CrMo 4; F.150.J; F155; F.1551	SCM 415 H; SCM 415 HRCH; SCM 415 M; SCM 415 RCH; SCM 415 TK; SCM 21 H		15CrMo5
6		1.6587	17CrNiMo6; 17 CrNiMo 6	820A16	18 NCD 6			14 NiCrMo 13			
6	9310; 9310H; 9310 RH; E 9310 H; G93106; H93100; H93106	1.6657	14NiCrMo13-4; 14 NiCrMo 13 4	832 H 13; 832 M 13; S.157; En 36 C	16 NCD 13		15 NiCrMo 13; 16 NiCrMo 12	14 NiCrMo 13; 14 NiCrMo 13-1; F.1560; F.1569			
6	5015; G50150	1.7015	15Cr3; 15 Cr 3	523 M 15	12 C 3; 15Cr2RR; 15 C 2				SCr 415; SCr 415 H; SCr 415 HRCH; SCr 415 RCH; SCr 21 H	15Ch	15Cr3
6	5132; 5132 H; G51320; H51320	1.7033	34Cr4; 34 Cr 4	530 A 32; 530 H 32; 530 M 32	32 C 4		34 Cr 4; 34 Cr KB	35 Cr 4; F.8221	SCr 430; SCr 430 H; SCr 430 HRCH; SCr 430 RCH; SCr 2 H	35Ch	34Cr4
6	5140; 5140 H; 5140 RH; G51400; H51400	1.7035	41Cr4; 41 Cr 4	530 A 40; 530 M 40; 530 H 40; En 18	42 C 4		41 Cr 4; 41 Cr 4 KB	41 Cr 4 DF; F.1211; F.1202	SCr 440; SCr 440 H	40Ch	41Cr4
6	5140; G51400	1.7045	42Cr4; 42 Cr 4	530 A 40	42 C 4 TS	2245	41 Cr 4	42 Cr 4	SCr 440		
6	5115; 5117; G51150; G51170	1.7131	16MnCr5; 16 MnCr 5	527 M 17; 590 H 17; 590 M 17	16MnCr5RR; 16 MC 5	2173	16 MnCr 5	F.1516		18ChG	16MnCrS5
6		1.7139	16MnCrS5; 16 MnCrS 5		BGH 7139; BOHLER E 411; VW 4221; OPEL QS1916; PROCONS 7139; E411; SES	2127					16MnCrS5
6	5155; 5155 H; 5150; G51550; H51550; G51600	1.7176	55Cr3; 55 Cr 3	525 A 58; 525 A 60; En 48	55 C 3; 55Cr3	2253	55 Cr 3	F.1431	SUP 9; SUP 9 A; SUP 9 M	50ChGA	55Cr3
6	4142; G41420	1.7223	41CrMo4; 41 CrMo 4		MOC 2; V320		41 CrMo 4	42 CrMo 4	SNB 22-1	40ChFA	
6	4140; 4140 H; 4140 RH; 4142; 4142 H; 4145; G41400; H41400; G41420; H41420; K14248; K14047	1.7225; 1.7227	42CrMo4; 42CrMo4V; 42 CrMo 4; 42 CrMo 4 V	708 M 40; 709 M 40; En 19; En 19 A	42 CD 4; 40 CD 4; 42CrMo4RR	2244; 42CrMo4	42 CrMo 4; 38 CrMo 4 KB; 41 CrMo 4	TO.D; TU.L	SCM 440 H; SCM 440 HRCH; SCM 440 M; SCM 440 RCH; SCM 440 TK; SNB 7 Class 2; SCM 4 H; SNB 22-1	40ChFA	42CrMo4

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	AISI/SAE/ UNS/ ASTM/AA	Werkstoff	DIN	BS	AFNOR	SS	UNI	UNE	JIS	GOST	EN
6	4147; 4147 H; 4150; 4150 H; 8650; 8650 H; G41470; G41500; G86500; H41470; H41500; H86500	1.7228	50CrMo4; 50 CrMo 4	708 M 40; 708 A 47		2512	653 M 31		SCM 445 H; SCM 445 HRCH; SCM 445 RCH; SCM 5 H		50CrMo4
6	8620; G86200	1.7321	20MoCr4; 20 MoCr 4			2625				BGH 7321; E320; SIQUAL 7321	20MoCr4
6	K11547; K11562; K11564; K11757; K11789; K12052; ASTM A182 F12	1.7335	13CrMo4-5; 13 CrMo4 4	620; 620-440; 620-470; 620-540; 621	15 CD 4-05	2216	14 CrMo 3; 14CrMo4 5	TU.E; TU.F; F.2631; 14 CrMo 4 5	SCMV 2; SFVA 12; STBA 22; STFA 22; STPA 20; STPA 22	12ChM; 15ChM	13CrMo4-5
6	K21390; K21590; ASTM A182 F22	1.7380	10CrMo9-10; 10 CrMo 9 10; GS-12CrMo9-10; GS-12 CrMo 9 10; G 12 CrMo9-12	622; 622-490; 622/515; 622/690; 1502-622	12 CD 9-10; 10 CD 9.10	2218	12 CrMo 9; 12 CrMo 10	TU.H	SCMQ 4 E; SCMV 4; SFVA F 22 A; SFVA F 22 B; SFVCM F 22 B; STBA 24; STFA 24; STPA 24	12Ch8	10CrMo9-10
6		1.7715	14MoV6-3; 14 MoV 6 3	1503-660-440				13 MoCrV 6			
6	E71400; K24065; K24728; A355 Class A	1.8509	41CrAlMo7-10; 41CrAlMo7; 41 CrAlMo 7	905 M 39; En 41 B	40 CAD 6.12	2940	41 CrAlMo 7	F.174; 41 CrAlMo 7; F1740	SACM 645; SACM 1	38Ch2MJuA	41B
6		1.6566	17NiCrMo6-4								17NiCrMo6-4
6	P20+S	1.2312	40CrMnMoS8-6		40 CMD 8 S						
6		1.7149	20MnCrS5; 20 MnCrS 5								20MnCrS5
6	P20+Ni	1.2738	40CrMnNiMo8-6-4; 40 CrMnNiMo 8 6 4		40 CMND 8					40Ch2GNM	40CrMnNiMo8-6-4
6		1.2311	40CrMnMo7; 40 CrMnMo 7		40 CMD 8		35 CrMo 8 KU	F.5302			40CrMnMo7
6		1.7238	49CrMo4; 49 CrMo 4								
6	4150; G41500	1.7701	52CrMoV4; 51CrMoV4; 51 CrMoV 4		51 CDV 4; 51CrMoV4		51 CrMoV 4				51CrMoV4
6		1.7337	16CrMo4-4; 16 CrMo 4 4				A 18 CrMo 45 KW		SCM 415 M; SCM 415; STBA 22; SFVA F12		
6		1.7242	16CrMo4; 16 CrMo 4		15 CD 3.5		18 CrMo 4	F.1550; 18 CrMo 4	SCM 418 H; SCM 418 HRCH; SCM 418 RCH; SCM 418 TK		16CrMo4

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	AISI/SAE/ UNS/ ASTM/AA	Werkstoff	DIN	BS	AFNOR	SS	UNI	UNE	JIS	GOST	EN
6	4419; 4419 H; 4520; G44190; H44190; G45200; K11522; K11820; K12020; K12023; K12320; K12821	1.5423	16Mo5				16 Mo 5 KG; 16 Mo 5 KW	TU.D; F.2602	SB 450 M; SB 480 M; SB 46 M SB 49 M		
6										30ChGSA	
6	HY-80; HY 80; HY80; K31820; MIL-S-21952										
6				605 M 36; En 16; En 16T							
7	4130; 4130 H; 4130 RH; G41300; H41300	1.7218	25CrMo4; 25 CrMo 4; GS-25 CrMo 4; G 25 CrMo 4	708 A 25	25 CD 4	2225	25 CrMo 4; 25 CrMo KB	F.222; F.1256	SCM 420 TK; SCM 430 M; SCM 430 RCH; SCM 430 TK; STKS 1	20ChM; 30ChM	25CrMo4
7		1.8070	21CrMoV5-11; 21 CrMoV 5 11				35 NiCr 9				
7		1.7755	GS-35 CrMoV 10 4; G35 CrMoV 10-4								
7		1.7733	24CrMoV5-5		20 CDV 6		21 CrMoV 5 11				
7	4340; 4340 H; 9850; G43400; G98500; H43400; K23028	1.6565	40NiCrMo6; 40 NiCrMo 6	817 M 40; En 24				F.1275; 40 NiCrMo 7	SNB 24-1; SNB 24-2; SNB 24-3; SNB 24-4; SNB 24-5; SNCM 439 RCH	40Ch2N2MA	40NiCrMo6
7	8640; 8640 H; 8740; 8740 H; 8742; G86400; G87400; G87420; H86400; H87400; K11640	1.6546	40NiCrMo2-2; 40 NiCrMo 2 2		40 NCD 2; 40 NCD TS		40 NiCrMo 2; 40 NiCrMo 2 KB	40 NiCrMo 2 DF; F.1205; F.1204; TO.E	SNCM 240; SNCM 240 RCH	38ChGNM	
7	8617; 8617 H; 8620; 8620 H; 8620 RH; 8617; G86170; G86200; H86170; H86200; K12147	1.6523	20NiCrMo2-2; 21NiCrMo2; 21 NiCrMo 2	805 H 20; 805 M 20; 806 M 20; En 362	20 NCD 2	2506	20 NiCrMo 2	20 NiCrMo 2; 20 NiCrMo 3-1; F.1522; F.1534	SNCM 220; SNCM 220 H; SNCM 220 HRCH; SNCM 220 M; SNCM 220 RCH; SNCM 21 H	20ChGNM	20NiCrMo2-2
7		1.5755	31NiCr14; 31 NiCr 14	653 M 31	18 NC 13						
7	3135	1.5710	36NiCr6; 36 NiCr 6	640 A 35	35 NC 6				SNC 236		36NiCr6

