

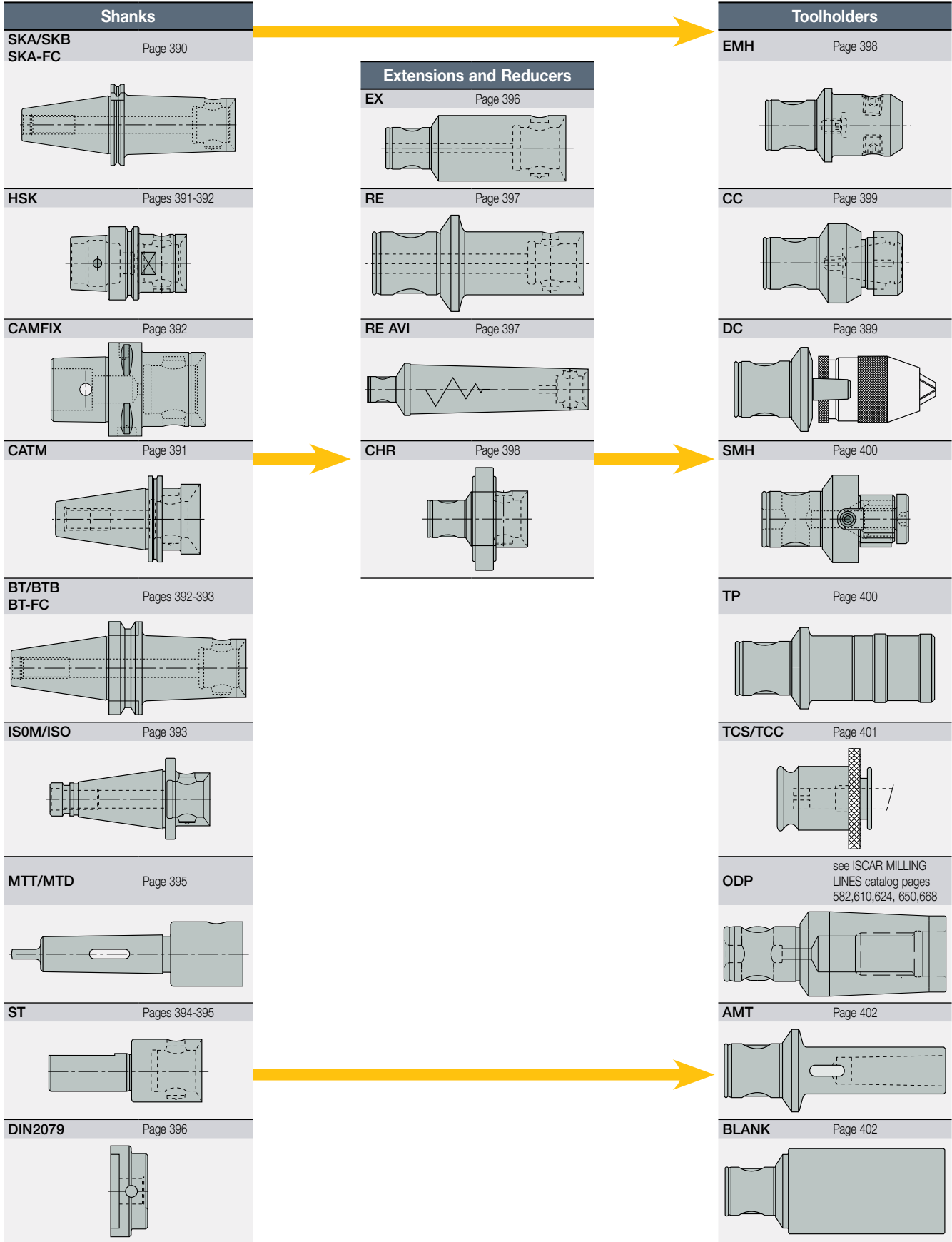
ITS BORE



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The ITS BORE System



The ITS BORE System

Rough Boring Heads

BHR MB 16, 20, 25, 32, 40, 50, 63, 80
 (ø18-200) Page 404

Diagram showing the BHR MB rough boring head and its tool options: IHPR, IHSR BW, CR LNHT, IHSR IHCR, IHBR, IHSR BW, and CR SOMT.

TCH AL 200, 300, 400, 500, 600, 700, 800
 (ø200-1200) Page 407

Diagram showing the TCH AL rough boring head assembly with components: BT-FM, SMH MB, DIN69871-FM, TCHH EX 100/300 Extension slides, and IHSR BW. Tool options shown are IHSR IHCR, IHPR, and IHBR.

Rough & Fine Boring Heads

BHC MB 25, 32, 40, 50, 63, 80
 (ø28-120) Page 411

Diagram showing the BHC MB rough and fine boring head and its tool options: IHSR C, IHRF C, and IHFF C.

Fine Boring Heads (10 µm)

BHE MB 14, 16, 20, 25, 32, 40
 (ø14.5-66) Page 418

Diagram showing the BHE MB fine boring head and its tool options: IHWF E, IHFF (E), IHRF, IHRF CH, and IHRF BW.

BHE MB-H 32, 50
 (ø2.5-22) Page 418

Diagram showing the BHE MB-H fine boring head and its tool option: PICCO ACE BH.

BHE MB 50, 63, 80
 (ø2.5-30)

Diagram showing the BHE MB fine boring head and its tool options: SLEEVE, IHAXF, IHAXF-E, IHAXF-AVI, PICCO ACE BH, and BHEH.

(ø28-56)

Diagram showing fine boring heads for diameter range 28-56 with tool options: BBH, IHFF, IHRF, BHEH, BBH D, and IHFF.

(ø40-90)

Diagram showing fine boring heads for diameter range 40-90 with tool options: BBH, IHFF, and IHRF.

(ø54-132)

Diagram showing fine boring heads for diameter range 54-132 with tool options: IHWF E, IHFF (E), IHRF, IHRF CH, and IHRF BW.

(ø72-200)

Diagram showing fine boring heads for diameter range 72-200 with tool options: BH NUT, BHEH, CW, IHFF, IHRF, and IHRF BW.

Pages 418-422

The ITS BORE System

Fine Boring Heads (2 μm)

BHF MB 16, 20, 25, 32, 40

(ø18-63) Page 425

BHF MB 50-BL

(ø2.5-22) Pages 423-424, 427

PICCO ACE BH

BHF MB 50-50X60

(ø2.5-30)

(ø28-54)

(ø54-108)

pages 425, 428

BHF MB 50, 63, 80

(ø77-500) Pages 429-431, 432

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

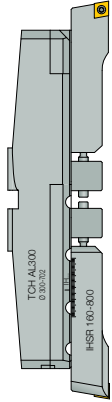








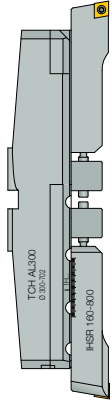















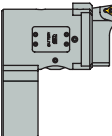











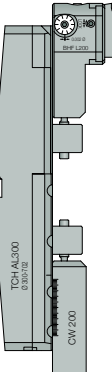


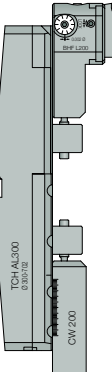





(ø200-1200) Page 438

DIN69871-FM

BHD 32, 40, 50, 63, 80

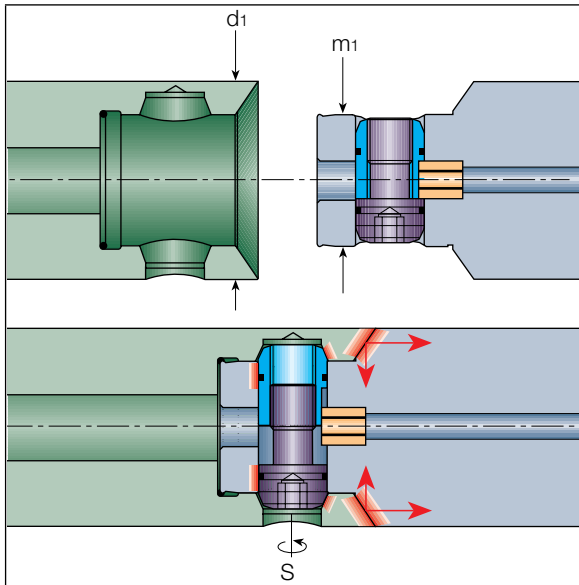
Pages 414-417

ITS BORE Boring Heads Selection Guide

MB Size	14	16	20	25	32	40	50	63	80		
Rough	BHR-TCH Ø18-1202										Roughing 
		BHR MB16-16 Ø18-22 	BHR MB20-20 Ø22-28 	BHR MB25-25 Ø28-38 	BHR MB32-32 Ø35.5-50 	BHR MB40-40 Ø50-68 	BHR MB50-50 Ø68-90 MB50-63 Ø90-120 	BHR MB63-63 Ø90-120 	BHR MB80-80 Ø120-200 		
Rough + Finish	BHC Ø28-120 10 µm										Page 407 
				BHC MB25-25 Ø28-36 	BHC MB32-32 Ø36-46 	BHC MB40-40 Ø46-60 	BHC MB50-50 Ø60-75 	BHC MB63-63 Ø75-95 	BHC MB80-80 Ø95-120 		
Finish	BHE Ø6-200 10 µm										TCH AL200 Ø200-602 TCH AL300 Ø300-702 TCH AL400 Ø400-802 TCH AL500 Ø500-902 TCH AL600 Ø600-1002 TCH AL700 Ø700-1102 TCH AL800 Ø800-1202
		BHE MB14-14 Ø14.5-18 	BHE MB16-16 Ø18-24 	BHE MB20-20 Ø22-30 	BHE MB25-25 Ø28-40 	BHE MB32-32 Ø35-53 	BHE MB40-40 Ø48-66 	BHE MB50-50 Ø2.5-110 	BHE MB63-63 Ø6-125 	BHE MB80-80 Ø6-200 	
Finish	BHE H Ø2.5-22 10 µm										BHD50 L200 Ø200-1202 
					BHE MB32-32...H Ø2.5-18 		BHE MB50-50...H Ø2.5-22 				
Finish	BHF Ø2.5-1202 2 µm										BHF L200 Ø200-1202 Page 437
		BHF MB16-16 Ø18-23 	BHF MB20-20 Ø22-29 	BHF MB25-25 Ø28-38 	BHF MB32-32 Ø35.5-50 	BHF MB40-40 Ø48-63 	BHF MB50-50 Ø2.5-108 BHF MB50-80 Ø2.5-160 BHF MB50-63 	BHF MB63-63 Ø2.5-125 	BHF MB80-80 Ø2.5-160 	BHF MB80-125 Ø135-500 	
Finish	BHF BL Ø2.5-22 2 µm										
					BHF MB50-32... BL Ø2.5-12 		BHF MB50-50... BL Ø6-22 				
Finish	BHD MB Ø2-1202 2 µm										Page 438 
					BHD MB32-32-83 Ø35-51 	BHD MB40-40-90 Ø48-64 	BHD MB50-50X60 Ø2.5-110 	BHD MB63-63X89 Ø6-125 	BHD MB80-80X104 Ø6-200 		

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.

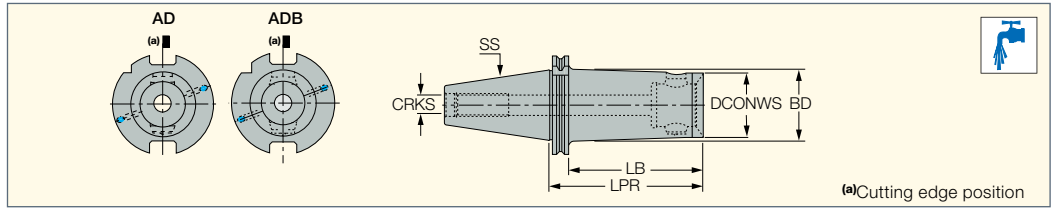


Designation	d_1	$\varnothing m_1$	Size Allen Key (mm)	Tightening Torque (Nm) ⚠	Maximum Driving Torque (Nm)
MB14	14	10	2.5	2-2.5	40
MB16	16	10	2.5	2-2.5	40
MB20	20	13	3	4-4.5	70
MB25	25	16	3	6.5-7.5	120
MB32	32	20	4	7-8	200
MB40	40	25	5	16-18	400
MB50	50	32	6	30-35	700
MB63	63	42	8	70-80	1600
MB80	80	42	8	70-80	1600
MB110	110	76	14	200-220	6300

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SKA-MB

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



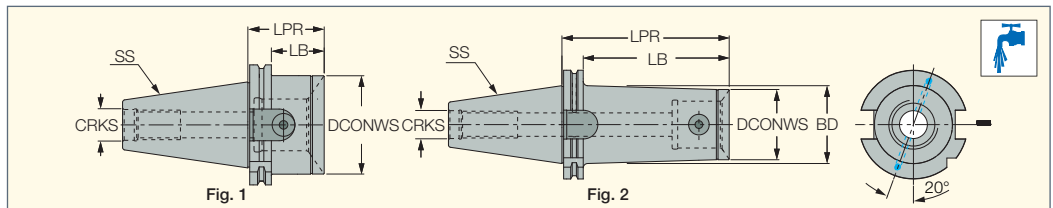
Designation	SS	DCONWS	LPR	LB	BD	CRKS	kg	↙
SKA 30-MB32	30	32.00	30.00	10.5	-	M12	0.40	HW 4.0
SKA 30-MB50	30	50.00	60.00	41.0	-	M12	0.67	HW 6.0
SKA 40-MB40	40	40.00	45.00	26.0	-	M16	0.94	HW 5.0
SKA 40-MB40X120 ADB	40	40.00	120.00	101.0	44.50	M16	1.70	HW 5.0
SKA 40-MB50	40	50.00	48.00	29.0	-	M16	0.99	HW 6.0
SKA 40-MB50X120 ADB	40	50.00	120.00	101.0	-	M16	2.04	HW 6.0
SKA 40-MB63	40	63.00	80.00	61.0	-	M16	1.52	HW 8.0
SKA 45-MB50	45	50.00	48.00	29.0	-	M20	1.77	HW 6.0
SKA 50-MB110X150	50	110.00	150.00	131.0	-	M24	8.47	HW 10.0
SKA 50-MB50	50	50.00	48.00	29.0	-	M24	2.82	HW 6.0
SKA 50-MB50X120 ADB	50	50.00	120.00	101.0	60.00	M24	4.03	HW 6.0
SKA 50-MB63	50	63.00	56.00	37.0	-	M24	2.95	HW 8.0
SKA 50-MB63X150 ADB	50	63.00	150.00	131.0	70.00	M24	2.81	HW 8.0
SKA 50-MB80	50	80.00	62.00	43.0	-	M24	3.51	HW 8.0
SKA 50-MB80X180 ADB	50	80.00	180.00	161.0	-	M24	7.90	HW 8.0
SKA 60-MB110X100	60	110.00	100.00	81.0	-	M30	10.50	HW 10.0
SKA 60-MB110X200	60	110.00	200.00	181.0	-	M30	18.00	HW 10.0
SKA 60-MB63X60	60	63.00	60.00	41.0	71.00	M30	9.47	HW 8.0
SKA 60-MB80X65	60	80.00	65.00	46.0	-	M30	10.38	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).

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SKA-FC-MB

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

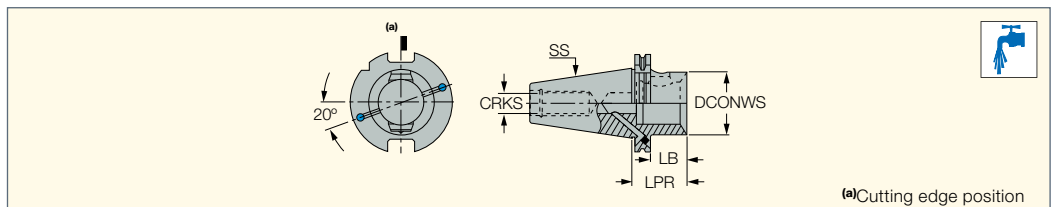


Designation	SS	DCONWS	LPR	BD	LB	CRKS	Fig.	kg	↙
SKA 40 FC MB50 ADB	40	50.00	48.00	-	29.0	M16	1.	0.90	HW 6.0
SKA 40 FC MB50X120 ADB	40	50.00	120.00	-	101.0	M16	2.	1.70	HW 6.0
SKA 40 FC MB63 ADB	40	63.00	80.00	-	-	M16	1.	1.50	HW 8.0
SKA 50 FC MB50 ADB	50	50.00	48.00	-	29.0	M24	1.	2.70	HW 6.0
SKA 50 FC MB50X120 ADB	50	50.00	120.00	60.00	101.0	M24	2.	3.50	HW 6.0
SKA 50 FC MB63 ADB	50	63.00	56.00	-	37.0	M24	1.	2.80	HW 8.0
SKA 50 FC MB63X150 ADB	50	63.00	150.00	75.50	131.0	M24	2.	5.00	HW 8.0
SKA 50 FC MB80 ADB	50	80.00	62.00	-	43.0	M24	1.	3.40	HW 8.0
SKA 50 FC MB80X180 ADB	50	80.00	180.00	-	161.0	M24	2.	6.90	HW 8.0

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SKB-MB

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



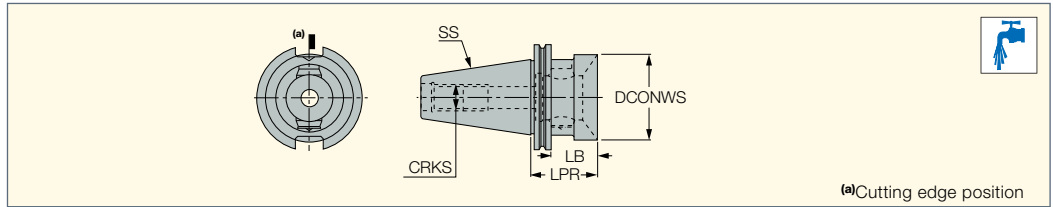
Designation	SS	DCONWS	LB	LPR	CRKS	kg	↙
SKB 40-MB50	40	50.00	29.0	48.00	M16	1.04	HW 6.0
SKB 40-MB63	40	63.00	61.0	80.00	M16	1.56	HW 8.0
SKB 50-MB50	50	50.00	29.0	48.00	M24	2.91	HW 6.0
SKB 50-MB63	50	63.00	37.0	56.00	M24	3.07	HW 8.0
SKB 50-MB80	50	80.00	43.0	62.00	M24	3.60	HW 8.0

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

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CATM-MB

MB Modular Boring Connection System with CATM FORM AD ANSIB5.5 Caterpillar Tapered Shanks and Metric Pull Stud Threads



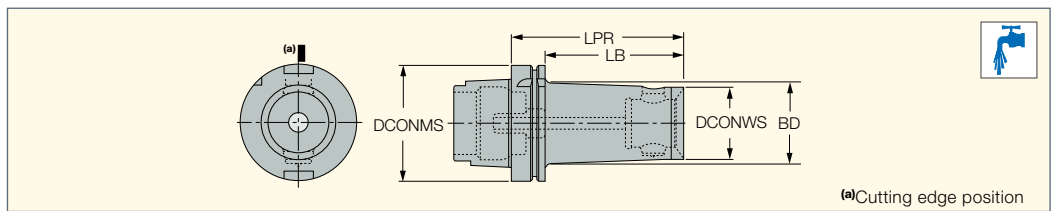
Designation	SS	DCONWS	LB	LPR	CRKS	kg	↙
CATM 40 MB50	40	50.00	47.0	66.00	M16	1.21	HW 6.0
CATM 40 MB63	40	63.00	-	100.00	M16	1.91	HW 8.0
CATM 45 MB50	45	50.00	29.0	48.00	M20	1.83	HW 6.0
CATM 50 MB50	50	50.00	29.0	48.00	M24	3.06	HW 6.0
CATM 50 MB63	50	63.00	37.0	56.00	M24	3.08	HW 8.0
CATM 50 MB80	50	80.00	43.0	62.00	M24	3.38	HW 8.0

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

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HSK A-MB

MB Modular Connection System with DIN 69893 HSK A Taper Shanks



Designation	DCONMS	DCONWS	LB	LPR	BD	kg	🧊	🔧	↙
HSK A40 MB32	40.00	32.00	28.0	48.00	-	0.32	COOLING TUBE HSK A40	WRENCH COOL TUBE HSK40*	HW 4.0
HSK A50 MB50	50.00	50.00	-	66.00	-	0.69	COOLING TUBE HSK A50	WRENCH COOL TUBE HSK50*	HW 6.0
HSK A63 MB40	63.00	40.00	34.0	60.00	-	0.92	COOLING TUBE HSK A63	WRENCH COOL TUBE HSK63*	HW 5.0
HSK A63 MB40X120	63.00	40.00	94.0	120.00	46.00	1.60	COOLING TUBE HSK A63	WRENCH COOL TUBE HSK63*	HW 5.0
HSK A63 MB50	63.00	50.00	40.0	66.00	-	1.04	COOLING TUBE HSK A63	WRENCH COOL TUBE HSK63*	HW 6.0
HSK A63 MB50X120	63.00	50.00	94.0	120.00	-	1.05	COOLING TUBE HSK A63	WRENCH COOL TUBE HSK63*	HW 6.0
HSK A63 MB63	63.00	63.00	-	75.00	-	1.15	COOLING TUBE HSK A63	WRENCH COOL TUBE HSK63*	HW 8.0
HSK A80 MB50	80.00	50.00	44.0	70.00	-	1.61	COOLING TUBE HSK A 80	WRENCH COOL TUBE HSK80*	HW 6.0
HSK A80 MB63	80.00	63.00	54.0	80.00	-	1.50	COOLING TUBE HSK A 80	WRENCH COOL TUBE HSK80*	HW 8.0
HSK A80 MB80	80.00	80.00	-	86.00	-	2.54	COOLING TUBE HSK A 80	WRENCH COOL TUBE HSK80*	HW 8.0
HSK A100 MB50	100.00	50.00	43.0	72.00	-	2.58	COOLING TUBE HSK A100	WRENCH COOL TUBE HSK100*	HW 6.0
HSK A100 MB50X120	100.00	50.00	91.0	120.00	60.00	1.05	COOLING TUBE HSK A100	WRENCH COOL TUBE HSK100*	HW 6.0
HSK A100 MB63	100.00	63.00	53.0	82.00	-	2.86	COOLING TUBE HSK A100	WRENCH COOL TUBE HSK100*	HW 8.0
HSK A100 MB63X150	100.00	63.00	121.0	150.00	70.00	4.71	COOLING TUBE HSK A100	WRENCH COOL TUBE HSK100*	HW 8.0
HSK A100 MB80	100.00	80.00	59.0	88.00	-	3.60	COOLING TUBE HSK A100	WRENCH COOL TUBE HSK100*	HW 8.0
HSK A100 MB80X180	100.00	80.00	151.0	180.00	-	6.50	COOLING TUBE HSK A100	WRENCH COOL TUBE HSK100*	HW 8.0

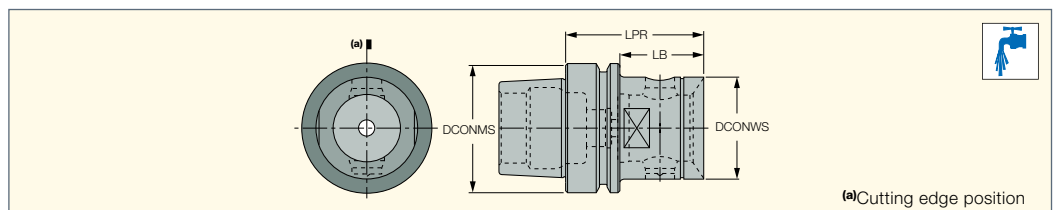
• A cooling tube must be used with all coolant through HSK spindles • Verify that the weight of the entire tool assembly does not exceed the machine spindle's carrying capability.

* Optional, should be ordered separately

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HSK E-MB

MB Modular Connection System with DIN 69893 E Taper Shanks



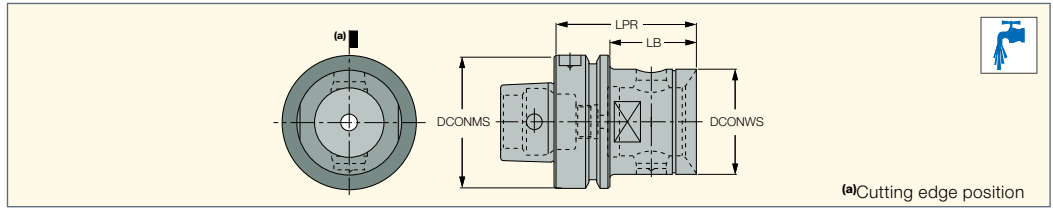
Designation	DCONMS	DCONWS	LB	LPR	kg	↙
HSK E40 MB32	40.00	32.00	22.0	42.00	0.30	HW 4.0
HSK E50 MB50	50.00	50.00	-	66.00	0.71	HW 6.0
HSK E63 MB50	63.00	50.00	40.0	66.00	1.87	HW 6.0

• 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.

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HSK F-MB

MB Modular Connection System with DIN 69893 F Taper Shanks



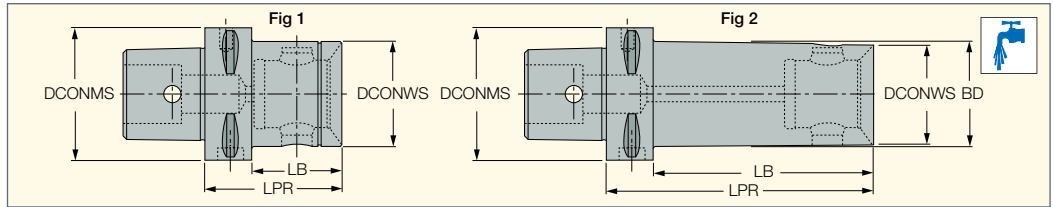
Designation	DCONMS	DCONWS	LB	LPR	kg	HW
HSK F 63 MB50	63.00	50.00	39.0	65.00	1.00	HW 6.0

- 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



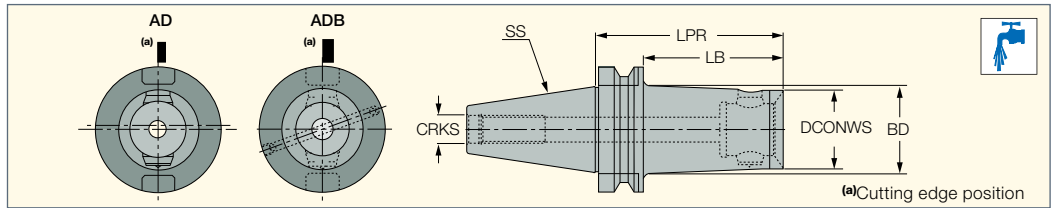
Designation	DCONMS	DCONWS	LPR	LB	BD	Fig.	kg	HW	COOLING TUBE	WRENCH COOL TUBE
C4 MB32X42	40.00	32.00	42.00	22.0	-	1.	0.30	HW 4.0	COOLING TUBE C4*	WRENCH COOL TUBE C4*
C4 MB40X45	40.00	40.00	45.00	-	-	1.	0.40	HW 5.0	COOLING TUBE C4*	WRENCH COOL TUBE C4*
C5 MB50X55	50.00	50.00	55.00	-	-	1.	0.72	HW 6.0	COOLING TUBE C5*	WRENCH COOL TUBE C5*
C6 MB40X50	63.00	40.00	50.00	28.0	-	1.	0.90	HW 5.0	COOLING TUBE C6*	WRENCH COOL TUBE C6*
C6 MB40X120	63.00	40.00	120.00	98.0	44.00	2.	1.50	HW 5.0	COOLING TUBE C6*	WRENCH COOL TUBE C6*
C6 MB50X55	63.00	50.00	55.00	33.0	50.00	2.	0.80	HW 6.0	COOLING TUBE C6*	WRENCH COOL TUBE C6*
C6 MB50X67	63.00	50.00	67.00	45.0	-	1.	1.10	HW 6.0	COOLING TUBE C6*	WRENCH COOL TUBE C6*
C6 MB50X120	63.00	50.00	120.00	98.0	54.00	2.	1.90	HW 6.0	COOLING TUBE C6*	WRENCH COOL TUBE C6*
C6 MB63X77	63.00	63.00	77.00	-	-	1.	1.54	HW 8.0	COOLING TUBE C6*	WRENCH COOL TUBE C6*
C8 MB50X60	80.00	50.00	60.00	30.0	-	1.	1.99	HW 6.0	COOLING TUBE C8*	WRENCH COOL TUBE C8*
C8 MB50X120	80.00	50.00	120.00	90.0	54.00	2.	2.80	HW 6.0	COOLING TUBE C8*	WRENCH COOL TUBE C8*
C8 MB63X70	80.00	63.00	70.00	40.0	-	1.	2.16	HW 8.0	COOLING TUBE C8*	WRENCH COOL TUBE C8*
C8 MB63X150	80.00	63.00	150.00	120.0	67.00	2.	4.00	HW 8.0	COOLING TUBE C8*	WRENCH COOL TUBE C8*
C8 MB80X75	80.00	80.00	75.00	-	-	1.	2.60	HW 8.0	COOLING TUBE C8*	WRENCH COOL TUBE C8*
C8 MB80X120	80.00	80.00	120.00	-	-	1.	4.30	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, should be ordered separately

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BT-MB

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

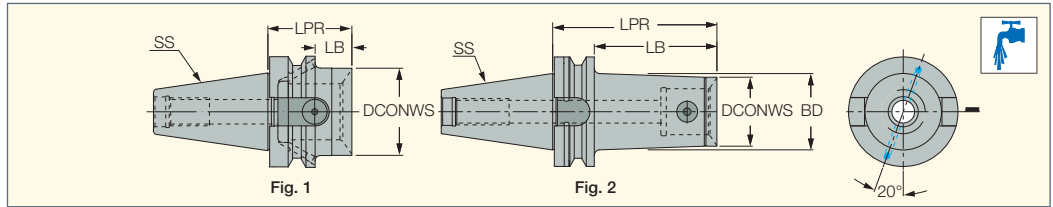


Designation	SS	DCONWS	LB	LPR	BD	CRKS	kg	HW
BT30 MB32	30	32.00	10.6	32.00	-	M12	0.38	HW 4.0
BT30 MB50	30	50.00	38.6	60.00	-	M12	0.70	HW 6.0
BT40 MB40	40	40.00	18.0	45.00	-	M16	0.99	HW 5.0
BT40 MB40X120 ADB	40	40.00	93.0	120.00	44.50	M16	1.78	HW 5.0
BT40 MB50	40	50.00	21.0	48.00	-	M16	1.00	HW 6.0
BT40 MB50X120 ADB	40	50.00	93.0	120.00	-	M16	2.08	HW 6.0
BT40 MB63	40	63.00	39.0	66.00	-	M16	1.35	HW 8.0
BT45 MB50	45	50.00	29.0	62.00	-	M20	2.32	HW 6.0
BT50 MB50	50	50.00	28.0	66.00	-	M24	3.78	HW 6.0
BT50 MB50X120 ADB	50	50.00	82.0	120.00	60.00	M24	4.64	HW 6.0
BT50 MB63	50	63.00	37.0	75.00	-	M24	3.98	HW 8.0
BT50 MB63X150 ADB	50	63.00	112.0	150.00	70.00	M24	5.85	HW 8.0
BT50 MB80	50	80.00	37.0	75.00	-	M24	4.30	HW 8.0
BT50 MB80X180 ADB	50	80.00	142.0	180.00	-	M24	8.19	HW 8.0
BT50 MB110X140	50	110.00	102.0	140.00	-	M24	6.80	HW 10.0
BT60 MB110X110	60	110.00	63.0	110.00	-	M30	11.50	HW 10.0
BT60 MB110X200	60	110.00	152.0	200.00	-	M30	18.10	HW 10.0

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

BT-FC-MB

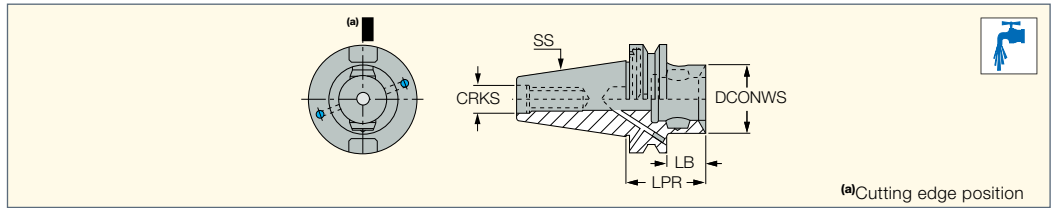
MB Modular Boring System
with BT MAS-403 Face Contact
ADB Tapered Shanks



Designation	SS	DCONWS	LPR	BD	LB	Fig.	kg	
BT30 FC MB50	30	50.00	60.00	-	32.0	1.	0.70	
BT40 FC MB50	40	50.00	48.00	-	21.0	1.	0.90	HW 6.0
BT40 FC MB50X120 ADB	40	50.00	120.00	-	93.0	2.	1.90	HW 5.0
BT40 FC MB63	40	63.00	66.00	-	-	1.	1.20	HW 8.0
BT50 FC MB50	50	50.00	66.00	-	28.0	1.	3.30	HW 6.0
BT50 FC MB50X120 ADB	50	50.00	120.00	60.00	82.0	2.	4.20	HW 6.0
BT50 FC MB63	50	63.00	75.00	-	37.0	1.	3.70	HW 8.0
BT50 FC MB63X150 ADB	50	63.00	150.00	70.00	112.0	2.	5.80	HW 8.0
BT50 FC MB80	50	80.00	75.00	-	37.0	1.	4.00	HW 8.0
BT50 FC MB80X180 ADB	50	80.00	180.00	-	142.0	2.	7.50	HW 8.0

BTB-MB

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

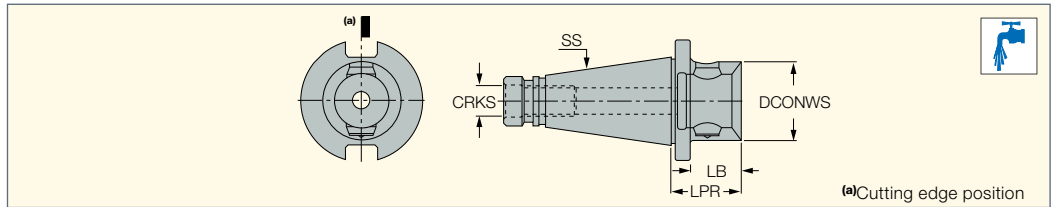


Designation	SS	DCONWS	LB	LPR	CRKS	kg	
BTB40 MB50	40	50.00	21.0	48.00	M16	0.96	HW 6.0
BTB40 MB63	40	63.00	-	66.00	M16	1.34	HW 8.0
BTB50 MB50X66	50	50.00	28.0	66.00	M24	3.89	HW 6.0
BTB50 MB63X75	50	63.00	37.0	75.00	M24	4.00	HW 8.0
BTB50 MB80	50	80.00	37.0	75.00	M24	4.30	HW 8.0

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

ISOM-MB

MB Modular Connection System
with DIN 2080-A Taper Shanks

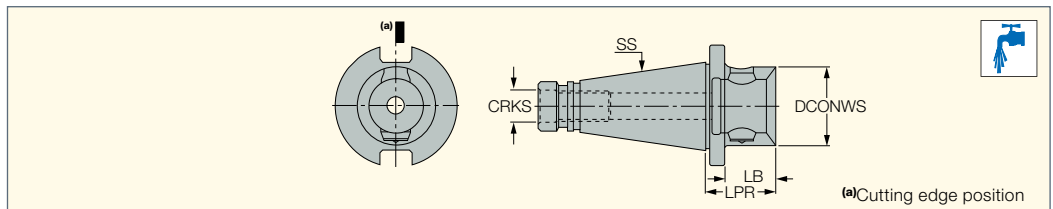


Designation	SS	DCONWS	LB	LPR	CRKS	kg	
ISOM 30-MB50	30	50.00	-	58.00	M12	0.78	HW 6.0
ISOM 40-MB50	40	50.00	36.0	48.00	M16	0.95	HW 6.0
ISOM 40-MB63	40	63.00	-	60.00	M16	1.34	HW 8.0
ISOM 45-MB50	45	50.00	33.0	48.00	M20	1.81	HW 6.0
ISOM 50-MB50	50	50.00	33.0	48.00	M24	2.82	HW 6.0
ISOM 50-MB63	50	63.00	41.0	56.00	M24	3.04	HW 8.0
ISOM 50-MB80	50	80.00	45.0	60.00	M24	3.60	HW 8.0

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

ISO-MB

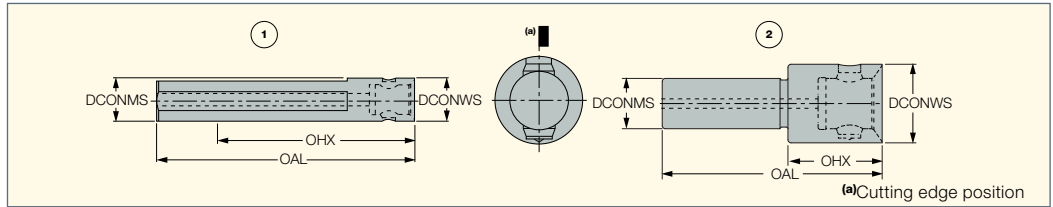
MB Modular Connection System
with ISO 297 Taper Shanks



Designation	SS	DCONWS	LB	LPR	CRKS	kg	
ISO 40-MB50	40	50.00	36.0	48.00	UNC 5/8"-11	1.03	HW 6.0
ISO 40-MB63	40	63.00	-	60.00	UNC 5/8"-11	1.36	HW 8.0
ISO 50-MB50	50	50.00	33.0	48.00	UNC 1.0"-8	2.83	HW 6.0
ISO 50-MB63	50	63.00	41.0	56.00	UNC 1.0"-8	2.94	HW 8.0
ISO 50-MB80	50	80.00	45.0	60.00	UNC 1.0"-8	3.56	HW 8.0

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

ST-MB
MB Modular Connection System
with Straight Cylindrical Shanks



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

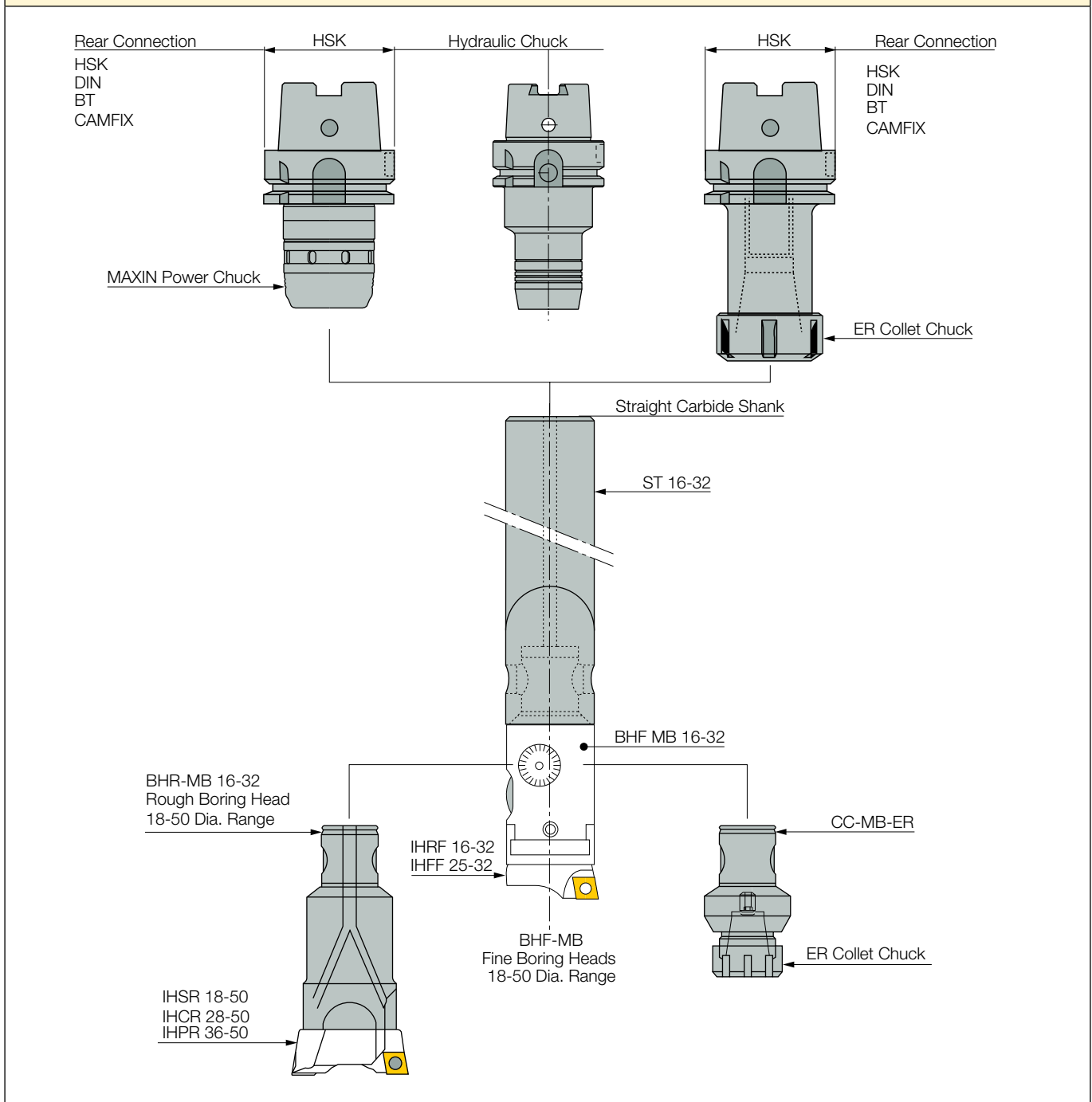
• Verify that the weight of the entire tool assembly does not exceed the machine spindle's carrying capability.

⁽¹⁾ Maximum overhang

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

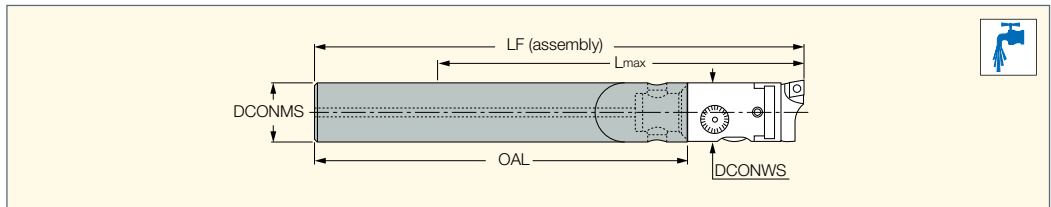
ST-MB Straight Carbide Shank with MB Connection Assembly Options

ST16-32 MB16-MB32 Diameter Range: 18-50 mm



ST-MB-E

MB Modular Connection System with Cylindrical Carbide Shanks

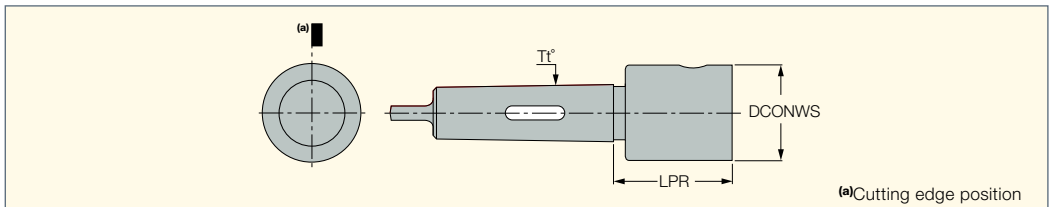


Designation	DCONMS	DCONWS	OAL	LF	L _{max}	kg	↙
ST 16-MB16X110E	16.00	16.00	110.00	144.00	100.0	0.28	HW 2.5
ST 16-MB16X140E	16.00	16.00	140.00	174.00	125.0	0.17	HW 2.5
ST 16-MB16X170E	16.00	16.00	170.00	204.00	160.0	0.42	HW 2.5
ST 20-MB20X135E	20.00	20.00	135.00	175.00	125.0	0.40	HW 3.0
ST 20-MB20X170E	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.

MTT-MB

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

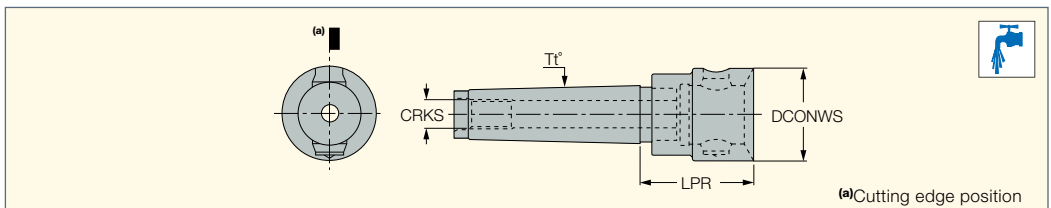


Designation	Tt°	DCONWS	LPR	kg	↙
MTT 5-MB63	MT5	63.00	65.00	2.16	HW 8.0

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

MTD-MB

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



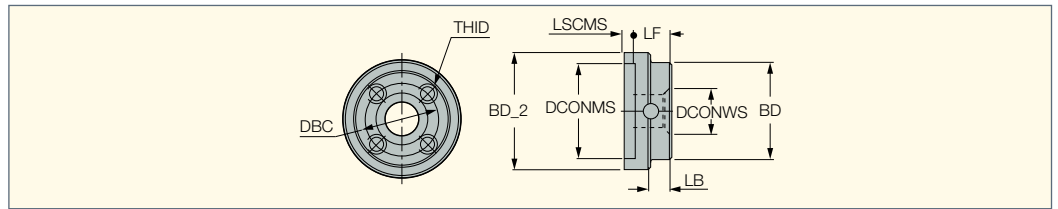
Designation	Tt°	DCONWS	LPR	CRKS	kg	↙
MTD 4-MB50	MT4	50.00	63.00	M16	0.93	HW 6.0
MTD 4-MB50 SIP	MT4	50.00	63.00	M14	0.98	HW 6.0

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

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DIN2079-MB

MB Modular Connection
System with DIN 2079 Spindle
Connecting Interface



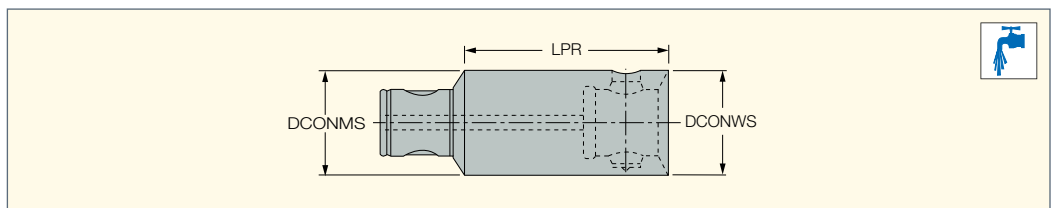
Designation	LF	DCONWS	LSCMS	LB	BD	BD_2	DCONMS	DBC	THID		
DIN2079 MB50 40	35.00	50.00	10.00	21.0	90.00	110.00	88.89	66.70	M12	1.96	HW 6.0
DIN2079 MB63 40	47.00	63.00	10.00	31.0	90.00	110.00	88.89	66.70	M12	2.06	HW 8.0
DIN2079 MB63 50	45.00	63.00	12.00	31.0	135.00	150.00	128.57	101.60	M16	4.60	HW 8.0
DIN2079 MB80 50	50.00	80.00	12.00	36.0	135.00	150.00	128.57	101.60	M16	5.00	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 directly on the machine spindle.

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EX-MB

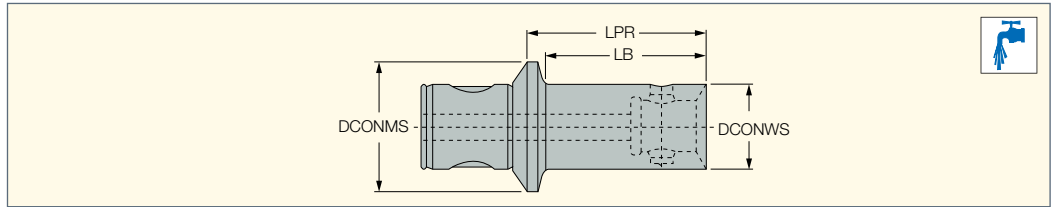
Extensions for the MB Modular
Connection System



Designation	DCONMS	LPR	DCONWS	
EX 14X25-MB14	14.00	25.00	14.00	0.04
EX 16X25-MB16	16.00	25.00	16.00	0.06
EX 20X32-MB20	20.00	32.00	20.00	0.09
EX 25X25-MB25	25.00	25.00	25.00	0.10
EX 25X40-MB25	25.00	40.00	25.00	0.16
EX 32X32-MB32	32.00	32.00	32.00	0.20
EX 32X50-MB32	32.00	50.00	32.00	0.31
EX 40X40-MB40	40.00	40.00	40.00	0.39
EX 40X63-MB40	40.00	63.00	40.00	0.61
EX 50X50-MB50	50.00	50.00	50.00	0.70
EX 50X80-MB50	50.00	80.00	50.00	1.20
EX 50X100-MB50	50.00	100.00	50.00	1.53
EX 63X63-MB63	63.00	63.00	63.00	1.49
EX 63X100-MB63	63.00	100.00	63.00	2.39
EX 63X125-MB63	63.00	125.00	63.00	2.99
EX 80X80-MB80	80.00	80.00	80.00	3.10
EX 80X125-MB80	80.00	125.00	80.00	4.90
EX 80X160-MB80	80.00	160.00	80.00	6.25
EX 110X140-MB110	110.00	140.00	110.00	10.45
EX 110X200-MB110	110.00	200.00	110.00	14.30

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

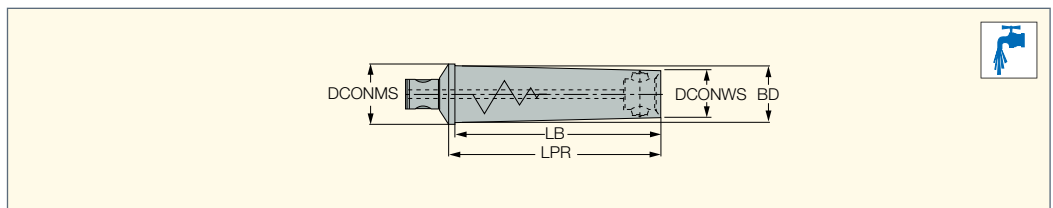
RE MB-MB
Reducers for the MB Modular Connection System



Designation	DCONMS	DCONWS	LPR	LB	kg
RE MB16-MB14X24	16.00	14.00	25.00	19.5	0.04
RE MB20-MB14X19	20.00	14.00	20.00	14.5	0.03
RE MB20-MB16X20	20.00	16.00	20.00	16.0	0.06
RE MB25-MB14X19	25.00	14.00	20.00	13.5	0.06
RE MB25-MB16X20	25.00	16.00	20.00	15.0	0.08
RE MB25-MB20X25	25.00	20.00	25.00	20.0	0.09
RE MB32-MB14X25	32.00	14.00	25.00	17.5	0.08
RE MB32-MB16X24	32.00	16.00	24.00	18.0	0.13
RE MB32-MB20X25	32.00	20.00	25.00	20.0	0.14
RE MB32-MB25X28	32.00	25.00	28.00	23.0	0.16
RE MB40-MB14X25	40.00	14.00	25.00	16.5	0.23
RE MB40-MB16X24	40.00	16.00	24.00	17.0	0.22
RE MB40-MB20X26	40.00	20.00	26.00	20.0	0.23
RE MB40-MB25X28	40.00	25.00	28.00	22.0	0.26
RE MB40-MB32X32	40.00	32.00	32.00	27.0	0.29
RE MB50-MB14X25	50.00	14.00	25.00	14.5	0.40
RE MB50-MB14X39	50.00	14.00	39.00	30.5	0.42
RE MB50-MB16X24	50.00	16.00	24.00	15.0	0.39
RE MB50-MB16X40	50.00	16.00	40.00	31.0	0.41
RE MB50-MB16X74	50.00	16.00	74.00	65.0	0.47
RE MB50-MB20X26	50.00	20.00	26.00	18.0	0.40
RE MB50-MB20X70	50.00	20.00	70.00	62.0	0.50
RE MB50-MB20X93	50.00	20.00	93.00	85.0	0.56
RE MB50-MB25X117	50.00	25.00	117.00	110.0	0.68
RE MB50-MB25X28	50.00	25.00	28.00	21.0	0.42
RE MB50-MB25X87	50.00	25.00	87.00	80.0	0.64
RE MB50-MB32X144	50.00	32.00	144.00	137.0	1.09
RE MB50-MB32X32	50.00	32.00	32.00	25.0	0.46
RE MB50-MB32X87	50.00	32.00	87.00	80.0	0.71
RE MB50-MB40X176	50.00	40.00	176.00	170.0	1.87
RE MB50-MB40X36	50.00	40.00	36.00	30.0	0.51
RE MB50-MB40X87	50.00	40.00	87.00	80.0	0.97
RE MB63-MB50X40	63.00	50.00	40.00	34.0	0.97
RE MB80-MB50X45	80.00	50.00	45.00	36.0	1.35
RE MB80-MB63X60	80.00	63.00	60.00	52.0	1.77
RE MB110-MB80X70	110.00	80.00	70.00	52.0	6.00

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

RE MB-AVI
MB Modular System Vibration Damping Reducers



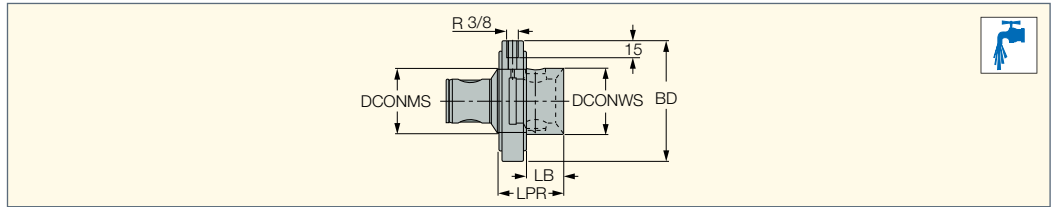
Designation	DCONMS	DCONWS	LPR	BD	LB	kg
RE MB50-MB16X74-AVI	50.00	16.00	74.00	17.50	65.0	0.51
RE MB50-MB20X93-AVI	50.00	20.00	93.00	21.50	85.0	0.65
RE MB50-MB25X117-AVI	50.00	25.00	117.00	27.00	110.0	0.92
RE MB50-MB32X144-AVI	50.00	32.00	144.00	35.00	138.0	1.47
RE MB50-MB40X176-AVI	50.00	40.00	176.00	47.00	170.0	2.66
RE MB63-MB50X220-AVI	63.00	50.00	220.00	60.00	214.0	5.00
RE MB80-MB63X280-AVI	80.00	63.00	280.00	77.00	272.0	10.40

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

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CHR MB

Coolant Supply Collar for the MB Modular Boring System



Designation	DCONMS	DCONWS	BD	LB	LPR	RPMX ⁽¹⁾	CP ⁽²⁾	
CHR MB63	63.00	63.00	115.00	35.0	63.00	3500	10	3.30

• 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.

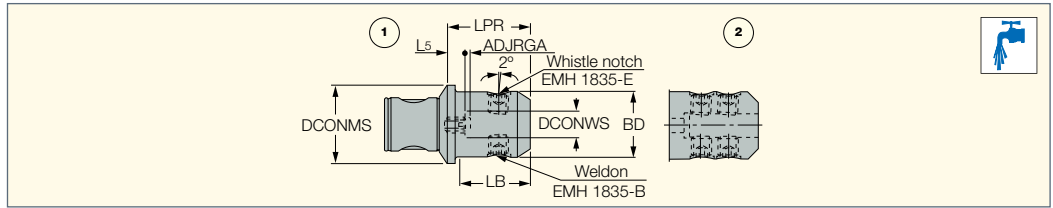
⁽¹⁾ Maximum RPM

⁽²⁾ Coolant pressure (Bar)

ITSBORE

EMH MB

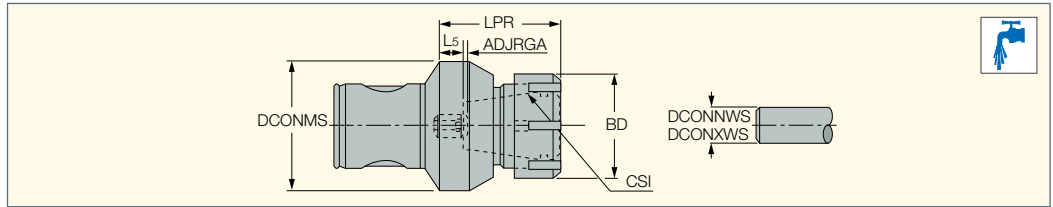
Weldon and Whistle Notch Side-Lock Holders with the MB Modular Boring Connection System



Designation	DCONMS	DCONWS	BD	LB	LPR	L5	ADJRGA	Fig.	
EMH MB50-6	50.00	6.00	25.00	32.5	44.00	7.00	2.0	1.	0.51
EMH MB50-8	50.00	8.00	28.00	33.0	44.00	7.00	2.0	1.	0.54
EMH MB50-10	50.00	10.00	35.00	42.0	52.00	11.00	3.0	1.	0.68
EMH MB50-12	50.00	12.00	42.00	48.0	57.00	11.00	3.0	1.	0.85
EMH MB50-14	50.00	14.00	42.00	48.0	57.00	11.00	3.0	1.	0.84
EMH MB50-16	50.00	16.00	48.00	61.0	67.00	17.00	4.0	1.	1.12
EMH MB50-20	50.00	20.00	51.00	-	67.00	16.00	4.0	1.	1.08
EMH MB50-25	50.00	25.00	63.00	-	80.00	22.00	4.0	2.	1.21
EMH MB63-16	63.00	16.00	48.00	53.0	64.00	14.00	4.0	1.	1.45
EMH MB63-20	63.00	20.00	52.00	56.0	66.00	14.00	4.0	1.	1.55
EMH MB63-25	63.00	25.00	64.00	-	74.00	16.00	4.0	2.	2.11
EMH MB63-32	63.00	32.00	72.00	-	76.00	14.00	4.0	2.	2.42
EMH MB80-40	80.00	40.00	80.00	-	83.00	12.00	4.0	2.	3.21

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

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



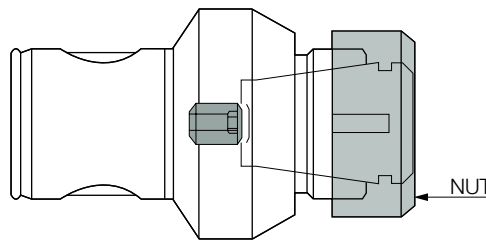
Designation	DCONMS	CSI	DCONNWS ⁽¹⁾	DCONXWS ⁽²⁾	BD	LPR	L5	ADJRG			
CC MB16 ER11M	16.00	ER11	0.5	7.0	16.00	25.00	2.50	2.0	0.05	NUT ER11 MINI	WRENCH ER11 MINI*
CC MB20 ER16M	20.00	ER16	0.5	10.0	22.00	32.00	1.00	2.0	0.05	NUT ER16 MINI	WRENCH ER16 MINI*
CC MB25 ER20M	25.00	ER20	1.0	13.0	28.00	40.00	2.50	2.0	0.14	NUT ER20 MINI	WRENCH ER20 MINI*
CC MB32 ER25M	32.00	ER25	1.0	16.0	35.00	42.00	1.50	2.0	0.23	NUT ER25 MINI	WRENCH ER25 MINI*
CC MB40 ER25	40.00	ER25	1.0	16.0	42.00	45.00	5.00	2.0	0.45	NUT ER25 TOP	WRENCH ER25*
CC MB50 ER25	50.00	ER25	1.0	16.0	42.00	48.00	7.00	2.0	0.67	NUT ER25 TOP	WRENCH ER25*
CC MB50 ER32	50.00	ER32	2.0	20.0	50.00	55.00	7.00	2.0	0.79	NUT ER32 TOP	WRENCH ER32*
CC MB63 ER32	63.00	ER32	2.0	20.0	50.00	59.00	12.00	2.0	1.35	NUT ER32 TOP	WRENCH ER32*
CC MB63 ER40	63.00	ER40	3.0	26.0	63.00	64.00	12.00	2.0	1.55	NUT ER40 TOP	WRENCH ER40*

• For ER collets, see ISCAR Tooling Systems Catalog.

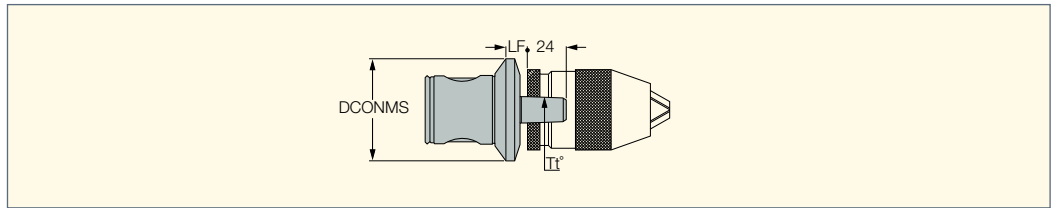
⁽¹⁾ Minimum diameter

⁽²⁾ Maximum diameter

* Optional, should be ordered separately



DC MB
DIN238 DC Drill Chuck
Arbor with the MB Modular
Connection System



Designation	DCONMS	Tt°	LF	
DC MB50 B16	50.00	B16	10.00	0.40
DC MB63 B16	63.00	B16	13.50	0.41

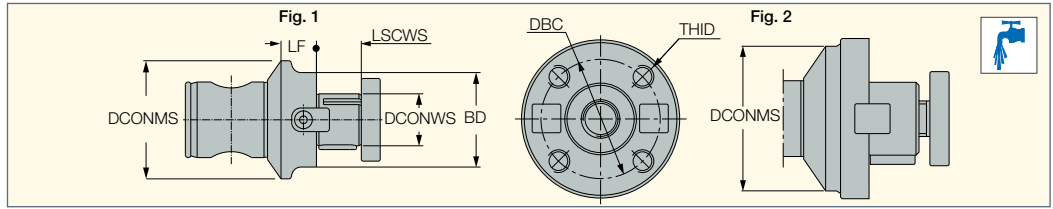
• Without drill chuck.



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SMH MB

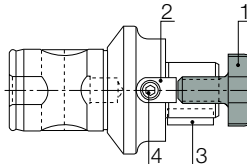
Shell Mill Holders with the MB Modular Boring Connection System







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



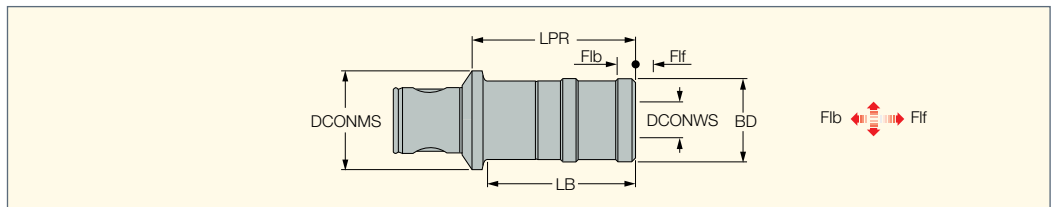
Spare Parts

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

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TP MB-M

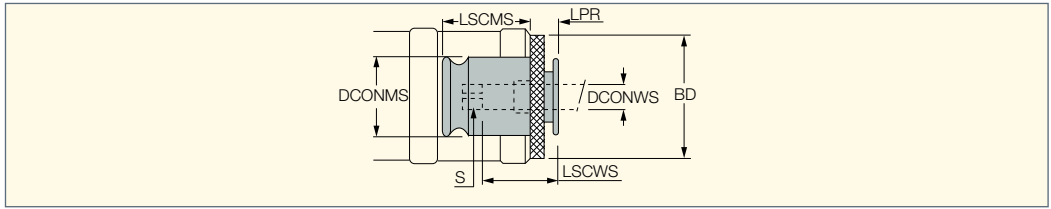
Tapping Chucks with the MB Modular Connection System



Designation	DCONMS	Tap min	Tap max	LB	LPR	BD	DCONWS	F1f	Flb	kg
TP MB50-M 3-12	50.00	M1	M14	65.0	76.00	36.00	19.00	7.5	7.5	0.78
TP MB50-M 8-20	50.00	M4.5	M20	-	106.00	53.00	31.00	12.5	12.5	1.60
TP MB63-M 3-12	63.00	M1	M14	57.2	70.00	36.00	19.00	7.5	7.5	1.14
TP MB63-M 8-20	63.00	M4.5	M20	93.0	104.00	53.00	31.00	12.5	12.5	1.88

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

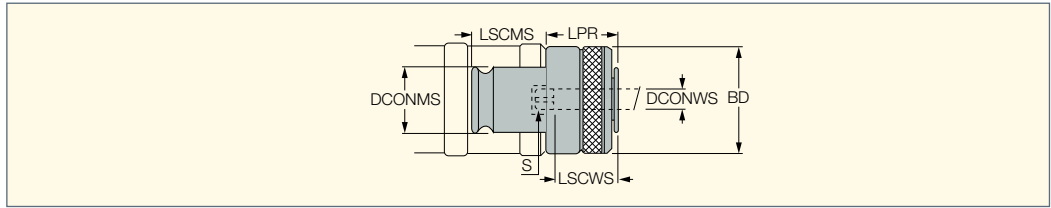
TCS-DIN
Quick Change Tap
Collets for Solid Taps



Designation	DCONWS ⁽¹⁾	S ⁽²⁾	S1 ⁽³⁾	S2 ⁽⁴⁾	BD	DCONMS	LPR	LSCMS	LSCWS	kg
TCS #1 DIN 4-3	4.00	3.00	M4	-	30.00	19.00	7.0	21.50	17.0	0.48
TCS #1 DIN 3.5-2.7	3.50	2.70	M3	M4.5, M5	30.00	19.00	7.0	21.50	17.0	0.01
TCS #1 DIN 4.5-3.4	4.50	3.40	M3.5	M6	30.00	19.00	7.0	21.50	17.0	0.08
TCS #1 DIN 6-4.9	6.00	4.90	M4.5, M6	M8	30.00	19.00	7.0	21.50	17.0	0.08
TCS #1 DIN 8-6.2	8.00	6.20	M8	-	30.00	19.00	7.0	21.50	17.0	0.10
TCS #1 DIN 9-7	9.00	7.00	-	M12	30.00	19.00	7.0	21.50	17.0	0.08
TCS #1 DIN 10-8	10.00	8.00	M10	-	30.00	19.00	7.0	21.50	17.0	0.10
TCS #1 DIN 11-9	11.00	9.00	M14	M14	30.00	19.00	7.0	21.50	17.0	0.48
TCS #2 DIN 8X6.2	8.00	6.20	M8	-	48.00	31.00	11.0	35.00	30.0	0.28
TCS #2 DIN 9X 7	9.00	7.00	-	M12	48.00	31.00	17.0	35.00	30.0	0.28
TCS #2 DIN 10X 8	10.00	8.00	M10	-	48.00	31.00	17.0	35.00	30.0	0.28
TCS #2 DIN 11X 9	11.00	9.00	-	M14	48.00	31.00	17.0	35.00	30.0	0.48
TCS #2 DIN 12X 9	12.00	9.00	-	M16	48.00	31.00	17.0	35.00	30.0	0.27
TCS #2 DIN 14X11	14.00	11.00	-	M18	48.00	31.00	17.0	35.00	30.0	0.25
TCS #2 DIN 16X12	16.00	12.00	-	M20	48.00	31.00	17.0	35.00	30.0	0.24

(1) According to tap shank size.
 (2) Square size.
 (3) Tap size according to DIN371
 (4) Tap size according to DIN376/374

TCC-DIN
Quick Change Tap Collets
with a Safety Clutch



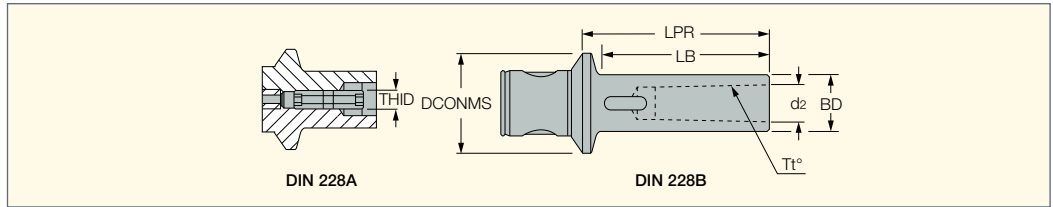
Designation	DCONWS ⁽¹⁾	S ⁽²⁾	S1 ⁽³⁾	S2 ⁽⁴⁾	BD	DCONMS	LPR	LSCMS	LSCWS	kg
TCC #1 DIN 2.8-2.1	2.80	2.10	M2, M2.5	M4	32.00	19.00	25.0	21.50	17.0	0.17
TCC #1 DIN 4-3	4.00	3.00	M3.5	-	32.00	19.00	25.0	21.50	17.0	0.34
TCC #1 DIN 4.5-3.4	4.50	3.40	M4	M6	32.00	19.00	25.0	21.50	17.0	0.17
TCC #1 DIN 6-4.9	6.00	4.90	M4.5, M6	M8	32.00	19.00	25.0	21.50	17.0	0.17
TCC #1 DIN 7-5.5	7.00	5.50	M7	M10	32.00	19.00	25.0	21.50	17.0	0.17
TCC #1 DIN 8-6.2	8.00	6.20	M8	-	32.00	19.00	25.0	21.50	17.0	0.16
TCC #1 DIN 9-7	9.00	7.00	-	M12	32.00	19.00	25.0	21.50	17.0	0.17
TCC #1 DIN 10-8	10.00	8.00	M10	-	32.00	19.00	25.0	21.50	17.0	0.16
TCC #1 DIN 11-9	11.00	9.00	M10	M14	32.00	19.00	25.0	21.50	17.0	0.15
TCC #2 DIN 6X4.9	6.00	4.90	M4.5, M6	M8	50.00	31.00	34.0	35.00	30.0	0.53
TCC #2 DIN 7X5.5	7.00	5.50	M7	M10	50.00	31.00	34.0	35.00	30.0	0.54
TCC #2 DIN 8X6.2	8.00	6.20	M8	-	50.00	31.00	34.0	35.00	30.0	0.53
TCC #2 DIN 9X7	9.00	7.00	M7	M12	50.00	31.00	34.0	35.00	30.0	0.53
TCC #2 DIN 10X8	10.00	8.00	M10	-	50.00	31.00	34.0	35.00	30.0	0.53
TCC #2 DIN 11X9	11.00	9.00	-	M14	50.00	31.00	34.0	35.00	30.0	0.53
TCC #2 DIN 12X9	12.00	9.00	-	M16	50.00	31.00	34.0	35.00	30.0	0.52
TCC #2 DIN 14X11	14.00	11.00	-	M18	50.00	31.00	34.0	35.00	30.0	0.51
TCC #2 DIN 16X12	16.00	12.00	-	M20	50.00	31.00	34.0	35.00	30.0	0.50

(1) According to tap shank size.
 (2) Square size.
 (3) Tap size according to DIN371
 (4) Tap size according to DIN376/374

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AMT MB-MT

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

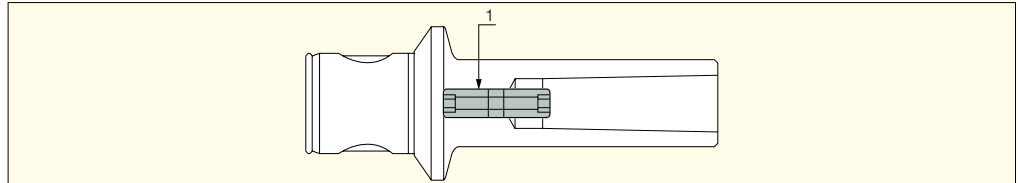


Designation	Tt°	DCONMS	d2	BD	THID	LB	LPR	kg
AMT MB50-MT1	MT1	50.00	12.07	20.00	M6	68.0	80.00	0.52
AMT MB50-MT2	MT2	50.00	17.78	30.00	M10	86.0	100.00	0.78
AMT MB50-MT3	MT3	50.00	23.82	36.00	M12	110.0	120.00	1.02
AMT MB63-MT3	MT3	63.00	23.82	36.00	M12	108.0	120.00	1.40
AMT MB63-MT4	MT4	63.00	31.26	48.00	M16	133.0	150.00	2.20

• 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



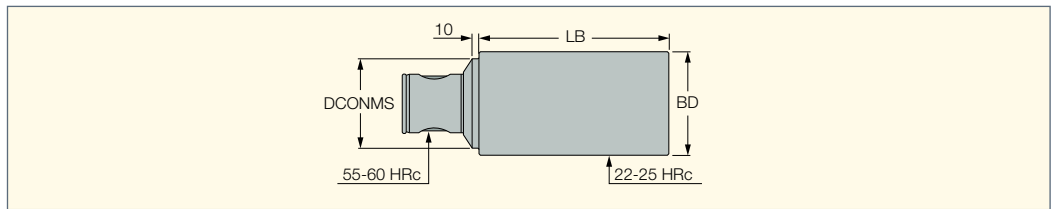
Spare Parts

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

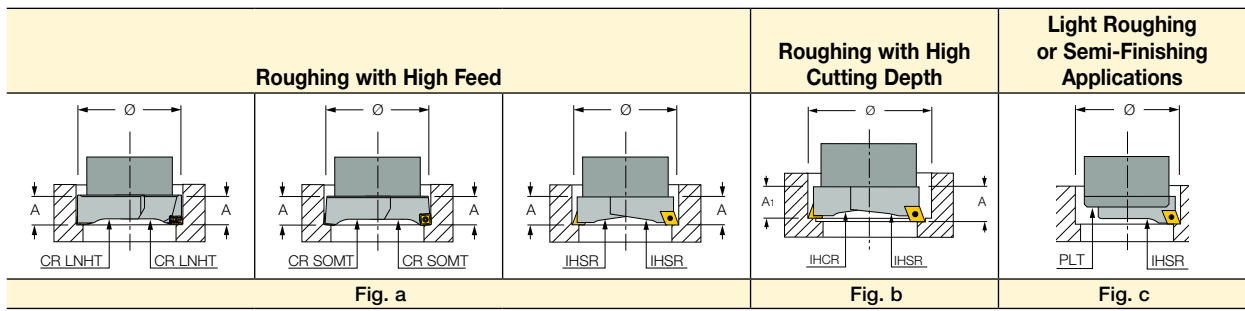


Designation	DCONMS	BD	LB	kg
BLANK MB50-63X160	50.00	63.00	160.00	4.44
BLANK MB63-80X200	63.00	80.00	200.00	8.77
BLANK MB80-100X250	80.00	100.00	250.00	16.62
BLANK MB110-130X250	110.00	130.00	250.00	18.00

• Material: 39NiCrMo3



Rough Boring Options



- 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).