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	AISI/SAE/ UNS/ ASTM/AA	Werkstoff	DIN	BS	AFNOR	SS	UNI	UNE	JIS	GOST	EN
7	4340; G43400; 4337; G43370	1.6582	34CrNiMo6; 34 CrNiMo 6	816 M 6; 817 M 40	34 CrNiMo 8; 35 NCD 6	2541	35 NiCrMo 6 KB	F.1272		38Ch2N2MA	34CrNiMo6
7		1.8519	31CrMoV9; 31 CrMoV 9							30Ch3MF	31CrMoV9
7	8630	1.6545	30NiCrMo2-2; 30 NiCrMo 2 2		30 NCD 2		30 NiCrMo 2 KB				
7	4340; G43400	1.6580	30CrNiMo8	823 M 30	30 CND 8; 30 NCD 8			30 CrNi Mo 8	SNCM 431		
7	K01907	1.5217	20MnV6; 20 MnV 6 N	55 C; GR 55; Grade 55	20MV6; TS E 455 4; TU E 455 4						20MnV6; S460
7	300M; 4340M; K44220	1.6928	41SiNiCrMoV7-6	S 155							
8		1.8523	40CrMoV13-9; 39CrMoV13-9; 39 CrMoV 13 9	897 M 39			36 CrMoV 12				40CrMoV13-9
8		1.8515	31CrMo12; 31 CrMo 12	722 M 24	30 CD 12	2240	32 CrMo 12	F.1712; F.124.A			31CrMo12; 40B
8		1.8161	58CrV4; 58 CrV 4								
8		1.7361	32CrMo12; 32 CrMo 12	722 M 24	30 CD 12	2240	30 CrMo 12	F.124.A			32CrMo12
8	9840; G98400	1.6511	36CrNiMo4; 36 CrNiMo 4	817 M 37; 816 M 40	40 NCD 3; 35 NCD 5		39 NiCrMo 4; 39 NiCrMo 4 KB	F.128; F.1280; 35 NiCrMo 4	SUP 10	40ChGNM; 40ChN2MA	36CrNiMo4
8	6145; 6150; 6150 H; G61500; H61500	1.8159	51CrV4; 50CrV4; 50 CrV 4	735 A 50; 735 A 51; 735 H 51; 735 M 50; En 47	50CrV4RR; 50 CV 4; 51 CV 4	2230	50 CrV 4	F.143; F.143.A; 51 CrV 4; F.1430	SUP 10; SUP 10-CSP; SUP 10 M	50ChFA; 50ChGFA	51CrV4
8	3435	1.5736	36NiCr10; 36 NiCr 10		30 NC 11				SNC 631; SNC 631 H; SNC 631 M		
8	A128 Grade A; J91109; J91129; J91139; J91149	1.3401; 1.3403	X120Mn12; X 120 Mn 12; G-X120 Mn 12	BW 10	Z 120 M 12	2183	GX 120 Mn 12	F.240.A; F.240.A1; AM-X 120 Mn 12; F.8251	SCMnH 1; SCMnH 11	110G13L	
8	4142; G41420	1.2332	47CrMo4	708 M 40	42 CD 4	2244	42 CrMo 4	42 CrMo 4	SCM; SCM 440		47CrMo4
8	4140 H; 4140 RH; 4140 HT		42CrMo4+QT								
8		1.8705	21MnCr6-5								
8											
9		1.6659	31NiCrMo13-4	830 M 31		2534		F.270			
9		1.5864	35NiCr18								
9		1.8715	17MnCr5-3								17MnCr5-3
10	K71340; K81340	1.5662	X8Ni9	1501-509; 1501-510; 502-650; 509-690	9 Ni; Z 8 N 09		X 10 Ni 9; X 12 Ni 09	F.2645; XBNi 09	SL9N520; SL9N590; STBL 690; STPL 690; SL9N53; SL9N60; STBL 70; STPL 70		X8Ni9

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	AISI/SAE/ UNS/ ASTM/AA	Werkstoff	DIN	BS	AFNOR	SS	UNI	UNE	JIS	GOST	EN
10	2515; A2515; 2517; E2517; K41583	1.5680	X12Ni5; 12Ni19;		Z 18 N 5; Z 10 N 05; 5 Ni				SL5N590; SL5N60		X12Ni5
10	D4; T30404; D6; T30406	1.2436	X210CrW12; X 210 CrW 12	BD6	Z 200 CD 12; Z 210 CW 12-01; X210CrW12-1	2312	X 215 CrW 12 1 KU	F.5213; X210 CrW 12	SKD 2		X210CrW12
10	H13; T20813	1.2344	X40CrMoV5-1; X40 CrMoV 5 1	BH 13	X 40 CrMoV 5; Z 40 CDV 5	2242	X 40 CrMoV 5 1 1 KU	F.5318; X 40 CrMoSiV 5	SKD 61	4Ch5MF1S	X40CrMoV5-1
10	A2; T30102	1.2363	X100CrMoV5; X100CrMoV5-1; X 100 CrMoV 5 1	BA 2	X 100 CrMoV 5; Z 100 CDW 5	2260	X 100 CrMoV 5 1 KU	F.536; F.5227; X 100 CrMoV 5	SKD 12		X100CrMoV5
10	H21; T20821	1.2581	X30WCrV9-3; X30WCrV9 3	BH 21	Z 30 WCV 9		X 30 WCrV 9 3 KU	F.5323; X 30 WCrV 9	SKD 5	3Ch2W8F	X30WCrV9-3; X30WCrV9 3
10		1.2601	X165CrMoV12; X 165 CrMoV 12			2310	X165CrMoW 12KU				X165CrMoV12
10		1.2316	X36CrMo17; X38CrMo16								X38CrMo16
10	M2; T11302	1.3343	HS6-5-2; HS 6-5-2; S 6-5-2	BM 2; BM2	Z 85 WDCV 06-05-04-02; 6-5-2; HS6-5-2	2722		F.550.A; F.5604	SKH 51	R6M5	HS6-5-2
10	H11; T20811	1.2343	X37CrMoV5-1; X38CrMoV5-1	BH 11	Z 38 CDV 5; X38CrMoV		X 37 CrMoV 5 1 KU	F.520.G; F.5137; X 37 CrMoSiV 5	SKD 6	4Ch5MFS	X37CrMoV5-1
10	H12; T20812	1.2606; 1.2605	X37CrMoW5-1; X 37 CrMoW 5 1; X35CrWMoV5; X 35 CrWMoV 5	BH 12	Z 35 CWDV 5; X35CrWMoV5		X 35 CrMoW 05 KU	F.537	SKD 62	5ChNM	X37CrMoW5-1; X35CrWMoV5
10	D2; T30402	1.2379	X153CrMoV12; X155CrVMo12-1; X155 CrVMo 12 1	BD 2	X 160 CrMoV 12; Z 160 CDV 12	2310	X 155 CrVMo 12 1 KU	F.520.A	SKD 10; SKD 11		X153CrMoV12
10		1.2085	X33CrS16; X 33 CrS 16		Z 35 V CD 17.S						X33CrS16
10		1.2162	21MnCr5; 21 MnCr 5		20 MC 5						21MnCr5
10		1.2767	X45NiCrMo4; 45NiCrMo16; X 45 NiCrMo 4		45 NCD 16		40 NiCrMoV 8 KU				X45NiCrMo4
10		1.2764	X19NiCrMo4; X 19 NiCrMo 4; GX19NiCrMo4								X19NiCrMo4
10	D3; T30403	1.2080	X210Cr12; X 210 Cr 12	BD 3	X200Cr12; Z 200 C 12		X 205 Cr 12 KU	F.521; F.5212; X 210 Cr 12	SKD 1	Ch12	X210Cr12
10		1.2367	X38CrMoV5-3; X 38 CrMoV 5 3								X38CrMoV5-3
10		1.6957	27NiCrMoV15-6; 26NiCrMoV14-5; 26 NiCrMoV 14 5								
10	501; 502; S50100; S50200; K41545	1.7362	X12CrMo5; X 11 CrMo 5; 12CrMo19-5; 12 CrMo 19 5					F.240.B; TU.J	SCMV 6; SFVA F 5 A; SFVA F 5 B; SFVA F 5 C; SFVA 5 D; SNB 5 Class 1; STBA 29; STFA 25; STPA 25		X12CrMo5
11	M33; T11333; M34; T11334	1.3249	HS2-9-2-8; S 2-9-2-8	BM 34				2-9-2-8; F.5611			

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	AISI/SAE/ UNS/ ASTM/AA	Werkstoff	DIN	BS	AFNOR	SS	UNI	UNE	JIS	GOST	EN
11	M41; T11341	1.3246	HS7-4-2-5; S 7-4-2-5		Z 110 WKCDV 07-05-04-04-02			F.5615; HS 7-4-2-5			HS7-4-2-5
11	M42; T11342	1.3247	HS2-10-1-8; S 2-10-1-8	BM 42	Z 110 DKCWV 09-08-04-02-01; 2-9-1-8; HS2-9-1-8	2716	HS 2-9-1-8	F.5617; HS 2-10-1-8	SKH 59		HS2-10-1-8
11		1.3207	HS10-4-3-10; S 10-4-3-10	BT 42	Z 130 WKCDV 10-10-04-04-03; 10-4-3-10; HS10-4-3-10		HS 10-4-3-10	F.550.B; F.5553; HS 10-4-3-10	SKH 57	R12F3K10M3-SCh	HS10-4-3-10
11	T15; T12015	1.3202	HS12-1-4-5; S 12-1-4-5	BT 15	HS12-1-4-5		HS 12-1-5-5	F.5563; HS 12-1-5-5		R13F4K5	
11		1.3243	HS6-5-2-5; S 6-5-2-5	BM 35	6-5-2-5; 6-5-2-5 HC; HS6-5-2-5; HS6-5-2-5HC; Z 85 WDKCV 06-05-05-04-02; Z 90 WDKCV 06-05-05-04-02	2723	HS 6-5-2-5	F.550.C; F.5613; HS 6-5-2-5	SKH 55	R6M5K5	HS6-5-2-5
11	M7; T11307	1.3348	HS2-9-2; S 2-9-2		Z 100 DCWV 09-04-02-02; 2-9-2; HS2-9-2	2782	HS 2 9 2	F.5607; HS 2-9-2	SKH 58		HS2-9-2
11	T4; T12004	1.3255	HS18-1-2-5; S 18-1-2-5	BT 4	Z 80 WKCV 19-05-04-01; HS 18-1-1-5		HS 18-1-1-5	F.5530; HS 18-1-1-5	SKH 3		HS18-1-2-5
11	T1; T12001	1.3355	HS18-0-1; S 18-0-1	BT 1	18-0-1; HS 18-0-1; Z 80 WCV 18-04-01	2750	HS 18-0-1	F.5520; HS 18-0-1	SKH 2	R18	HS18-0-1
11			X10NiMoCrV6								
12	430 F; S43020	1.4104	X12CrMoS17; X 12 CrMoS 17		Z 13 CF 17	2383	X 10 CrS 17	F.3413	SUS 430 F		X12CrMoS17
12	S31500	1.4417	GX2CrNiMoN25-7-3			2376					GX2CrNiMoN 25-7-3
12		1.4742	X10CrAlSi18; X10CrAl18		Z 12 CAS 18			F.3113; X 10 CrAl 18	SUS 21	15Ch18SJu	X10CrAlSi18
12		1.4724	X10CrAlSi13; X10CrAl13; X 10 CrAl 13				X 10 CrAl 12	F.3152; X 10 CrAl 13		10Ch13SJu	X10CrAlSi13
12	434; S43400	1.4113	X6CrMo17-1; X 6 CrMo 17 1	434 S 17	Z 8 CD 17-01	2325		F.3116	SUS 434		X6CrMo17-1
12	HNV-6; HNV6; S65006	1.4747	X80CrNiSi20; X 80 CrNiSi 20	443 S 65	Z 80 CSN 20-02		X 80 CrSiNi 20	F.320B	SUH 4		
12	446; S44600	1.4762	X10CrAlSi25; X10CrAl24; X 10 CrAl 24		Z 10 CAS 24	2322		F.3154	SUH 446		X10CrAlSi25
12	EV 8; S63008	1.4871	X53CrMnNiN21-9; X 53 CrMnNiN 21 9	349 S 52	Z 52 CMN 21-9 Az		X 53 CrMnNiN 21 9	F.3217	SUH 35, SUH 36	55Ch20G9AN4	X53CrMnNiN21-9
12		1.4001	X7Cr14; X 7 Cr 14; G-X 7 Cr 13		Z 8 C 13 FF				SUS 4105		X7Cr14
12	440 B; S44003	1.4112	X90CrMoV18		X 89 CrMoV 18-1			SUS 440B			X90CrMoV18
12	410 S; 403; S41008; S40300	1.4000	X6Cr13; X 6 Cr 13	403 S 17	Z 8 C 12	2301	X 6 Cr 13	F.3110	SUS 403; SUS 403 FB; SUS 410 S	08Ch13	X6Cr13