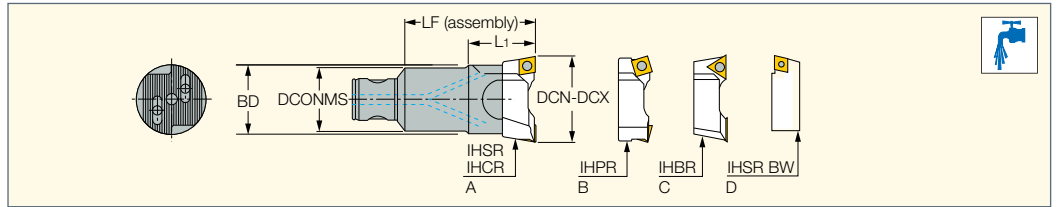


Rough Boring Head Diameter Range

	10	20	30	40	50	60	70	80	90	100	110	120	130	200	300	400	500	600	700	800	900	1000	1100	1200	Assembly Reference	Page
BHR MB16-16x34			18-22																							843
BHR MB20-20x40			22-28																							
BHR MB25-25x50				28-38																						
BHR MB32-32x63					35.5-50																					
BHR MB40-40x80						50-68																				
BHR MB50-50x100							68-90																			
BHR MB50-63x80										90-120																
BHR MB63-63x125											90-120															
BHR MB80-80x140														120-200												
TCH AL200																					200-602					847
TCH AL300																						300-702				
TCH AL400																							400-802			
TCH AL 500																								500-902		
TCH AL 600																									600-1002	
TCH AL 700																									700-1102	
TCH AL 800																									800-1202	

BHR MB

Rough Boring Heads for Diameter Range 18-200 mm







Designation	BD	DCONMS	LF	DCN ⁽¹⁾	DCX ⁽²⁾	L1	IH ⁽³⁾	RPMX ⁽⁴⁾	kg
BHR MB16-16X34	16.00	16.00	34.00	18.0	22.0	-	IH...18-22	12000	0.06
BHR MB20-20X40	20.00	20.00	40.50	22.0	28.0	-	IH...22-28	12000	0.11
BHR MB25-25X50	25.00	25.00	50.00	28.0	38.0	-	IH...28-38	10000	0.18
BHR MB32-32X63	32.00	32.00	63.00	35.5	50.0	-	IH...36-50	10000	0.36
BHR MB40-40X80	40.00	40.00	80.00	50.0	68.0	-	IH...50-68	8000	0.70
BHR MB50-50X100	55.00	50.00	100.00	68.0	90.0	50.0	IH...68-90	8000	1.49
BHR MB50-63X80	72.00	50.00	80.00	90.0	120.0	60.0	IH...90-120	8000	1.50
BHR MB63-63X125	72.00	63.00	125.00	90.0	120.0	63.0	IH...90-120	6000	3.09
BHR MB80-80X140	95.00	80.00	140.00	120.0	200.0	75.0	IH...120-800	5000	5.38

• 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

* Optional, should be ordered separately



BHR MB - Additional Information

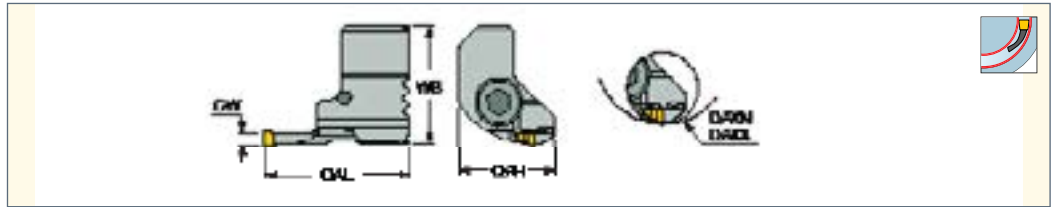


<p>BHR MB16- 16X34 Ø18 ~ .22</p>	<p>MB16 IHSR 18-22</p>	<p>IHSR 20-24 BW</p>	
<p>BHR MB20- 20X40 Ø22 ~ 28</p>	<p>MB20 IHSR 22-28</p>	<p>IHSR 23.5-30BW</p>	
<p>BHR MB25- 25X50 Ø28 ~ 38</p>	<p>MB25 IHSR 28-38 IHCR 28-38</p>	<p>IHSR 29.5-40BW</p>	<p>IHSR 26-38 CH15 IHSR 26-38 CH45 IHSR 26-38 CH30</p>
<p>BHR MB32- 32X63 Ø35.5 ~ 50</p>	<p>MB32 IHSR 36-50 IHPR 36-50 IHSR 36-50-09 IHCR 36-50</p>	<p>IHSR 39-52 BW</p>	<p>IHSR 34.5-49 CH15 IHSR 34.5-49 CH45 IHSR 34.5-49 CH30</p>
<p>BHR MB40- 40X80 Ø50 ~ 68</p>	<p>MB40 IHSR 50-68 IHPR 50-68 IHSR 50-68-12 IHCR 50-68-12</p>	<p>IHSR 51-70 BW</p>	<p>IHSR 46.5-66 CH15 IHSR 46.5-66 CH45 IHSR 46.5-66 CH30</p>
<p>BHR MB50- 50X100 Ø68 ~ 90</p>	<p>MB50 IHSR 68-90 IHCR 68-90 IHPR 68-90</p>	<p>IHSR 69-92 BW</p>	<p>IHSR 65-88 CH15 IHSR 65-88 CH45 IHSR 65-88 CH30</p>
<p>BHR MB50- 63X80 Ø90 ~ 120</p>	<p>MB50 IHSR 90-120 IHCR 90-120 IHPR 90-120 IHBR 90-120</p>		<p>IHSR 91-122 BW</p>
<p>BHR MB63- 63X125 Ø90 ~ 120</p>	<p>MB63 IHSR 90-120 IHCR 90-120 IHPR 90-120 IHBR 90-120</p>		<p>IHSR 91-122 BW</p>
<p>BHR MB80- 80X140 Ø120 ~ 200</p>	<p>MB80 IHSR 120-160 IHBR 120-160 IHCR 120-160 IHPR 120-160</p>		<p>IHSR 121-162 BW</p>
<p>BHR MB80- 80X140 Ø120 ~ 200</p>	<p>MB80 IHSR 160-800 IHCR 160-800 IHPR 160-800 IHBR 160-800 IHSR 160-800-19 IHPR 160-800-19</p>		<p>IHSR 161-802 BW</p>



IHSR-MIFR

Trepanning Cartridges Carrying MINICUT 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	8.0	21.0	1.50	2.20	32.00	23.00	17.50	MI.R 8	SR 14-297	T-8/5
IHSR 19-34 MIFR10	19.0	34.0	2.00	3.00	27.00	22.00	17.80	MI.R 10	SR 34-506	T-9/5

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

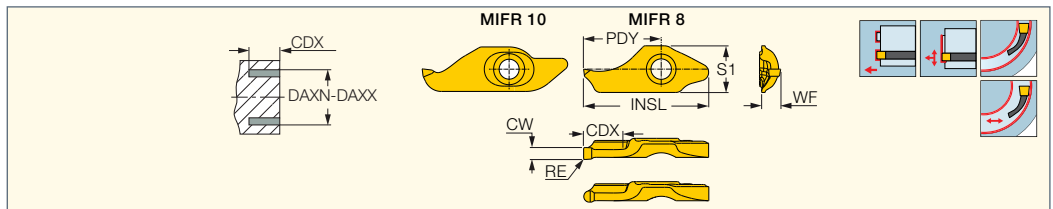
For inserts, see pages: MIFR (406)

For holders, see pages: BHR MB (404)



MIFR

Screw-Clamped Inserts for Internal Face Grooving and Turning



Designation	Dimensions											IC908	Recommended Machining Data	
	INSL	CW	CWTOL ⁽¹⁾	RE	RETOL ⁽²⁾	WF	S1	DAXN ⁽³⁾	DAXX ⁽⁴⁾	CDX	PDY		f face-groove (mm/rev)	f face-turn (mm/rev)
MIFR 8-1.50-0.20	17.70	1.50	0.02	0.20	0.020	2.60	6.5	8.0	11.5	5.50	11.00	●	0.02-0.10	0.02-0.06
MIFR 8-1.60-0.80	17.70	1.60	0.02	0.80	0.020	2.60	6.5	8.0	12.1	5.50	11.00	●	0.02-0.10	0.02-0.06
MIFR 8-2.00-0.20	17.70	2.00	0.02	0.20	0.020	2.80	6.5	8.0	16.0	5.50	11.00	●	0.02-0.10	0.02-0.06
MIFR 8-2.20-0.20	17.70	2.20	0.02	0.20	0.020	2.90	6.5	8.0	21.0	5.50	11.00	●	0.02-0.10	0.02-0.06
MIFR 10-2.00-0.20	25.10	2.00	0.02	0.20	0.020	3.00	7.6	10.0	-	9.00	14.80	●	0.02-0.10	0.02-0.06
MIFR 10-2.00-1.00	25.10	2.00	0.02	1.00	0.020	3.00	7.6	10.0	-	9.00	14.80	●	0.02-0.10	0.02-0.06
MIFR 10-2.50-0.20	25.10	2.50	0.02	0.20	0.020	3.10	7.6	10.0	30.0	9.00	14.80	●	0.02-0.10	0.02-0.06
MIFR 10-2.50-1.25	25.10	2.50	0.02	1.25	0.020	3.30	7.6	10.0	-	9.00	14.80	●	0.02-0.10	0.02-0.06
MIFR 10-3.00-0.20	25.10	3.00	0.02	0.20	0.020	3.40	7.6	10.0	30.0	9.00	14.80	●	0.02-0.10	0.02-0.06
MIFR 10-3.00-1.50	25.10	3.00	0.02	1.50	0.020	3.30	7.6	10.0	34.0	9.00	14.80	●	0.02-0.10	0.02-0.06

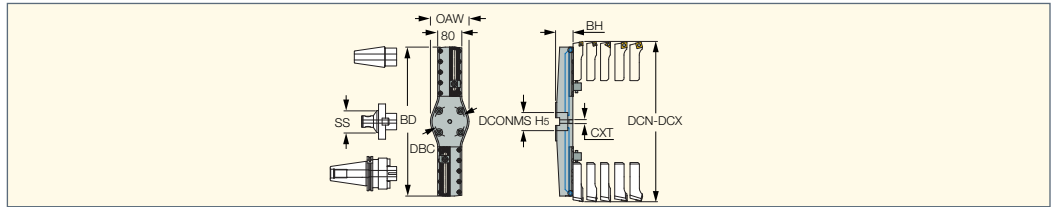
• Recommended cutting speeds and feeds can increased by 20-30% for aluminum, and reduced by 20-30% for titanium and Inconel

- (1) Cutting width tolerance (+/-)
- (2) Corner radius tolerance (+/-)
- (3) Minimum axial grooving diameter
- (4) Maximum axial grooving diameter

For tools, see pages: IHSR-MIFR (406)

TCH AL

Aluminum Twin Cutter Heads for Rough and Fine Boring Operations, Diameter Range 200-1200 mm



Designation	DCN ⁽¹⁾	DCX ⁽²⁾	BD	DCONMS	DBC	SS	OAW	CXT	BH	CSP ⁽³⁾	RPMX ⁽⁴⁾	
TCH AL200	200.0	602.0	194.00	40.00	66.70	80	-	-	54.00	1	700	3.20
TCH AL300	300.0	702.0	288.00	40.00	66.70	80	-	-	54.00	1	400	3.90
TCH AL400	400.0	802.0	394.00	40.00	66.70	80	-	1/4GAS	61.00	0	300	6.90
TCH AL500	500.0	902.0	494.00	60.00	101.60	80,110	128.0	1/4GAS	69.00	0	200	8.70
TCH AL600	600.0	1002.0	594.00	60.00	101.60	80,110	128.0	1/4GAS	71.00	0	200	8.34
TCH AL700	700.0	1102.0	694.00	60.00	101.60	80,110	128.0	1/4GAS	74.00	0	200	8.34
TCH AL800	800.0	1202.0	794.00	60.00	101.60	80,110	128.0	1/4GAS	80.00	0	150	15.20

- Aluminum body, with steel serrated seats
- The "O" position on the counterweight balances the BHF boring head for 200 mm boring diameter position. For every 10 mm 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 436-437, 468

⁽¹⁾ Cutting diameter minimum

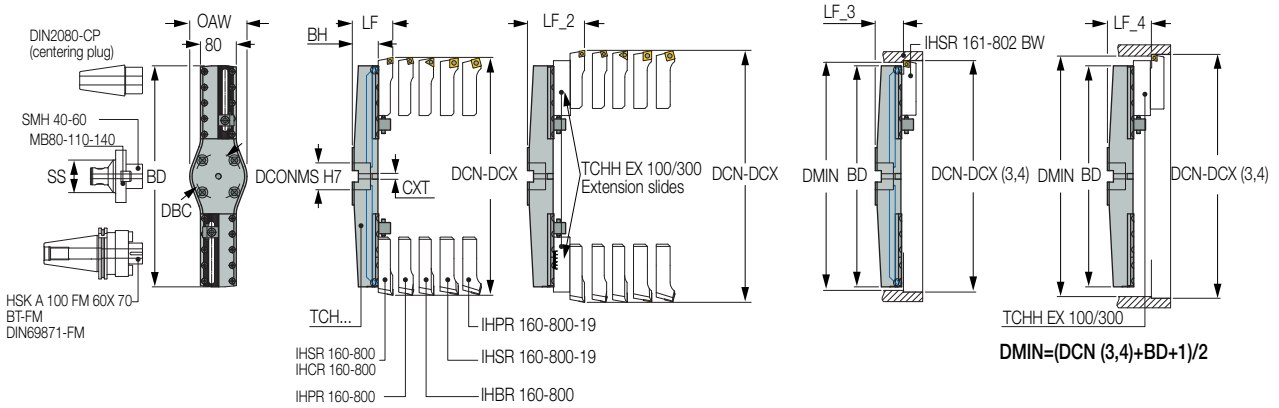
⁽²⁾ Cutting diameter maximum

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

⁽⁴⁾ Maximum RPM

For tools, see pages: IHBR (409) • IHCR (408) • IHPR (408) • IHSR (408) • IHSR-BW (410)

Large Diameter Double Edge Rough Boring Options



$$D_{MIN} = (DCN(3,4) + BD + 1) / 2$$

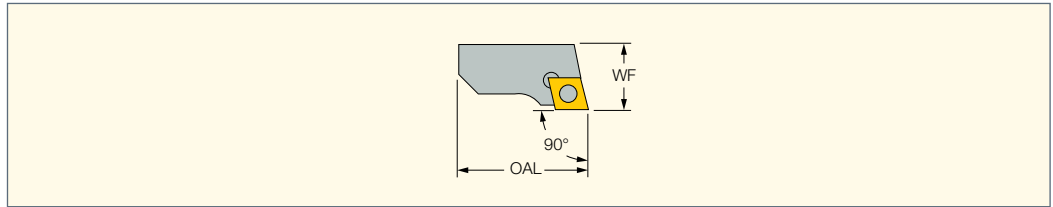
Aluminum Twin Cutter Heads

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	200-300	300-400	400-500	500-600	600-700	700-800	800-900
IH.R 160-800/-19	TCHH EX 100	DCN-DCX	300-400	400-500	500-600	600-700	700-800	800-900	900-1000
IH.R 160-800/-19	TCHH EX 300	DCN-DCX	400-600	500-700	600-800	700-900	800-1000	900-1100	1000-1200
IHSR 161-802 BW		DCN-DCX (3,4)	202-302	302-402	402-502	502-602	602-702	702-802	802-902
IHSR 161-802 BW	TCHH EX 100	DCN-DCX (3,4)	302-402	402-502	502-602	602-702	702-802	802-902	902-1002
IHSR 161-802 BW	TCHH EX 300	DCN-DCX (3,4)	402-602	502-702	602-802	702-902	802-1002	902-1102	1002-1202
IH.R 160-800		LF	86	86	93	101	103	106	112
IH.R 160-800-19		LF	94	94	101	109	111	114	120
IH.R 160-800	TCHH EX 100	LF_2	116	116	123	131	133	136	142
IH.R 160-800	TCHH EX 300	LF_2	126	126	133	141	143	146	152
IH.R 160-800-19	TCHH EX 100	LF_2	124	124	131	139	141	144	150
IH.R 160-800-19	TCHH EX 300	LF_2	134	134	141	149	151	154	160
IHSR 161-802 BW		LF_3	56.5	56.5	63.5	71.5	73.5	76.5	82.5
IHSR 161-802 BW	TCHH EX 100	LF_4	86.5	86.5	93.5	101.5	103.5	106.5	112.5
IHSR 161-802 BW	TCHH EX 300	LF_4	96.5	96.5	103.5	111.5	113.5	116.5	122.5

ITSBORE

IHSR

Rough Boring Tools for Twin Cutters with a Radial and Axial Edge Positioned Inner to the Opposite Finishing Tool



Designation	DCN ⁽¹⁾	DCX ⁽²⁾	WF	OAL	Insert			
IHSR 18-22	18.0	22.0	8.00	15.00	CCMT 0602...	SR 14-548	T-7/5	
IHSR 22-28	22.0	28.0	9.50	19.00	CCMT 0602...	SR 14-548	T-7/5	
IHSR 28-38	28.0	38.0	12.50	23.00	CCMT 0602...	SR 14-548	T-7/5	
IHSR 36-50	35.5	50.0	15.00	32.00	CCMT 0602...	SR 14-548	T-7/5	
IHSR 36-50-09	35.5	50.0	15.00	32.00	CCMT 09T3...	SR 16-236	T-15/5	
IHSR 50-68	50.0	68.0	19.00	40.00	CCMT 09T3...	SR 16-236	T-15/5	
IHSR 50-68-12	50.0	68.0	19.00	40.00	CCMT 1204...	SR 16-212	T-20/5	
IHSR 68-90	68.0	90.0	22.00	54.00	CCMT 1204...	SR 16-212	T-20/5	
IHSR 90-120	90.0	120.0	27.00	70.50	CCMT 1204...	SR 16-212	T-20/5	
IHSR 120-160	120.0	160.0	32.00	94.50	CCMT 1204...	SR 16-212	T-20/5	
IHSR 160-800	160.0	800.0	32.00	130.00	CCMT 1204...	SR 16-212	T-20/5	
IHSR 160-800-19	160.0	800.0	40.00	130.00	CNMG 1906...	SR 10402352		HW 4.0

• For user guide, see pages 403, 471-477

⁽¹⁾ Cutting diameter minimum

⁽²⁾ Cutting diameter maximum

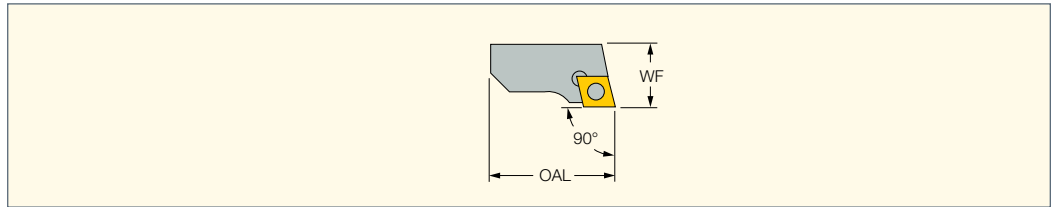
For inserts, see pages: CCET-WF (453) • CCGT-AF (455) • CCGT-AS (455) • CCGW/CCMT (CBN) (454) • CCMT (PCD) (454) • CCMT-14 (453) • CCMT-PF (452) • CCMT-WG (454) • CCMT/CCGT (453) • CCMT/CCGT-SM (452)

For holders, see pages: BHR MB (404) • TCH AL (407) • TCHH EX (438)

ITSBORE

IHCR

Boring Toolholders for the MB Modular Boring System



Designation	DCN ⁽¹⁾	DCX ⁽²⁾	WF	OAL	Insert			
IHCR 28-38	28.0	38.0	12.30	23.00	CCMT 0602...	SR 14-548	T-7/5	
IHCR 36-50	35.5	50.0	14.80	32.00	CCMT 0602...	SR 14-548	T-7/5	
IHCR 36-50-09	36.0	50.0	14.80	32.00	CCMT 09T3...	SR 16-236	T-15/5	
IHCR 50-68	50.0	68.0	18.70	40.00	CCMT 09T3...	SR 16-236	T-15/5	
IHCR 50-68-12	50.0	68.0	18.70	40.00	CCMT 1204...	SR 16-212	T-20/5	
IHCR 68-90	68.0	90.0	21.70	54.00	CCMT 1204...	SR 16-212	T-20/5	
IHCR 90-120	90.0	120.0	26.70	70.50	CCMT 1204...	SR 16-212	T-20/5	
IHCR 120-160	120.0	160.0	31.70	94.50	CCMT 1204...	SR 16-212	T-20/5	
IHCR 160-800	160.0	800.0	31.70	130.00	CCMT 1204...	SR 16-212	T-20/5	

• For user guide, see pages 403, 471-477

⁽¹⁾ Cutting diameter minimum

⁽²⁾ Cutting diameter maximum

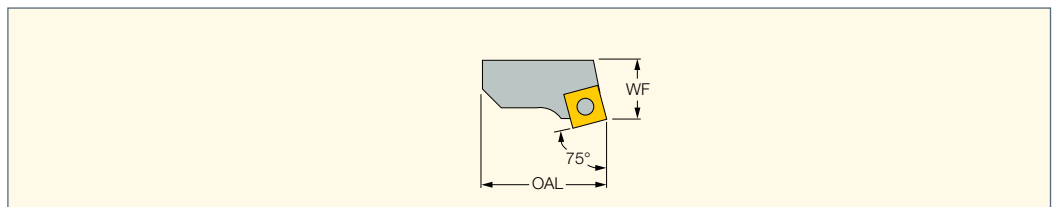
For inserts, see pages: CCET-WF (453) • CCGT-AF (455) • CCGT-AS (455) • CCGW/CCMT (CBN) (454) • CCMT (PCD) (454) • CCMT-14 (453) • CCMT-PF (452) • CCMT-WG (454) • CCMT/CCGT (453) • CCMT/CCGT-SM (452)

For holders, see pages: BHR MB (404) • TCH AL (407) • TCHH EX (438)

ITSBORE

IHPR

75° Rough Boring Toolholders



Designation	DCN ⁽¹⁾	DCX ⁽²⁾	WF	OAL	Insert			
IHPR 36-50	35.5	50.0	15.00	32.00	SCMT 09T3...	SR 16-236	T-15/5	
IHPR 50-68	50.0	68.0	19.00	40.00	SCMT 09T3...	SR 16-236	T-15/5	
IHPR 68-90	68.0	90.0	22.00	53.90	SCMT 1204...	SR 16-212	T-20/5	
IHPR 90-120	90.0	120.0	27.00	70.50	SCMT 1204...	SR 16-212	T-20/5	
IHPR 120-160	120.0	160.0	32.00	94.50	SCMT 1204...	SR 16-212	T-20/5	
IHPR 160-800	160.0	800.0	32.00	130.00	SCMT 1204...	SR 16-212	T-20/5	
IHPR 160-800-19	160.0	800.0	40.00	129.00	SNMG 1906...	SR10402352		HW 4.0

• For user guide, see pages 403, 471-477

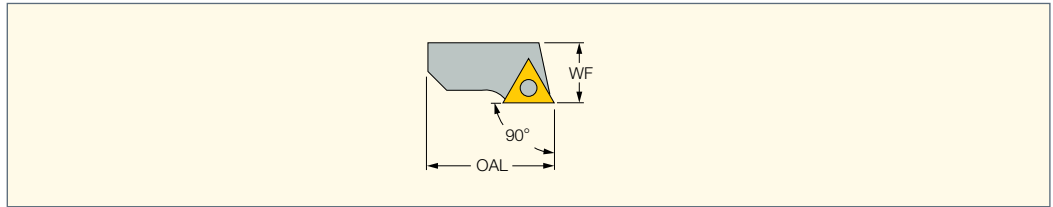
⁽¹⁾ Cutting diameter minimum

⁽²⁾ Cutting diameter maximum

For inserts, see pages: SCGT-AS (458) • SCMT-14 (457) • SCMT-19 (458) • SCMT-SM (457)

For holders, see pages: BHR MB (404) • TCH AL (407) • TCHH EX (438)

IHBR
Rough Boring Toolholders



Designation	DCN ⁽¹⁾	DCX ⁽²⁾	WF	OAL	Insert		
IHBR 90-120	90.0	120.0	27.00	70.50	TCMT 2205...	SR 16-212	T-20/5
IHBR 120-160	120.0	160.0	32.00	94.50	TCMT 2205...	SR 16-212	T-20/5
IHBR 160-800	160.0	800.0	32.00	130.00	TCMT 2205...	SR 16-212	T-20/5

• For user guide, see pages 403, 471-477

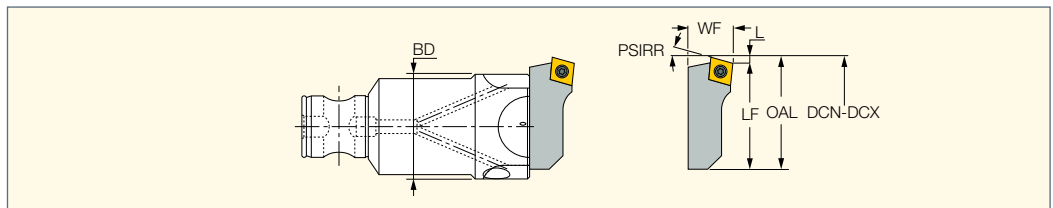
⁽¹⁾ Cutting diameter minimum

⁽²⁾ Cutting diameter maximum

For inserts, see pages: TCMT-19 (458) • TCMT-SM (459)

For holders, see pages: BHR MB (404) • TCH AL (407) • TCHH EX (438)

IHSR-CH
Chamfering Tools for
BHR Boring Heads



Designation	DCN ⁽¹⁾	PSIRR	LF	OAL	WF	L	BD	DCX ⁽²⁾	Insert		
IHSR 26-38 CH15	26.0	15.0	21.40	23.00	12.50	1.60	25.00	38.00	CCMT 0602...	SR 14-548	T-7/5
IHSR 26-38 CH30	26.0	30.0	20.00	23.00	12.50	3.00	25.00	38.00	CCMT 0602...	SR 14-548	T-7/5
IHSR 26-38 CH45	26.0	45.0	18.70	23.00	12.50	4.30	25.00	38.00	CCMT 0602...	SR 14-548	T-7/5
IHSR 34.5-49 CH15	34.5	15.0	29.40	31.00	15.00	1.60	32.00	49.00	CCMT 0602...	SR 14-548	T-7/5
IHSR 34.5-49 CH30	34.5	30.0	28.00	31.00	15.00	3.00	32.00	49.00	CCMT 0602...	SR 14-548	T-7/5
IHSR 34.5-49 CH45	34.5	45.0	26.70	31.00	15.00	4.30	32.00	49.00	CCMT 0602...	SR 14-548	T-7/5
IHSR 46.5-66 CH15	46.5	15.0	36.60	39.00	19.00	2.40	40.00	66.00	CCMT 09T3...	SR 16-236	T-15/5
IHSR 46.5-66 CH30	46.5	30.0	34.40	39.00	19.00	4.60	40.00	66.00	CCMT 09T3...	SR 16-236	T-15/5
IHSR 46.5-66 CH45	46.5	45.0	32.50	39.00	19.00	6.50	40.00	66.00	CCMT 09T3...	SR 16-236	T-15/5
IHSR 65-88 CH15	65.0	15.0	49.80	53.00	22.00	3.20	50.00	88.00	CCMT 1204...	SR 16-212	T-20/5
IHSR 65-88 CH30	65.0	30.0	46.80	53.00	22.00	6.20	50.00	88.00	CCMT 1204...	SR 16-212	T-20/5
IHSR 65-88 CH45	65.0	45.0	44.20	53.00	22.00	8.80	50.00	88.00	CCMT 1204...	SR 16-212	T-20/5

• For user guide, see pages 403,471-477

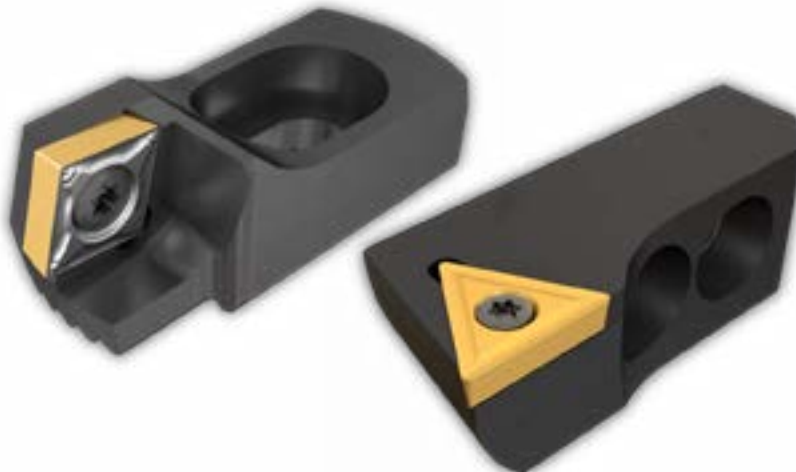
⁽¹⁾ Cutting diameter minimum

⁽²⁾ Cutting diameter maximum

For inserts, see pages: CCET-WF (453) • CCGT-AF (455) • CCGT-AS (455) • CCMT-14 (453) • CCMT-PF (452) • CCMT-WG (454) • CCMT/CCGT (453)

• CCMT/CCGT-SM (452)

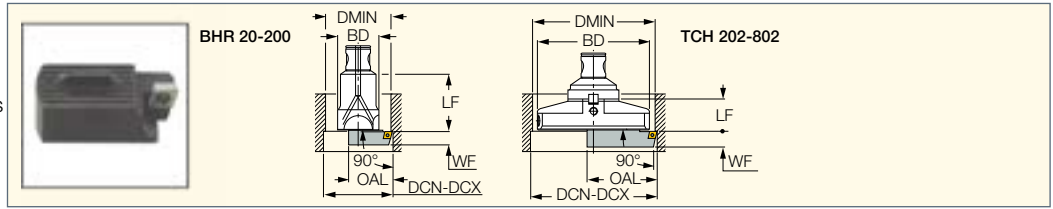
For holders, see pages: BHR MB (404)



ITSBORE

IHSR-BW

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



Designation	SS ⁽¹⁾	BD	DCN ⁽²⁾	LF	DCX ⁽³⁾	WF	OAL	Insert
IHSR 20-24 BW	BHR MB16-16	16.0	20	27.5	24	10	16.00	CCMT 0602...
IHSR 23.5-30BW	BHR MB20-20	20.0	23.5	32.5	30	11	19.50	CCMT 0602...
IHSR 29.5-40BW	BHR MB25-25	25.0	29.5	39.0	40	14.5	24.00	CCMT 0602...
IHSR 39-52 BW	BHR MB32-32	32.0	39	50.0	52	17	32.00	CCMT 09T3...
IHSR 51-70 BW	BHR MB40-40	40.0	51	63.5	70	21	42.00	CCMT 1204...
IHSR 69-92 BW	BHR MB50-50	55.0	69	80.5	92	24.5	57.00	CCMT 1204...
IHSR 91-122 BW	BHR MB63-63	72.0	91	100.5	122	28.5	76.00	CCMT 1204...
IHSR 121-162 BW	BHR MB80-80	95.0	121	110.5	162	31.5	101.00	CCMT 1204...
IHSR 161-802 BW	BHR MB80-80	95.0	161	110.5	202	31.5	122	CCMT 1204...
	TCH AL200	194	202	56.5	302	28	122	CCMT 1204...
	TCH AL300	288	302	56.5	402	28	122	CCMT 1204...
	TCH AL400	394	402	63.5	502	28	122	CCMT 1204...
	TCH AL500	494	502	71.5	602	28	122	CCMT 1204...
	TCH AL600	594	602	73.5	702	28	122	CCMT 1204...
	TCH AL700	694	702	76.5	802	28	122	CCMT 1204...
TCH AL800	794	802	82.5	902	28	122	CCMT 1204...	

• DMIN=(min bore diameter)=(DCN+BD+1)/2 • BD=Size of the boring head being used • For user guide, see pages 403, 471-477

⁽¹⁾ Suitable boring heads



⁽²⁾ Cutting diameter minimum

⁽³⁾ Cutting diameter maximum

For inserts, see pages: CCET-WF (453) • CCGT-AF (455) • CCGT-AS (455) • CCGW/CCMT (CBN) (454) • CCMT (PCD) (454) • CCMT-14 (453) • CCMT-PF (452) • CCMT-WG (454) • CCMT/CCGT (453) • CCMT/CCGT-SM (452)

For holders, see pages: BHR MB (404) • TCH AL (407, 438) • TCHH EX (438)

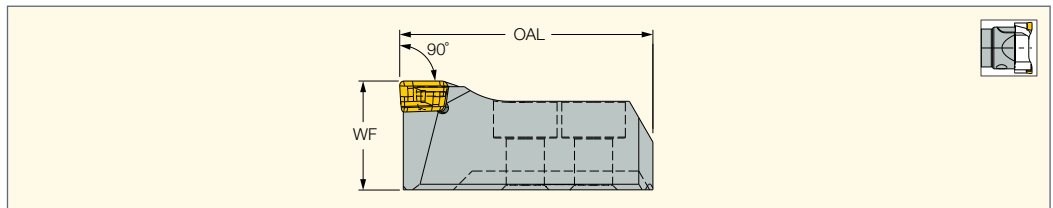
Spare Parts

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 a Tangential Insert for BHR MB50-50X100 Boring Head



Designation	DCN ⁽¹⁾	DCX ⁽²⁾	WF	OAL	MIID ⁽³⁾
CR LNHT10 68-90-CP	68.00	90.00	23.10	53.76	HTP LN.. 1006

• For user guide, see pages 403, 471-477

⁽¹⁾ Cutting diameter minimum

⁽²⁾ Cutting diameter maximum

⁽³⁾ Master insert identification

For inserts, see pages: HTP LN.. 1006 (450)

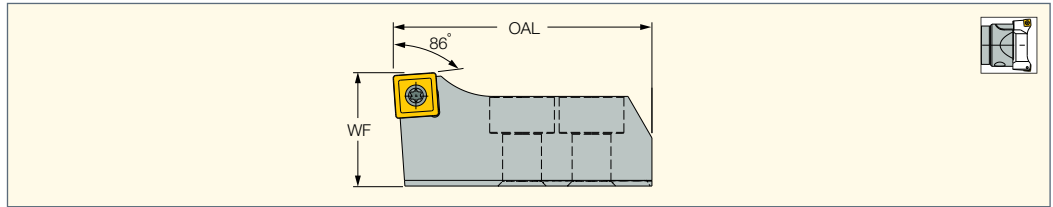
For holders, see pages: BHR MB (404)

Spare Parts

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

CR SOMT

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



Designation	DCN ⁽¹⁾	DCX ⁽²⁾	WF	OAL	MIID ⁽³⁾
CR SOMT09 68-90-CP	68.00	90.00	23.60	54.00	SO.T 09...

• For user guide, see pages 403, 471-477

⁽¹⁾ Cutting diameter minimum




⁽²⁾ Cutting diameter maximum

⁽³⁾ Master insert identification

For inserts, see pages: SOGX/T-AL (115) • SOMT-DT (116) • SOMT-GF (115) • SOMT-HD (116)

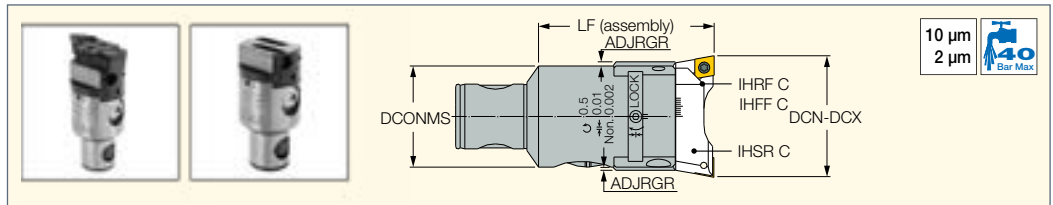
For holders, see pages: BHR MB (404)


Spare Parts

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

BHC MB

Combi Rough and Fine Boring Heads with 10 µm Direct Diameter Adjustment and 2 µm by a Vernier Scale



Designation	DCONMS	LF	DCN ⁽¹⁾	DCX ⁽²⁾	ADJRGR	IH	RPMX ⁽³⁾	
BHC MB25-25-57	25.00	56.50	28.0	36.0	0.50	IH...-C	10000	0.23
BHC MB32-32-71	32.00	71.00	36.0	46.0	0.50	IH...-C	10000	0.45
BHC MB40-40-90	40.00	90.00	46.0	60.0	1.00	IH...-C	8000	0.70
BHC MB50-50-87	50.00	87.00	60.0	75.0	1.00	IH...-C	8000	1.21
BHC MB63-63-109	63.00	109.00	75.0	95.0	2.00	IH...-C	6000	2.70
BHC MB80-80-130	80.00	130.00	95.0	120.0	2.00	IH...-C	5000	4.41

• The roughing head precedes the finishing head by 0.2 mm. Each head can be adjusted independently

• Important: insert radius for combi rough and fine boring must be the same size.