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	AISI/SAE/ UNS/ ASTM/AA	Werkstoff	DIN	BS	AFNOR	SS	UNI	UNE	JIS	GOST	EN
12	410; S41000; S41001; CA-15	1.4006	X12Cr13; GX12Cr13; X 12 Cr 13; X 10 Cr 13	410 S 21; ANC 1 grade A; En 56 A	Z 10 C 13; Z 13 C 13	2302	X 12 Cr 13 KG; X 12 Cr 13 KW	F.3401	SUS 410; SUS 410 FB; SUS 410 TB; SUS 410 TKA; SUS 410 TKC; SUS F 410-A; SUS F 410-B; SUS F 410-C	12Ch13; 15Ch13L	X13Cr13
12	405; S40500	1.4002	X6CrAl13; X 6 CrAl 13	405 S 17	Z 8 CA 12		X 6 CrAl 13	F.3111	SUS 405; SUS 405 TB; SUS 405 TP		X6CrAl13
12	416; S41600	1.4005	X12CrS13; X 12 CrS 13	416 S 21; En 56 AM	Z 11 CF 13	2380	X12 CrS 13	F.3411	SUS 416		X12CrS13
12		1.4015	X8Cr17								
12	430; S43000	1.4016	X6Cr17; X 6 Cr 17	430 S 17; 430 S 15; 430 S 18	Z 8 C 17	2320	X 8 Cr 17	F.310.D; F.3113	SUS 430; SUS 430 TB; SUS 430 TKA; SUS 430 TKC; SUS 430 TP	12Ch17	X6Cr17
12		1.4027	GX20Cr14	ANC 1 grade B; ANC 1 grade C; 420 C 24; 420 C 29	Z 20 C 13 M				SCS 2	20Ch13L	
12	420 F; S42020	1.4028	X30Cr13; X 30 Cr 13	420 S 37; 420 S 45; En 56 C; En 56 D	Z 33 C 13 Cl; Z 33 C 13; Z 30 C 13	2304	X 30 Cr 13	F.3403	SUS 420 F; SUS 420 J 2; SUS 420 J 2-CSP; SUS 420 J 2 FB; SUS 420 J 2 TKA	30Ch13	X30Cr13
12		1.4086	GX120Cr29; G-X 120 Cr 29	452 C 11							
12		1.4340	GX40CrNi27-4; G-X 40 CrNi 27 4								
12		1.4720	X20CrMo13; X 20 CrMo 13								
12	439; 430 Ti; S43035; S43036; XM 8	1.4510	X3CrTi17; X 6 CrTi 17		Z 4 CT 17		X 6 CrTi 17	F.3115; X 5 CrTi 17	SUS 430 LX; SUS 430 LXTB; SUS XM8TB	08Ch17T	X3CrTi17
12	446-1	1.4749	X18CrN28		Z 12 C 25						X18CrN28
12		1.4511	X3CrNb17; X 6 CrNb 17		Z 4 CNb 17		X 6 CrNb 17	F.3122; X 5 CrNb 17	SUS 430 LX; SUS 430 LXTB		X3CrNb17
12	409; S40900	1.4512	X2CrTi12; X 6 CrTi 12	LW 19; 409 S 19	Z 3 CT 12		X 6 CrTi 12	F.3121	SUH 409 L; SUS 409 LTB; SUS 409 TB		X2CrTi12
12		1.4418	X4CrNiMo16-5-1; X 4 CrNiMo 16 5		Z 6 CND 16-04-01	2387					X4CrNiMo16-5-1
12	420; S42000	1.4021	X20Cr13; X 20 Cr 13	420 S 37; 420 S 29; En 56 C	Z 20 C 13 Cl; Z 20 C 13	2303	X 20 Cr 13	F.310.J; F.3402	SUS 420 J 1; SUS 420 J 1 FB; SUS 420 J 1 TKA	20Ch13	X20Cr13
13	420; S42000; S42080	1.4031	X39Cr13; X 38 Cr 13		Z 40 C 14 Cl; Z 40 C 14	2304	X 40 Cr 14	F.3404; X40 Cr 13	SUS 420 J 2	40Ch13	X39Cr13
13		1.4922	X20CrMoV11-1; X20CrMoV12-1; X 20 CrMoV 12 1	BS 762		2317	X 20 CrMoNi 12 01				X20CrMoV11-1; X20CrMoV12-1
13		1.4923	X22CrMoV12-1; X21CrMoNiV12-1; X 22 CrMoV 12 1								X22CrMoV12-1; X21CrMoNiV12-1
13	420; S42000	1.4021	X20Cr13; X 20 Cr 13	420 S 37; 420 S 29; En 56 C	Z 20 C 13 Cl; Z 20 C 13	2303	X 20 Cr 13	F.310.J; F.3402; X 20 Cr 13	SUS 420 J 1; SUS 420 J 1 FB; SUS 420 J 1 TKA	20Ch13	X20Cr13

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	AISI/SAE/ UNS/ ASTM/AA	Werkstoff	DIN	BS	AFNOR	SS	UNI	UNE	JIS	GOST	EN
13	420; S42000	1.4034	X46Cr13; X 46 Cr 13		Z 44 C 14 Cl; Z 44 C 14; Z 38 C 13 M		X 40 Cr 14	F.3405; X 40 Cr 13		40Ch13	X46Cr13
13	431; S43100	1.4057	X17CrNi16-2; X 20 CrNi 17 2; X 22 CrNi 17	431 S 29; En 57	Z 15 CN 16.02 Cl; Z 15 CN 16-02	2321	X16 CrNi 16	F.313; F.3427; X 19 CrNi 17 2	SUS 431; SUS 431 FB	14Ch17N2; 20Ch17N2	X17CrNi16-2
13	CA 6-NM; S41500; J91540	1.4313	X3CrNiMo13-4; X 4 CrNi 13 4		Z 6 CN 13-04; Z 6 CN 13-4; Z 4 CND 13.4 M	2384					X3CrNiMo13-4
13		1.4122	X39CrMo17-1; X 35 CrMo 17				X 39 CrMo 17-1				X39CrMo17-1
13	422; S42200	1.4935	X20CrMoWV12-1; X 20 CrMoWV 12 1								X20CrMoWV12-1
13	HNV 3; S65007	1.4718	X45CrSi9-3; X 45 CrS 9 3; G-X 45 CrNi 9 3	401 S 45; En 52	Z 45 CS 9		X 45 CrSi 8	F.322; F.3220	SUH 1	40Ch9S2; 4Ch9S2	X45CrSi9-3
13		1.2083; 1.2083 ESR	X40Cr14; X 42 Cr 13		X40Cr14; Z 40 C 14	2314	X 41 Cr 13 KU	F.5263; X 40 Cr 13	SUS 420 J 2		X40Cr14
13	CA 6-NM; J91540	1.4317	GX4CrNi13-4; G-X 5 CrNi 13 4	425 C 11; 425 C 12	Z 4 CND 13 4 M		GX 6 CrNi 13 04		SCS 6; SCS 6X		GX4CrNi13-4
13	S13800; XM-13	1.4534	X3CrNiMoAl 13-8-2; X 3 CrNiMoAl 13 8 2	FE-PM1503							X3CrNiMoAl 13-8-2
14	15-5PH; 15-5 PH; XM-12; S15500; J92110	1.4545; 1.4545.9	X5CrNiCuNb15-5		Z 7 CNU 15-05						X5CrNiCu15-3
14	329; S31260; S32900	1.4460	X3CrNiMo27-5-2; X 4 CrNiMo 27 5 2		Z 3 CND 25-07 Az; Z 5 CND 27-05 Az	2324		F.3552; F.3309; X 8 CrNiMo 27-05; X 8 CrNiMo 26 6	SUS 329 J 1; SUS 329 J 1 FB; SUS 329 J 1 TB; SUS 329 J 1 TP	10Ch26N5M	X3CrNiMo27-5-2
14	321; S32100	1.4541	X6CrNiTi18-10	321 S 31; LW 18; LW 24; LWCF 18; LWCF 24; 321 S 12; 321 S 50; 321 S 51; 321 S 50-490; 1010; 1115	Z 6 CNT 18-10	2337	X 6 CrNiTi 18 11; X 6 CrNiTi 18 11 KG; X 6 CrNiTi 18 11 KW; X 6 CrNiTi 18 11 KT	F.332; F.3523; X 6 CrNiTi 18 10	SUS 321	06Ch18N10T; 08Ch18N10T; 09Ch18N10T; 12Ch18N10T	X6CrNiTi18-10
14		1.4425	X2CrNiMo18-13-3								
14	316; 316H; 316 H; S31600; S31609	1.4401	X5CrNiMo17-12-2; X 5 CrNiMo 18 10	316 S 31; 316 S 33; 316 S 17; 316 S 19; 316 S 40; 316 S 41; 845	Z 6 CND 17-11; Z 6 CND 17-11-02-FF; Z 7 CND 17-11-02; Z 7 CND 17-12-02	2347	X 5 CrNiMo 17 12; X 5 CrNiMo 17 12 KG; X 5 CrNiMo 17 12 KW	F.310.A; F.3534; X 5 CrNiMo 17 12 2	SUS 316; SUS 316 A; SUS 316 FB; SUS 316 HFB; SUS 316 HTB; SUS 316 HTP; SUS 316 TB; SUS 316 TBS	08Ch16N11M3	X5CrNiMo17-12-2
14		1.4821	X20CrNiSi25-4		Z20CNS25.04						X20CrNiSi25-4
14	J92701	1.4312	GX10CrNi18-8	ANC 3 grade A; ANC 3 A; 302 C 25	Z 10 CN 18.9 M				SCS 12; SCS 13A	10Ch18N9L	
14	J92605; J93005	1.4823	GX40CrNiSi27-4; G-X 40 CrNiSi 27 4						SCH 11 X		GX40CrNiSi27-4
14		1.4585	GX7CrNiMoCuNb18-18; G-X 7 CrNiMoCuNb 18 18				X 6 CrNiMoTi 17 12				

Material Group No.	USA	Germany		U.K.	France	Sweden	Italy	Spain	Japan	Russia	EURONORM
	AISI/SAE/ UNS/ ASTM/AA	Werkstoff	DIN	BS	AFNOR	SS	UNI	UNE	JIS	GOST	EN
14	347; J92640; J82710	1.4552	GX5CrNiNb19-11; G-X 5 CrNiNb 18 9	347 C 17; 821 grade Nb	Z 4 CNNb 19.10 M; Z 6 CNNb 18.10 M			AM-X 7 CrNiNb 20 10; F.8413	SCS 21; SCS 21 X		GX5CrNiNb19-11
14		1.4500	GX7NiCrMoCuNb25-20; G-X 7 NiCrMoCuNb 25-20		23 NCDU 25.20 M						
14	304; S30400	1.4301	X5CrNi18-10; X 5 CrNi 18 9	304 S 15; 304 S 31; LW 13; LW 15; LW 21; LWCF 13; LWCF 15; 302 S 17; 304 S 16; 304 S 17; 304 S 40	Z 4 CN 19-10 FF; Z 5 CN 17-08; Z 6 CN 18-09; Z 7 CN 18-09	2333; 2332	X 5 CrNi 18 10; X 5 CrNi 18 10 KG; X 5 CrNi 18 10 KW; X 5 CrNi 18 10 KT	F.3504; X 5 CrNi 18 10	SUS 304; SUS 304 A; SUS 304-CSP; SUS 304 FB; SUS 304 TB; SUS 304 TBS; SUS 304 TKA; SUS 304 TKC	08Ch18N10	X5CrNi18-10
14	304L; 304 L; S30403; J92500; J92600	1.4306; 1.4309	X2CrNi19-11; GXCrNi19-11	304 S 11; LW 20; LWCF 20; S.536; T.74; 304 C 12; 305 S 11	Z 1 CN 18-12; Z 2 CN 18-10; Z 3 CN 19.10 M; Z 3 CN 18-10; Z 3 CN 19-11; Z 3 CN 19-11 FF	2352	X 3 CrNi 18 11; X 2 CrNi 18 11; GX 2 CrNi 19 10	F.310.G; F.3503; X 2 CrNi 19 10; AM-X 2 CrNi 19 10; F.8412	SCS19	03Ch18N11	X2CrNi19-11; GXCrNi19-11
14	304H; 304 H; CF-8; J92590; J92600; J92650; J92710	1.4308	GX5CrNi19-10; G-X 6 CrNi 18 9	304 C 15	Z 6 CN 18.10 M; Z 6 CN 19.9 M			AM-X 7 CrNi 20 10; F.8411	SCS 13; SCS 13 A; SCS 13 X	07Ch18N9L	GX5CrNi19-10; 58E
14	J92701	1.4312	GX10CrNi18-8; G-X 10 CrNi 18 8	ANC 3 grade A; ANC 3 A; 3025 S 25	Z 10 CND 18.9 M				SCS 12	10Ch18N9L	GX10CrNi18-8
14	S32304	1.4362	X2CrNiN23-4; X 2 CrNiN 23 4		Z 3 CN 23-04 Az	2327					X2CrNiN23-4
14	201; S20100	1.4372	X12CrMnNiN17-7-5		Z 12 CMN 17-07 Az				SUS 201		X12CrMnNiN 17-7-5
14	316; S31600	1.4436	X3CrNiMo17-13-3; X 5 CrNiMo 17 13 3	316 S 31; 316 S 33; LW 23; LWCF 23; 316 S 19; 316 S 40; 316 S 41; 1.4436	Z 6 CND 18-12-03; Z6 CND 18-13; Z 7 CND 18-12-03	2343	X 5 CrNiMo 17 13; X 8 CrNiMo 17 13	F.3538; X 5 CrNiMo 17 13 3	SUS 316; SUS 316 A; SUS 316 FB; SUS 316 TB; SUS 316 TBS; SUS 316 TKA; SUS 316 TKC; SUS 316 TP		X3CrNiMo17-13-3
14	316L; 316 L; S31603; J92700; J92800	1.4404	X2CrNiMo17-12-2; X2CrNiMo17-13-2; X 2 CrNiMo 17 12 2; X 2 CrNiMo 17 13 2	316 S 11; 316 S 13; 316 S 14; 316 S 30; S.161; S.537; T.75	Z 2 CND 17-12; Z 3 CND 17-11-02; Z 3 CND 17-12-02; Z 3 CND 17-12-02 FF; Z 3 CND 18-12-03	2348	X 2 CrNiMo 17 12	F.310.K; F.3533; F.3537	SUS 316 L; SUS 316 LFB; SUS 316 LTBS; SUS 316 LTP; SUS 316 F 316 L		X2CrNiMo17-13-2
14	316LN; 316 LN; S31653	1.4406	X2CrNiMoN17-11-2; X2CrNiMoN17-12-2; X 2 CrNiMoN 17 12 2	316 S 61; 316 S 63	Z 2 CND 17-11 Az		X 2 CrNiMoN 17 12	F.3542; X 2 CrNiMoN 17 12 2	SUS 316 LN; SUS F 316 LN		X2CrNiMoN 17-11-2
14	CF-8M; J92900	1.4408	GX5CrNiMo 19-11-2; G-X 6 CrNiMo 18 10	ANC 4 grade B; ANC 4 B; 316 C 16; 845 grade B				AM-X 7 CrNiMo 20 10; F.8414	SCS 14; SCS 14 A; SCS 14 X	07Ch18N10G2S2M2L	GX5CrNiMo 19-11-2

Material Group No.	USA	Germany		U.K.	France	Sweden	Italy	Spain	Japan	Russia	EURONORM
	AISI/SAE/ UNS/ ASTM/AA	Werkstoff	DIN	BS	AFNOR	SS	UNI	UNE	JIS	GOST	EN
14	S32750	1.4410	X2CrNiMoN25-7-4; X 10 CrNiMo 18 9		Z 5 CND 25-06 Az	2328					X2CrNiMoN 25-7-4
14	316LN; 316 LN; S31563	1.4429	X2CrNiMoN17-13-3; X 2 CrNiMoN 17 13 3	316 S 63; 1.4429	Z 3 CND 17-12 Az	2375	X 2 CrNiMoN 17 13	F.3543; X 2 CrNiMoN 17 13 3	SUS 316 LN; SUS F 316 LN		X2CrNiMoN 17-13-3
14	316L; 316 L; S31603; J92800	1.4435	X2CrNiMo18-4-3; X 2 CrNiMo18 14 3	316 S 13; 316 S 11; 316 S 14; 316 S 31; LW 22; LWCF 22; 845 B	Z 3 CND 17-12-03; Z 3 CND 18-14-03	2353	X 2 CrNiMoN 17 13; X 2 CrNiMoN 17 13 KG; X 2 CrNiMoN 17 13 KW	F.3533-X2 CrNiMo 17 13 2	SUS 316 L; SUS 316 LFB; SUS 316 LTBS; SUS 316 LTP; SUS F 316 L	O3Ch17N14M3	X2CrNiMo18-4-3
14	S31726	1.4439	X2CrNiMoN17-13-5; X 2 CrNiMoN 17 13 5		Z 3 CND 18-14-05 Az			F.3544; X 2 CrNiMoN 17 13 5			X2CrNiMoN 17-13-5
14	317; S31700	1.4449	X3CrNiMo18-12-3	317 S 16			X 5 CrNiMo 18 15		SUS 317; SUS 317 TB; SUS 317 TP; SUS F 317		X3CrNiMo18-12-3
14	329; S31260; S32900	1.4460	X3CrNiMoN27-5-2; X 4 CrNiMoN 27 5 2		Z 5 CND 27-05 Az; Z 3 CND 25-07 Az	2324		F.3552; F.3309; X 8 CrNiMo 27-05; X 8 CrNiMo 26 6	SUS 329 J 1; SUS 329 J 1 FB; SUS 329 J 1 TB; SUS 329 J 1 TP	10Ch26N5M	X3CrNiMoN27-5-2
14	S31803; S31260; S32900	1.4462	X2CrNiMoN22-5-3; X 2 CrNiMoN 22 5 3	318 S 13; 1.4462	Z 2 CND 24-08 Az; Z 3 CND 25-06-03 Az; Z 3 CND 25 -05 Az	2377			SUS 329 J 3 L; SUS 329 J 3 LTB; SUS 329 J 3 LTP		X2CrNiMoN22-5-3
14	631; 17-7PH; 17-7 PH; S17700	1.4568; 1.4564; 1.4504	X7CrNiAl17-7; X 7 CrNiAl 17 7	301 S 81	Z 9 CNA 17-07; Z 8 CNA 17-07	2388		X 2 CrNiMo 17 12	SUS 631; SUS 631 J 1; SUS 631-CSP	09Ch17N7Ju1	X7CrNiAl17-7
14	443; 444; S44300; S44400	1.4521	X2CrMoTi18-2; X 2 CrMoTi 18 2		Z 3 CDT 18-02; Z 3 CDT 18-2	2326		F.3123; X 2 CrMoTiNb 18 2	SUS 444; SUS 444 TB; SUS 444 TP		X2CrMoTi18-2
14	904L; 904 L; N08904	1.4539	X1NiCrMoCu25-20-5; X 1 NiCrMoCuN 25 20 5	904 S 13	Z 2 NCDU 25-20	2562					X1NiCrMoCu 25-20-5
14	630; 17-4PH; 17-4 PH; S17400	1.4542	X5CrNiCuNb16-4; X 5 CrNiChNb 17 4		Z 7 CNU 15-05; Z 7 CNU 16-04; Z 7 CNU 17-04				SUS 630; SUS 630 FB; SUS F 630		X5CrNiCuNb16-4
14	S31254	1.4547	X1CrNiMoN20-18-7			2378					X1CrNiMoN 20-18-7
14	631; 17-7PH; 17-7 PH; S17700	1.4568	X7CrNiAl17-7; X 7 CrNiAl 17 7	301 S 81	Z 9 CNA 17-07; Z 8 CNA 17-07	2388		X 2 CrNiMo 17 12	SUS 631; SUS 631 J 1; SUS 631-CSP	09Ch17N7Ju1	X7CrNiAl17-7
14	316 Ti; S31635	1.4571	X6CrNiMoTi17-12-2; X 6 CrNiMoTi 17 12 2	320 S 31; 320 S 18	Z 6 CNDT 17-12	2350	X 6 CrNiMoTi 17 12; X 6 CrNiMoTi 17 12 KG; X 6 CrNiMoTi 17 12 KW	F.310.B; F.3535; X 6 CrNiMoTi 17 12 2	SUS 316 Ti; SUS 316 TiTB; SUS 316 TiTP	08Ch16N11M3T; 08Ch17N13M2T; 10Ch17N13M2T	X6CrNiMoTi 17-12-2
14	309S; 309 S; 309; S30908; S30900	1.4833	X12CrNi23-13; X 7 CrNi 23 14	309 S 24	Z 15 CN 23-13; Z 15 CN 24-13		X 6 CrNi 23 14		SUS 309 S; SUS 309 S TB; SUS 309 S TP		X12CrNi23-13
14	S30415	1.4891	X4CrNiSiN18-10; X 4 CrNiSiN 18 10			2372					X4CrNiSiN 18-10
14	S30815	1.4893	X9CrNiSiNCe21-11-2; X 8 CrNiSiN 21 11			2368					X9CrNiSiNCe 21-11-2

Material Group No.	USA	Germany		U.K.	France	Sweden	Italy	Spain	Japan	Russia	EURONORM
	AISI/SAE/ UNS/ ASTM/AA	Werkstoff	DIN	BS	AFNOR	SS	UNI	UNE	JIS	GOST	EN
14	304H; 304 H; S30409; S30480	1.4948	X6CrNi18-10; X6CrNi18-11; X 6 CrNi 18 11;	304 S 50; 304 S 51; 801 grade A	Z 5 CN 18-09				SUS 302		X6CrNi18-10
14		1.4581	GX5CrNiMoNb19-11-2; G X 5 CrNiMoNb 18 10	ANC 4 grade C; ANC 4 C; 318 C 17; 845 grade Nb	Z 4 CNDNb 18.12 M		GX 6 CrNiMoNb 20 11		SCS 22		GX5CrNiMoNb 19-11-2
14	303; S30300	1.4305	X8CrNiS18-9; X 10 CrNiS 18 9	303 S 31	Z 8 CNF 18-09	2346	X 10 CrNiS 18 09	F.310.C; F.3508; X 10 CrNiS 18-09	SUS 303	30Ch18N11	X8CrNiS18-9; 58M
14	304L; 304 L; S30403	1.4306	X2CrNi19-11; X 2 CrNi 19 11	304 S 11; LW14; LW 20; LWCF 14; LWCF 20; S.536; T.74; 304 C 12; 304 S 11	Z 1 CN 18-12; Z 3 CN 18-10; Z 3 CN 19-11; Z 3 CN 19-11 FF	2352	X 2 CrNi 18 11; X 3 CrNi 18 11	F.310.G; F.3503; X 2 CrNi 18 10	SUS 304 L; SUS 304 LFP; SUS 304 LTB; SUS 304 LTBS; SUS 304 LTP; SUS F 304 L	03Ch18N11	X2CrNi19-11
14	301; J 230; S30100; S30200	1.4310	X10CrNi18-8; X 12 CrNi 17 7	301 S 21; 301 S 22	Z 11 CN 17-08; Z 11 CN 18-08; Z 12 18-09	2331	X 12 CrNi 17 07	F.3517; X 2 CrNiN 18 10	SUS 301; SUS 301-CSP; SUS 302; SUS 302 FB	12Ch18N9	X10CrNi18-8
14	304LN; 304 LN; S30453	1.4311	X2CrNiN18-10; X 2 CrNiN 18 10	304 S 61	Z 3 CN 18-10 Az; Z 3 CN 18-07 Az	2371	X 2 CrNiN 18 11	F.3541; X 2 CrNiN 18 10	SUS 304 LN; SUS F 304 LN		X2CrNiN18-10
14	304B1; 304B2; 304B3; 304 B1; 304 B2; 304 B3; S30461; S30462; S30463	1.4350	X5CrNi18-9	304 S 31	Z 6 CN 18.09	2332; 2333	X 5 CrNi 18 10	F.3551			58E
14	317L; 317 L; S31703	1.4438	X2CrNiMo18-15-4; X2 CrNiMo 18 16 4	317 S 12	Z 2 CND 19-15-04; Z 3 CND 19-15-04	2367	X 2 CrNiMo 18 16	F.3539; X2 CrNiMo 18 16 4	SUS 317 L; SUS 317 LFB; SUS 317 LTB; SUS 317 LTP; SUS F 317 L; SUS Y 317 L		X2CrNiMo18-15-4
14	321H; 321 H; S32109	1.4878	X12CrNiTi18-10; X 12 CrNiTi 18-9	321 S 31	Z 6 CNT 18-10	2337	X 6 CrNiTi 18.11	F.3553	SUS 321; SUS 321 HFB; SUS 321 HTB; SUS 321 HTP; SUS 321 TKA; SUS 321 TP; SUS F 321; SUS Y 321		X12CrNiTi18-10; 58B
14	347; 348; S34700; S34800	1.4550	X6CrNiNb18-10; X 6 CrNiNb 18 10	347 S 31; ANC 3 grade B; ANC 3 B; 347 S 20; 347 S 40; 347 S 50; 347 S 51	Z 6 CNNb 18-10	2338	X 6 CrNiNb 18 11; X 6 CrNiNb 18 11 KG; X 6 CrNiNb 18 11 KW; X 6 CrNiNb 18 11 KT	F.3524; X 6 CrNiNb 18 10	SUS 347; SUS 347 FB; SUS 347 HTB; SUS 347 TB; SUS 347 TKA; SUS 347 TP; SUS F 347	08Ch18N12B	X6CrNiNb18-10; 58F;
14	318; S31803	1.4583	X10CrNiMoNb18-12; X 10CrNiMoNb 18 12		Z 6 CNDNb 18-12		X 6 CrNiMoNb 20 11				