• For spare parts, see page 468

⁽¹⁾ Cutting diameter minimum

⁽²⁾ Cutting diameter maximum

⁽³⁾ Maximum RPM

For tools, see pages: IHFF-C (413) • IHRF-C (413) • IHSR-C (413)

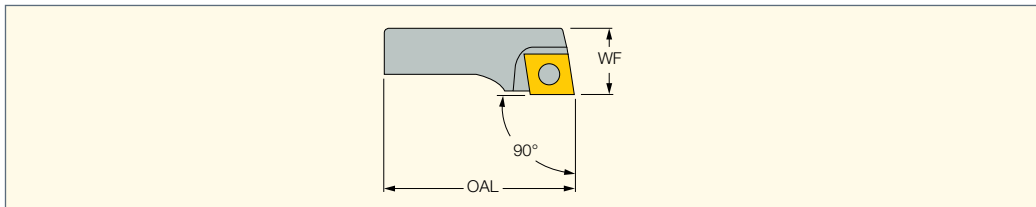
Graduated dial of 0.01 mm with circular vernier of 0.002 mm





ITSBORE

IHRF-C

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



Designation	DCN ⁽¹⁾	DCX ⁽²⁾	WF	OAL	Insert		
IHRF 28-36 C	28.0	36.0	9.80	24.00	CCGT 0602...	SR 14-548	T-7/5
IHRF 36-46 C	36.0	46.0	11.30	30.00	CCGT 0602...	SR 14-548	T-7/5
IHRF 46-60 C	46.0	60.0	13.80	40.00	CCGT 09T3...	SR 16-236	T-15/5
IHRF 60-75 C	60.0	75.0	18.80	54.00	CCGT 09T3...	SR 16-236	T-15/5
IHRF 75-95 C	75.0	95.0	24.30	68.00	CCGT 09T3...	SR 16-236	T-15/5
IHRF 95-120 C	95.0	120.0	29.30	87.00	CCGT 09T3...	SR 16-236	T-15/5

• For user guide, see page 477

⁽¹⁾ Cutting diameter minimum

⁽²⁾ Cutting diameter maximum

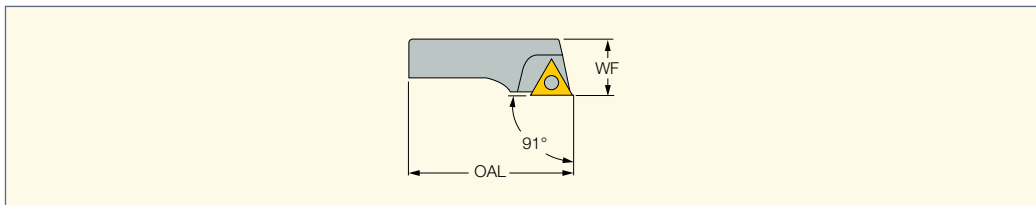
For inserts, see pages: CCGT-AS (455) • CCGW/CCMT (CBN) (454) • CCMT (PCD) (454) • CCMT-14 (453) • CCMT-PF (452) • CCMT-WG (454) • CCMT/CCGT (453) • CCMT/CCGT-SM (452)



For holders, see pages: BHC MB (411)

ITSBORE

IHFF-C

Triangular Finishing Insert Holders
for BHC Combi Boring Heads



Designation	WF	OAL	DCN ⁽¹⁾	DCX ⁽²⁾	Insert		
IHFF 28-36 C	9.80	24.00	28.00	36.00	TPGX 0902...	SR 14-298	T-8/5
IHFF 36-46 C	11.30	30.00	36.00	46.00	TPGX 0902...	SR 14-298	T-8/5
IHFF 46-60 C	13.80	40.00	46.00	60.00	TPGX 1103...	SR-17979 M3X8	T-8/5
IHFF 60-75 C	18.80	54.00	60.00	75.00	TPGX 1103...	SR-17979 M3X8	T-8/5
IHFF 75-95 C	25.30	68.00	75.00	95.00	TPGX 1103...	SR-17979 M3X8	T-8/5
IHFF 95-120 C	29.30	87.00	95.00	120.00	TPGX 1103...	SR-17979 M3X8	T-8/5

• For user guide, see page 477

⁽¹⁾ Cutting diameter minimum

⁽²⁾ Cutting diameter maximum

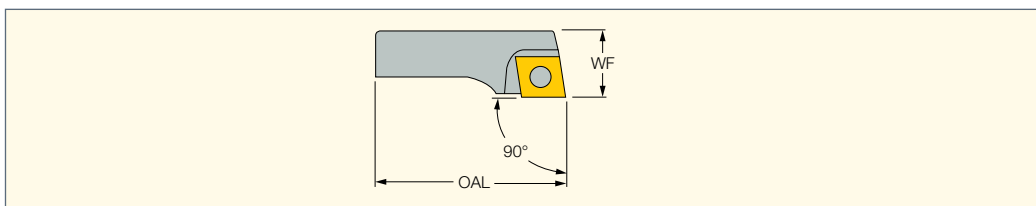
For inserts, see pages: TPGX (459) • TPGX (CBN) (460)



For holders, see pages: BHC MB (411)

ITSBORE

IHSR-C

Rhombic Roughing Insert Holders
for BHC Combi Boring Heads



Designation	DCN ⁽¹⁾	DCX ⁽²⁾	WF	OAL	Insert		
IHSR 28-36 C	28.0	36.0	10.00	24.00	CCMT 0602...	SR 14-548	T-7/5
IHSR 36-46 C	36.0	46.0	11.50	30.00	CCMT 0602...	SR 14-548	T-7/5
IHSR 46-60 C	46.0	60.0	14.00	40.00	CCMT 09T3...	SR 16-236	T-15/5
IHSR 60-75 C	60.0	75.0	19.00	54.00	CCMT 09T3...	SR 16-236	T-15/5
IHSR 75-95 C	75.0	95.0	24.50	68.00	CCMT 09T3...	SR 16-236	T-15/5
IHSR 95-120 C	95.0	120.0	29.50	87.00	CCMT 09T3...	SR 16-236	T-15/5

• For user guide, see page 477

⁽¹⁾ Cutting diameter minimum

⁽²⁾ Cutting diameter maximum

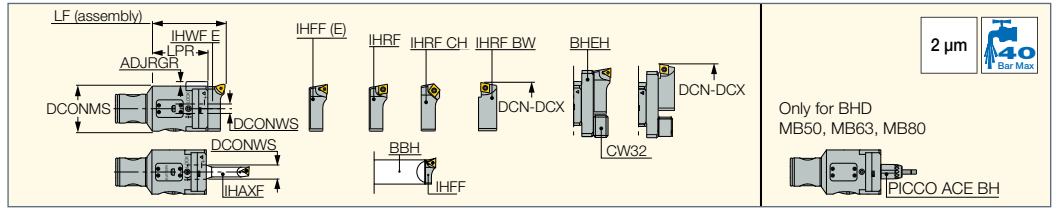
For inserts, see pages: CCET-WF (453) • CCGT-AF (455) • CCGT-AS (455) • CCGW/CCMT (CBN) (454) • CCMT (PCD) (454) • CCMT-14 (453) • CCMT-PF (452) • CCMT-WG (454) • CCMT/CCGT (453) • CCMT/CCGT-SM (452)

For holders, see pages: BHC MB (411)

ITSBORE

BHD MB

Fine Boring Heads with Digital
2 µm Direct Adjustment
Diametric Display



Only for BHD
MB50, MB63, MB80



Designation	LF	DCONMS	DCN ⁽¹⁾	DCX ⁽²⁾	LPR	ADJRGR	DCONWS	RPMX ⁽³⁾	kg
BHD MB32-32-83	83.00	32.00	35.0	51.0	71.5	3.00	-	20000	0.41
BHD MB40-40-90	90.00	40.00	48.0	64.0	76.0	4.00	-	20000	0.73
BHD MB50-50-60	80.00	50.00	2.5	110.0	61.0	5.00	16.00	20000	1.10
BHD MB63-63-89	88.50	63.00	6.0	125.0	69.5	5.00	16.00	20000	2.20
BHD MB80-80-104	104.00	80.00	6.0	200.0	84.5	5.00	16.00	20000	3.90

- For spare parts, see pages 435-436
- Note that a protruding reset button dictates the enlargement of the actual DCONMS by 2 mm 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 (432) • IHAXF-AVI (434) • IHAXF-E (434) • IHHF (436) • IHRF (436) • IHRF-BW (439) • IHRF-CH (439) • IHWFE (436)

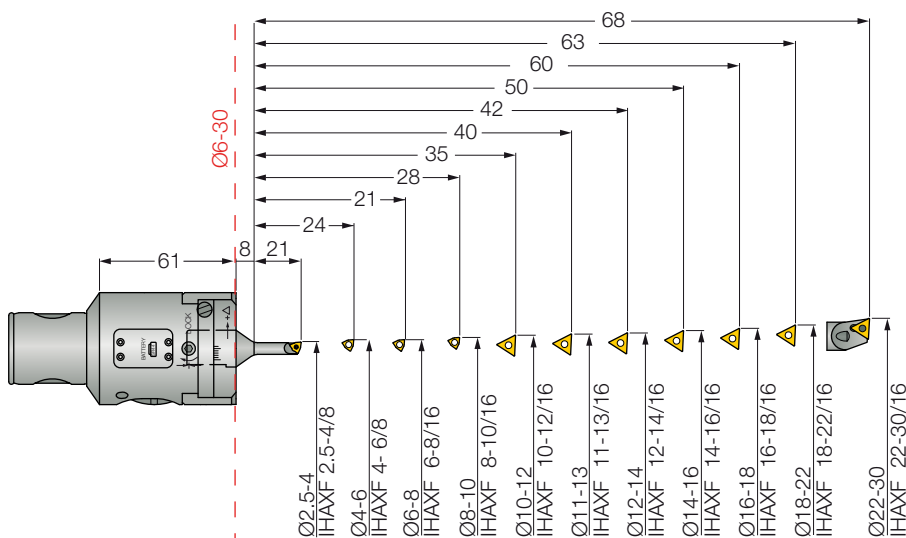


Fine Boring Head Range 2 µm Direct Diametric Adjustment

BHD MB50-50X60 ø2.5-110



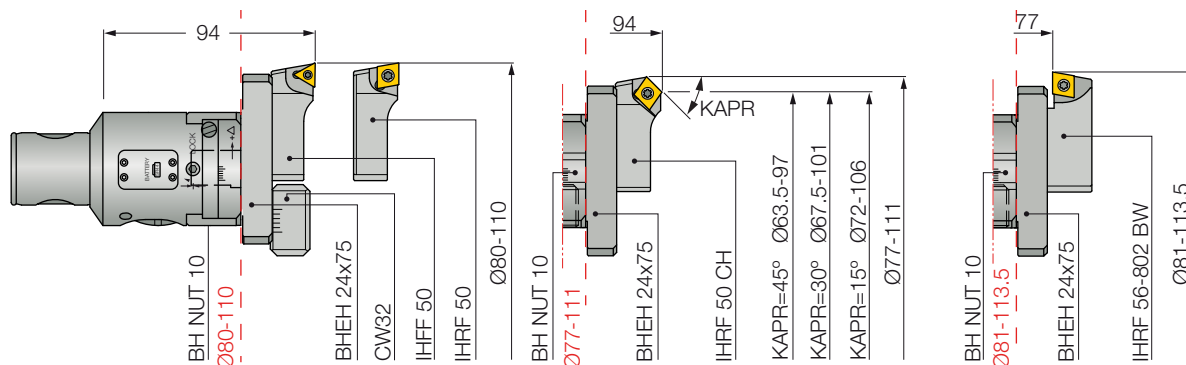
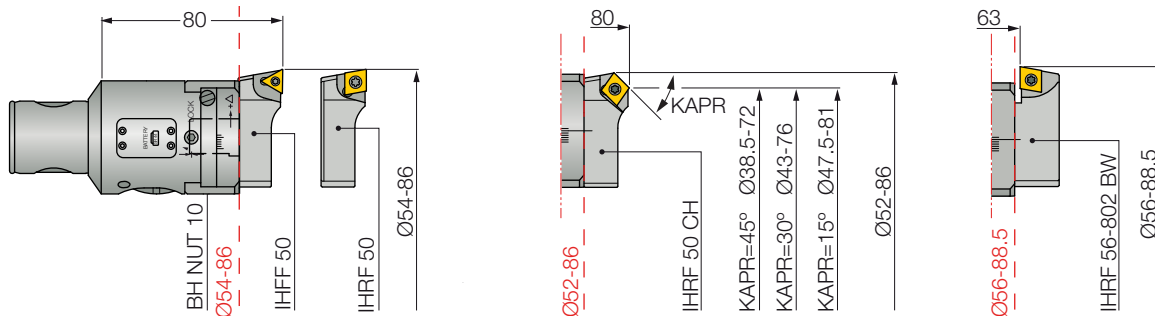
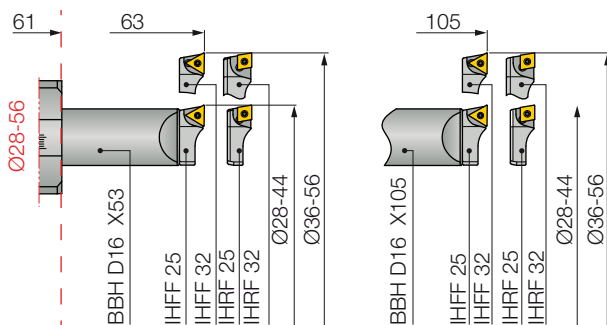
2 µm



SLEEVE D8-D16



REQUIRED FOR IHAXF.../8

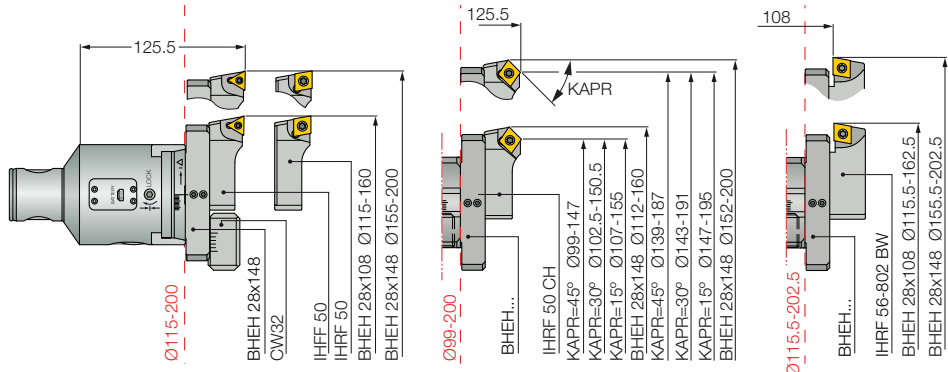
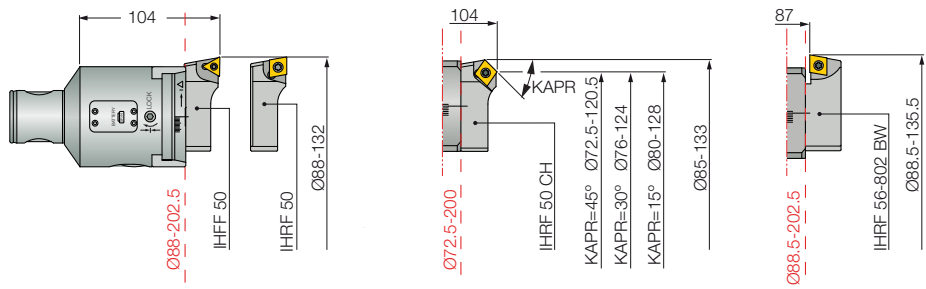
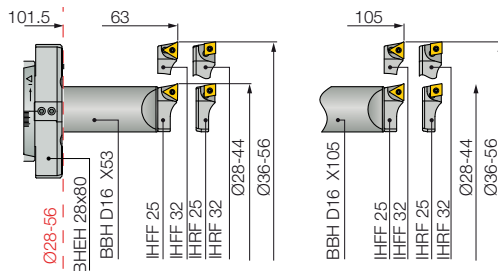
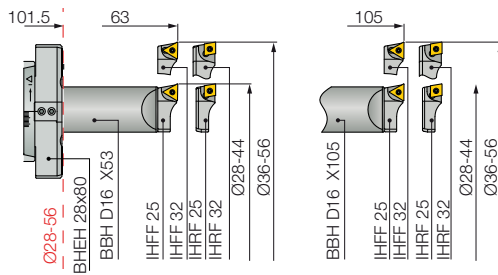
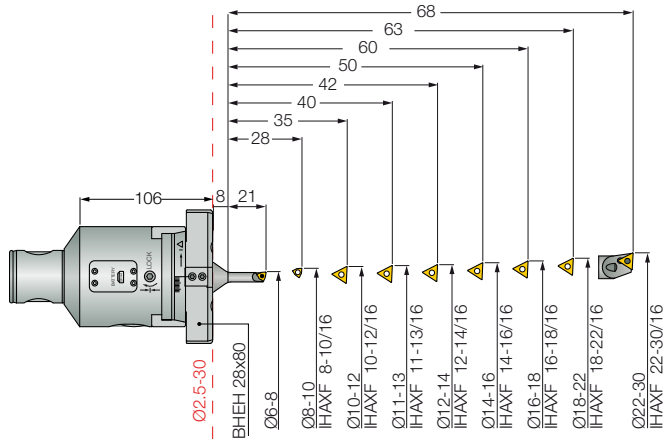


Fine Boring Head Range 2 µm Direct Diametric Adjustment

BHD MB63-63X89 Ø6-125



2 µm

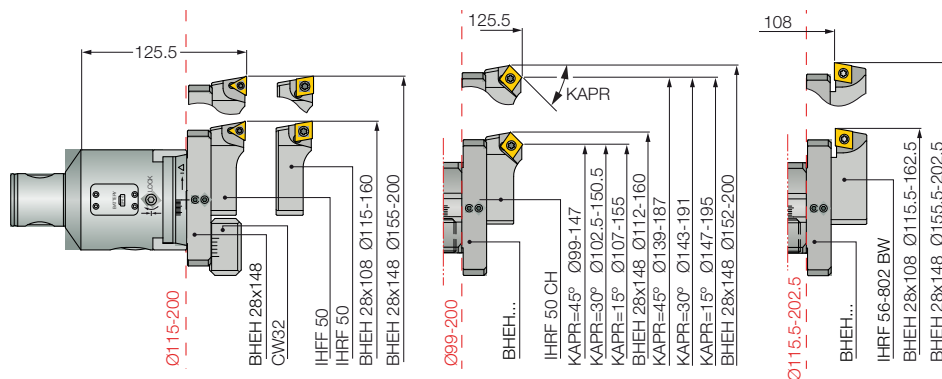
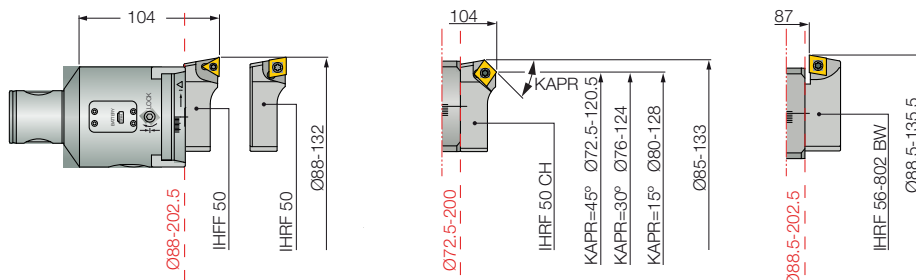
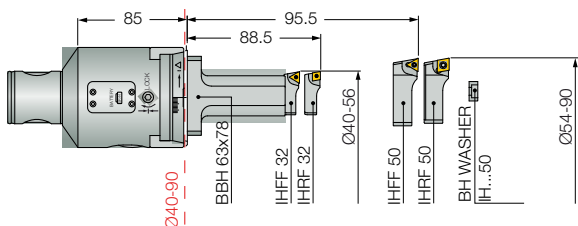
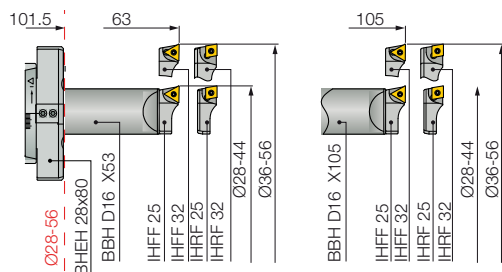
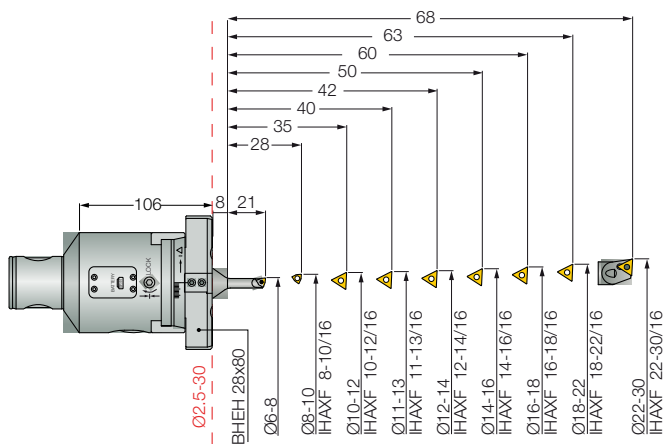


Fine Boring Head Range 2 µm Direct Diametric Adjustment

BHD MB80-80X104 ø6-200



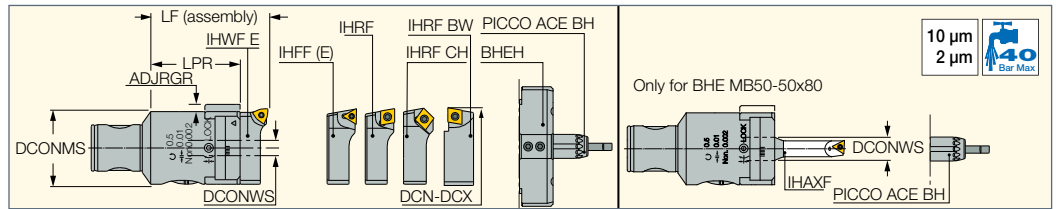
2 µm



ITSBORE

BHE MB

Fine Boring Heads with the MB Connection, 10 µm Direct Diametric Adjustment and 2 µm by a Vernier Scale



Designation	DCONMS	LF	DCN ⁽¹⁾	DCX ⁽²⁾	LPR	ADJRGR	DCONWS	kg
BHE MB14-14-30	14.00	30.00	14.5	18.0	22.0	1.00	-	0.05
BHE MB16-16-34	16.00	34.00	18.0	24.0	26.0	2.00	-	0.08
BHE MB20-20-40	20.00	40.00	22.0	30.0	31.5	3.00	-	0.05
BHE MB25-25-50	25.00	50.00	28.0	40.0	40.0	3.00	-	0.20
BHE MB32-32-63	32.00	63.00	35.0	53.0	51.5	4.00	-	0.41
BHE MB40-40-80	40.00	80.00	48.0	66.0	66.0	5.00	-	0.79
BHE MB50-50-80	50.00	80.00	2.5	110.0	61.0	5.00	16.00	1.04
BHE MB63-63-89	63.00	89.00	6.0	125.0	69.5	10.00	-	1.00
BHE MB80-80-104	80.00	104.00	6.0	200.0	84.5	12.00	-	3.84

• For boring options, see pages 388, 419-422 • For spare parts, see pages 435-436, 467

⁽¹⁾ Cutting diameter minimum

⁽²⁾ Cutting diameter maximum

For tools, see pages: IHAXF (432) • IHAXF-AVI (434) • IHAXF-E (434) • IHFF (436) • IHRF (436) • IHRF-BW (439) • IHRF-CH (439) • IHWF (436)

Boring Head Diameter Range

	10	20	30	40	50	60	70	80	90	100	120	130	140	150	160	170	180	190	200	
BHE MB32-35-53 H			2.5~	18																
BHE MB50-50-60 H			2.5	~22																
BHE MB14-14-30			14.5~	18																
BHE MB16-16-34			18	~24																
BHE MB20-20-40			22~	30																
BHE MB25-25-50			28~	40																
BHE MB32-32-63				35	~53															
BHE MB40-40-80					48	~66														
BHE MB50-50-80											2.5~110									
BHE MB63-63-89												6~	125							
BHE MB80-80-104																				6~200
BHC MB25-25-57			28	~36																
BHC MB32-32-71				36	~46															
BHC MB40-40-90					46~	60														
BHC MB50-50-86						60	~75													
BHC MB63-63-108							75	~95												
BHC MB80-80-129												95~	120							

BHE MB50-50-80

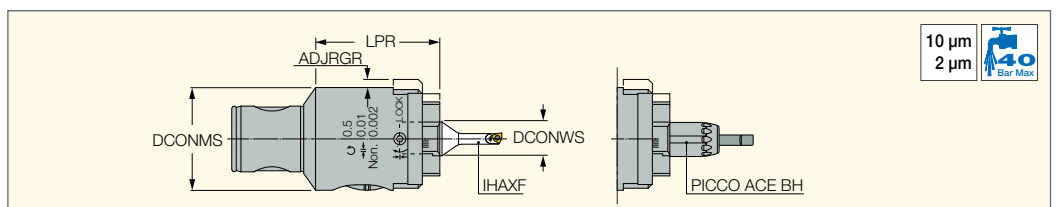


Graduated dial of 0.01 mm with circular vernier of 0.002 mm

ITSBORE

BHE MB-H

Fine Boring Heads for High Rotation Speed with a 10 Micrometer Direct Dia. Adjustment and 2 Micrometer by a Vernier Scale



Designation	DCONMS	LPR	DCN ⁽¹⁾	DCX ⁽²⁾	DCONWS	ADJRGR	RPMX ⁽³⁾	kg
BHE MB32-32-53 H	32.00	53.00	2.5	18.0	8.00	0.50	10000	0.35
BHE MB50-50-60 H	50.00	60.00	2.5	22.0	16.00	1.00	8000	1.00

• For spare parts, see pages 435-436, 467

⁽¹⁾ Cutting diameter minimum

⁽²⁾ Cutting diameter maximum

⁽³⁾ Maximum RPM

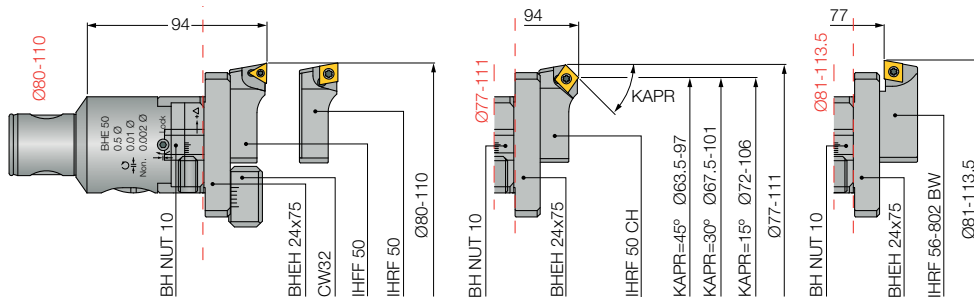
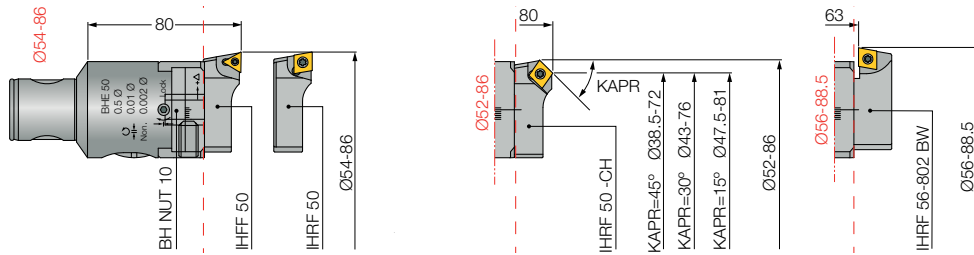
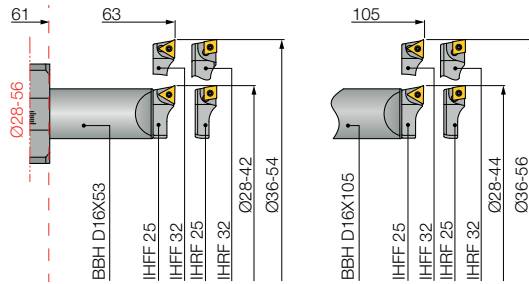
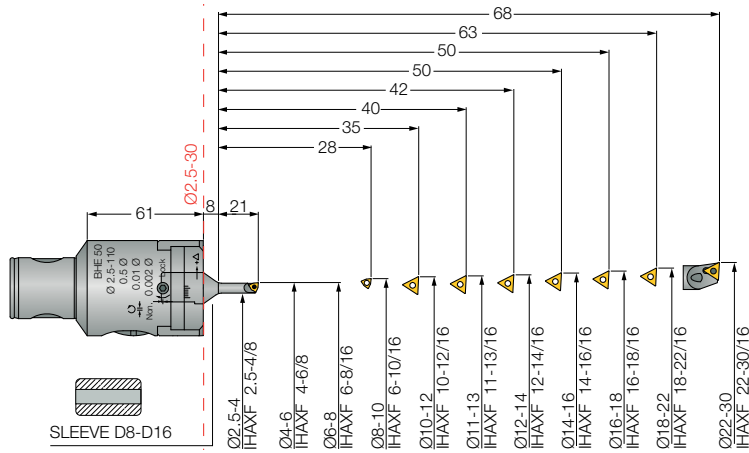
For tools, see pages: IHAXF (432) • IHAXF-AVI (434) • IHAXF-E (434)

Fine Boring Head Range

10 µm Direct Diametric Adjustment and 2 µm by a Vernier Scale

BHE MB50-50x80 ø2.5-113.5

2 µm
10 µm



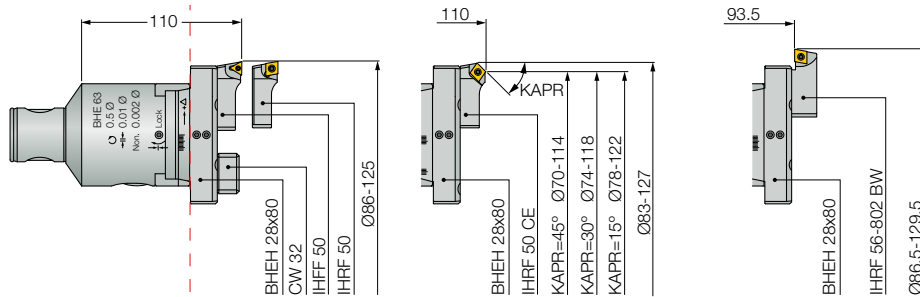
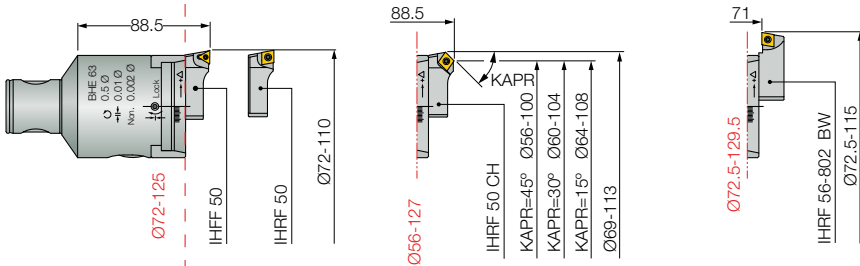
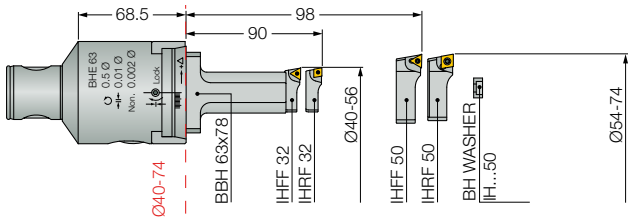
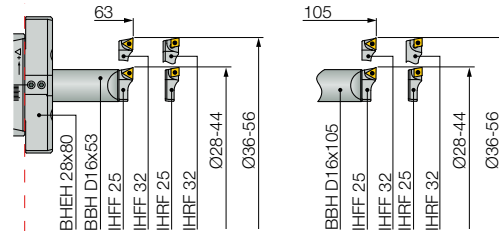
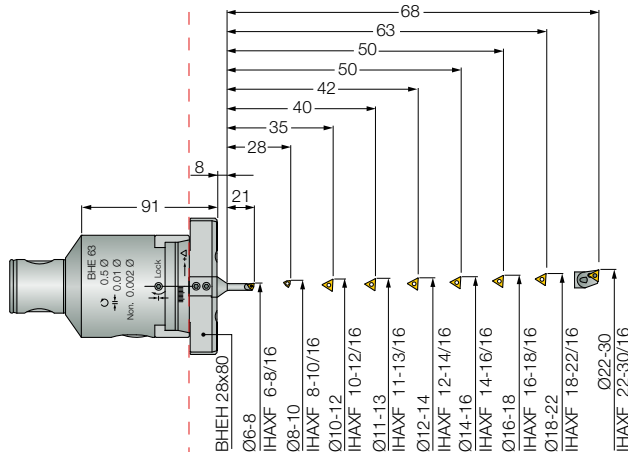
⚠ See page 481

Fine Boring Head Range

10 µm Direct Diametric Adjustment and 2 µm by a Vernier Scale

BHE MB63-63x89 Ø6-129.5

2 µm
10 µm



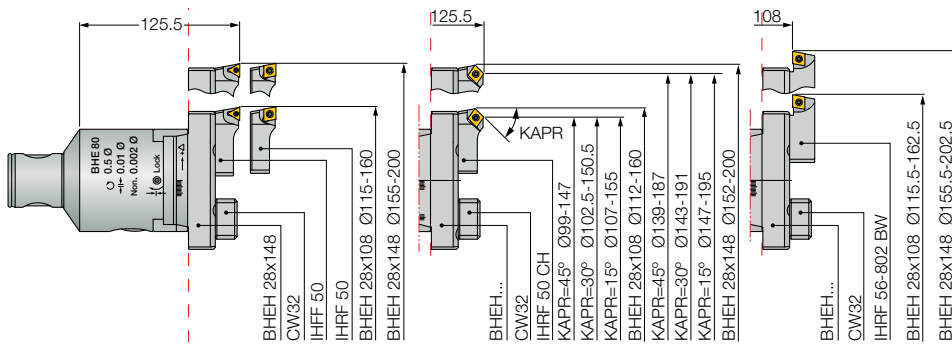
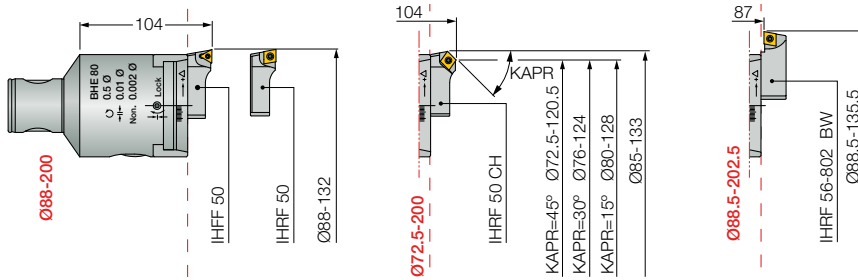
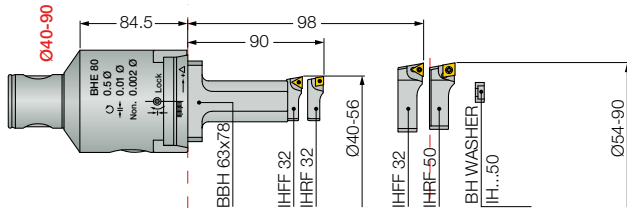
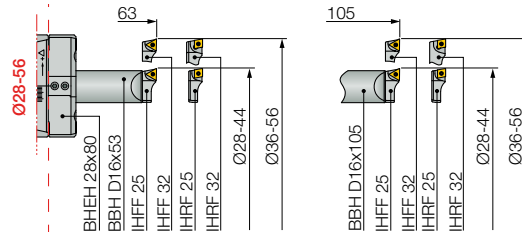
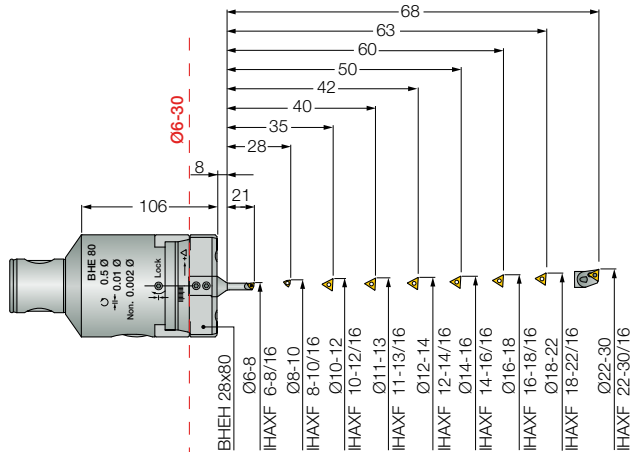
⚠ See page 482

Fine Boring Head Range

10 µm Direct Diametric Adjustment and 2 µm by a Vernier Scale

BHE MB80-80x104 ø6-202.5

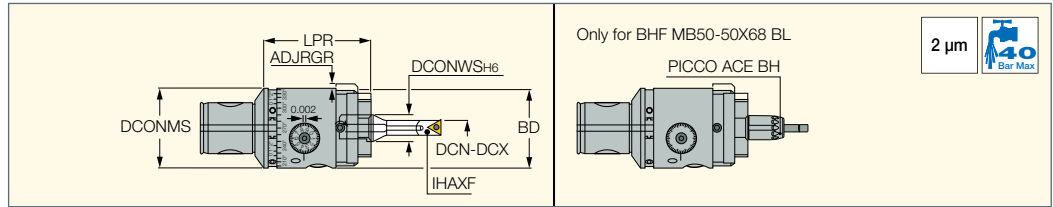
2 µm
10 µm



⚠ See page 482

BHF MB-BL

Fine Boring Heads with a Balancing Mechanism and a 2 Micrometer Direct Diametric Adjustment



Designation	DCONMS	BD	LPR	DCN ⁽¹⁾	DCX ⁽²⁾	DCONWS	ADJRGR	RPMX ⁽³⁾	kg
BHF MB50-32X60 BL	50.00	32.00	60.00	2.5	12.0	8.00	3.00	20000	0.80
BHF MB50-50X68 BL	50.00	50.00	68.50	6.0	22.0	16.00	4.00	20000	1.12

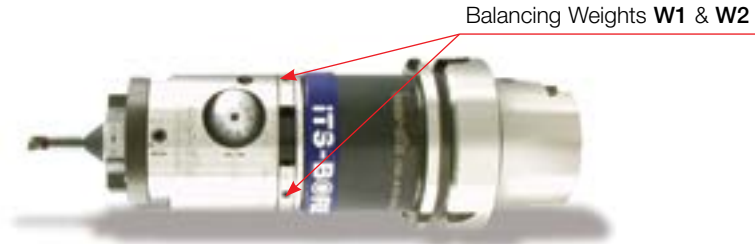
• For boring options, see page 427 • For spare parts, see page 466 • For cutting conditions, see page 477

⁽¹⁾ Cutting diameter minimum

⁽²⁾ Cutting diameter maximum

⁽³⁾ Maximum RPM

For tools, see pages: IHAXF (432)



BHF MB50-32X60 BL and BHF 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 2.5-22 mm diameters.