Material Group No.	USA	Germany		U.K.	France	Sweden	Italy	Spain	Japan	Russia	EURONORM
	AISI/SAE/ UNS/ ASTM/AA	Werkstoff	DIN	BS	AFNOR	SS	UNI	UNE	JIS	GOST	EN
14	310H; 310 H; 310S; 310 S; S31008; S31009	1.4845	X8CrNi25-21; X 12 CrNi 25 21	310 S 16; 310 S 24; 310 S 25; 310 S 31	Z 8 CN 25-20; Z 12 CN 25-20; Z 12 CN 26-21	2361	X 6 CrNi 25 20 (X 6 CrNi 25 20)	F.331	SUS 310 S; SUS 310 FB; SUS 310 STG; SUS 310 STP; SUS310 TB; SYS Y 310 S	10Ch23N18; 20Ch23N18	X12CrNi25-21
14		1.4465; 1.4466	X1CrNiMoN25-22-2; X 2 CrNiMoN 25 22 7								X1CrNiMoN 25-22-2
14	309; S30900	1.4828	X15CrNiSi20-12; X 15 CrNiSi 20 12	309 S 24	Z 9 CN 24-13; Z 17 CNS 20-12		X 16 CrNi 23 14	F.3312; X 15 CrNiSi 20-12	SUH 309; SUS 309 TB; SUS 309 TP	20Ch20N14S2	58C; X15CrNiSi20-12
14	HK; J94203; J94204; J94224	1.4848	GX40CrNiSi25-20; G-X 40 CrNiSi 25 20	310 C 40; 310 C 45			G X 40 CrNi 26 20	AM-X 40 CrNi 25 20; F.8452	SCH 21; SCH 22; SCH 22 X		GX40CrNiSi25-20
14	HK 30; J93503; J94003; J94013; HH	1.4837; 1.4848+Nb	GX40CrNiSi25-12; G-X 40 CrNiSi 25 12	309 C 30			G X 35 CrNi 25 12		SCH 13; SCH 13 A; SCH 13 X; SCH 17; SCS 17	40Ch24N12SL	GX40CrNiSi25-12
14	310; 314; S3100; S31400; S31500	1.4841	X15CrNiSi25-21; X 15 CrNiSi 25 20	314 S 25	Z 15 CNS 25-20		X 16 CrNiSi 25 20	F.3310; X 15 CrNiSi 25-20	SUH 310; SUS 310 TB; SUS Y 310	20Ch25N20S2	X15CrNiSi25-21
14		1.4849	GX40NiCrSiNb38-19; G-X 40 NiCrSi 38 18								GX40NiCrSiNb 38-19
14	S32760; SA351/995; 25Cr-7Ni-Mo-N	1.4501	X2CrNiMoCuWN25-7-4	1.4501	Z 3 CNDU 25-06 Az						X2CrNiMoCuWN 25-7-4
14	348; S34800	1.4546	X5CrNiNb18-10	2 S.130; 2 S.143; 3 S.144; 3 S.145; S.525; S.527							
14		1.4544; 1.4544.9		S.524; S.526; 2 S 129	Z 10 CNT 18-11; 9160/C 63; 9160C201		X 6 CrNiTi 18 11			08Ch18N12T	FE-PA 13
14		1.6900	X12CrNi18-9; X 12 CrNi 18 9								
14		1.4829	X12CrNi22-12; X 12 CrNi 22 12								
14		1.4882	X50CrMnNiNbN21-9		Z 50 CMNNb 21.09						X50CrMnNiNbN 21-9
14	316N; 316 N; J92804	1.4409	GX2CrNiMo19-11-2; G-X 2 CrNiMo 19 11 2		Z 3 CND 19.10 M		GX2 CrNiMo 19 11	AM-X 2 CrNiMo 19 11; F.8415	SCS 16 A; SCS 16 AX SCS 16 AXN		GX2CrNiMo 19-11-2
14	304L; 304 L J92500; J92620	1.4309	GX2CrNi19-11	304 C 12	Z 3 CN 19.10 M		GX 2 CrNi 19 10	AM-X 2 CrNi 19 10; F.8412	SCS 19; SCS 19 A		GX2CrNi19-11
15	A48 25 B; Class 25; No 25 B	0.6015	EN-GJL-150; GG 15; EN-JL 1020	Grade 150	Ft 15 D; R 15 D	01 15-00	G 14; G 15	FG 15	FC 15; FC 150	SCh 15	EN-GJL-150; EN-JL 1020
15	A48-30 B; Class 30, No.30 B	0.6020	EN-GJL-200; GG 20; EN-JL 1030	Grade 220	Ft 20 D	01 20-00	G 20; Gh 190	FG 20	FC 20; FC 200	SCh 20	EN-GJL-200; EN-JL 1030
15	A48-20 B; Class 20; No 20 B	0.6010	EN-GJL-100; GG 10; EN-JL 1010		Ft 10 D	01 10-00	G 10	FG 10	FC 10; FC 100	SCh10	EN-GJL-100; EN-JL 1010
16	A48-45 B; Class 45; No 45 B	0.6030	EN-GJL-300; GG 30; EN-JL 1050	Grade 300	Ft 30 D	01 30-00	G 30	FG 30	FC 30; FC 300	SCh 30	EN-GJL-300; EN-JL 1050

Material Group No.	USA	Germany		U.K.	France	Sweden	Italy	Spain	Japan	Russia	EURONORM
	AISI/SAE/ UNS/ ASTM/AA	Werkstoff	DIN	BS	AFNOR	SS	UNI	UNE	JIS	GOST	EN
16	A48-50 B; Class 50; No 50 B	0.6035	EN-GJL-350; GG 35; EN-JL 1060	Grade 350	Ft 35 D	01 35-00	G 35	FG 35	FC 35; FC350	SCh 35	EN-GJL-350; GG 35; EN-JL 1060
16	A48-60 B; Class 60; No 60 B	0.6040	EN-JLZ; GG 40	Grade 400	Ft 40 D	01 40-00				SCh 40	EN-JLZ
16	A48-40 B; Class 40; No 40 B	0.6025	EN-GJL-250; GG 25; EN-JL 140	Grade260	Ft 25 D	01 25-00	G 25	FG 25	FC 25	SCh 25	EN-GJL-250; EN-JL 140
17		0.7033	EN-GJS-350-22-LT; GGG 35.3	350/22 L 40	FGS 370-/17	0717-15	GS 370-17	FNG 38-17	FCD 350-22L	VCh42-12	EN-GJS-350-22-LT
17	60-40-18; A536 60-40-18	0.7043	EN-GJS-400-18; EN-GJS-400-18-LT; GGG-40.3; EN-GJS-400-18A-LT	370/7; SNG 370/17	FGS 370-17	0717-15	GSO 400-12			VCh 42-2	EN-GJS-400-18; EN-GJS-400-18-LT; EN-GJS-400-18A-LT
17	60-40-18; A536 60-40-18	0.7040	EN-GJS-400-15; EN-JS 1030; GGG-40	420/12; SNG 420/12	FCS 400-12	0717-02	GS 400-12	FGE 38-17	FCD 40	VCh 42-12	EN-GJS-400-15; EN-JS 1030
17	65-45-12; A536 65-45-12	5.3107	EN-GJS-450-10	450/10; SNG 450/10	FGS 450-10		GS 400-12	FGE 42-12	FCD450	VCh 45	EN-GJS-450-10
18	65-45-12; A536 65-45-12	0.7050	EN-GJS-500-7; EN-GJS-500-7A; EN-JS 1050; GGG-50	500/7	FGS 500-7	0727-02	GS 500/7	FGE 50-7	FCD 50; FCD 500; FCD 500-7	VCh 50-2	EN-GJS-500-7; EN-GJS-500-7A; EN-JS 1050
18	80-55-06; A536 80-55-06	0.7060	EN-GJS-600-3; EN-GJS-600-3A; EN-JS 1060; GGG-60	600/3	FGS 600-3	0732-03	GS 600/3	FGE 60-2	FCD 60; FCD 600; FCD 600-3		
18		0.7652	GGG-NiMn 13 7	S-NiMn 13 7	S-NM 13 7	07 32-03	GGG 60	GGG 60			
18	100-70-03; A536 100-70-03	0.7070	EN-GJS-700-2; EN-JS 1070; GGG-70	700/2; SNG700/2	FGS 700-2	0737-01	GS 700-2	FGE 70-2	FCD 70; FCD 700; FCD 700-2	VCh 70-2	EN-GJS-700-2; EN-JS 1070
18	A439 Type D-2	0.7660	GGG-NiCr 20 2	S-NiCr 20 2	S-NC 20-2						
18	A439 Type D-2 B	0.7661	GGG-NiCr 20 3	S-NiCr 20 3	S-NC 20 3						
19	A47-32510; A47 Class 32510; A47 Grade 32510; 32510	0.8135	EN-GJMB-350-10; EN-JM 1130; GTS-35-10; GTS-35	B 340/12; 310 B340/12	MN 35-10; A32-702 MN 350-10	0810	B 35-10	GTS 35; 36114 Type A	FCMB 340; G5703 FCMB 340	KCh 35-10	EN-GJMB-350-10; EN-JM 1130
19	A47-35018, A47 Class 35018; A47 Grade 35018				MN 380-18; A32-702 MN 380-18					KCh 37-12	
19	A47-22010; A47 Class 22010; A47 Grade 22010; UNS F22200			B 32-10; 6681 B 32-10					FCMB 310	KCh 33-8	
20	A220-50005; A220 Class 50005; A220 Grade 50005	0.8155	EN-GJMB-550-4; EN-JM1160; GTS-55-04	P 55-04; P 510/4	MP 60-3; A32-703 MP 60-3; Mn 550-4	0856-00	P 55-04	Type C; 36116 Type C	FCMP 540	KCh 55-4; KCh60-3	EN-GJMB-550-4; EN-JM1160
20	A220-70003; A220 Class 70003; A220 Grade 70003	0.8165	EN-GJMB-650-2; EN-JM1180; GTS-65-02	P 65-02; 6681 P 65-02; P 570/3	Mn 650-3	0862-030	GMN 65		FCMP 590	KCh 63-3	EN-GJMB-650-2; EN-JM1180

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	AISI/SAE/ UNS/ ASTM/AA	Werkstoff	DIN	BS	AFNOR	SS	UNI	UNE	JIS	GOST	EN
20	A220-70003; A220 Class 70003; A220 Grade 70003	0.8170	EN-GJMB-700-2; EN-JM1190; GTS-70-02	P 70-2; 6681 P 70-2; P 690/2	MP 70-2; A 32-703 MP 70-2; Mn 700-2	0862-03	P 70-2; GMN 70	36116 Type A	FCMP 690	KCh 70-2	EN-GJMB-700-2; EN-JM1190
20	A220-45006; A220 Class 45006; A220 Grade 45006 A220-45008; A220 Class 45008; A220 Grade 45008	0.8145	EN-GJMD-450-6; EN-JM1140; GTS-45-06; GTS-45	P 45-06; 6681 P 45-06	MP 50-5; A32-703 MP 50-5	0854-00	P 45-06	Type E; 36116 Type E		KCh 45-7	EN-GJMD-450-6; EN-JM1140
20	A220-80002; A220 Class 80002; A220 Grade 80002			P 70-2	MN 700-2	854			FCMP 70; FCMP 700	KCh 80-1.5	
20	A220-90001; A220 Class 90001; A220 Grade 90001										
20	A220-60004; A220 Class 60004; A220 Grade 60004										
20	A220-40010; A220 Class 40010; A220 Grade 40010					0852-00					
20		0.8040	EN-GJMW-400-5; GTW-40-05	W 40-05	MB 400-5		W 40-05	36113 Type A	FCMW 370		EN-GJMW-400-5; EN-JM1030
20		0.8035	EN-GJMW-350-4; GTW-35-04	W 35-04	MB 35-7		W 35-04	36113 Type B	FCMW 330		EN-GJMW-350-4; EN-JM1010
21	AA5005; AA5006; A95005; A95006; 5005; 5005A; 5006	3.3315	AlMg1; AlMg1C	N41	A G0-6	144106	L3350		A5005	1510; AMg1	AlMg1C; 5005A
21	AA1050; A91050; 1050; 1050A	3.0255	Al99,5; Al99.5	1B	A5	14407	9001/2	L-3051		AD0	Al99.5; Al99,5; 1050A
21	AA1200; A91200 ; 1200; 1200A	3.0205	Al99,0; Al99.0; Al99	1C	A4	144010	Al99.0	L-3001	A1200	A0	Al99.0; AL99,0; 1200
22	AA2017; A92017; 2017; 2017A	3.1325; 3.1124	AlCu2,5Si(A); AlCu2.5Si(A); AlCuMg1		A-U4G			L-3120		V65	AlCu2.5Si(A); AlCu2,5Si(A); 2017A
22		3.2315	AlMgSi1	H30	A-SGM0.7	144312	9006/4	L-3453		AD35	AlSiMgMn; 6082
22		3.4345	AlZnMgCuO,5; AlZnMgCuO.5								AlZnMgCu0.5; AlZnMgCu0,5; 7022
22		3.1655	AlCu6BiPb; AlCuBiPb	FC1	A-U5PbBi	144355	9002/5	L-3192	A2011		AlCu6BiPb; 2011

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	AISI/SAE/ UNS/ ASTM/AA	Werkstoff	DIN	BS	AFNOR	SS	UNI	UNE	JIS	GOST	EN
22	AA7075; A97075; 7075	3.4365; 3.4364	AlZn5,5MgCu; AlZn5.5MgCu; AlZnMgCu1,5; AlZnMgCu1.5	7075; L95; L96	A-Z5GU		9007/2	L-3710	A7075	B95	AlZn5.5MgCu; AlZn5,.5MgCu; AW-7075; 7075
22	AA2024; A92024; 2024	3.1355; 3.1354	AlCuMg2	2024; 2L97	A-U4G1		9002/4; 3583	L-3140	A2024	D16	AlCu4Mg1; 2024
22		3.4335	AlZn4,5Mg1; AlZn4.5Mg1	H17	A-Z5G	144425	9007/1	L-3741			AlZn4.5Mg1; AlZn4,5Mg1; 7020
22	AA6061; A96061; 6061	3.3211; 3.3214	AlMg1SiCu	H20	A-GSUC		9006/2	L-3420	A6061	AD33	EN AW-6061; EN AW-AlMg1SiCu; AlMg1SiCu
23		3.3261	G-AlMg5Si; GK-AlMg5Si; AlMg5Si; VDS 245	LM5		144163				AL13	EN AC-51400; EN AC-AlMg5Si; G-AlMg5Si; AlMg5Si
23		3.2982	GD-AlSi12(Cu); G-AlSi12(Cu); AlSi12(Cu); VDS 231 D		A-S12U		3048				EN AC-47100; EN AC-AlSi12C; G-AlSi12Cu; AlSi12Cu; AlSi12Cu1(Fe)
23	520.0; AA 520.0; A05200				A-G10S		3056	L-2310	AC7B	A18	
23	222.0; AA 222.0; A02220			LM12			3041	L-2110			
23	518.0; AA 518.0; A05180	3.3292	G-AlMg9; GD-AlMg9; AlMg9; VDS 349								EN AC-51200; EN AC-AlMg9; G-AlMg9; AlMg9
23	203.0; AA 203.0; A02030	3.1754	G-AlCu5Ni1,5; G-AlCu5Ni1.5		AU5NKZr						
23	ER4047; A94047	3.2585	SG-AlSi12	4047A; NG2		144262					SG-AlSi12; EL-AlSi12
23	712.0; AA 712.0; A07120		G-AlZn10Si8Mg; GK-AlZn10Si8Mg; AlZn10Si8Mg; VDS 108		A-Z5GF		3602				EN AC-71100; EN AC-AlZn10Si8Mg; G-AlZn10Si8Mg; AlZn10Si8Mg
23	514.0; 514.1; AA 514.0; AA 514.1; A05140; A05141	3.3561	G-AlMg5; GK-AlMg5; AlMg5; EN AC-51300; VDS 244		A-G6		3058	L-2331		AL28; AMg5Mz;	EN AC-51300; EN AC-AlMg5; G-AlMg5; AlMg5
23	B413.0; AA B413.0; A24130; B213.0; AA 213.0; A22130	3.2581; 3,2582	G-AlSi12; GK-AlSi12; GD-AlSi12; AlSi12	LM6	A-S13	144261	4514	L-2520	AC3		EN AC-44200; EN AC-AlSi12; G-AlSi12; GD-AlSi12; AlSi12
23		3.2211	G-AlSi11; GK-AlSi11; AlSi11								EN AC-44000; EN AC-AlSi11; G-AlSi11
23	A444.0; AA A444.0; A14440									AK7	
23		3.3541	G-AlMg3; GK-AlMg3; GF-AlMg3; AlMg3; VDC 244	H20	A-G3T	144224	3059	L-2341	ADC6		EN AC-51100; EN AC-AlMg3; G-AlMg3; AlMg3

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	AISI/SAE/ UNS/ ASTM/AA	Werkstoff	DIN	BS	AFNOR	SS	UNI	UNE	JIS	GOST	EN
24	515.0; AA 515.0; A05150	3.3241	G-AlMg3Si; GK-AlMg3Si; GF-AlMg3Si; AlMg3Si; AlMg3Si1								G-AlMg3Si1; AlMg3Si
24		3.2373	G-AlSi9Mg; GK-AlSi9Mg; AlSi9Mg		A-S9G		3051		AC4A	AK9	G-AlSi9Mg; AlSi9Mg
24	A356.0; AA A356.0; A13560; A356.2; AA A356.2; A13562	3.2371	G-AlSi7Mg; GK-AlSi7Mg; GF-AlSi7Mg; AlSi7Mg	2L99	A-S7G03			L-2651	AC4CH	AL9	G-AlSi7Mg; AlSi7Mg
24	204.0; AA 204.0; A02040	3.1371	G-AlCu4TiMg; GK-AlCu4TiMg; GF-AlCu4TiMg; AlCu4TiMg		AU5GT			L-2140	AC1B		EN AC-21000; EN AC-AlCu4TiMg; G-AlCu4TiMg
24	A333.0; AA A333.0; A13330	3.2161	G-AlSi8Cu3; GK-AlSi8Cu3			144163				AL13	EN AC-AlSi8Cu3; EN AC-AlSi8Cu3; G-AlSi8Cu3
24	380.0; AA 380.0; A03800	3.2163	G-AlSi9Cu3; GD-AlSi9Cu3; AlSi9Cu3; VDS 226	LM24	A-S9U3	144252	3610	L-2630	AC4B	AK8M3; AK8	EN AC-46200; EN AC-AlSi8Cu3; G-AlSi9Cu3; AlSi8Cu3
24	365.0; AA 365.0; A03650		G-AlSi10MnMg								EN AC-43500; EN AC-AlSi10MnMg; G-AlSi10MnMg
24	319.0; AA 319.0; A03190	3.2151	G-AlSi6Cu4; GK-AlSi6Cu4; AlSi6Cu4; VDS 225	LM21	A-S5UZ	144230	7369/4	L-2620	AC2B	AK5M	EN AC-45000; EN AC-AlSi6Cu4; G-AlSi6Cu4; AlSi6Cu4
24		3.2383	G-AlSi10MgCu; GK-AlSi10MgCu; G-AlSi10Mg(Cu); GK-AlSi10Mg(Cu); AlSi10MgCu; AlSi10Mg(Cu)		A-S10UG						
24		3.2381; 3.2385	G-AlSi10Mg; GK-AlSi10Mg; GD-AlSi10Mg; AlSi10Mg; VDS 239		A-S10G	144253					EN AC-43000; EN AC-AlSi10Mg; G-AlSi10Mg; AlSi10Mg
24		3.1841	G-AlCu4Ti; AlCu4Ti							AL19	EN AC-21100; EN AC-AlCu4Ti; G-AlCu4Ti; AlCu4Ti
25	390.0; AA 390.0; A03900		G-AlSi17Cu4Mg	LM30		4282					EN AB-48100; EN AC-48100; G-AlSi17Cu4Mg; AlSi17Cu4Mg
25	393.0; AA 393.0; A03930		G-AlSi20CuMgNi; AlSi20CuMgNi	LM29						AK21M2N2	
25			G-AlSi18Cu1MgNi; AlSi18Cu1MgNi	LM28							
26	C36000	2.0375	CuZn36Pb3	CZ124	CuZn36Pb3		12167		C3600; C3601; C3602		CuZn36Pb3; CW603N
26	C83810	2.1098	CuSn3Zn8Pb5-C; G-CuSn2ZnPb	LG1							CuSn3Zn8Pb5-C
26	C83600	2.1096; 2.1096.01	CuSn5Zn5Pb5-C; G-CuSn5ZnPb; Rg 5	LG2	CuPb5Sn5Zn5; UE5; U-E 5 Pb 5 Z 5	5204-15			H5111; H2203	BrO5Ts5S5	CuSn5Zn5Pb5-C