Balance Correction for BHF MB50-32x60BL

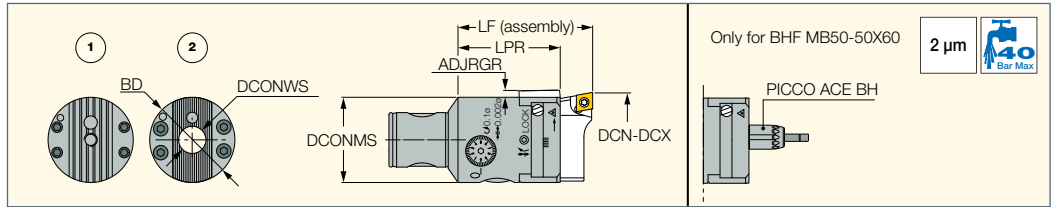
TOOLS	Ø BORE	SKB 40-MB50		BTB 40 MB50		HSK 63 MB50	
		W ₁	W ₂	W ₁	W ₂	W ₁	W ₂
IHAXF 2.5-4/8	2.5	66°	283°	54°	292°	60°	257°
	3	76°	283°	56°	284°	8°	196°
	3.5	83°	360°	44°	246°	107°	261°
	4	116°	285°	30°	224°	128°	264°
IHAXF 4-6/8	4	71°	293°	50°	294°	63°	262°
	4.5	75°	287°	55°	287°	6°	194°
	5.5	4°	238°	44°	248°	129°	287°
	5.5	126°	298°	32°	229°	129°	268°
IHAXF 6-8/8	6	123°	264°	145°	301°	136°	254°
	6.6	2°	302°	45°	307°	68°	280°
	6.5	75°	288°	56°	288°	78°	274°
	7.7	5°	280°	55°	280°	179°	351°
IHAXF 8-10/8	7.5	16°	199°	78°	295°	129°	284°
	8	121°	292°	18°	214°	128°	275°
	8	70°	295°	49°	297°	88°	300°
	8.5	75°	280°	55°	281°	51°	245°
IHAXF 10-12/8	9	67°	255°	49°	258°	160°	330°
	9.5	131°	302°	19°	216°	112°	273°
	10	119°	272°	167°	320°	129°	266°
	10	65°	293°	46°	293°	56°	257°
IHAXF 10-12/8	10.5	66°	273°	29°	262°	182°	351°
	11	44°	234°	45°	255°	163°	317°
	11.5	130°	295°	16°	214°	131°	270°
	12	127°	275°	156°	312°	138°	259°

Balancing Data for Various BHF...MB...BL Boring Combinations (continued)

Balance Correction for BHF MB50-50x68 BL							
TOOLS	Ø BORE	SKB 40-MB50		BTB 40 MB50		HSK 63 MB50	
		W ₁	W ₂	W ₁	W ₂	W ₁	W ₂
IHAXF 6- 8/16	6.0	43°	315°	46°	346°	46°	346°
	6.5	63°	326°	44°	326°	59°	336°
	7	82°	305°	67°	304°	93°	323°
	7.5	30°	205°	62°	255°	5.5°	163°
IHAXF 8-10/16	8	124°	242°	126°	258°	92°	219°
	8	42°	312°	36°	336°	48°	348°
	8.5	52°	328°	39°	339°	75°	330°
	9	68°	318°	51°	317°	112°	331°
IHAXF 10-12/16	9.5	104°	283°	73°	268°	56°	212°
	10	110°	270°	15°	200°	113°	222°
	10	35°	336°	30°	330°	44°	344°
	10.5	44°	321°	32°	332°	45°	345°
IHAXF 12-14/16	11	56°	307°	35°	312°	71°	325°
	11.5	153°	328°	21°	223°	327°	121°
	12	139°	297°	171°	333°	84°	234°
	12	30°	330°	26°	326°	40°	340°
IHAXF 14-16/16	12.5	32°	332°	28°	328°	48°	334°
	13	64°	281°	40°	280°	80°	304°
	13.5	38°	236°	42°	261°	38°	208°
	14	138°	253°	177°	300°	114°	236°
IHAXF 16-18/16	14	22°	324°	18°	318°	39°	339°
	14.5	30°	330°	16°	316°	57°	357°
	15	37°	257°	22°	266°	54°	302°
	15.5	184°	340°	35°	270°	130°	297°
IHAXF 18-22/16	16	160°	253°	172°	277°	138°	251°
	16	26°	326°	24°	324°	58°	358°
	16.5	36°	303°	14°	313°	37°	319°
	17	37°	276°	27°	292°	56°	272°
IHAXF 18-22/16	17.5	151°	287°	187°	324°	128°	288°
	18	160°	279°	189°	304°	140°	243°
	18	10°	310°	6°	305°	28°	328°
	18.5	29°	328°	0°	300°	17°	313°
	19	200°	317°	230°	332°	26°	259°
	19.5	190°	295°	208°	307°	169°	303°
	20	180°	242°	188°	249°	174°	234°
	20.5	179°	240°	186°	247°	168°	228°
21	176°	236°	174°	236°	169°	229°	
21.5	190°	252°	141°	202°	170°	230°	
22	180°	240°	170°	230°	176°	236°	

BHF MB16-MB50
Dia. 2.5-108

Fine Boring Heads with a 2 µm Direct Diametric Adjustment for a Diameter Range of 2.5 up to 108 mm



Designation	DCONMS	BD	LF	LPR	ADJRGR	DCN ⁽¹⁾	DCX ⁽²⁾	DCONWS	Fig.	IH	RPMX ⁽³⁾	kg		
BHF MB16-16X34 RV	16.00	16.00	34.0	26.00	1.00	18.0	23.0	-	1.	IH.. 16..	12000	0.11	BH LOCK NUT 14/16	BH LOCK SR 14/16
BHF MB20-20X40 RV	20.00	20.00	40.0	32.60	2.00	22.0	29.0	-	1.	IH.. 20..	12000	0.14	BH LOCK NUT 20	BH LOCK SR 20
BHF MB25-25X50	25.00	25.00	50.0	40.00	2.00	28.0	38.0	-	1.	IH.. 25..	10000	0.21	BH LOCK NUT 25	BH LOCK SR 25
BHF MB32-32X63	32.00	32.00	63.0	51.50	3.00	35.5	50.0	-	1.	IH.. 32..	10000	0.43	BH LOCK NUT 32	BH LOCK SR 32
BHF MB40-40X80	40.00	40.00	80.0	66.00	4.00	48.0	63.0	-	1.	IH.. 40..	8000	0.79	BH LOCK NUT 40	BH LOCK SR 40
BHF MB50-50X60	50.00	50.00	79.0	60.00	4.00	2.5	108.0	16.00	2.	IH.. 50..	8000	1.09	BH NUT 10	BH LOCK SR 50

• For user guide, see pages 428, 481 • For spare parts, see page 466

⁽¹⁾ Cutting diameter minimum

⁽²⁾ Cutting diameter maximum

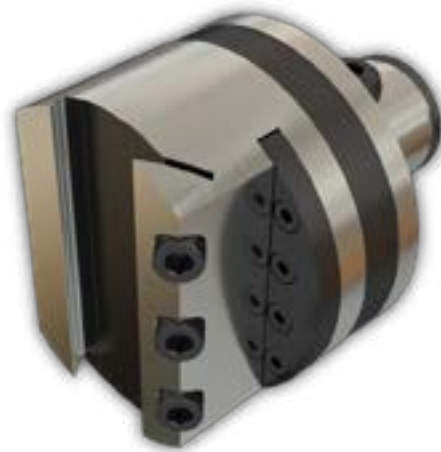
⁽³⁾ Maximum RPM

For tools, see pages: IHAXF (432) • IHAXF-AVI (434) • IHAXF-E (434) • IHFF (436) • IHRF (436) • IHRF-BW (439) • IHRF-CH (439)

Fine Boring Head Diameter Range

Assembly Reference

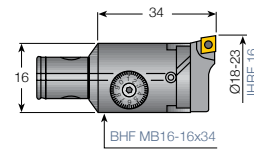
	0	10	20	30	40	50	60	70	80	90	100	110	120	130	150	180	280	400	600	700	800	1200	Page				
BHF MB16-16x34				18-23																				864			
BHF MB20-20x40				22-29																					862		
BHF MB25-25x50					28-38																					864	
BHF MB32-32x63						35.5-50																					871
BHF MB40-40x80							48-63																				
BHF MB50-32x60 BL			2.5-12																					862			
BHF MB50-50x68 BL				6-22																					864		
BHF MB50-50x60											2.5-108												871				
BHF MB50-63x87																2.5-160										876	
BHF MB50-80x94																	2.5-220										871
BHF MB80-80x94																	2.5-220							876			
BHF MB80-125x114																					36-500				876		
TCH AL 200																					200-602		876				
TCH AL 300																						300-702				876	
TCH AL 400																						400-802					876
TCH AL 500																	500-902							876			
TCH AL 600																	600-1002								876		
TCH AL 700																	700-1102						876				
TCH AL 800																	800-1202									876	



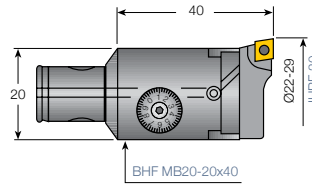
BHF Fine Boring Heads high precision machining to a close tolerance with high surface quality. These heads enable a fine diametric adjustment as small as 2 μm with a direct reading.

BHF MB16-MB40 Diameter Range: 18-63

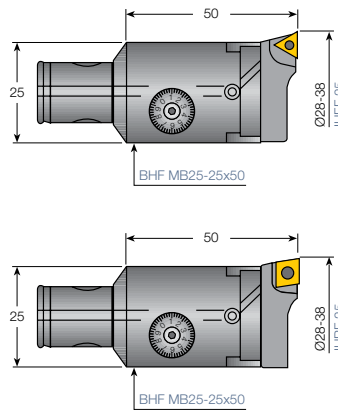
ø18-23
BHF MB16-16X34 RV



ø22-29
BHF MB20-20X40 RV

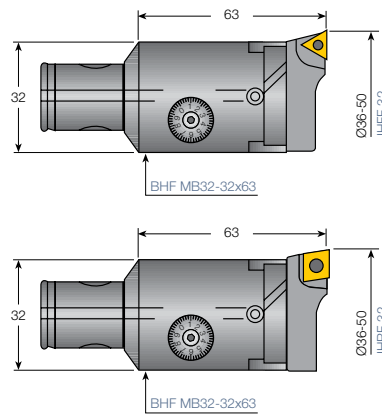


ø28-38
BHF MB25-25x50

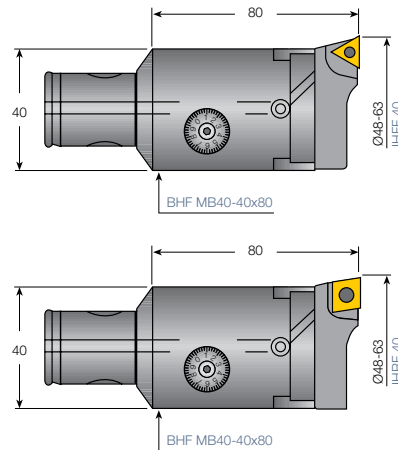


BHF MB16-MB40 Diameter Range: 18-63

ø36-50
BHF MB32-32x63



ø48-63
BHF MB40-40x80

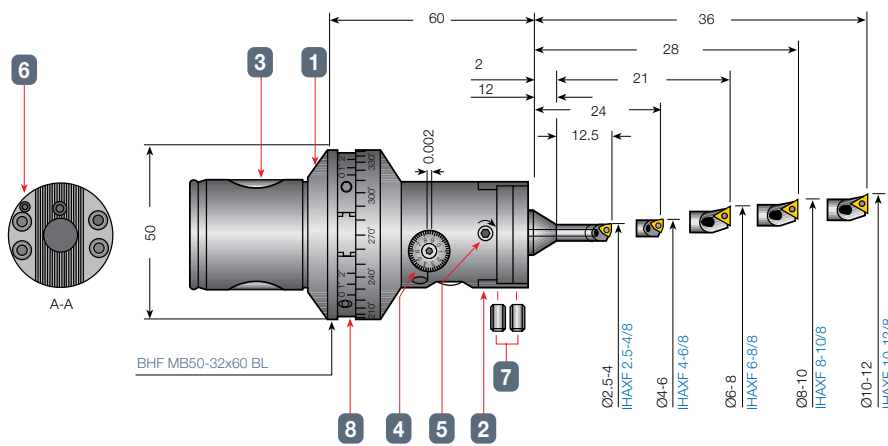


Fine Boring Heads with Balancing Rings

2 µm Direct Diametric Adjustment

BHF MB50-32x60 BL ø2.5-12

2 µm

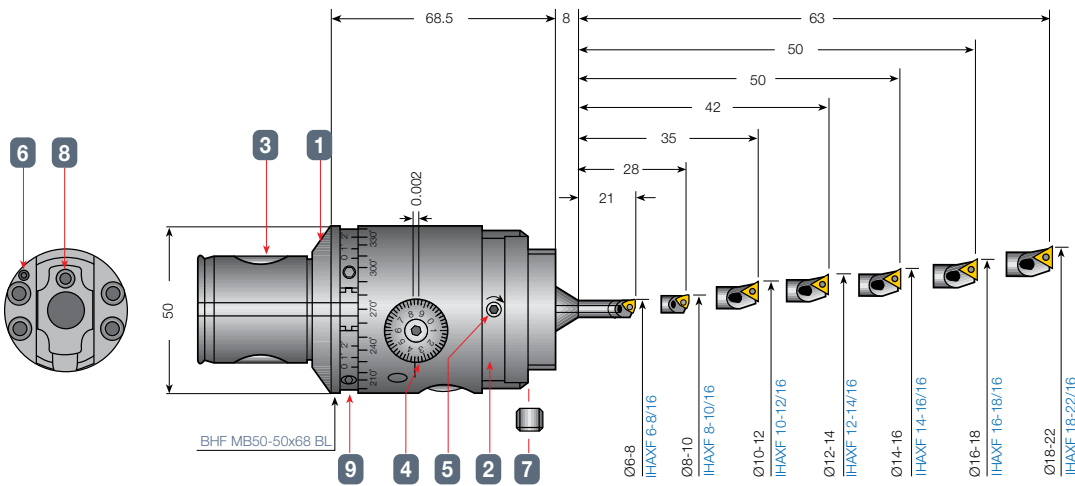


- 1 Body
- 2 Tool Slide
- 3 Expanding Pin
- ⚠ 4 Graduated Dial
- 5 Slide Locking Screw
- 6 Coolant Nozzle
- 7 Boring Bar Locking Screws
- 8 Balancing Rings

⚠ See page 481

BHF MB50-50x68 BL ø6-22

2 µm



- 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

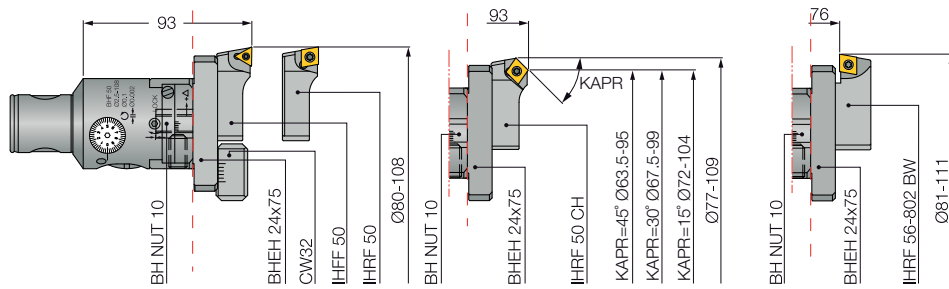
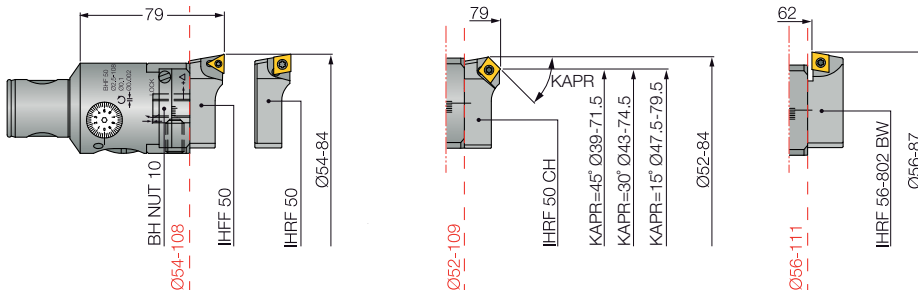
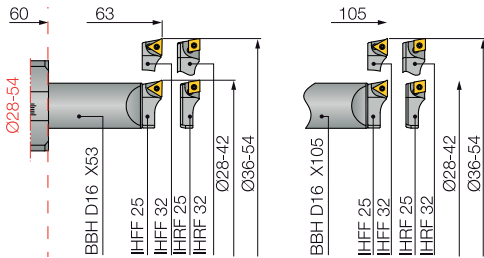
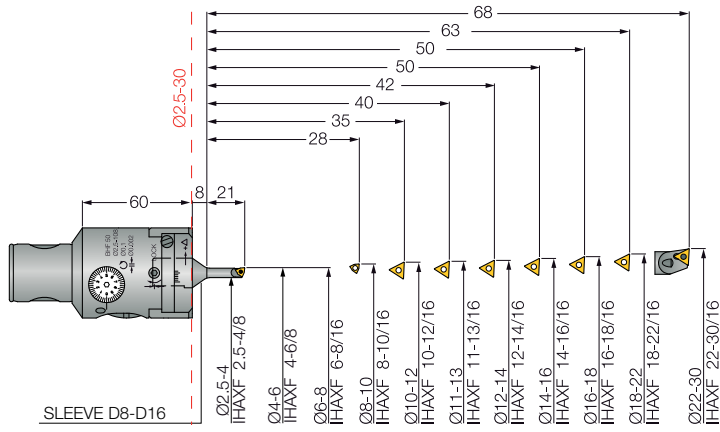
⚠ See page 481

Fine Boring Head Range

2 µm Direct Diametric Adjustment

BHF MB50-50x60 ø2.5-108

2 µm



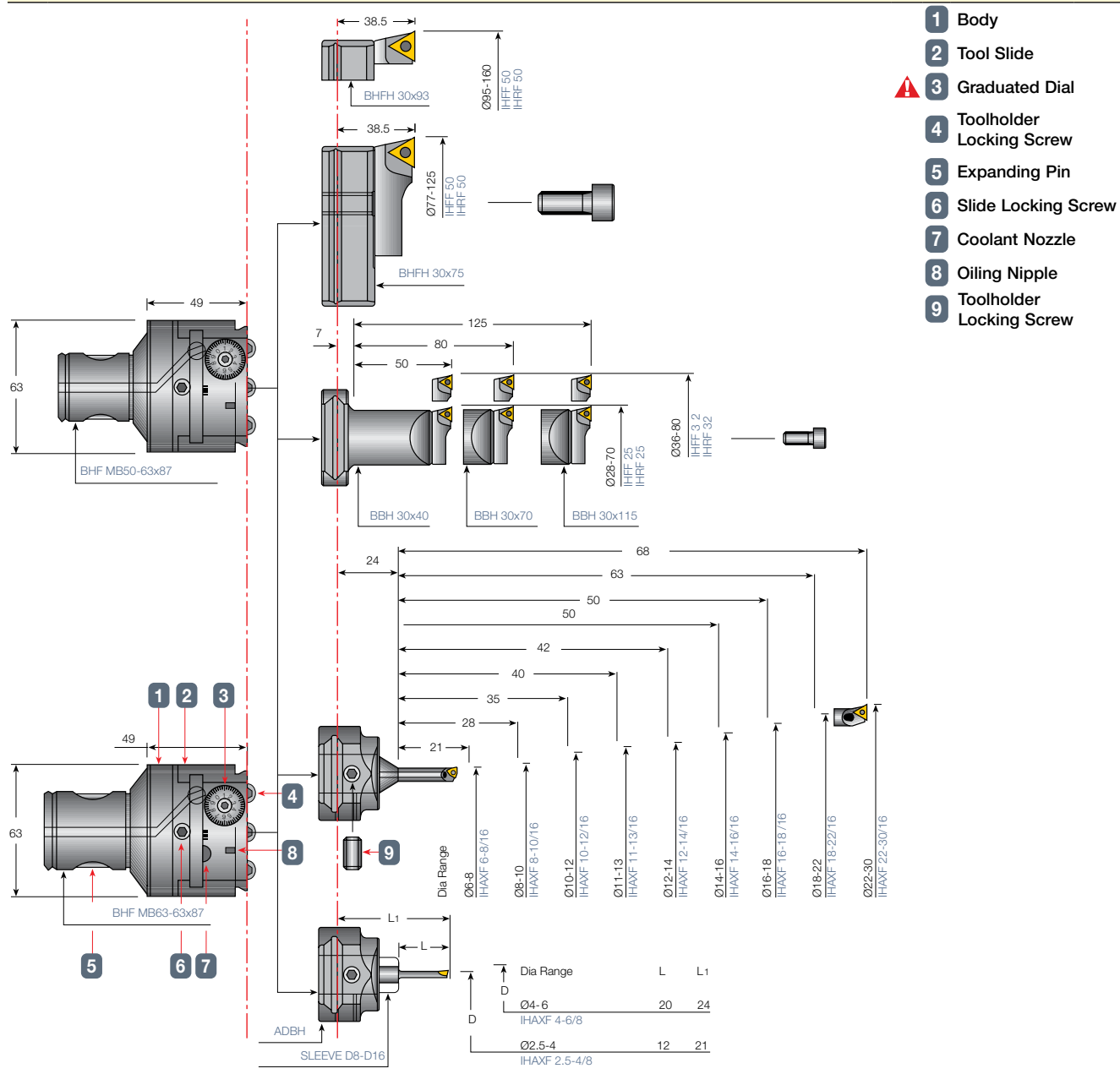
See page 481

Fine Boring Head Range

2 µm Direct Diametric Adjustment

BHF MB50-63x87 ø2.5-160
BHF MB63-63x87 ø2.5-160

2 µm

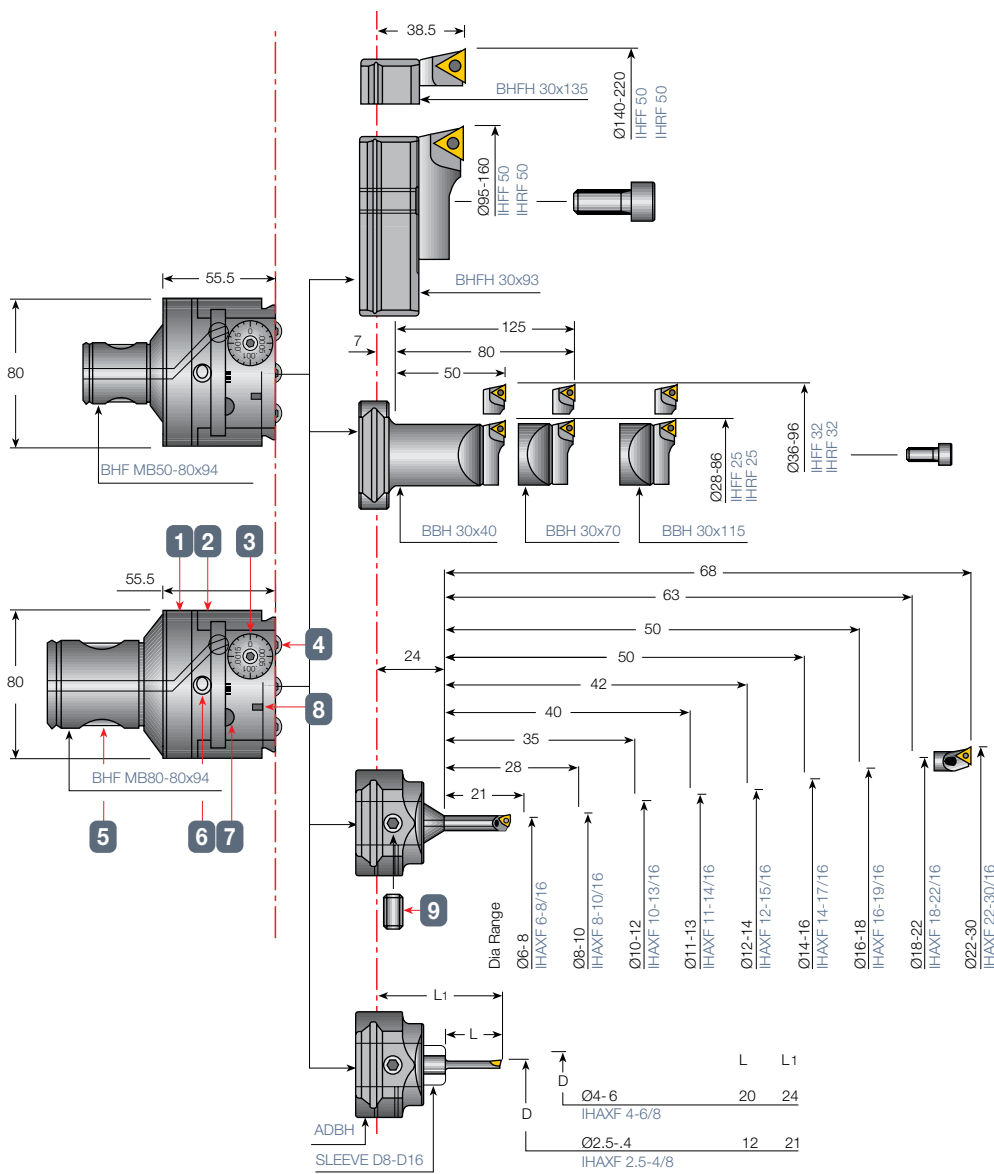


See pages 481-482

Fine Boring Head Range
2 µm Direct Diametric Adjustment

BHF MB50-80x94 Ø2.5-220
BHF MB80-80x94 Ø2.5-220

2 µm



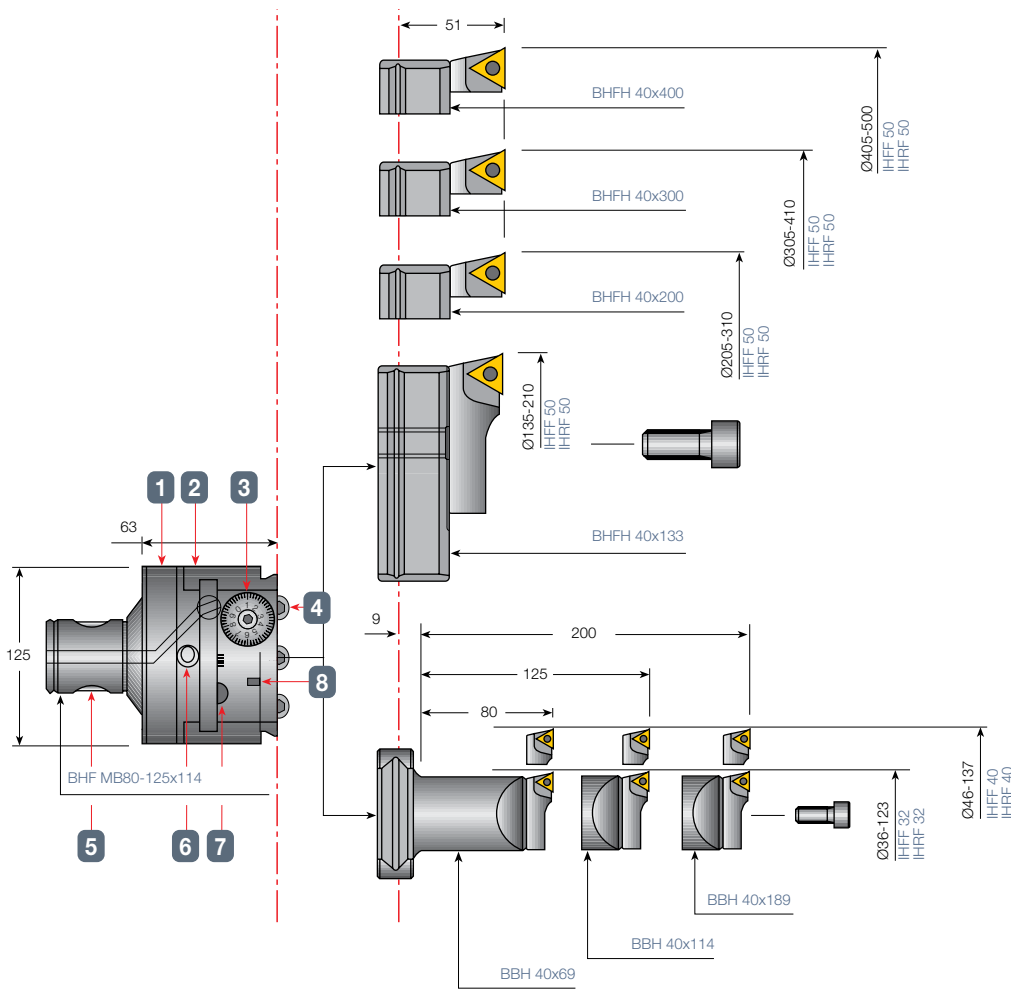
- 1 Body
- 2 Tool Slide
- 3 Graduated Dial
- 4 Toolholder Locking Screw
- 5 Expanding Pin
- 6 Slide Locking Screw
- 7 Coolant Nozzle
- 8 Oiling Nipple
- 9 Toolholder Locking Screw

See pages 481-482

Fine Boring Head Range
2 µm Direct Diametric Adjustment

BHF MB80-125x114 ø36-500

2 µm



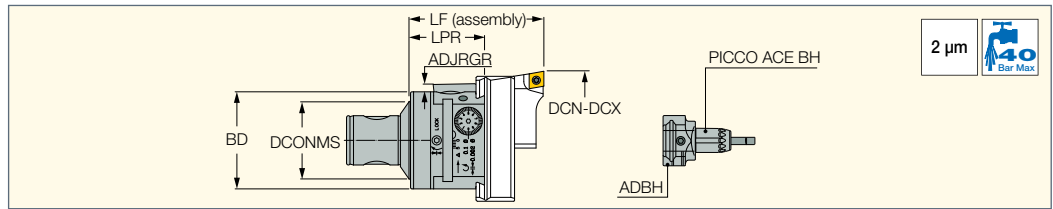
- 1 Body
- 2 Tool Slide
- ⚠ 3 Graduated Dial
- 4 Toolholder Locking Screw
- 5 Expanding Pin
- 6 Slide Locking Screw
- 7 Coolant Nozzle
- 8 Oiling Nipple

⚠ See page 482

ITSBORE

BHF MB50-MB80
Dia. 2.5-500

Fine Boring Heads with a 2 µm Direct Diametric Adjustment for a Diameter Range of 2.5 up to 500 mm



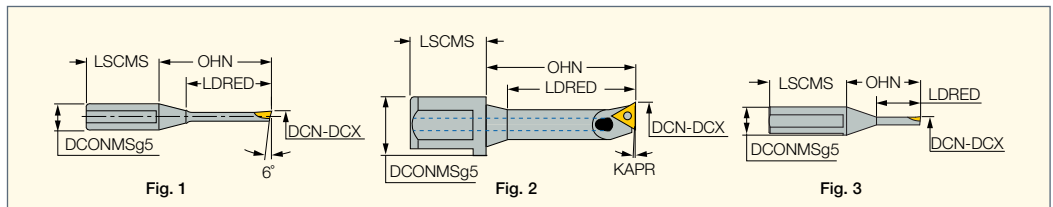
Designation	DCONMS	BD	LF	DCN ⁽⁴⁾	DCX ⁽⁵⁾	LPR	ADJRGR	RPMX ⁽⁶⁾	
BHF MB50-63X87 ⁽¹⁾	50.00	63.00	87.0	2.5	125.0	49.00	5.00	8000	1.28
BHF MB50-80X94 ⁽²⁾	50.00	80.00	94.0	2.5	160.0	58.00	5.00	8000	2.22
BHF MB63-63X87 ⁽¹⁾	63.00	63.00	87.0	2.5	125.0	49.00	5.00	6000	1.57
BHF MB80-80X94 ⁽²⁾	80.00	80.00	94.0	2.5	160.0	58.00	5.00	5000	2.63
BHF MB80-125X114 ⁽³⁾	80.00	125.00	114.0	135.0	500.0	63.00	5.00	4000	5.72

• For user guide, see pages 429-431, 478-483 • For spare parts, see page 466

- ⁽¹⁾ Use with slide BHFH 30X75 or BHFH 30X93.
- ⁽²⁾ Use with slide BHFH 30X93 or BHFH 30X135.
- ⁽³⁾ Use with slide BHFH 40X133, BHFH 40X200, BHFH 40X300 and BHFH 40X400.
- ⁽⁴⁾ Cutting diameter minimum
- ⁽⁵⁾ Cutting diameter maximum
- ⁽⁶⁾ Maximum RPM

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⁾	2.50	4.00	12.5	21.00	22.00	8.00	1.	3.0	SOLID	0		
IHAXF 4- 6/8 ⁽¹⁾	4.00	6.00	20.0	24.00	24.00	8.00	1.	3.0	SOLID	0		
IHAXF 6- 8/16	6.00	8.00	21.0	29.00	22.00	16.00	2.	3.0	WCGT 0201...	1	SR 14-299	T-6/5
IHAXF 6- 8/8	6.00	8.00	21.0	23.00	16.00	8.00	3.	5.0	WCGT 0201...	1	SR 14-299	T-6/5
IHAXF 8-10/16	8.00	10.00	28.0	36.00	22.00	16.00	2.	3.0	WCGT 0201...	1	SR 14-299	T-6/5
IHAXF 8-10/8	8.00	10.00	-	28.00	16.00	8.00	3.	5.0	WCGT 0201...	1	SR 14-299	T-6/5
IHAXF 10-12/16	10.00	12.00	35.0	43.00	22.00	16.00	2.	3.0	TPGX 0902...	1	SR 14-298	T-8/5
IHAXF 10-12/8	10.00	12.00	-	36.00	16.00	8.00	3.	5.0	TPGX 0902...	1	SR 14-298	T-8/5
IHAXF 11-13/16	11.00	13.00	40.0	48.00	22.00	16.00	2.	3.0	TPGX 0902...	1	SR 14-298	T-8/5
IHAXF 12-14/16	12.00	14.00	42.0	48.00	22.00	16.00	2.	3.0	TPGX 0902...	1	SR 14-298	T-8/5
IHAXF 12-14/8	12.00	14.00	-	42.00	14.00	8.00	3.	3.0	TPGX 0902...	1	SR 14-298	T-8/5
IHAXF 14-16/16	14.00	16.00	50.0	52.00	22.00	16.00	2.	3.0	TPGX 0902...	1	SR 14-298	T-8/5
IHAXF 14-16/8	14.00	16.00	-	48.00	14.00	8.00	3.	3.0	TPGX 0902...	1	SR 14-298	T-8/5
IHAXF 16-18/16	16.00	18.00	50.0	58.00	22.00	16.00	2.	3.0	TPGX 0902...	1	SR 14-298	T-8/5
IHAXF 16-18/8	16.00	18.00	-	54.00	14.00	8.00	3.	3.0	TPGX 0902...	1	SR 14-298	T-8/5
IHAXF 18-22/16	18.00	22.00	-	63.00	22.00	16.00	2.	3.0	TPGX 0902...	1	SR 14-298	T-8/5
IHAXF 22-30/16	22.00	30.00	-	68.00	22.00	16.00	2.	3.0	TPGX 0902...	1	SR 14-298	T-8/5

- ⁽¹⁾ Brazed tool
- ⁽²⁾ Cutting diameter minimum
- ⁽³⁾ Cutting diameter maximum
- ⁽⁴⁾ Minimum overhang
- ⁽⁵⁾ For DCONMS=8 mm, 16 mm O.D. sleeves should be used
- ⁽⁶⁾ Tool cutting edge angle
- ⁽⁷⁾ 0 - Without coolant supply, 1 - With coolant supply

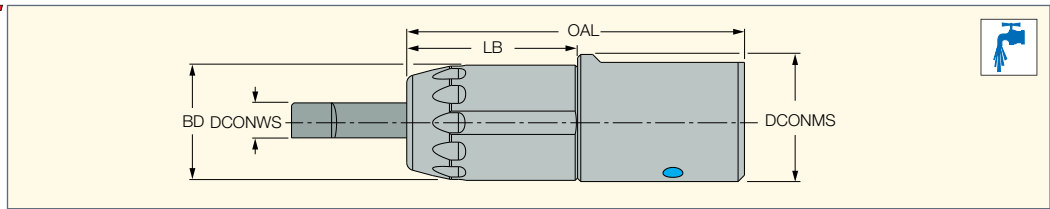
For inserts, see pages: TPGX (459) • TPGX (CBN) (460) • TPGX (PCD) (460) • WCGT (459)


For holders, see pages: ADBH (435) • BHD MB (414) • BHE MB (418) • BHE MB-H (418) • BHF MB-BL (423) • BHF MB16-MB50 Dia. 2.5-108 (425) • SLEEVE (433)

PICCOACE ITSBORE

PICCO ACE-BH

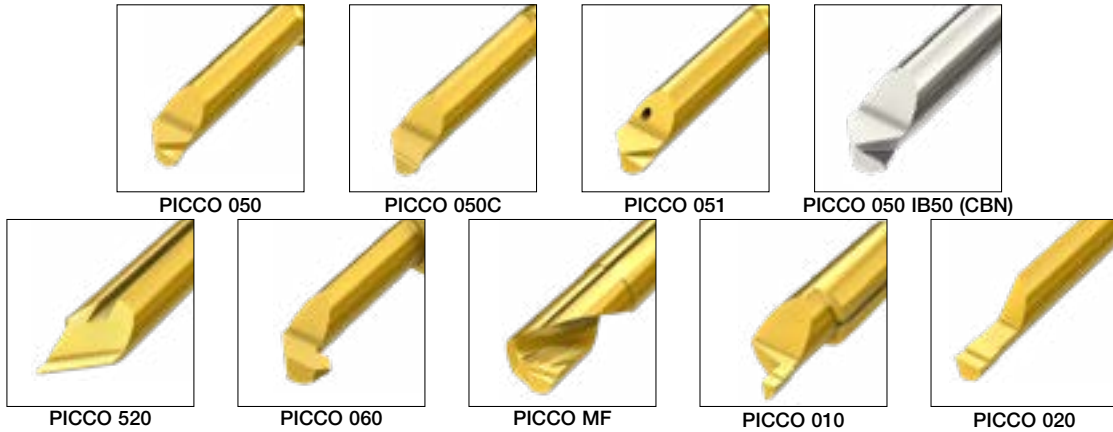
Holders with Short Shanks for ITS BORE System Carrying PICCOCUT Inserts



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

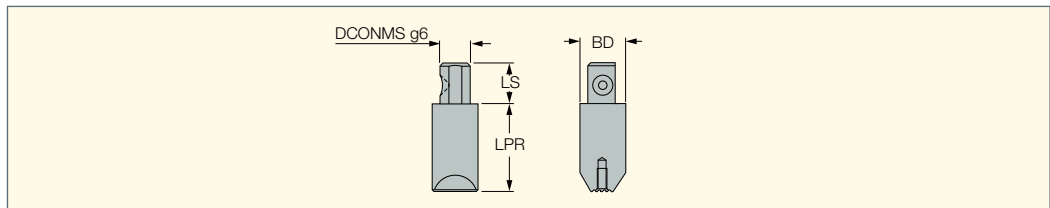
The PICCO-ACE-BH Holders Can Carry a Wide Range of PICCOCUT Insert Geometries




ITSBORE

BBH D16

Extension Slides for MB Modular Fine Boring Holders



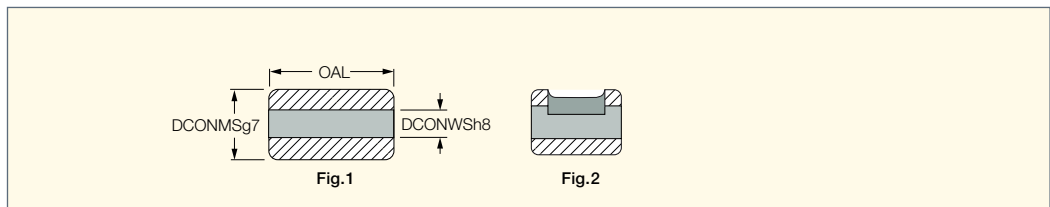
Designation	DCONMS	LPR	BD	LS	
BBH D16-53	16.00	53.00	25.00	21.50	0.50
BBH D16-105	16.00	95.00	25.00	21.50	0.80

For tools, see pages: IHFF (436) • IHRF (436)

ITSBORE

SLEEVE

Reduction Sleeves for Boring Bars on the MB Modular Boring System



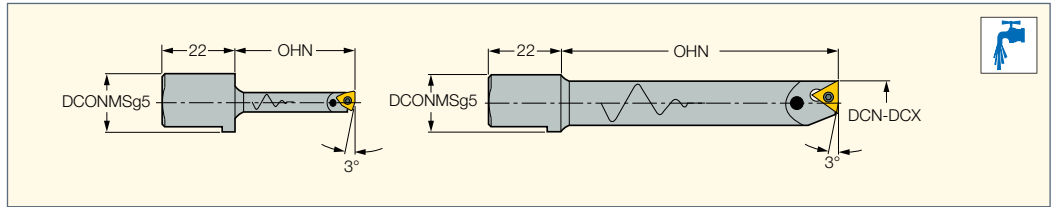
Designation	DCONMS	DCONWS	OAL	Fig.
SLEEVE D 8-D16	16.00	8.00	23.00	2.



For tools, see pages: IHAXF (432)

ITSBORE

IHAXF-AVI

Heavy Metal Vibration Damping Boring Bars



Designation	DCN ⁽¹⁾	DCX ⁽²⁾	OHN ⁽³⁾	DCONMS	Insert		
IHAXF 6- 8-AVI	6.00	8.00	36.0	16.00	WCGT 0201...	SR 14-299	T-6/5
IHAXF 8-10-AVI	8.00	10.00	48.0	16.00	WCGT 0201...	SR 14-299	T-6/5
IHAXF 10-12-AVI	10.00	12.00	60.0	16.00	TPGX 0902...	SR 14-298	T-8/5
IHAXF 12-14-AVI	12.00	14.00	72.0	16.00	TPGX 0902...	SR 14-298	T-8/5
IHAXF 14-16-AVI	14.00	16.00	84.0	16.00	TPGX 0902...	SR 14-298	T-8/5
IHAXF 16-18-AVI	16.00	18.00	96.0	16.00	TPGX 0902...	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

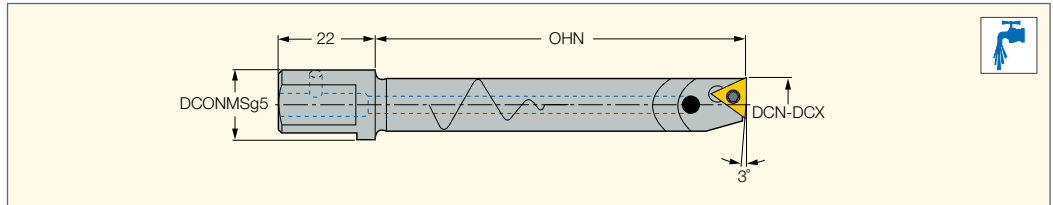
For inserts, see pages: TPGX (459) • TPGX (CBN) (460) • WCGT (459)



For holders, see pages: ADBH (435) • BHD MB (414) • BHE MB (418) • BHE MB-H (418) • BHF MB16-MB50 Dia. 2.5-108 (425)

ITSBORE

IHAXF-E

Carbide Vibration Dampening Boring Bars



Designation	DCN ⁽¹⁾	DCX ⁽²⁾	OHN ⁽³⁾	DCONMS	Insert		
IHAXF 6- 8-E	6.00	8.00	45.0	16.00	WCGT 0201...	SR 14-299	T-6/5
IHAXF 8-10-E	8.00	10.00	60.0	16.00	WCGT 0201...	SR 14-299	T-6/5
IHAXF 10-12-E	10.00	12.00	75.0	16.00	TPGX 0902...	SR 14-298	T-8/5
IHAXF 12-14-E	12.00	14.00	90.0	16.00	TPGX 0902...	SR 14-298	T-8/5
IHAXF 14-16-E	14.00	16.00	105.0	16.00	TPGX 0902...	SR 14-298	T-8/5
IHAXF 16-18-E	16.00	18.00	120.0	16.00	TPGX 0902...	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

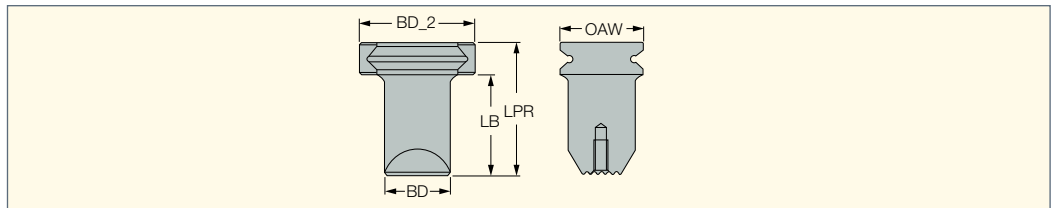
For inserts, see pages: TPGX (459) • TPGX (CBN) (460) • WCGT (459)


For holders, see pages: ADBH (435) • BHD MB (414) • BHE MB (418) • BHE MB-H (418) • BHF MB16-MB50 Dia. 2.5-108 (425)

ITSBORE

BBH 30/40

Extension Slides for MB Modular Fine Boring Holders



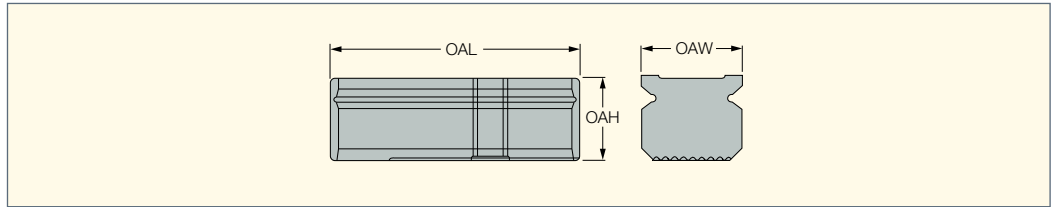
Designation	OAW	LB	BD	LPR	BD 2	
BBH 30X40	30.5	40.0	25.00	52.50	43.00	0.27
BBH 30X70	30.5	70.0	25.00	82.50	43.00	0.38
BBH 30X115	30.5	115.0	27.00	127.50	43.00	0.64
BBH 40X69	40.0	69.0	32.00	86.00	56.00	0.69
BBH 40X114	40.0	114.0	32.00	131.00	56.00	0.98
BBH 40X189	40.0	189.0	38.00	206.00	56.00	1.94

For tools, see pages: IHFF (436) • IHRF (436)

ITSBORE

BHFH

Counter Weight Slides for MB Modular Fine Boring Holders



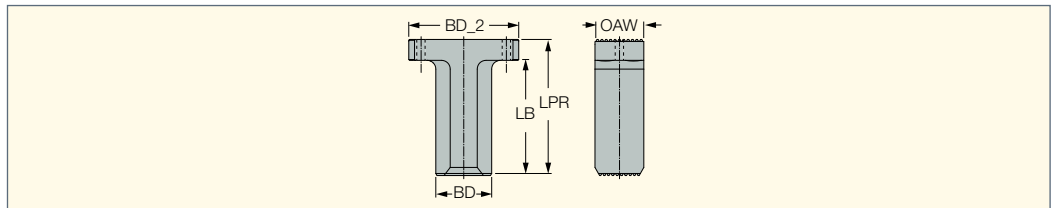
Designation	OAW	OAL	OAH	kg	
BHFH 30X75	30.5	75.00	25.00	0.44	SR M10X25 DIN912
BHFH 30X93	30.5	93.00	25.00	0.54	SR M10X25 DIN912
BHFH 30X135	30.5	135.00	25.00	0.76	SR M10X25 DIN912
BHFH 40X133	40.0	133.00	40.00	1.52	SR M10X25 DIN912
BHFH 40X200	40.0	200.00	40.00	2.30	SR M10X25 DIN912
BHFH 40X300	40.0	300.00	40.00	3.47	SR M10X25 DIN912
BHFH 40X400	40.0	400.00	40.00	4.56	SR M10X25 DIN912

For tools, see pages: IHFF (436) • IHRF (436) • IHRF-BW (439) • IHRF-CH (439)

ITSBORE

BBH 63

Extension Slides for MB Modular BHE Fine Boring Holders



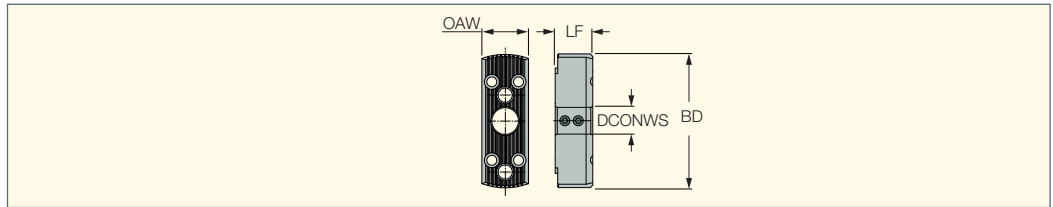
Designation	BD_2	LPR	BD	LB	OAW	kg
BBH 63X78	63.00	78.00	32.00	66.0	28.0	0.52

For tools, see pages: IHFF (436) • IHRF (436)

ITSBORE

BHEH

Slides for MB Modular BHE Fine Boring Holders



Designation	OAW	BD	LF	DCONWS	kg				
BHEH 24X75	24.0	75.00	14.50	-	0.20				
BHEH 28X80	28.0	80.00	22.50	16.00	0.33	SR M6X6 DIN913*	SR M5X25DIN912*	HW 4.0*	HW 3.0*
BHEH 28X108	28.0	108.00	22.50	-	0.53				
BHEH 28X148	28.0	148.00	22.50	-	0.69				

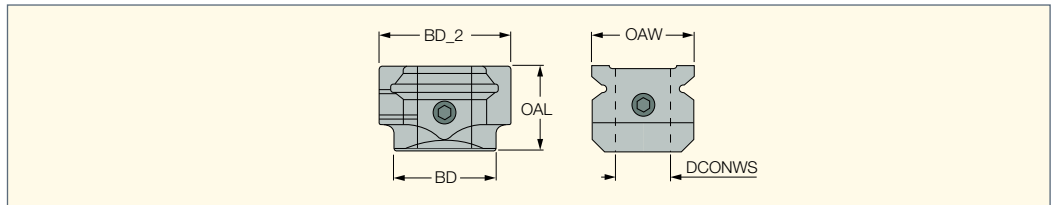
* Optional, should be ordered separately

For tools, see pages: IHFF (436) • IHRF (436) • IHRF-BW (439) • IHRF-CH (439)

ITSBORE

ADBH

Sleeve for MB Modular Fine Boring Holders



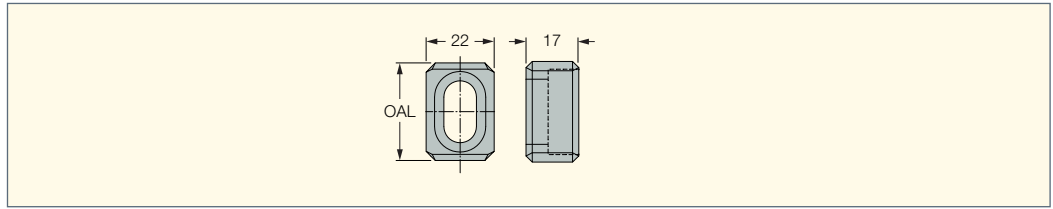
Designation	BD	DCONWS	OAL	BD_2	OAW	kg
ADBH 30XD16	30.00	16.00	25.00	39.00	30.5	0.15

For tools, see pages: IHAXF (432) • IHAXF-AVI (434) • IHAXF-E (434)

ITSBORE

CW32

Counter Balancing Weight
Used on BHEH Slide for
Fine Boring Holders

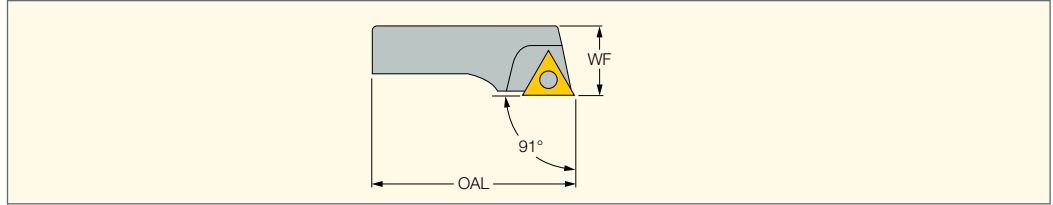


Designation	OAL	
CW32	31.50	0.05

ITSBORE

IHFF

Triangular Insert Holders
for Mounting on MB
Fine Boring Heads



Designation	WF	OAL	DCN ⁽¹⁾	DCX ⁽²⁾	Insert		
IHFF 25	10.00	26.50	28.0	40.0	TPGX 0902...	SR 14-298	T-8/5
IHFF 32	11.50	34.50	35.0	53.0	TPGX 0902...	SR 14-298	T-8/5
IHFF 40	14.00	44.60	48.0	66.0	TPGX 1103...	SR-17979 M3X8	T-8/5
IHFF 50	19.00	52.00	54.0	86.0	TPGX 1103...	SR-17979 M3X8	T-8/5

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

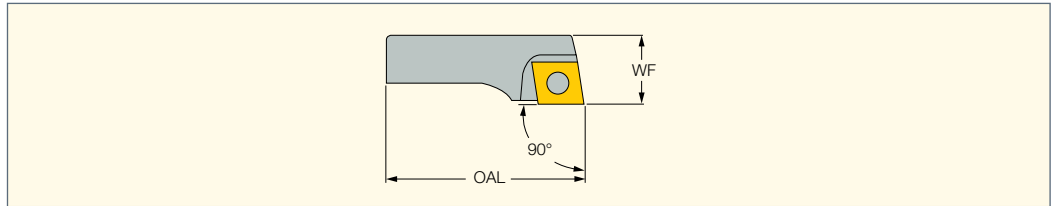
For inserts, see pages: TPGX (459) • TPGX (CBN) (460)

For holders, see pages: BBH 30/40 (434) • BBH 63 (435) • BBH D16 (433) • BHD 50 L200 (437) • BHD MB (414) • BHE MB (418) • BHEH (435) • BHF L200 (437) • BHF MB16-MB50 Dia. 2.5-108 (425) • BHFH (435)

ITSBORE

IHRF

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



Designation	WF	OAL	DCN ⁽¹⁾	DCX ⁽²⁾	Insert		
IHRF 16	8.00	17.00	18.0	24.0	CCGT 0602...	SR 14-548	T-7/5
IHRF 20	8.50	21.00	22.0	30.0	CCGT 0602...	SR 14-548	T-7/5
IHRF 25	10.00	26.50	28.0	40.0	CCGT 0602...	SR 14-548	T-7/5
IHRF 32	11.50	34.50	35.0	53.0	CCGT 0602...	SR 14-548	T-7/5
IHRF 40	14.00	44.00	48.0	66.0	CCGT 09T3...	SR 16-236	T-15/5
IHRF 50	19.00	52.00	54.0	86.0	CCGT 09T3...	SR 16-236	T-15/5

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

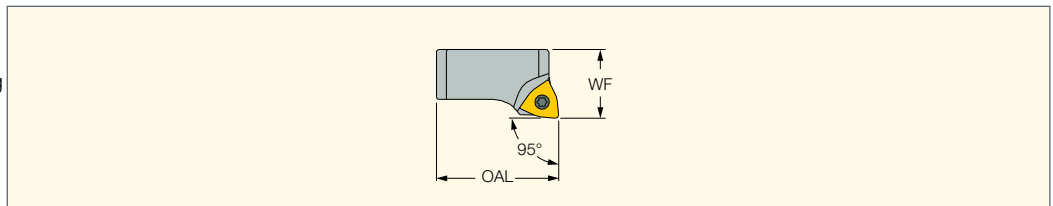
For inserts, see pages: CCET-WF (453) • CCGT-AF (455) • CCGT-AS (455) • CCGW/CCMT (CBN) (454) • CCMT (PCD) (454) • CCMT-14 (453) • CCMT-PF (452) • CCMT-WG (454) • CCMT/CCGT (453) • CCMT/CCGT-SM (452)

For holders, see pages: BBH 30/40 (434) • BBH 63 (435) • BBH D16 (433) • BHD 50 L200 (437) • BHD MB (414) • BHE MB (418) • BHEH (435) • BHF L200 (437) • BHF MB16-MB50 Dia. 2.5-108 (425) • BHFH (435)

ITSBORE

IHWF

Trigon Insert Holders for Mounting
on MB Fine Boring Heads



Designation	WF	OAL	DCN ⁽¹⁾	DCX ⁽²⁾	Insert
IHWF 14 E	8.00	14.00	14.5	18.0	WCGT 0201...

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

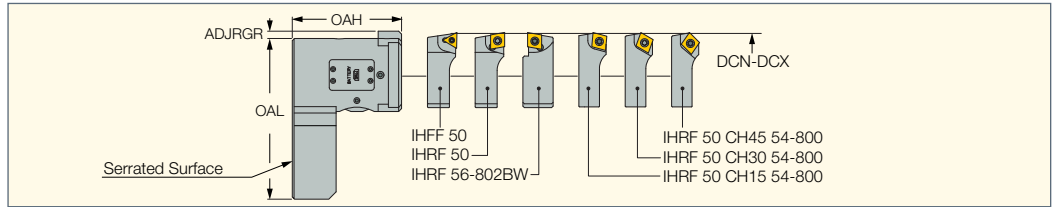
For inserts, see pages: WCGT (459)

For holders, see pages: BHD MB (414) • BHE MB (418)

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⁾	
BHD 50 L200	200.0	1202.0	110.00	74.0	5.00	20000	1.70

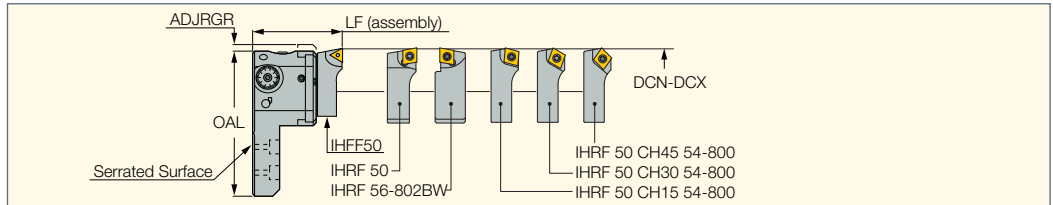
(1) Cutting diameter minimum
 (2) Cutting diameter maximum
 (3) Maximum RPM

For tools, see pages: IHFF (436) • IHRF (436) • IHRF-BW (439) • IHRF-CH (439)

ITSBORE

BHF L200

Fine Boring Slide Head for TCH AL Large Diameter Holders



Designation	DCN ⁽¹⁾	DCX ⁽²⁾	OAL	LF	ADJRGR	
BHF L200	200.0	1202.0	110.00	67.0	5.00	1.27

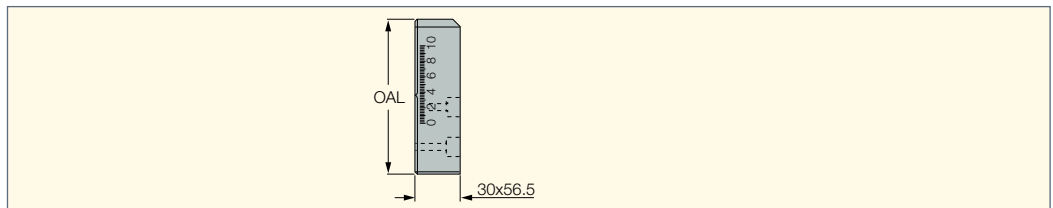
(1) Cutting diameter minimum
 (2) Cutting diameter maximum

For tools, see pages: IHFF (436) • IHRF (436) • IHRF-BW (439) • IHRF-CH (439)

ITSBORE

CW200

Counter Balancing Weight for TCH AL Rough and Fine Boring Holders



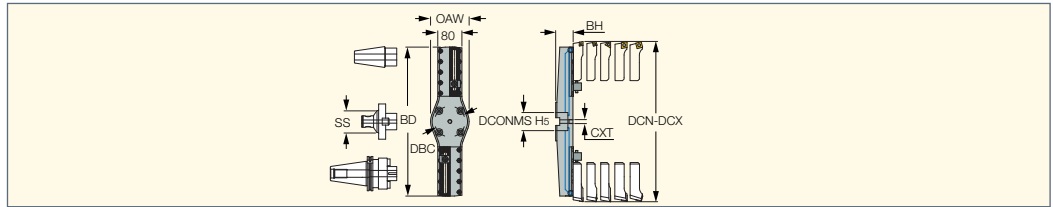
Designation	OAL	
CW200	105.00	1.12



ITSBORE

TCH AL

Aluminum Twin Cutter Heads for Rough and Fine Boring Operations, Diameter Range 200-1200 mm



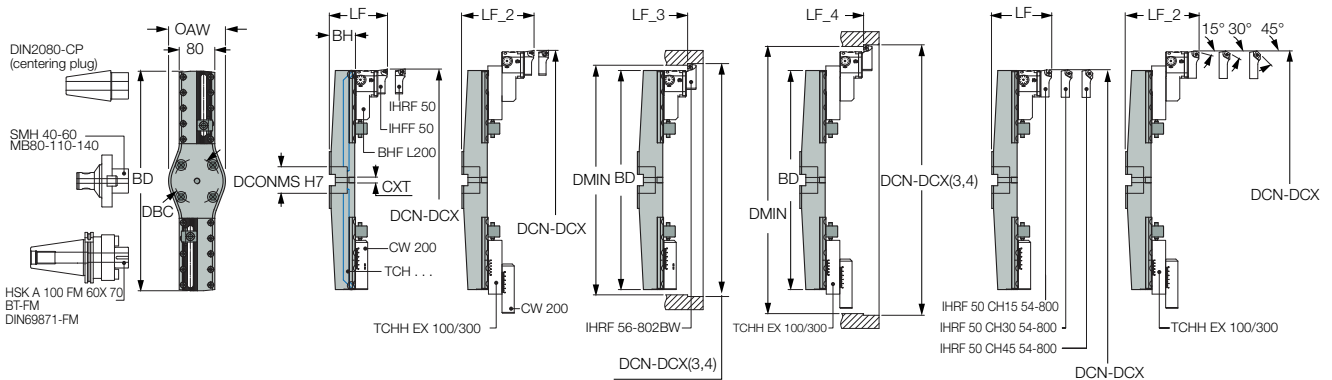
Designation	DCN ⁽¹⁾	DCX ⁽²⁾	BD	DCONMS	DBC	SS	OAW	CXT	BH	CSP ⁽³⁾	RPMX ⁽⁴⁾	
TCH AL200	200.0	602.0	194.00	40.00	66.70	80	-	-	54.00	1	700	3.20
TCH AL300	300.0	702.0	288.00	40.00	66.70	80	-	-	54.00	1	400	3.90
TCH AL400	400.0	802.0	394.00	40.00	66.70	80	-	1/4GAS	61.00	0	300	6.90
TCH AL500	500.0	902.0	494.00	60.00	101.60	80,110	128.0	1/4GAS	69.00	0	200	8.70
TCH AL600	600.0	1002.0	594.00	60.00	101.60	80,110	128.0	1/4GAS	71.00	0	200	8.34
TCH AL700	700.0	1102.0	694.00	60.00	101.60	80,110	128.0	1/4GAS	74.00	0	200	8.34
TCH AL800	800.0	1202.0	794.00	60.00	101.60	80,110	128.0	1/4GAS	80.00	0	150	15.20

• Aluminum body, with steel serrated seats • The "O" position on the counterweight balances the BHF boring head for 200 mm boring diameter position. For every 10 mm 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 436-437, 469

- (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 (409) • IHCR (408) • IHPR (408) • IHSR (408) • IHSR-BW (410)

Large Diameter Double Edge Fine Boring Options

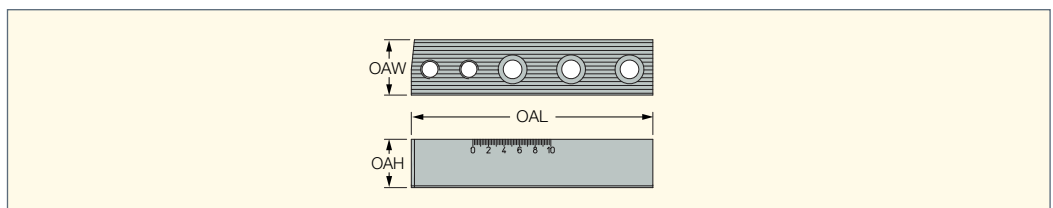


Aluminum Twin Cutter Heads										
Boring Tools	Fine Boring Slide Head	Extension Slides	Dimensions	TCH 200	TCH 300	TCH 400	TCH 500	TCH 600	TCH 700	TCH 800
IH.F 50	BHF L200 / BHD50 L200		DCN-DCX	200-300	300-400	400-500	500-600	600-700	700-800	800-900
IH.F 50	BHF L200 / BHD50 L200	TCHH EX 100	DCN-DCX	300-400	400-500	500-600	600-700	700-800	800-900	900-1000
IH.F 50	BHF L200 / BHD50 L200	TCHH EX 300	DCN-DCX	400-600	500-700	600-800	700-900	800-1000	900-1100	1000-1200
IHRF 56-802BW	BHF L200 / BHD50 L200		DCN-DCX(3,4)	202-302	302-402	402-502	502-602	602-702	702-802	802-902
IHRF 56-802BW	BHF L200 / BHD50 L200	TCHH EX 100	DCN-DCX(3,4)	302-402	402-502	502-602	602-702	702-802	802-902	902-1002
IHRF 56-802BW	BHF L200 / BHD50 L200	TCHH EX 300	DCN-DCX(3,4)	402-602	502-702	602-802	702-902	802-1002	902-1102	1002-1202
IH.F 50	BHF L200		LF	120	120	127	135	137	140	146
IH.F 50	BHF L200	TCHH EX 100	LF_2	150	150	157	165	167	170	176
IH.F 50	BHF L200	TCHH EX 300	LF_2	160	160	167	175	177	180	186
IHRF 56-802BW	BHF L200		LF_3	103	103	110	118	120	123	129
IHRF 56-802BW	BHF L200	TCHH EX 100	LF_4	133	133	140	148	150	153	159
IHRF 56-802BW	BHF L200	TCHH EX 300	LF_4	143	143	150	158	160	163	169
IH.F 50	BHD50 L200		LF	147	147	154	162	164	167	173
IH.F 50	BHD50 L200	TCHH EX 100	LF_2	177	177	184	192	194	197	203
IH.F 50	BHD50 L200	TCHH EX 300	LF_2	187	187	194	202	204	207	213
IHRF 56-802BW	BHD50 L200		LF_3	130	130	137	145	147	150	156
IHRF 56-802BW	BHD50 L200	TCHH EX 100	LF_4	160	160	167	175	177	180	186
IHRF 56-802BW	BHD50 L200	TCHH EX 300	LF_4	170	170	177	185	187	190	196

ITSBORE

TCHH EX

Boring Tools Extension Slides for TCH AL Boring Heads

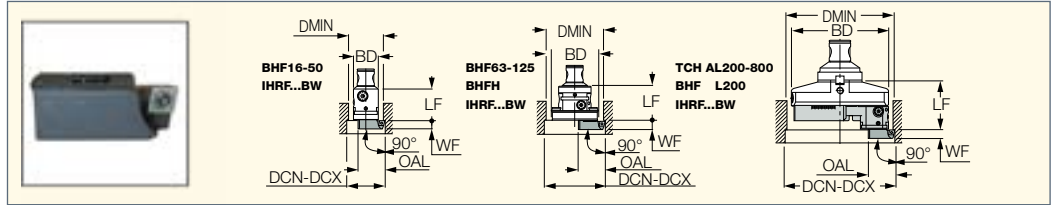


Designation	OAH	OAW	OAL	
TCHH EX100	31.00	35.5	155.00	1.50
TCHH EX300	41.00	35.5	255.00	2.80

For tools, see pages: IHBR (409) • IHCR (408) • IHPR (408) • IHSR (408) • IHSR-BW (410)

IHRF-BW

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



Designation	SS (1)	BD	DCN(2)	LF	DCX(3)	WF	OAL	Insert
IHRF 20-25BW	BHF MB16-16x34	16	20	27.5	25	8	18	CCMT 0602...
IHRF 24.5-32BW	BHF MB20-20x40	20	24.5	33.5	32	8.5	22.5	CCMT 0602...
IHRF 31.5-41.5BW	BHF MB25-25x50	25	31.5	41.5	40.5	9.5	28.5	CCMT 0602...
IHRF 38.5-51.5BW	BHF MB32-32x63	32	38.5	53	51.5	11	35.5	CCMT 0602...
IHRF 50.5-65BW	BHF MB40-40x80	40	50.5	68	65	13.5	46	CCMT 09T3...
IHRF 56-802BW	BHF MB50-50x80	50	56	62	87	17.5	53	CCMT 09T3...
	BHF MB63-63x87+BHFH...	75-93	82	70.5	127	17.5	53	CCMT 09T3...
	BHF MB80-80x94+BHFH...	93-135	100	79.5	162	17.5	53	CCMT 09T3...
	BHF MB80-125x114+BHFH...	133-400	140	98	502	17.5	53	CCMT 09T3...
	TCH AL200+BHF L200/BHD 50 L200	194	202	103	302	17.5	53	CCMT 09T3...
	TCH AL300+BHF L200/BHD 50 L200	288	302	103	402	17.5	53	CCMT 09T3...
	TCH AL400+BHF L200/BHD 50 L200	394	402	110	502	17.5	53	CCMT 09T3...
	TCH AL500+BHF L200/BHD 50 L200	494	502	118	602	17.5	53	CCMT 09T3...
	TCH AL600+BHF L200/BHD 50 L200	594	602	120	702	17.5	53	CCMT 09T3...
TCH AL700+BHF L200/BHD 50 L200	694	702	123	802	17.5	53	CCMT 09T3...	
TCH AL800+BHF L200/BHD 50 L200	794	802	129	902	17.5	53	CCMT 09T3...	

• 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 (455) • CCGW/CCMT (CBN) (454) • CCMT (PCD) (454) • CCMT-14 (453) • CCMT-PF (452) • CCMT-WG (454) • CCMT/CCGT (453) • CCMT/CCGT-SM (452)

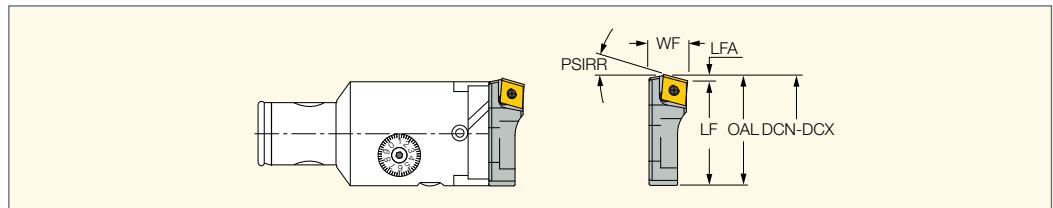
For holders, see pages: BHD 50 L200 (437) • BHD MB (414) • BHE MB (418) • BHEH (435) • BHF L200 (437) • BHF MB16-MB50 Dia. 2.5-108 (425) • BHFH (435)

Spare Parts

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

IHRF-CH

Chamfering Tools for BHF Boring Heads



Designation	DCN(1)	DCX(2)	LF	OAL	WF	LFA	PSIRR	Insert
IHRF 16 CH20 18-23	18.00	23.00	17.80	20.00	11.00	2.20	20.0	CCGT 0602...
IHRF 16 CH30 18-23	18.00	23.00	16.80	20.00	9.00	3.20	30.0	CCGT 0602...
IHRF 16 CH45 18-23	18.00	23.00	15.54	20.10	9.50	4.60	45.0	CCGT 0602...
IHRF 16 CH60 18-23	18.00	23.00	14.50	20.00	9.50	5.60	60.0	CCGT 0602...
IHRF 20 CH15 22-29	22.00	29.00	22.30	24.00	11.00	1.70	15.0	CCGT 0602...
IHRF 20 CH20 22-29	22.00	29.00	21.70	24.00	11.00	2.20	20.0	CCGT 0602...
IHRF 20 CH30 22-29	22.00	29.00	20.80	24.00	9.00	3.20	30.0	CCGT 0602...
IHRF 20 CH60 22-29	22.00	29.00	18.40	24.00	9.50	5.60	60.0	CCGT 0602...
IHRF 25 CH15 28-38	28.00	38.00	24.00	25.70	10.40	1.70	15.0	CCGT 0602...
IHRF 25 CH30 28-38	28.00	38.00	22.60	25.60	10.40	3.20	30.0	CCGT 0602...
IHRF 25 CH45 28-38	28.00	38.00	21.40	25.90	10.40	4.40	45.0	CCGT 0602...
IHRF 32 CH15 35-53	35.00	53.00	32.00	33.70	12.60	1.70	15.0	CCGT 0602...
IHRF 32 CH30 35-53	35.00	53.00	30.50	33.70	12.10	3.20	30.0	CCGT 0602...
IHRF 32 CH45 36-50	36.00	50.00	29.20	33.70	12.10	4.60	45.0	CCGT 0602...
IHRF 32 CH60 36-50	36.00	50.00	29.30	34.80	12.00	5.60	60.0	CCGT 0602...
IHRF 40 CH60 48-63	48.00	63.00	39.10	47.50	16.50	8.40	60.0	CCGT 09T3...
IHRF 40 CH15 48-66	48.00	66.00	44.90	47.40	17.50	2.50	15.0	CCGT 09T3...
IHRF 40 CH30 48-66	48.00	66.00	38.20	42.90	14.40	4.70	30.0	CCGT 09T3...
IHRF 40 CH45 48-66	48.00	66.00	36.40	43.00	14.40	6.70	45.0	CCGT 09T3...
IHRF 50 CH15 54-800	54.00	800.00	48.10	50.60	19.00	2.50	15.0	CCGT 09T3...
IHRF 50 CH20 54-800	54.00	800.00	52.20	55.50	18.00	3.30	20.0	CCGT 09T3...
IHRF 50 CH30 54-800	54.00	800.00	49.95	50.80	19.00	4.70	30.0	CCGT 09T3...
IHRF 50 CH45 54-800	54.00	800.00	44.00	50.60	19.00	6.70	45.0	CCGT 09T3...
IHRF 50 CH60 54-800	54.00	800.00	47.10	55.50	16.50	8.40	60.0	CCGT 09T3...

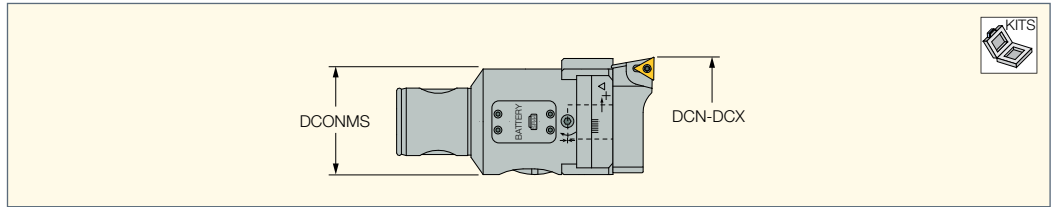
(1) Cutting diameter minimum
(2) Cutting diameter maximum

For inserts, see pages: CCGT-AS (455) • CCGW/CCMT (CBN) (454) • CCMT (PCD) (454) • CCMT-14 (453) • CCMT-PF (452) • CCMT-WG (454) • CCMT/CCGT (453) • CCMT/CCGT-SM (452)

For holders, see pages: BHD 50 L200 (437) • BHD MB (414) • BHE MB (418) • BHEH (435) • BHF L200 (437) • BHF MB16-MB50 Dia. 2.5-108 (425) • BHFH (435)

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	6.00	50.00	110.00
KIT BHD MB63-63 6-125	6.00	63.00	125.00
KIT BHD MB80-80 6-200	6.00	80.00	200.00

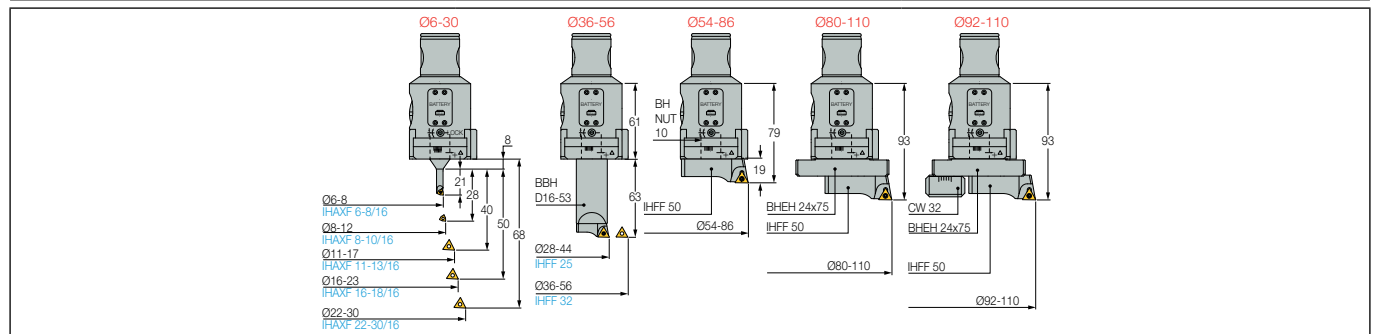
⁽¹⁾ Cutting diameter minimum
⁽²⁾ Cutting diameter maximum

Boring Kit BHD MB50-50 metric/inch (ø6-110 mm)

Fine Boring Head with a 2 µm Direct Diametric Adjustment Resolution and a Built-in Digital Display



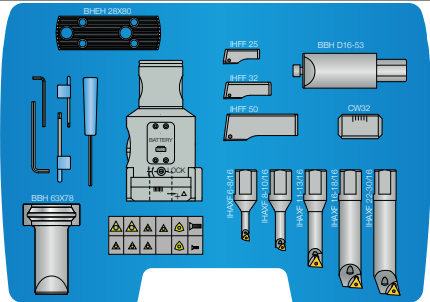
	2 µm	Tools	Inserts
		1 BHD MB50-50x60	2 WCGT 020102L
		1 IHFF 25	5 TPGX 730-L
		1 IHFF 32	1 TPGX 220-L
		1 IHFF 50	
		1 IHAXF 6-8/16	
		1 IHAXF 8-10/16	
		1 IHAXF 11-13/16	
		1 IHAXF 16-18/16	
		1 IHAXF 22-30/16	
		1 BBH D16-53	
		1 BHEH 24x75	
		1 BH NUT 10	
		1 CW 32	

Designation	MB	Boring Range
KIT BHD MB50-50 6-110	50	6-110

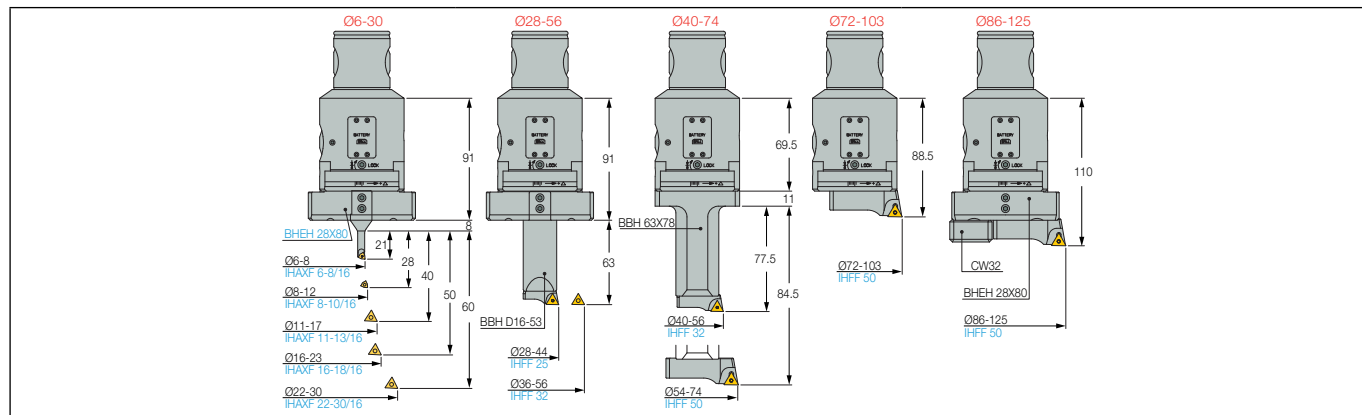


Boring Kit BHD MB63-63 6-125 metric/inch (ø6-125 mm)