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	AISI/SAE/ UNS/ ASTM/AA	Werkstoff	DIN	BS	AFNOR	SS	UNI	UNE	JIS	GOST	EN
26	C93200	2.1090	CuSn7Zn4Pb7-C; G-CuSn7ZnPb; GC-CuSn7ZnPb; GZ-CuSn7ZnPb; Rg 7	GC 493K	CuSn7Pb6Zn4; UE7; U-E 7 Z 5 Pb 4						CuSn7Zn4Pb7-C
26	C93800	2.1182	CuSn7Pb15-C; G-CuPb15Sn; GC-CuPb15Sn; GZ-CuPb15Sn	LB1	U-Pb15E8; U-Pb 15 E8			C-3300			CuSn7Pb15-C; CC496K
26	C93700	2.1176	CuSn10Pb10-C; G-CuPb10Sn; GC-CuPb10Sn; GZ-CuPb10Sn	LB2	U-Pb10						CuSn10Pb10-C
27	C22000	2.0230	CuZn10; Ms90	CZ101	U-Z10; CuZn10		P-CuZn10; P-OT90		C2200	L90	CuZn10; CW501L
27	C86200; SAE 430A	2.0596	CuZn34Mn3Al2Fe1-C; G-CuZn34Al2; GK-CuZn34Al2; GZ-CuZn34Al2	HTB 1	U-Z36N3; CuZn19Al6Y20				HBSC4; H5102/class 3; H5102/class 4	LTs23A; LTs23A6Zh3MTs2	CuZn34Mn3Al2 Fe1-C; CC764S
27	C27200	2.0335	CuZn36; Ms64	CZ108	U-Z36; CuZn 36		C 2700			L63	CuZn36; CW507L
27	C27400	2.0321	CuZn37; Ms63	CZ108			P-CuZn37; P-OT63		C2720	L63	CuZn37; CW508L
27	C86400	2.0592	CuZn35Mn2Al1Fe1-C; G-CuZn35Al1; GK-CuZn35Al1; GZ-CuZn35Al1; G-Ms60	HTB 1					HBSC1; CAC301		CuZn35Mn2Al1 Fe1-C; CC765S
27	C46400	2.0530	CuZn38Sn1As; CuZn38Sn1	CZ112			P-CuZn39Sn1		C4640	LO60-1	CuZn38Sn1As; CW717R
27	C23000; 85Cu-15Zn	2.0240	CuZn15 ; CuZn 15	CZ102	U-Z15; CuZn15	5112-02; 5112-04; 5112-05			C2300		CuZn15; CW502L
27	C24000; 80Cu-20Zn	2.0250	CuZn20; CuZn 20; Ms80	CZ103	CuZn20	5114-02; 5114-04; 5114-05			C2400		CuZn20; CW503L
27	C26000; CA260	2.0265	CuZn30; CuZn 30	CZ106	CuZn30				C2600		CuZn30; CW505L
28	C63000	2.0966	CuAl10Ni5Fe4; CuAl 10 Ni 5 Fe 4	CA 104	U-A10N; CuAl9Ni5Fe3		P-CuAl10Ni5Fe5		C6301	BrAD; BrAZhN10-4-4; N10-4-4	CuAl10Ni5Fe4; CW307G
28	C90700	2.1050	CuSn10-C; G-CuSn 10; SnBz10	CT1	CuSn8						CuSn10-C; CC480K
28	C90800; C91700	2.1052; 2.1052.01; 2.1052.04; 2.1052.03	CuSn12-C; G-CuSn12; GZ-CuSn12; SnBz12, Gbz12	PB2	UE12P				CAC502C; PBC2C		CuSn12-C; CC483K
28	C95800; C95810	2.0975	G-CuAl10Fe5Ni5-C; G-CuAl 10 Ni; NiAlBz-F60		CuAl10Fe5Ni5 Y70				CAC703C		CC333G
28	C11000	2.0060	Cu-ETP; E-Cu57; E Cu 57	C101	Cu-B		Cu-DHP	C11020	C1100	M1	Cu-ETP; E-Cu57; CW004A
28	C81500	2.1292	G-CuCrF 35	CC1-FF	U-Cr0.8Zr						
28	C10300	2.0070	Cu-HCP; Cu-PHC; SE-Cu						C103	LS60-2	Cu-HCP; CW020A; Cu-PHC; CW021A
28	C10100; C10200	2.0040	Cu-OF; OF-Cu	C103; C110	Ci-c1; Cu-c2			C-1120	C1011; C1020	M0b	Cu-OF; CW008A
28	C86550	2.0590	G-CuZn40Fe; G-SoMsF30								G-CuZn40Fe

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	AISI/SAE/ UNS/ ASTM/AA	Werkstoff	DIN	BS	AFNOR	SS	UNI	UNE	JIS	GOST	EN
28	C18100; C18150	2.1293	CuCr1Zr; CuCrZr	CC102	U-C1Z; U-Cr0.8Zr						CuCr1Zr; CW106C
28	C11000; C12200	2.0090	Cu-DHP; E-Cu58; E Cu 58 SF-Cu	C106	Cu-B				C1100; C1220	M1f	Cu-DHP; E-Cu58; CW024A
28	C95500	2.0971	CuAl9Ni3Fe2		UA9					BrA10Zh4N4L	
28	C61000	2.0920	CuAl8; Cu Al 8		CuAl8					BrA7	CuAl8
31	330; N08330	1.4864	X12NiCrSi35-16; X12NiCrSi36-16; X12 NiCrSi 36 16	NA 17; INCOLOY alloy DS	Z 20 NCS 33-16; Z 12 NCS 37-18; Z 12 NCS 35-16			F.3313	SUH 330		
31	N08002; N08004; N08005; N08030	1.4865	GX40NiCrSi38-19 GX40NiCrSi38-18; G-X40 NiCrSi38 18	330 C 11; 330 C 40; 331 C 40			GX 50 NiCr 39 19		SCH 15; SCH 16		GX40NiCrSi38-18
31		1.4558	X2NiCrAlTi32-20; X2 NiCrAlTi 32 20	NA 15					NCF 800		X2NiCrAlTi32-20
31	N08031	1.4562	X1NiCrMoCu32-28-7; X1 NiCrMoCu 32 28 7								X1NiCrMoCu 32-28-7
31		1.4958	X5NiCrAlTi31-20; X5 NiCrAlTi 31 20	NA 15					NCF 800 H; NCF 718		X5NiCrAlTi31-20
31	N08811	1.4959	X8NiCrAlTi32-21; X8 NiCrAlTi 32 21	NA 15; NA 15 H	Z 8 NC 33-21; Z 10 NC 32-21						X8NiCrAlTi32-21
31	N08028	1.4563	X1NiCrMoCu31-27-4; X1 NiCrMoCu 31 27 4		Z 2 NCDU 31-27; Z 1 NCDU 31-27-03	2584				EK77; ChN30MDB	X1NiCrMoCu 31-27-4
31	B 163; N08800; N08810; N08332; N08811	1.4876	X10NiCrAlTi32-21; X10NiCrAlTi32-20; X10 NiCrAlTi 32 20	NA 15; NA 15 H	Z 10 NC 32-21; Z 8 NC 33-21			F.3314; F.3545	NCF 800; NCF 800 TB; NCF 800 TP		X10NiCrAlTi32-21
32	S590; J 467	1.4977	X40CoCrNi20-20; X40 CoCrNi 20 20		Z 42 CNKDWNb						
32	660; S66286	1.4980	X6NiCrTiMoVB25-15-2; X5NiCrTi26-15 X6 NiCrTiMoVB 25 15 2; X5 NiCrTi 26 15	HR 51; HR 52	Z 3 NCT 25; Z 6 NCTDV 25.15 B						X6NiCrTiMoVB 25-15-2; X5NiCrTi26-15
32		1.4943; 1.4944	X4NiCrTi25-15; X5NiCrTi26-15	HR 51	Z 6 NCTDV 25-15 B	2570					X4NiCrTi25-15; X5NiCrTi26-15
32	661; R30155	1.4971	X12CrCoNi21-20; X12 CrCoNi 21 20								X12CrCoNi21-20
32	Haynes 556; R30556										
33	Incoloy 825; N08825;	2.4858	NiCr21Mo	NA 16	NC 21 Fe DU					ChN38VT	
33	Hastelloy C-4; N06455	2.4610	NiMo16Cr16Ti								
33	Nimonic 75; N06075; AMS 5715	2.4630; 2.4951	NiCr20Ti	HR 5; HR 203-4	NC 20 T						
33	Inconel 625; N06625; AMS 5666	2.4856	NiCr22Mo9Nb	NA 21	NC 22 FeDNb						
33	Inconel 690; N06690	2.4642	NiC29Fe		NC 30 Fe						
33	Monel 400; N04400	2.4360; 2.4361	NiCu30Fe	NA 13	NU 30						

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	AISI/SAE/ UNS/ ASTM/AA	Werkstoff	DIN	BS	AFNOR	SS	UNI	UNE	JIS	GOST	EN
33	Hastelloy X; N06002; 5390A; AMS 5754; AMS 5536	2.4603; 2.4665	NiCr30FeMo; NiCr22Fe18Mo; NiCr21Fe18Mo9	HR 6	NC 22 FeD						
33	Inconel 617; N06617; AMS 5887	2.4663a	NiCr23Co12Mo		NC 14 K 9 T 5 DWA						
33	Nimonic 90; N07090; AMS 5829	2.4632; 2.4969	NiCr20Co18Ti; NiCr 20 Co 18 Ti	HR 2; HR202; HR 402; HR 501; HR 502; HR 503	Z 8 NCDT 42						NiCr20Co18Ti
33	Haynes 214; NO7214	2.4646	NiCr16Al								
33	Rene 41; N07041; AMS 5712; AMS 5713	2.4973	NiCr19Co11MoTi; NiCr 19 CoMo		NC 19 KDT						
33	Hastelloy B2; N10665	2.4617; 2.4616; 2.4615	NiMo28; EL-NiM29; SG(UP)-NiMo27						YNiMo-7		NiMo28
33	Udimet L-605; R30605	2.4964	CoCr20W15Ni								
33	Monel R-405; N04405	2.4360; 2.4361	NiCu30Fe	NA 13	NU 30						
33	Inconel 600; N06600; AMS 5665	2.4816	NiCr15Fe8; NiCr 15 Fe	NA 14	NC 16 FeT					ChN78T	NiCr15Fe8
33	Inconel 601; N06601	2.4851	NiCr23Fe15A; NiCr 23 Fe		N C 23 FeA					ChN60Yu	NiCr23Fe15A
33	Nimonic 263; N07263; AMS 5872; AMS 5886	2.4650	NiCo20Cr20MoTi; NiCo 20 Cr 20 MoTi MoTi	HR 10; HR 206; HR 404	NCK 20 D						NiCo20Cr20MoTi
34	Haynes 188; Jetalloy 209; R30188; AMS 5772	2.4964	CoCr22W14Ni		KC22WN						
34	Monel K-500; N05500	2.4375	NiCu30Al3Ti; NiCu 30 Al	NA 18	NU 30 AT						NiCu30Al3Ti
34	Inconel 718; N07718; AMS 5596; AMS 5589	2.4668	NiCr19Nb5Mo3; NiCr 19 NbMo; NiCr19Fe19Nb5Mo3	HR 8	NC 19 Fe Nb						NiCr19Nb5Mo3
34		2.4955	NiFe25Cr20NbTi; NiFe 25 Cr 20 NbTi		NiFe25Cr20NbTi						NiFe25Cr20NbTi
34	Incoloy 925; N09925	2.4670									
34	Nimonic 901; N09901; AMS 5660; AMS 5661	2.4662	NiFe35Cr14MoTi; NiCr13Mo6Ti3; NiCr 13 Mo 6 Ti 3		Z8 NCDT 42						
34	Udimet 500; N07500; AISI 684	2.4983	NiCr18Co18MoAlTi		NCK 19 DAT						NiCr18Co18MoAlTi
34	Nimonic 80A; N07080	2.4631; 2.4952	NiCr20TiAl; NiCr 20 TiAl	HR 401; HR 601	NC 20 TA				NCF 80 A	ChN77TYuR; ChN56VMTYu	NiCr20TiAl
34	Jetalloy 209; AMS 5772		CoCr22W14Ni		KC 22 WN						
34	Altemp S-816	2.4989	CoCr20Ni20W							Altemp S-816	
34	MAR-M 246	2.4675	NiCr23Mo16Cu; NiCr 23 Mo 16 Cu								NiCr23Mo16Cu