Fine Boring Head with a 2 µm Direct Diametric Adjustment Resolution and a Built-in Digital Display



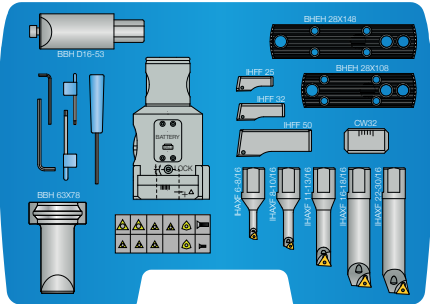
		Tools		Inserts	
			<ul style="list-style-type: none"> 1 BHD MB63-63-89 1 BBH 63X78 1 BHEH 28X80 1 BBH 16-53 1 CW32 1 IHAXF 6- 8/16 1 IHAXF 8-10/16 1 IHAXF 11-13/16 1 IHAXF 16-18/16 1 IHAXF 22-30/16 1 IHFF 25 1 IHFF 32 1 IHFF 50 	<ul style="list-style-type: none"> 2 WCGT 020102L 5 TPGX 730-L 1 TPGX 220-L 	

Designation	MB d1	Boring Range
KIT BHD MB63-63 6-125	63	2.5-125

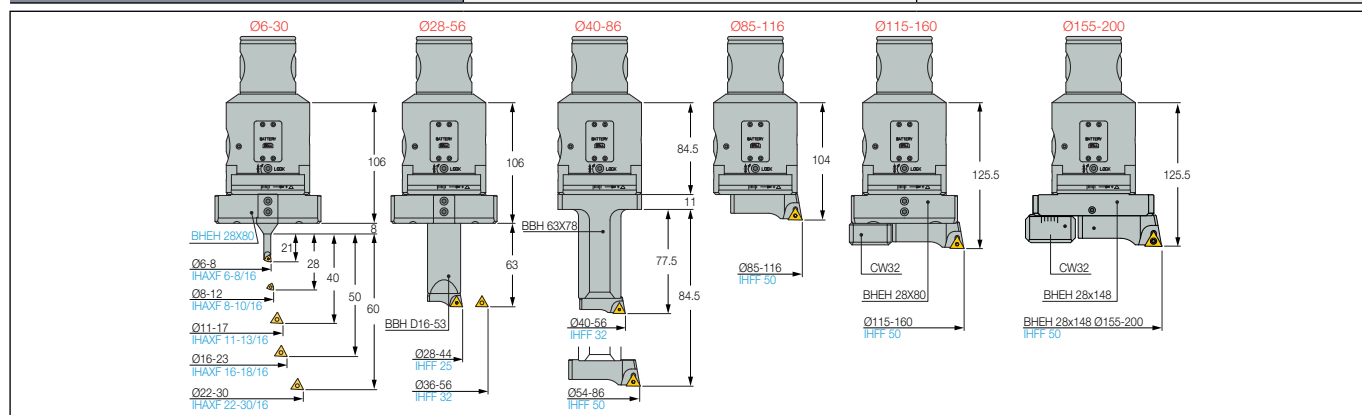


Boring KIT BHD MB80-80 6-200 metric/inch (ø6-200 mm)

Fine Boring Head with a 2 µm Direct Diametric Adjustment Resolution and a Built-in Digital Display



		Tools		Inserts	
			<ul style="list-style-type: none"> 1 BHD MB80-80-104 1 BBH D16-53 1 BBH 63X78 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 	<ul style="list-style-type: none"> 2 WCGT 020102L 5 TPGX 730-L 1 TPGX 220-L 	

Designation	MB	Boring Range
KIT BHD MB80-80 6-200	80	6-200



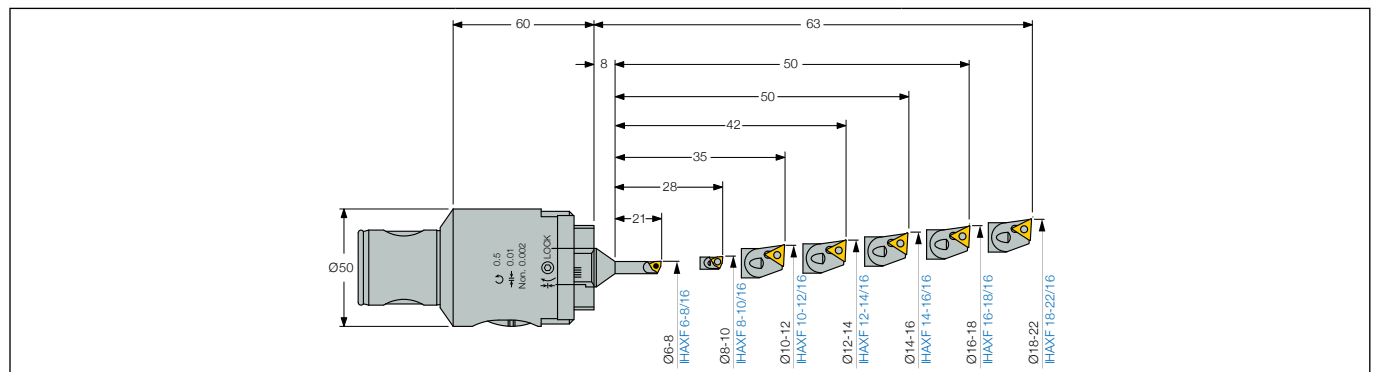
Boring KIT BHE MB50-50 6-22 H (ø6-22 mm)

Fine Boring Head 10 µm Direct Diametric Adjustment and a 2 µm by a Vernier Scale

		10 µm 2 µm	Boring Tools	Inserts
			1 BHE MB50-50X60 H 1 IHAXF 6-8/16 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	5 TPGX 090202L 2 WCGT 020102L

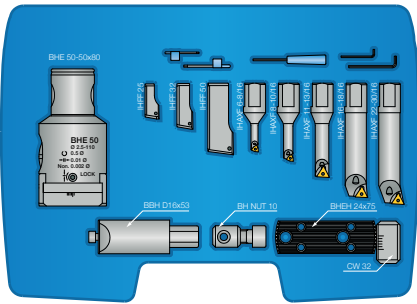

Designation	MB	Boring Range
KIT BHE MB50-50 6-22 H	50	6-22

10 µm direct diametric adjustment and 2 µm by a Vernier scale



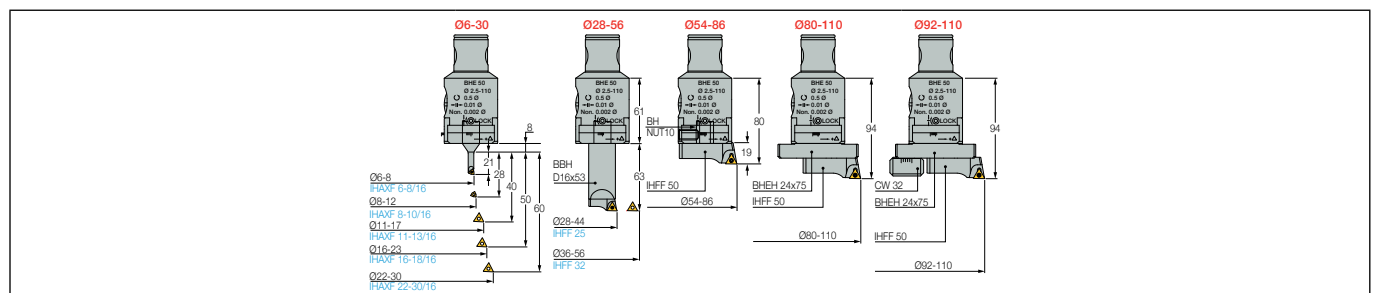
Boring KIT BHE MB50-50 6-110 (ø6-110 mm)

Fine Boring Head 10 µm Direct Diametric Adjustment and a 2 µm by a Vernier Scale

		10 µm 2 µm	Boring Tools
			1 BHE MB50-50x80 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


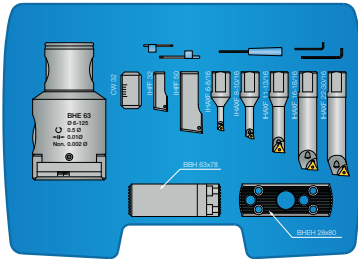
Designation	MB	Boring Range
KIT BHE MB50-50 6-110	50	6-110

10 µm direct diametric adjustment and 2 µm by a Vernier scale

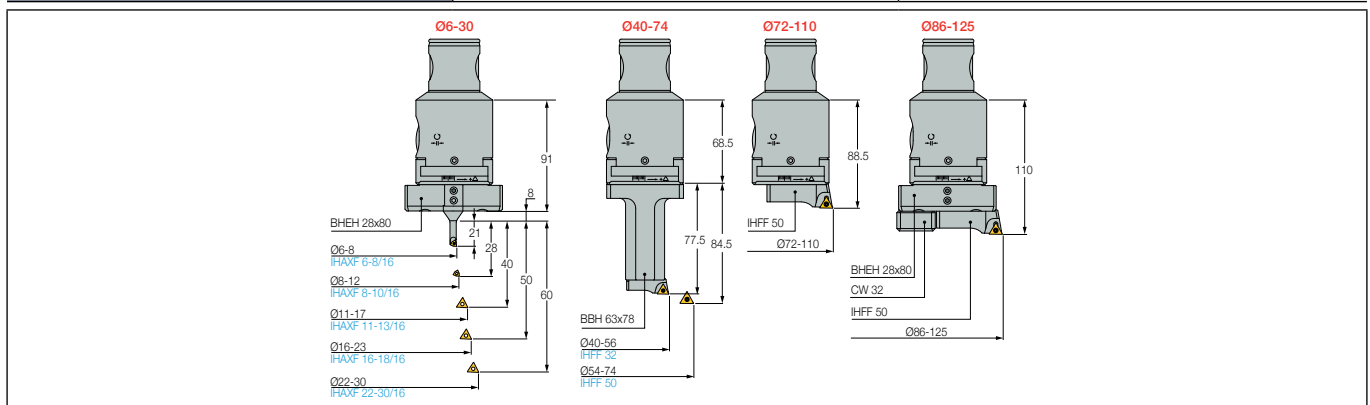


Boring KIT BHD MB63-63 6-125 (ø6-125 mm)

Fine Boring Head 10 µm Direct Diametric Adjustment and a 2 µm by a Vernier Scale


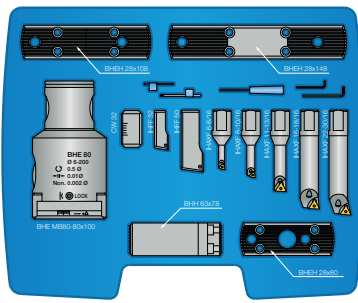
	10 µm 2 µm	Boring Tools
		1 BHD MB63-63x89 1 IHFF 32 1 IHFF 50 1 IHFF 6-8/16 1 IHAXF 8-10/16 1 IHAXF 11-13/16 1 IHAXF 16-18/16 1 IHAXF 22-30/16 1 BH 63x78 1 BHEH 28x80 1 BH WASHER IH..50 1 CW 32

Designation	MB	Boring Range
KIT BHD MB63-63 6-125	63	6-125



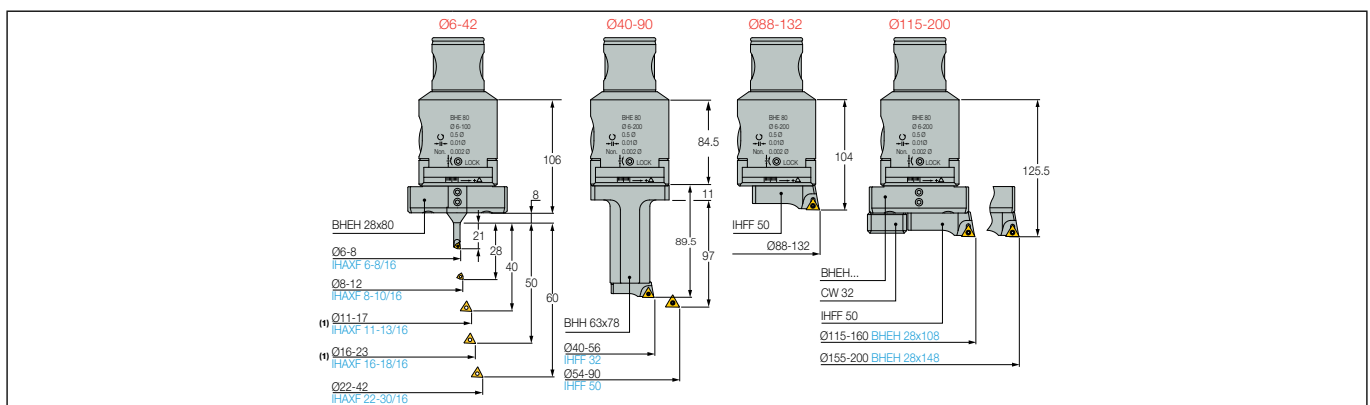
Boring KIT BHE MB80-80 6-200 (ø6-200 mm)

Fine Boring Head 10 µm Direct Diametric Adjustment and a 2 µm by a Vernier Scale

	10 µm 2 µm	Boring Tools
		1 BHE MB80-80x104 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 BH 63x78 1 BHEH 28x80 1 BHEH 28x108 1 BHEH 28x148 1 BH WASHER IH..50 1 CW 32

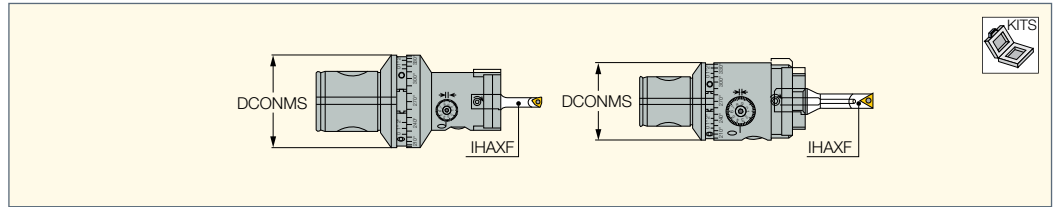
Designation	MB	Boring Range
KIT BHE MB80-80 6-200	80	6-200

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



KIT BHF MB-BL

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



Designation	DCONMS	DCN ⁽²⁾	DCX ⁽³⁾	RPMX ⁽⁴⁾
KIT BHF MB50-50 6-22 BL ⁽¹⁾	50.00	6.00	22.00	20000

⁽¹⁾ Balanced to G2.5/20,000 RPM.



⁽²⁾ Cutting diameter minimum

⁽³⁾ Cutting diameter maximum

⁽⁴⁾ Maximum RPM

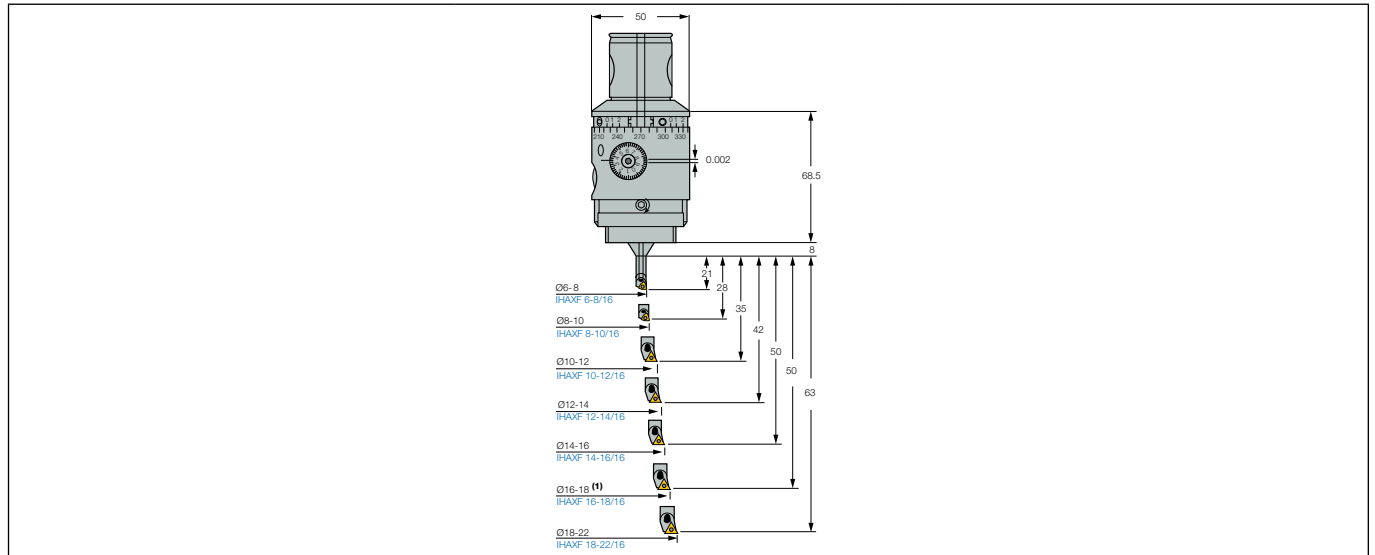
Boring KIT BHF MB50-50 6-22 BL (ø6-22 mm)

BHF BL Fine Boring Balanceable Head

 2 µm	Tools	Inserts
		1 BHF MB50-50X68 BL
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		

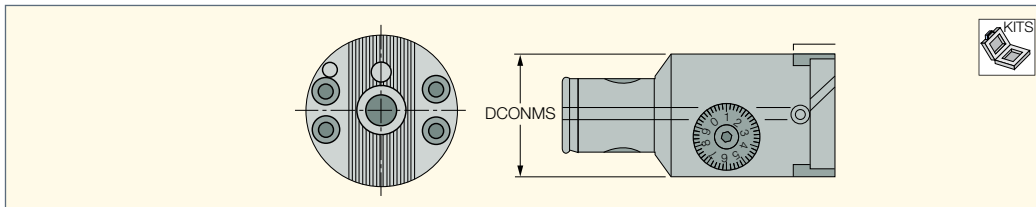
Designation	MB	Boring Range
KIT BHF MB50-50 6-22 BL	50	6-22

⁽¹⁾ On BHF BL max. balanceable dia. is 20 mm.



KIT BHF-MB

Contains a Fine Boring Head and Various Boring Tools and Inserts



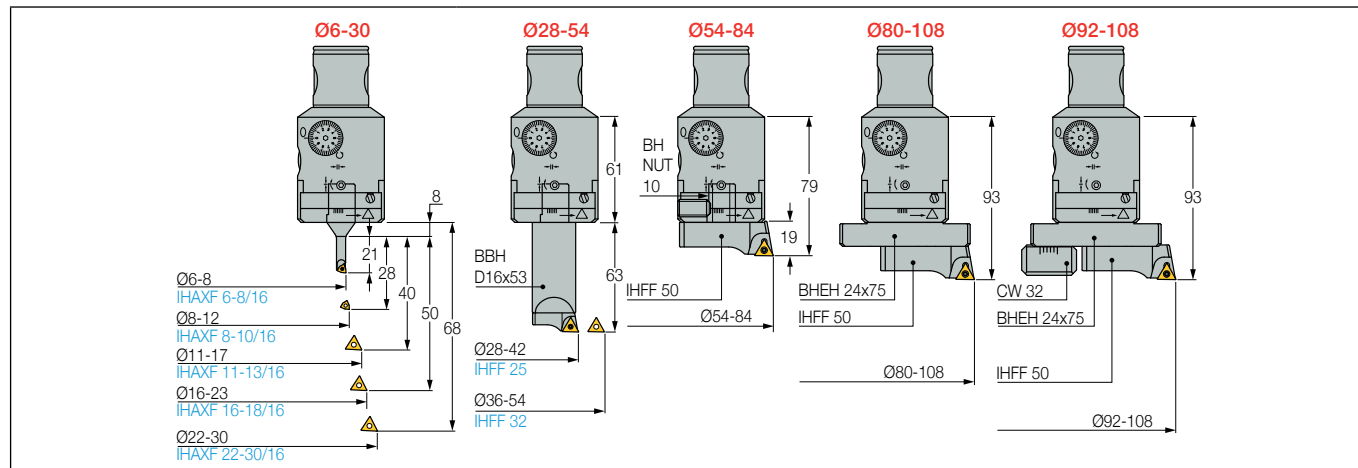
Designation	DCN ⁽¹⁾	DCX ⁽²⁾	DCONMS	RPMX ⁽³⁾
KIT BHF MB50-50 6-108	6.00	108.00	50.00	8000
KIT BHF MB50-63 6-125	6.00	125.00	50.00	8000
KIT BHF MB50-80 6-220	6.00	220.00	50.00	8000
KIT BHF MB63-63 6-125	6.00	125.00	63.00	6000
KIT BHF MB80-80 6-220	6.00	220.00	80.00	5000

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

Boring KIT BHF MB50-50 6-108 (ø6-108 mm)

 2 µm	Tools	Inserts
		1 BHF MB50-50x60
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
KIT BHF MB50-50 6-108	50	6-108





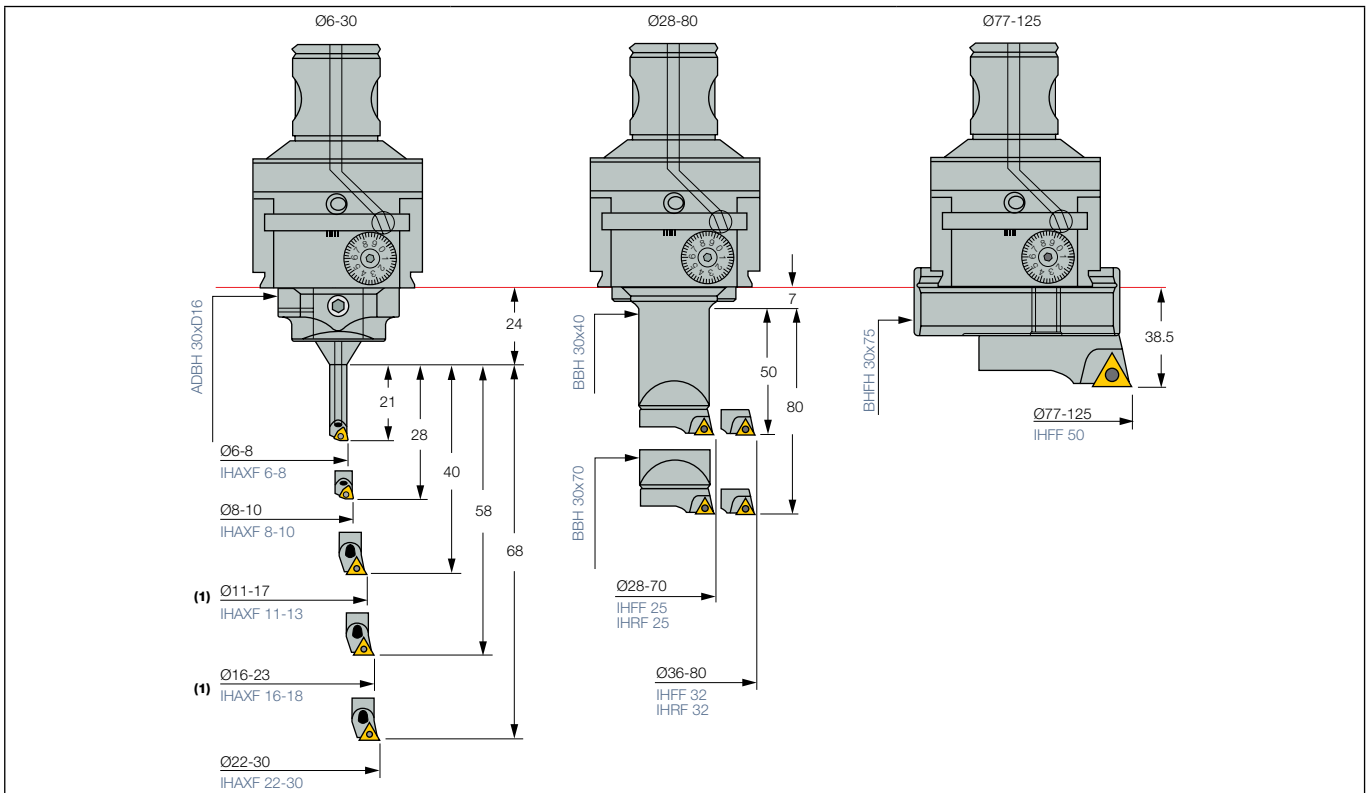
2 µm



Tools	Inserts
1 BHF 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	

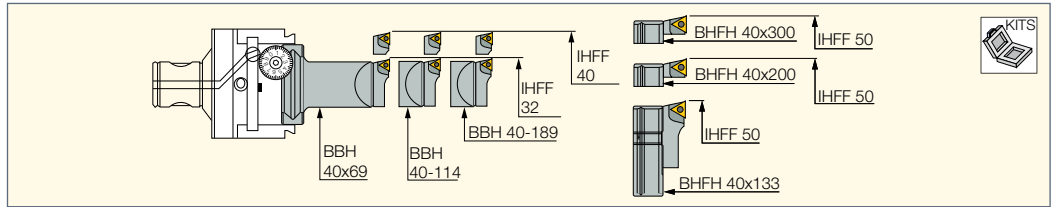
Designation	MB	Boring Range
KIT BHF MB50-63 6-125	50	6-125
KIT BHF MB63-63 6-125	63	6-125

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



KIT BHFH-MB

Contains Adapters, Extensions and Boring Bars for 36 to 410 mm Boring Range



Designation	DCONMS	DCN ⁽¹⁾	DCX ⁽²⁾
KIT BHFH MB80-125	80.00	36.00	410.00

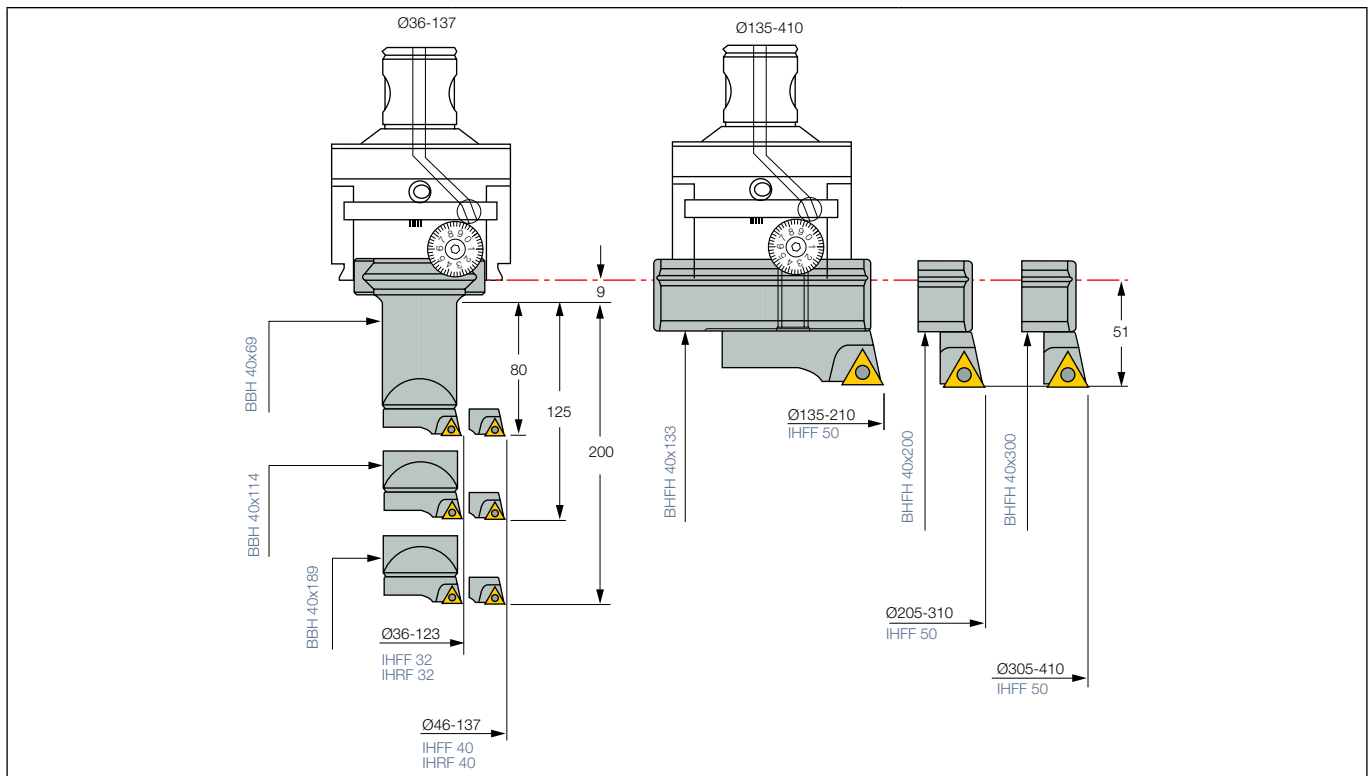
⁽¹⁾ Cutting diameter minimum
⁽²⁾ Cutting diameter maximum

KIT BHFH MB80-125 36-410

Holder for BHF MB80-125x114 ø36-410

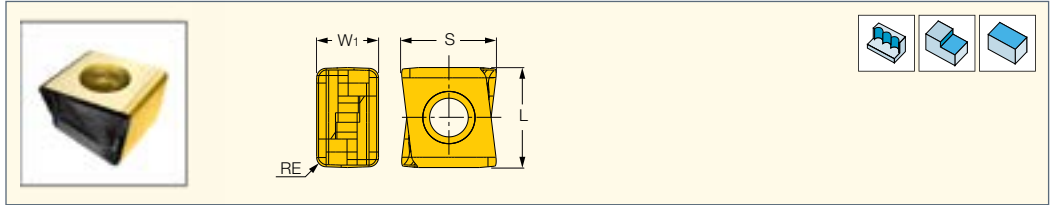
	ACCESSORIES
	1 BBH 40x69
	1 BBH 40x114
	1 BBH 40x189
	1 BHFH 40x133
	1 BHFH 40x200
	1 BHFH 40x300
	1 IHFF 32
	1 IHFF 40
1 IHFF 50	

Designation	MB	Boring Range
KIT BHFH MB80-125 36-410	80	36-410



HTP LN.. 1006

Tangentially Clamped Inserts with 4 Cutting Edges for Plungers



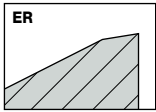
Designation	Dimensions				Tough ← Hard					Recommended Machining Data f _z (mm/t)
	W1	L	S	RE	IC330	IC830	IC808	IC810	IC07	
HTP LNAR 1006 FR ⁽¹⁾	6.50	10.50	10.13	1.00			•			0.05-0.15
HTP LNAR 1006 FR-P	6.50	10.50	10.13	1.00					•	0.05-0.15
HTP LNHT 1006 ER	6.50	10.50	9.93	1.00	•	•	•	•		0.10-0.15
HTP LNHT 1006 ETR	6.50	10.50	9.93	1.00	•	•	•			0.12-0.20
HTP LNMT 1006 ER ⁽²⁾	6.50	10.50	9.96	1.00	•	•	•			0.08-0.15

• FR-P - For machining aluminum, ER- For general applications, ETR- First priority for hardened steel

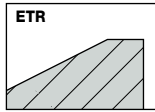
⁽¹⁾ FR - Sharp cutting edge for unstable conditions and for ISO S material

⁽²⁾ Mounting this insert increases tool diameter by 0.1 mm

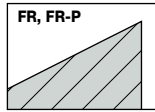
For tools, see page: CR LNHT (410)



ER- For general applications



ETR- First priority for hardened steel



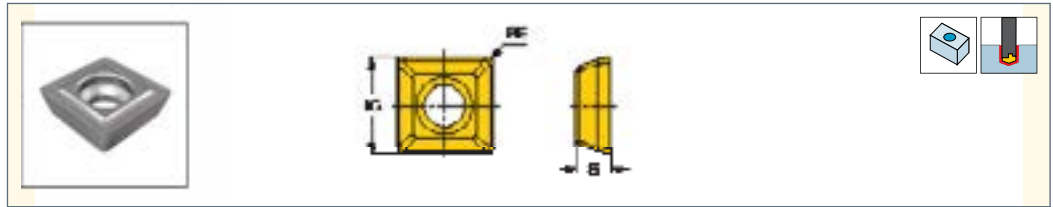
FR, FR-P- For machining aluminum





SOMT-DT

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



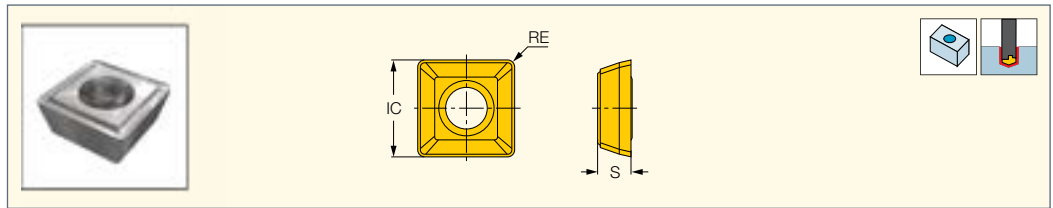
Designation	Dimensions			Tough ↔ Hard					
	IC	S	RE	IC328	IC5500	IC808	IC908	IC8080	IC9080
SOMT 09T306-DT	9.00	3.81	0.60		•	•	•	•	•

For tools, see pages: CR SOMT (411) • DR-2D-N (106) • DR-3D-N (108) • DR-4D-N (109) • DR-4D-T (112) • DR-CA (113)



SOMT-GF

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



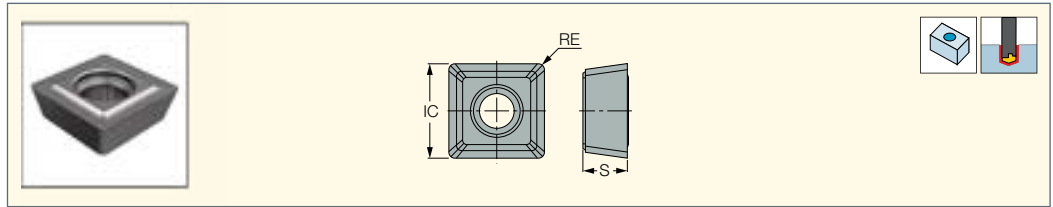
Designation	Dimensions			Tough ↔ Hard	
	IC	S	RE	IC328	IC908
SOMT 09T306-GF	9.00	3.81	0.60	•	•

For tools, see pages: CR SOMT (411) • DR-2D-N (106) • DR-3D-N (108) • DR-4D-N (109) • DR-4D-T (112) • DR-CA (113)



SOGX/T-AL

Inserts for DR Drills for Aluminum



Designation	Dimensions			IC08
	IC	S	RE	
SOGT 09T306-AL	9.00	3.81	0.60	•

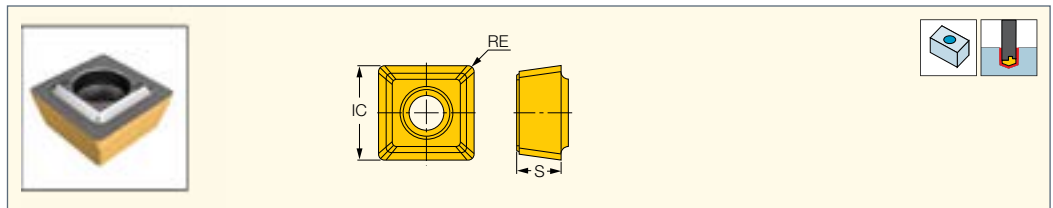
• Sharp cutting edge with polished rake for aluminum

For tools, see pages: CR SOMT (411) • DR-2D-N (106) • DR-3D-N (108) • DR-4D-N (109) • DR-4D-T (112) • DR-5D-N (111)



SOMT-HD

Inserts for DR Drills for Carbon Steel and Soft Materials



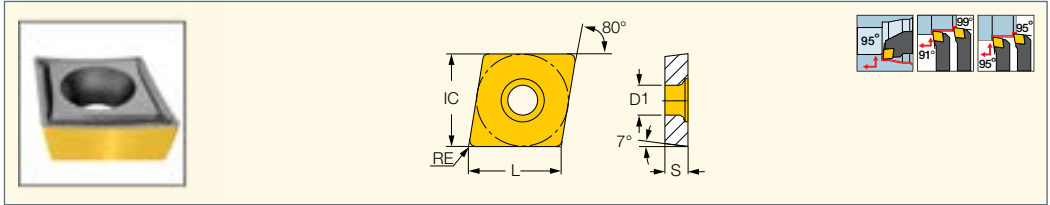
Designation	Dimensions			IC808
	IC	S	RE	
SOMT 09T306-HD	9.00	3.81	0.60	•

For tools, see pages: CR SOMT (411) • DR-2D-N (106) • DR-3D-N (108) • DR-4D-N (109) • DR-4D-T (112) • DR-CA (113)

ISOTURN

CCMT/CCGT-SM

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



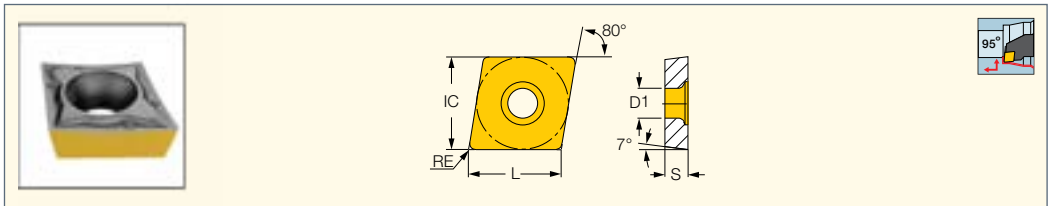
Designation	Dimensions					Tough ↔ Hard										Recommended Machining Data		
	L	IC	S	RE	D1	IC6025	IC8250	IC8015	IC8150	IC20	IC5010	IC428	IC5005	IC806	IC807	IC907	a _p (mm)	f (mm/rev)
CCGT 060201-SM	6.45	6.35	2.38	0.10	2.80											●	0.25-2.00	0.05-0.20
CCGT 060202-SM	6.45	6.35	2.38	0.20	2.80											●	0.25-2.00	0.05-0.25
CCMT 060202-SM	6.45	6.35	2.38	0.20	2.80		●		●					●			0.25-2.00	0.05-0.25
CCMT 060204-SM	6.45	6.35	2.38	0.40	2.80	●	●	●	●					●	●	●	0.50-2.50	0.07-0.25
CCMT 060208-SM	6.45	6.35	2.38	0.80	2.80	●		●							●	●	0.50-2.50	0.07-0.25
CCMT 09T302-SM	9.70	9.52	3.97	0.20	4.40	●	●	●						●	●	●	0.50-2.50	0.06-0.25
CCMT 09T304-SM	9.70	9.52	3.97	0.40	4.40	●	●		●	●	●			●	●	●	0.50-2.50	0.06-0.25
CCMT 09T308-SM	9.70	9.52	3.97	0.80	4.40	●	●	●		●				●	●	●	0.50-3.00	0.07-0.25
CCMT 120404-SM	12.90	12.70	4.76	0.40	5.50		●		●					●	●	●	0.70-3.50	0.07-0.25
CCMT 120408-SM	12.90	12.70	4.76	0.80	5.50	●	●	●	●						●	●	0.70-3.50	0.07-0.30