Material Group No.	USA	Germany		U.K.	France	Sweden	Italy	Spain	Japan	Russia	EURONORM
	AISI/SAE/ UNS/ ASTM/AA	Werkstoff	DIN	BS	AFNOR	SS	UNI	UNE	JIS	GOST	EN
34	Inconel 722; N07722; AMS 5411										
34	Waspaloy; N07001; AISI 685; AMS 5704; AMS 5706; AMS 5708; AMS 5544	2.4654	NiCr20Co13Mo4Ti3AL; NiCr 19 Co 14 Mo 4 Ti		NC 20 K 14						NiCr20Co 13Mo4Ti3AL
34	Rene 80				NC14 K9 T5 DWA						
35	5388C; N30002; CW-12MW;	2.4883	G-NiM16CrW								
35	N7M; N-7M; N30007	2.4685	G-NiMo28		ND 30 M						
35	N12MV; N-12MV; N30012	2.4882; 9.4810; 2.4810/9.4810	G-NiMo30								
35	Nimocast PK24; N13100; AMS 5397	2.4674	G-NiCo15Cr10AlTiMo	HC 204	NK 15 CAT						
35	Jethete M-252; N07252; AMS 5551	2.4916	G-NiCr19Co; G-NICR 19 Co								
35	Nimocast 713; N07713; AMS 5391; Inconel 713LC	2.4670	G-NiCr13Al6MoNb	HC 203	NC 13 AD						
35	M-35-1; N214135	2.4365; 2.4365/9.4365	G-NiCu40Nb						NiCuC		
36	Titanium Grade 1; R50250; ASTM GR. 1	3.7024; 3.7025	Ti 1; Ti 99.8	TA1	T-35		Ti1-Type 1	Ti-PO1	Class 2; Gr-1	VT1-00	Ti 99.8
36	Titanium Grade 2; R50400; AMS 4902; AMS 4941; AST M Gr. 2	3.7034; 3.7035; 3.7036	Ti 2; Ti 99.7	TA2; TA3; TA4; TA5	T-40		Ti1-Type 2	Ti-PO2	Class 2; Gr-2	VT1-0	Ti 99.7
36	Titanium Grade 3; R50500; ASTM Gr. 3	3.7055; 3.7056	Ti 3; Ti 99.6	DTD 5023, DTD 5273	T-50		Ti1-Type 3		Class 3; Gr-3		Ti 99.6
36	Titanium Grade 4; R50700; ASTM Gr. 4	3.7064; 3.7065; 3.7066	Ti 4; Ti 99.5	TA7; TA8; TA9	T-60		Ti1-Type 4		Class 4; Gr-4		Ti 99.5
36	Titanium Grade 7; R52400; Ti-0.15Pd	3.7235					Ti2Pd-Type 7		Class 13; Gr-13		
37	Titanium Grade 5; R56400; Ti-6Al-4V	3.7165; 3.7164	Ti6Al4V	TA10; TA11; TA12; TA13; TA 28; TA56; Ti-Al-V	TA6V; T-A 6 V; Ti-P.63		TiAl6V4-Type 5	Ti-P63	Class 6 0; Gr 6 0; SAT-64	VT6	Ti6Al4V

Material Group No.	USA	Germany		U.K.	France	Sweden	Italy	Spain	Japan	Russia	EURONORM
	AISI/SAE/ UNS/ ASTM/AA	Werkstoff	DIN	BS	AFNOR	SS	UNI	UNE	JIS	GOST	EN
37	Titanium Grade 6Al-2Sn-4Zr-2Mo; R54620; 6Al-2Sn-4Zr-2Mo	3.7145; 3.7144	TiAl6Sn2Zr4Mo2							VT25	TiAl6Sn2Zr4Mo2
37		3.7175; 3.7174	TiAl6V6Sn2								
37	Titanium Grade 9; R56320; Ti-3Al-2.5V	3.7195; 3.7194	Ti6Al2.5V				TiAl3V2.5-Type 9		Class 6 1; Gr 6 1	PT-3V	Ti6Al2.5V
37		3.7124	TiCu2	TA 21; TA22; TA23; TA24	T-U2			Ti-P11			
37		3.7185; 3.7184	Ti4Al4Mo2Sn; TiAl4Mo4Sn4Si0.5	TA45; TA46; TA47; TA48; TA49; TA50; TA57	T-A4DE			Ti-P68			
37	Titanium Grade 6; R54520; Ti-5Al-2.5Sn	3.7115.1; 3.7115	TiAl5Sn2.5; TiAl 5 Sn 22	TA14; TA17	T-A5E; Ti-P.65				SAT-525	VT5-1	TiAl5Sn2.5
37	R56410; Ti-10V-2Fe-3Al										
37	Titanium grade 23; R56401; Ti-6Al-4V-ELI		Ti6Al4V ELI	TA11			TiAl6V4ELI-Type 5.1		Class 6 1; Gr 6 1		
37										VST 5553	Ti5Al5V5Mo3Cr; Ti-5Al-5V-5Mo-3Cr
37	Ti-4Al-3Mo-1V				T-A4D3V					VT14	
37										VT22	
38		1.2762	75CrMoNiW6-7; 75 CrMoNiW 6 7								75CrMoNiW6-7
38	W1; T72301	1.1625	C80W2; C 80 W2	BW 18				F.520.U; F.5107; C 80	SK 75; SK 85; SK 85 M; SK 5; SK 5 M; SK 6	U8-1	C80W2
38	W110; T72301	1.1545	C105U; C 105 W 1; C 105 U		C 105 E 2 U; Y1 105; C105E2U	1880	C 100 KU	F.515; F.516	SK 105; SK 3; TC 105	U10A-1; U10A-2; U11-1	C105U
38		1.6746	32NiCrMo14-5; 32 NiCrMo 14-5	832 M 31	35 NCD 14			F.1262-32 NiCrMo 12			32NiCrMo14-5
38	W210; T72302	1.2833	100V1; 100 V 1	BW 2	C 105 E 2 UV 1; Y1 105 V; 100 V 2		102 V 2 KU		SKS 43		100V1
38	6145; 6150; 6150 H; G61500; H61500	1.8159	51CrV4; 50CrV4; 50 CrV 4	735 A 50; 735 A 51; 735 H 51; 735 M 50; En 47	50CrV4RR; 50 CV 4; 51 CV 4	2230	50 CrV 4	F.143; F.143.A; 51 CrV 4; F.1430	SUP 10; SUP 10-CSP; SUP 10 M	50ChFA; 50ChGFA	51CrV4
38	P20; T51620	1.2330	35CrMo4; 35 CrMo 4	708 A 37	34 CD 4	2234	35 CrMo 4				35CrMo4
38		1.8721	26MnCr6-3								26MnCr6-3
38		1.2083; 1.2083 ESR	X40Cr14; X 42 Cr 13		X40Cr14; Z 40 C 14	2314	X 41 Cr 13 KU	F.5263; X 40 Cr 13	SUS 420 J 2		X40Cr14

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	AISI/SAE/ UNS/ ASTM/AA	Werkstoff	DIN	BS	AFNOR	SS	UNI	UNE	JIS	GOST	EN
38	300M; 4340M; K44220	1.6928	41SiNiCrMoV7-6								S 155
38										30ChGSA	
39	A2; T30102	1.2363	X100CrMoV5; X100CrMoV5-1; X 100 CrMoV 5 1	BA 2	X 100 CrMoV 5; Z 100 CDW 5	2260	X 100 CrMoV 5 1 KU	F.536; F.5227; X 100 CrMoV 5	SKD 12		X100CrMoV5
39	D2; T30402	1.2379	X153CrMoV12; X155CrVMo12-1; X155 CrVMo 12 1	BD 2	X 160 CrMoV 12; Z 160 CDV 12	2310	X 155 CrVMo 12 1 KU	F.520.A	SKD 10; SKD 11		X153CrMoV12
39	D3; T30403	1.2080	X210Cr12; X 210 Cr 12	BD 3	X200Cr12; Z 200 C 12		X 205 Cr 12 KU	F.521; F.5212; X 210 Cr 12	SKD 1	Ch12	X210Cr12
39	L3; T61203	1.2067	102Cr6; 102 Cr 6; 100 Cr 6	BL 3; BL3	100Cr6RR; 100 C 6; 100Cr6; Y 100 C 6		102 Cr 6 KU	F.5230; 100 Cr 6	SUJ 2	Ch	102Cr6
39	M1; H41; T11301; T20841	1.3346	HS2-9-1; S 2-9-1	BM 1	HS 2-8-1; Z 85 DCWV 08-04-02-01						HS2-9-1
39	T1; T12001	1.3355	HS18-0-1; S 18-0-1	BT 1	18-0-1; HS 18-0-1; Z 80 WCV 18-04-01	2750	HS 18-0-1	F.5520; HS 18-0-1	SKH 2	R18	HS18-0-1
39	O2; T31502	1.2842	90MnCrV8; 90 MnCrV 8	BO 2; BO2	90 MnV 8; 90 MV 8		90 MoVCr 8 KU	90 MnCrV 8; F.5229			90MnCrV8
39	H13; T20813	1.2344	X40CrMoV5-1; X40 CrMoV 5 1	BH 13	X 40 CrMoV 5; Z 40 CDV 5	2242	X 40 CrMoV 5 1 1 KU	F.5318; X 40 CrMoSiV 5	SKD 61	4Ch5MF1S	X40CrMoV5-1
39	440C; S44004; S44025	1.4125	X105CrMo17; X105 CrMo 17		Z 100 CD 17 Cl; Z 100 CD 17				SUS 440 C	95Ch18; 110Ch18M-SChD	X105CrMo17
40	A 532 III A 25% Cr	0.9650	G-X 260 Cr 27	Grade 3 D		0466-00				ChWG	
40	Ni-Hard 4	0.9630	G-X 300 CrNiSi 9 5 2								
40	Ni-Hard 1	0.9625	G-X 330 NiCr 4 2	Grade 2 B		0513-00					
40	A 532 III A 25% Cr	0.9655	G-X 300 CrMo 27 1	Grade 3 E						20Ch25N20S2	
40	Ni-Hard 2	0.9620	G-X 260 NiCr 4 2	Grade 2 A		0512-00					
41	A532 IID20%CrMo-LC	0.9645; 5.5609	G-X 260 CrMoNi 20 2 1	Grade 3C							EN-GJN-HV600(XCr23)
41	A532 IIC15%CrMo-HC	0.9635; 0.9640	G-X 300 CrMo 15 3; G-X 300 CrMoNi 15 2 1	Grade 3A; Grade 3B							EN-GJN-HV600(XCr14)

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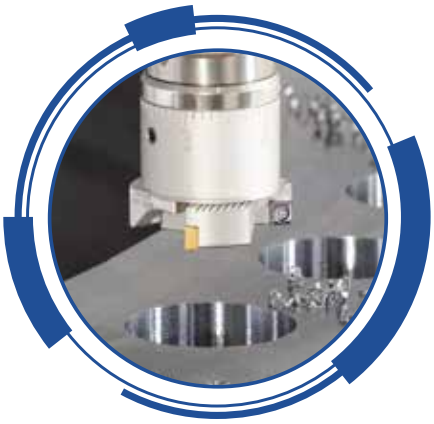
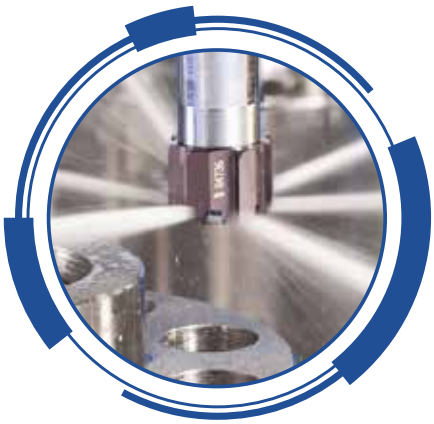

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