For tools, see pages: IHCR (408) • IHRF (436) • IHRF-BW (439) • IHRF-C (413) • IHRF-CH (439) • IHSR (408) • IHSR-BW (410) • IHSR-C (413) • IHSR-CH (409)

ISOTURN

CCMT-PF

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



Designation	Dimensions					Tough ↔ Hard							Recommended Machining Data	
	L	IC	S	RE	D1	IC830	IC6025	IC6015	IC806	IC807	IC907	IC804	a _p (mm)	f (mm/rev)
CCMT 060202-PF	6.30	6.35	2.38	0.20	2.80	●	●	●	●	●	●	●	0.20-2.50	0.04-0.25
CCMT 060204-PF	6.30	6.35	2.38	0.40	2.80	●	●	●	●	●	●	●	0.40-2.50	0.04-0.30
CCMT 09T302-PF	9.70	9.52	3.97	0.20	4.40	●		●	●	●	●	●	0.50-3.00	0.05-0.30
CCMT 09T304-PF	9.70	9.52	3.97	0.40	4.40	●	●	●	●	●	●	●	0.50-3.50	0.05-0.35

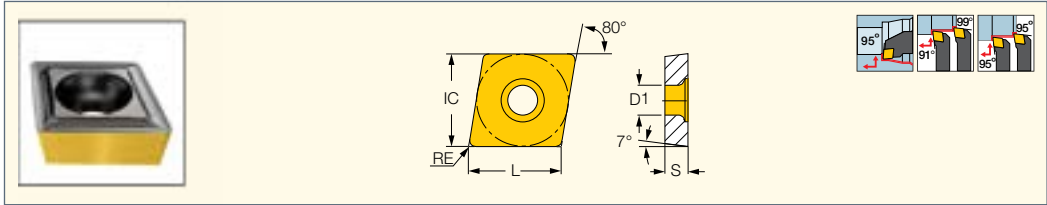
For tools, see pages: IHCR (408) • IHRF (436) • IHRF-BW (439) • IHRF-C (413) • IHRF-CH (439) • IHSR (408) • IHSR-BW (410) • IHSR-C (413) • IHSR-CH (409)



ISOTURN

CCMT-14

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



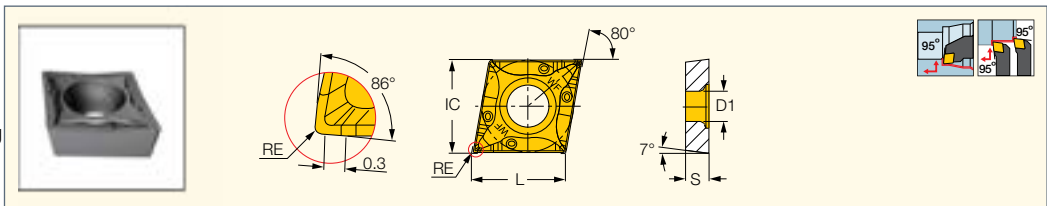
Designation	Dimensions					Tough ↔ Hard							Recommended Machining Data	
	L	IC	S	RE	D1	IC830	IC8250	IC20	IC428	IC5005	IC807	IC907	a _p (mm)	f (mm/rev)
CCMT 060204-14	6.30	6.35	2.38	0.40	2.80	●		●	●	●	●	●	0.50-2.50	0.14-0.25
CCMT 09T304-14	9.70	9.52	3.97	0.40	4.40		●				●	●	0.50-3.00	0.14-0.25
CCMT 09T308-14	9.70	9.52	3.97	0.80	4.40	●	●	●	●	●			0.80-3.00	0.14-0.30
CCMT 120408-14	12.90	12.70	4.76	0.80	5.50	●		●					0.80-3.00	0.14-0.30

For tools, see pages: IHCR (408) • IHRF (436) • IHRF-BW (439) • IHRF-C (413) • IHRF-CH (439) • IHSR (408) • IHSR-BW (410) • IHSR-C (413) • IHSR-CH (409)

ISOTURN

CCET-WF

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



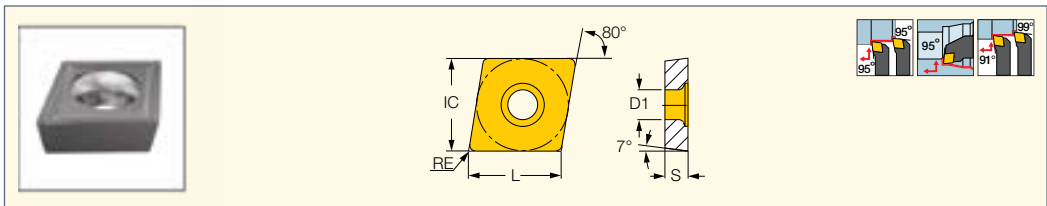
Designation	Dimensions						IC907	Recommended Machining Data	
	L	IC	S	RE	D1	a _p (mm)		f (mm/rev)	
CCET 0602005-WF	6.30	6.35	2.38	0.05	2.80	●	0.05-2.00	0.01-0.20	
CCET 09T3005-WF	9.50	9.52	3.97	0.05	4.40	●	0.05-2.00	0.01-0.20	

For tools, see pages: IHCR (408) • IHRF (436) • IHSR (408) • IHSR-BW (410) • IHSR-C (413) • IHSR-CH (409)

ISOTURN

CCMT/CCGT

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



Designation	Dimensions					Tough ↔ Hard					Recommended Machining Data	
	L	IC	S	RE	D1	IC8250	IC30N	IC20	IC20N	IC520N	a _p (mm)	f (mm/rev)
CCGT 060202	6.45	6.35	2.38	0.20	2.80		●				0.50-2.00	0.10-0.20
CCGT 060202L (1)	6.45	6.35	2.38	0.20	2.80		●	●			0.50-2.00	0.10-0.20
CCGT 060204	6.45	6.35	2.38	0.40	2.80		●				0.50-2.00	0.10-0.20
CCGT 060204L (1)	6.45	6.35	2.38	0.40	2.80		●				0.50-2.00	0.10-0.20
CCMT 060202	6.45	6.35	2.38	0.20	2.80	●			●		0.50-2.00	0.10-0.20
CCMT 060204	6.45	6.35	2.38	0.40	2.80		●		●	●	0.50-2.00	0.12-0.22
CCMT 09T302	9.70	9.52	3.97	0.20	4.40				●	●	0.50-2.50	0.12-0.25
CCMT 09T304	9.70	9.52	3.97	0.40	4.40				●	●	0.50-2.50	0.12-0.25
CCMT 09T308	9.70	9.52	3.97	0.80	4.40				●	●	0.80-3.00	0.14-0.25

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

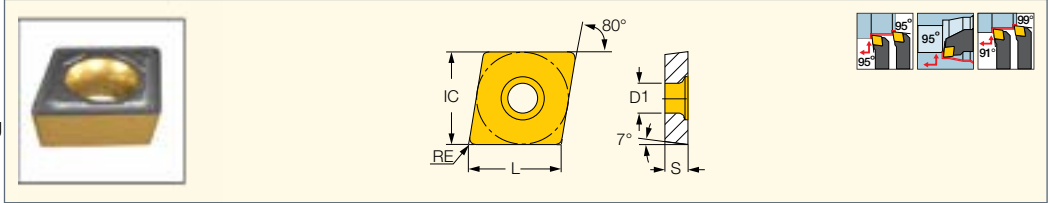
(1) Left-hand insert

For tools, see pages: IHCR (408) • IHRF (436) • IHRF-BW (439) • IHRF-C (413) • IHRF-CH (439) • IHSR (408) • IHSR-BW (410) • IHSR-C (413) • IHSR-CH (409)

ISOTURN

CCMT-WG

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



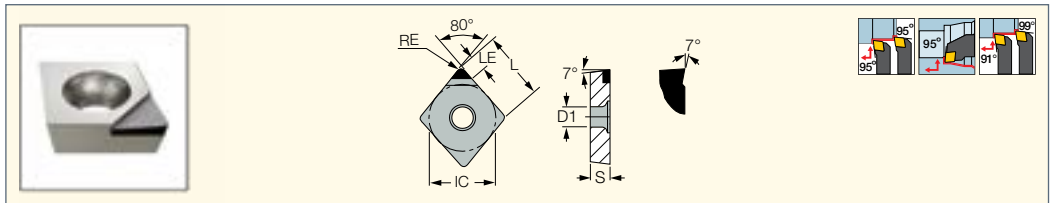
Designation	Dimensions					Tough ↔ Hard			Recommended Machining Data	
	L	IC	S	RE	D1	IC8250	IC807	IC907	ap (mm)	f (mm/rev)
CCMT 060204-WG	6.30	6.35	2.38	0.40	2.80		●	●	0.40-2.00	0.10-0.35
CCMT 09T304-WG	9.70	9.52	3.97	0.40	4.40	●			0.40-2.00	0.14-0.30
CCMT 09T308-WG	9.70	9.52	3.97	0.80	4.40	●			0.50-2.50	0.20-0.38
CCMT 120408-WG	12.90	12.70	4.76	0.80	5.50	●			0.50-3.00	0.20-0.36

For tools, see pages: • IHCR (408) • IHRF (436) • IHRF-BW (439) • IHRF-C (413) • IHRF-CH (439) • IHSR (408) • IHSR-BW (410) • IHSR-C (413) • IHSR-CH (409)

ISOTURN

CCMT (PCD)

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



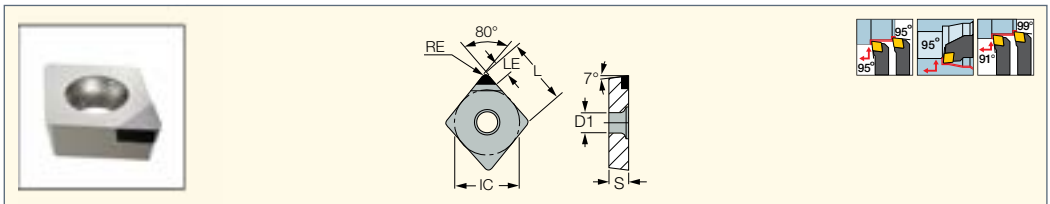
Designation	Dimensions						ID5	Recommended Machining Data	
	L	IC	S	RE	LE	D1		ap (mm)	f (mm/rev)
CCMT 060202D	6.30	6.35	2.38	0.20	3.1	2.80	●	0.08-3.00	0.05-0.30
CCMT 060204D	6.30	6.35	2.38	0.40	3.0	2.80	●	0.10-3.00	0.05-0.30
CCMT 09T304D	9.70	9.52	3.97	0.40	3.9	4.40	●	0.10-3.00	0.05-0.30

For tools, see pages: IHCR (408) • IHRF (436) • IHRF-BW (439) • IHRF-C (413) • IHRF-CH (439) • IHSR (408) • IHSR-BW (410) • IHSR-C (413)

ISOTURN

CCGW/CCMT (CBN)

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



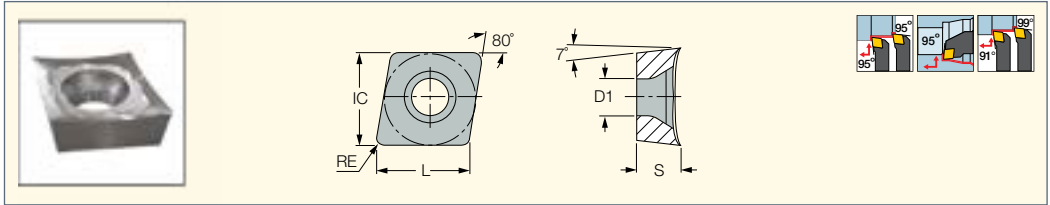
Designation	Dimensions						Tough ↔ Hard			Recommended Machining Data	
	L	IC	S	RE	LE	D1	IB05H	IB55	IB10H	ap (mm)	f (mm/rev)
CCGW 03X102T01015-1	3.63	3.57	1.39	0.20	2.0	1.90	●		●	0.05-0.50	0.05-0.20
CCGW 03X104T01015-1	3.63	3.57	1.39	0.40	2.3	1.90	●		●	0.05-0.50	0.05-0.20
CCGW 04T102T01015-1	4.44	4.37	1.79	0.20	2.0	2.30	●		●	0.05-0.50	0.05-0.20
CCGW 04T104T01015-1	4.44	4.37	1.79	0.40	2.3	2.30	●		●	0.05-0.50	0.05-0.20
CCMT 060202T	6.30	6.35	2.38	0.20	2.6	2.80		●		0.05-0.50	0.05-0.20
CCMT 060204T	6.30	6.35	2.38	0.40	2.7	2.80		●		0.05-0.50	0.05-0.20
CCMT 09T304T	9.70	9.52	3.97	0.40	2.9	4.40		●		0.05-0.50	0.05-0.20
CCMT 09T308T	9.70	9.52	3.97	0.80	3.6	4.40		●		0.05-0.50	0.05-0.20

For tools, see pages: IHCR (408) • IHRF (436) • IHRF-BW (439) • IHRF-C (413) • IHRF-CH (439) • IHSR (408) • IHSR-BW (410) • IHSR-C (413)

ISOTURN

CCGT-AS

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



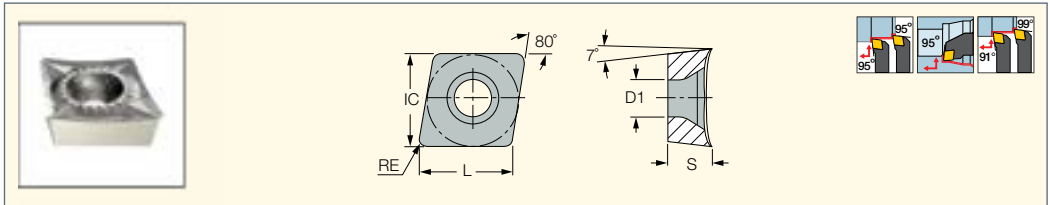
Designation	Dimensions						IC20	Recommended Machining Data	
	L	IC	S	RE	D1	a _p (mm)		f (mm/rev)	
CCGT 060201-AS	6.40	6.35	2.38	0.10	2.80	●	0.50-2.00	0.10-0.20	
CCGT 060202-AS	6.40	6.35	2.38	0.20	2.80	●	0.50-2.00	0.10-0.20	
CCGT 060204-AS	6.40	6.35	2.38	0.40	2.80	●	0.50-2.00	0.10-0.25	
CCGT 09T301-AS	9.70	9.52	3.97	0.10	4.40	●	0.50-2.50	0.10-0.25	
CCGT 09T302-AS	9.70	9.52	3.97	0.20	4.40	●	0.50-2.50	0.10-0.25	
CCGT 09T304-AS	9.70	9.52	3.97	0.40	4.40	●	0.50-2.50	0.10-0.25	
CCGT 09T308-AS	9.70	9.52	3.97	0.80	4.40	●	0.80-3.00	0.10-0.30	
CCGT 120402-AS	12.90	12.70	4.76	0.20	5.50	●	0.50-2.50	0.10-0.25	
CCGT 120404-AS	12.90	12.70	4.76	0.40	5.50	●	0.50-2.50	0.10-0.25	
CCGT 120408-AS	12.90	12.70	4.76	0.80	5.50	●	1.00-3.50	0.10-0.30	

For tools, see pages: IHCR (408) • IHRF (436) • IHRF-BW (439) • IHRF-C (413) • IHRF-CH (439) • IHSR (408) • IHSR-BW (410) • IHSR-C (413) • IHSR-CH (409)

ISOTURN

CCGT-AF

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



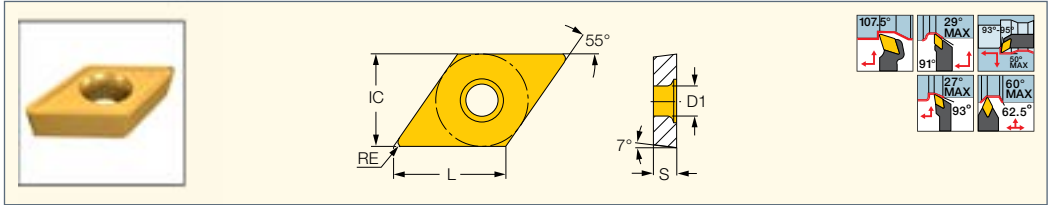
Designation	Dimensions						IC20	Recommended Machining Data	
	L	IC	S	RE	D1	a _p (mm)		f (mm/rev)	
CCGT 09T308-AF	9.70	9.52	3.97	0.80	4.40	●	0.80-3.00	0.15-0.25	
CCGT 120408-AF	12.90	12.70	4.76	0.80	5.50	●	1.00-3.50	0.15-0.30	

For tools, see pages: IHCR (408) • IHRF (436) • IHSR (408) • IHSR-BW (410) • IHSR-C (413) • IHSR-CH (409)

ISOTURN

DCMT-14

55° Rhombic Inserts with a Positive Flank for Semi-Finishing and Finish Turning on Soft Materials and Exotic Alloys

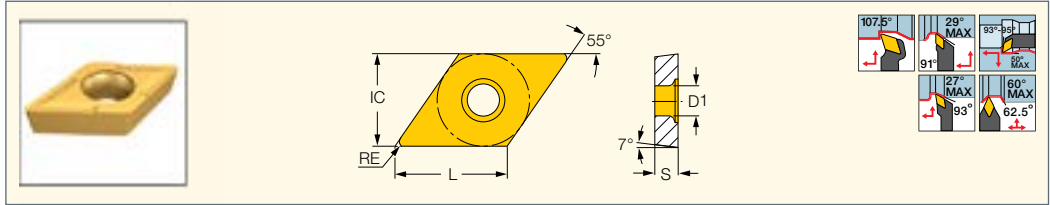


Designation	Dimensions					Tough ↔ Hard					Recommended Machining Data	
	L	IC	S	RE	D1	IC830	IC8150	IC20	IC428	IC5005	ap (mm)	f (mm/rev)
DCMT 11T304-14	11.60	9.52	3.97	0.40	4.40	●	●	●			1.00-2.50	0.14-0.25
DCMT 11T308-14	11.60	9.52	3.97	0.80	4.40		●	●	●	●	1.50-3.00	0.14-0.29

ISOTURN

DCMT/DCGT

55° Rhombic Inserts with a 7° Positive Clearance for Finishing Applications



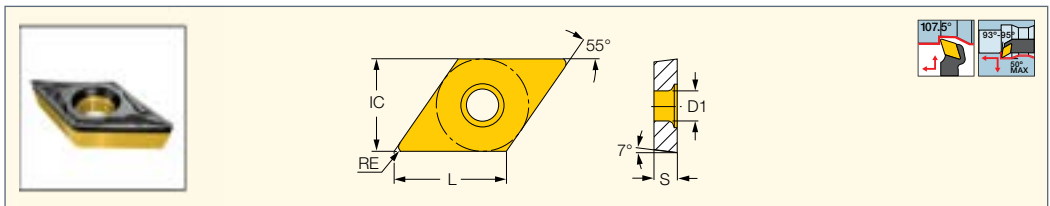
Designation	Dimensions					Tough ↔ Hard							Recommended Machining Data		
	L	IC	S	RE	D1	IC830	IC8250	IC908	IC30N	IC530N	IC8150	IC20N	IC520N	ap (mm)	f (mm/rev)
DCGT 070201R (1)	7.70	6.35	2.38	0.10	2.80			●						0.25-1.50	0.05-0.15
DCGT 070202	7.70	6.35	2.38	0.20	2.80				●					0.50-2.00	0.08-0.20
DCGT 070204	7.70	6.35	2.38	0.40	2.80				●					0.80-2.50	0.10-0.25
DCMT 070202	7.70	6.35	2.38	0.20	2.80	●	●				●	●	●	0.50-2.00	0.08-0.20
DCMT 070204	7.70	6.35	2.38	0.40	2.80	●	●				●	●	●	0.50-2.00	0.08-0.22
DCGT 11T302	11.60	9.52	3.97	0.20	4.40				●					0.50-2.00	0.08-0.20
DCGT 11T304	11.60	9.52	3.97	0.40	4.40				●					1.00-2.50	0.12-0.25
DCMT 11T302	11.60	9.52	3.97	0.20	4.40				●	●				0.50-2.00	0.08-0.20
DCMT 11T304	11.60	9.52	3.97	0.40	4.40				●					0.50-2.00	0.12-0.25
DCMT 11T308	11.60	9.52	3.97	0.80	4.40	●								1.50-3.00	0.14-0.29

• Right-hand inserts for right-hand external tools and for left-hand internal tools • For user guide and cutting speed recommendations, see pages ..
 (1) Right-hand insert

ISOTURN

DCMT/DCGT-PF

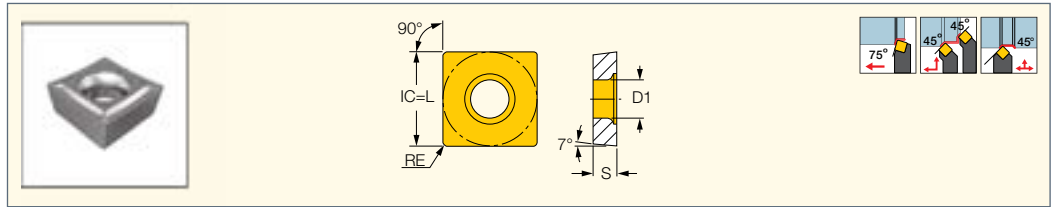
55° Rhombic Inserts with a Positive Flank for Semi-Finish and Finishing on Soft Materials and Exotic Alloys



Designation	Dimensions					Tough ↔ Hard								Recommended Machining Data		
	L	IC	S	RE	D1	IC830	IC6025	IC8250	IC908	IC6015	IC806	IC807	IC907	IC804	ap (mm)	f (mm/rev)
DCGT 070201-PF	7.70	6.35	2.38	0.10	2.80				●						0.30-3.00	0.02-0.25
DCGT 070202-PF	7.70	6.35	2.38	0.20	2.80				●						0.40-3.00	0.03-0.25
DCGT 070204-PF	7.70	6.35	2.38	0.40	2.80				●						0.50-3.00	0.05-0.25
DCMT 070201-PF	7.70	6.35	2.38	0.10	2.80							●	●		0.30-3.00	0.02-0.25
DCMT 070202-PF	7.70	6.35	2.38	0.20	2.80	●									0.40-3.00	0.03-0.25
DCMT 070204-PF	7.70	6.35	2.38	0.40	2.80	●									0.50-3.00	0.05-0.25
DCMT 070208-PF	7.70	6.35	2.38	0.80	2.80							●	●		0.70-3.00	0.08-0.25
DCGT 11T301-PF	11.60	9.52	3.97	0.10	4.40				●						0.30-3.00	0.03-0.25
DCGT 11T302-PF	11.60	9.52	3.97	0.20	4.40				●						0.40-3.00	0.04-0.25
DCGT 11T304-PF	11.60	9.52	3.97	0.40	4.40				●						0.50-3.00	0.05-0.25
DCGT 11T308-PF	11.60	9.52	3.97	0.80	4.40				●						0.70-3.00	0.10-0.25
DCMT 11T302-PF	11.60	9.52	3.97	0.20	4.40	●				●	●	●	●		0.30-3.00	0.04-0.25
DCMT 11T304-PF	11.60	9.52	3.97	0.40	4.40	●	●	●		●	●	●	●		0.50-3.00	0.05-0.25
DCMT 11T308-PF	11.60	9.52	3.97	0.80	4.40	●	●	●		●	●	●	●		0.70-3.00	0.10-0.25

SCMT-SM

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

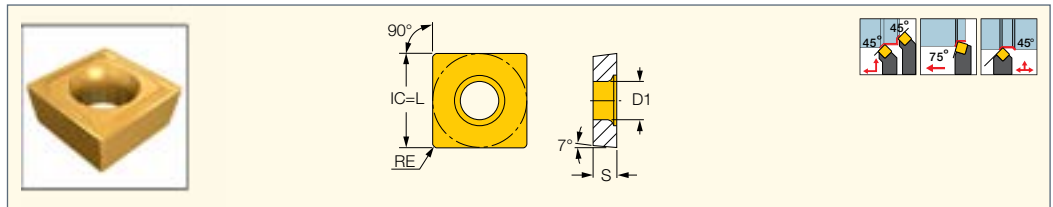


Designation	Dimensions				Tough ↔ Hard							Recommended Machining Data	
	L	S	RE	D1	IC880	IC6025	IC8250	IC8150	IC5005	IC807	IC907	a _p (mm)	f (mm/rev)
SCMT 09T304-SM	9.52	3.97	0.40	4.40			•	•		•	•	0.50-3.00	0.07-0.25
SCMT 09T308-SM	9.52	3.97	0.80	4.40	•	•	•	•	•	•	•	0.50-3.00	0.10-0.30
SCMT 120404-SM	12.70	4.76	0.40	5.50				•				0.50-3.50	0.10-0.25
SCMT 120408-SM	12.70	4.76	0.80	5.50			•	•		•	•	1.00-4.00	0.10-0.30

For tools, see page: IHPR (408)

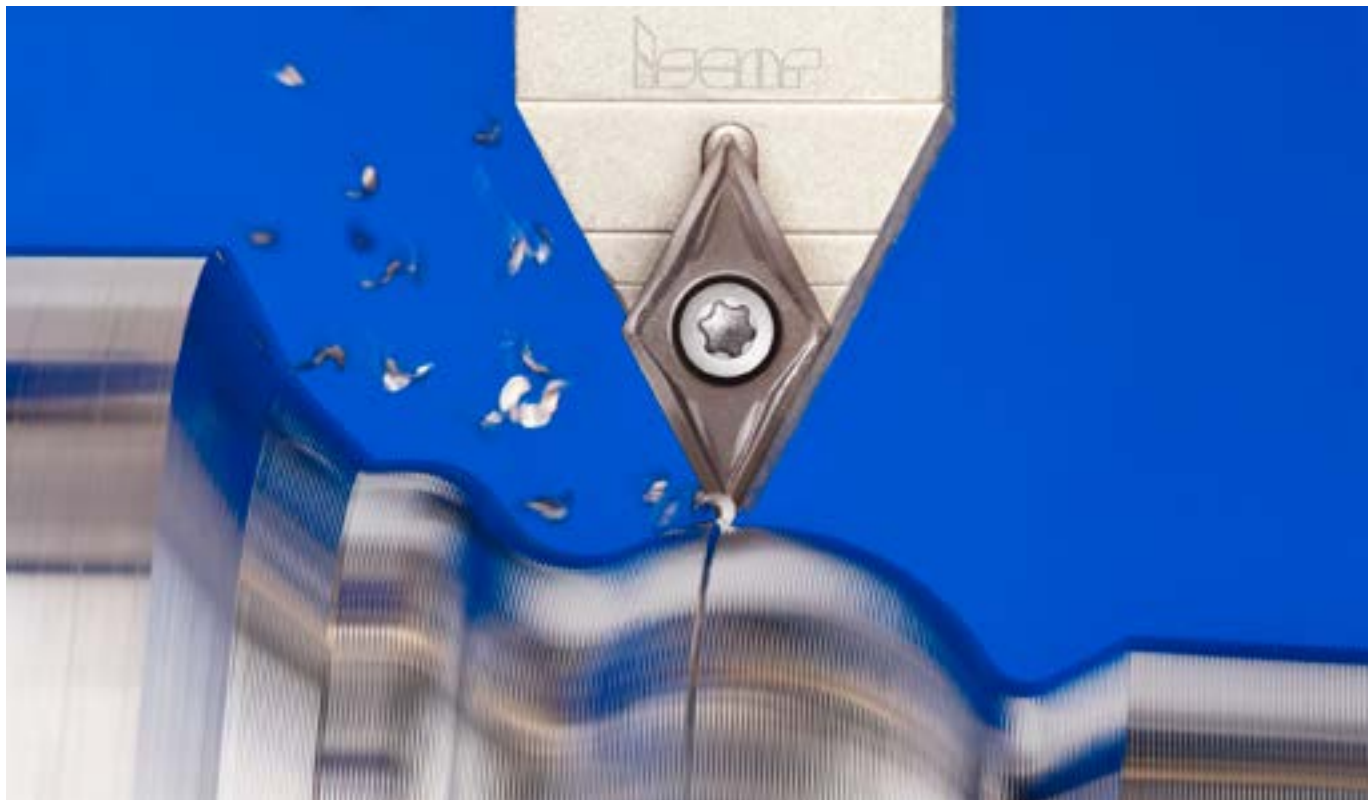
SCMT-14

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



Designation	Dimensions				Tough ↔ Hard			Recommended Machining Data	
	L	S	RE	D1	IC8250	IC807	IC907	a _p (mm)	f (mm/rev)
SCMT 09T304-14	9.52	3.97	0.40	4.40		•	•	1.00-3.50	0.12-0.30
SCMT 120404-14	12.70	4.76	0.40	5.50	•			1.00-4.00	0.12-0.30

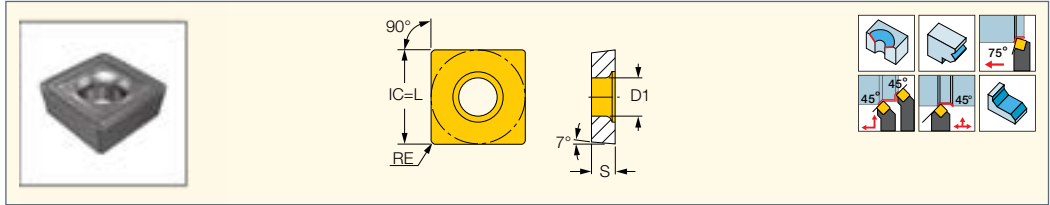
For tools, see page: IHPR (408)



ISOTURN

SCMT-19

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



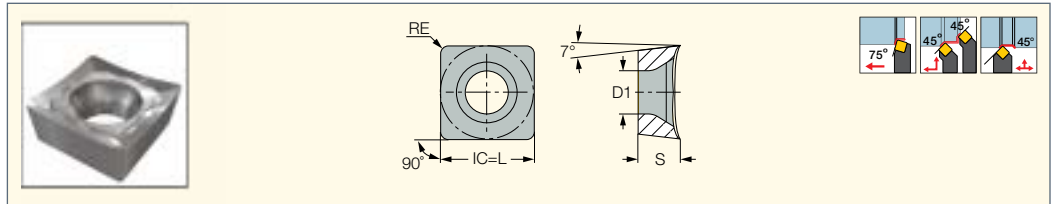
Designation	Dimensions				Tough ↔ Hard					Recommended Machining Data	
	L	S	RE	D1	IC830	IC20	IC5005	IC907	IC907	a _p (mm)	f _z (mm/rev)
SCMT 120408-19	12.70	4.76	0.80	5.50	●	●	●	●	●	3.00-8.00	0.08-0.15
SCMT 120412-19	12.70	4.76	1.20	5.50		●				3.00-8.00	0.08-0.15

For tools, see page: IHPR (408)

ISOTURN

SCGT-AS

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



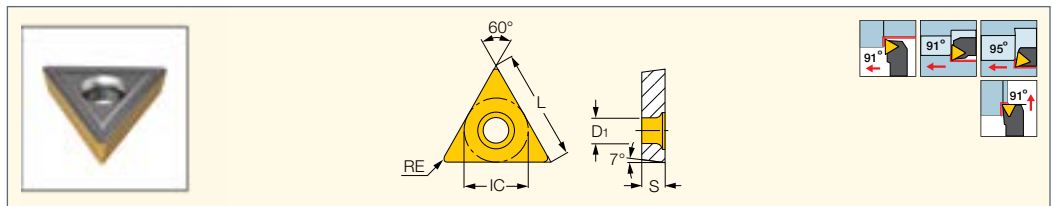
Designation	Dimensions						IC20	Recommended Machining Data	
	L	IC	S	RE	D1	a _p (mm)		f (mm/rev)	
SCGT 09T308-AS	9.52	9.52	3.97	0.80	4.40	●	0.50-3.00	0.10-0.30	
SCGT 120404-AS	12.70	12.70	4.76	0.40	5.50	●	1.00-4.00	0.10-0.30	
SCGT 120408-AS	12.70	12.70	4.76	0.80	5.50	●	1.00-4.00	0.10-0.30	

For tools, see page: IHPR (408)

ISOTURN

TCMT-19

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



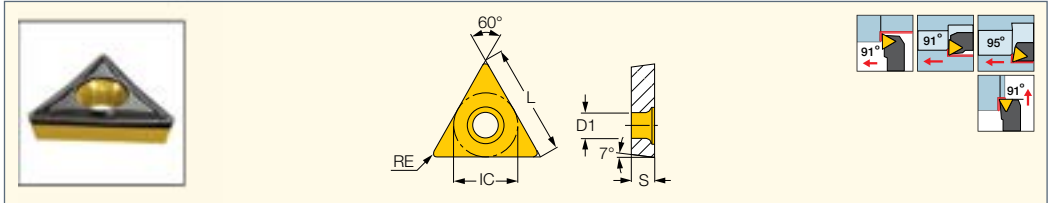
Designation	Dimensions					Tough ↔ Hard				Recommended Machining Data	
	L	IC	S	RE	D1	IC830	IC50M	IC8150	IC20	a _p (mm)	f (mm/rev)
TCMT 110204-19	11.00	6.35	2.38	0.40	2.80		●	●	●	0.50-3.00	0.10-0.30
TCMT 16T308-19	16.50	9.52	3.97	0.80	4.40	●	●		●	1.00-4.00	0.20-0.35
TCMT 220508-19	22.00	12.70	5.00	0.80	5.50		●			1.00-4.00	0.20-0.35

For tools, see page: IHBR (409)

ISOTURN

TCMT-SM

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



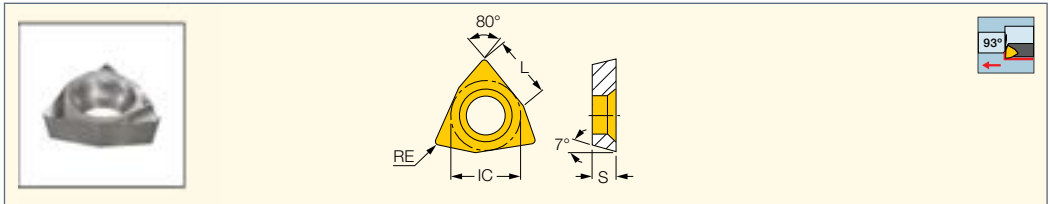
Designation	Dimensions					Tough ↔ Hard									Recommended Machining Data		
	L	IC	S	RE	D1	IC830	IC8350	IC8250	IC908	IC8150	IC5010	IC428	IC5005	IC807	IC907	a _p (mm)	f (mm/rev)
TCMT 110204-SM	11.00	6.35	2.38	0.40	2.80		•	•	•	•	•		•	•	•	0.20-3.00	0.05-0.25
TCMT 110208-SM	11.00	6.35	2.38	0.80	2.80			•						•	•	0.50-2.50	0.07-0.25
TCMT 16T304-SM	16.50	9.52	3.97	0.40	4.40	•		•					•	•	•	0.50-3.00	0.06-0.25
TCMT 16T308-SM	16.50	9.52	3.97	0.80	4.40	•		•					•	•	•	0.50-3.00	0.08-0.28
TCMT 16T308-SM*	16.50	9.52	3.97	0.80	4.40		•									0.50-3.00	0.08-0.28

For tools, see page: IHBR (409)

ISOTURN

WCGT

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



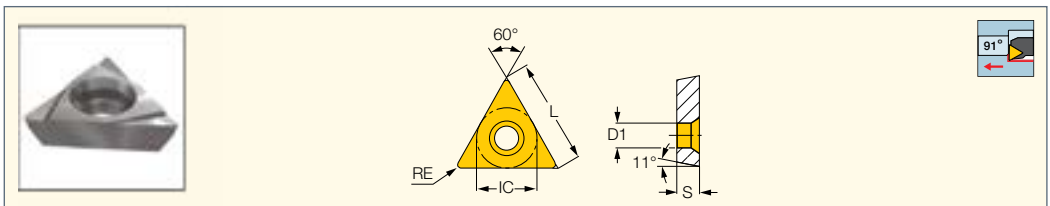
Designation	Dimensions				Tough ↔ Hard		Recommended Machining Data	
	L	IC	S	RE	IC908	IC30N	a _p (mm)	f (mm/rev)
WCGT 020102L	2.18	3.97	1.59	0.20	•	•	0.40-2.00	0.05-0.10
WCGT 020104L	2.18	3.97	1.59	0.40	•	•	0.40-2.00	0.10-0.15

For tools, see pages: IHAXF (432) • IHAXF-AVI (434) • IHAXF-E (434) • IHWF (436)

ISOTURN

TPGX

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



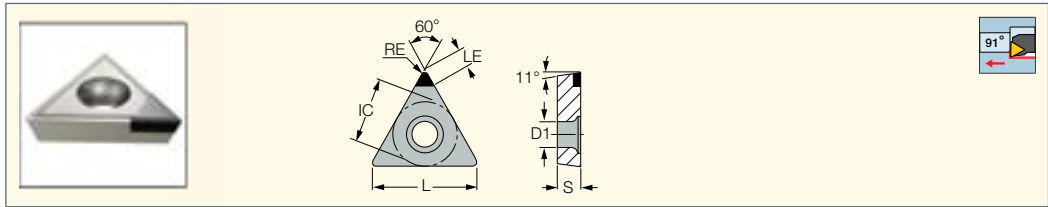
Designation	Dimensions					Tough ↔ Hard				Recommended Machining Data	
	L	IC	S	RE	D1	IC908	IC20	IC20N	IC520N	a _p (mm)	f (mm/rev)
TPGX 090202-L	9.52	5.56	2.38	0.20	3.00	•	•	•	•	1.00-2.00	0.10-0.20
TPGX 090204-L	9.52	5.56	2.38	0.40	3.00	•	•	•	•	1.00-2.50	0.15-0.20
TPGX 110302-L	11.00	6.35	3.18	0.20	3.50	•	•	•	•	1.00-2.50	0.10-0.20
TPGX 110304-L	11.00	6.35	3.18	0.40	3.50	•	•	•	•	1.00-3.00	0.15-0.20
TPGX 110308-L	11.00	6.35	3.18	0.80	3.50		•			1.00-3.50	0.15-0.25

For tools, see pages: IHAXF (432) • IHAXF-AVI (434) • IHAXF-E (434) • IHFF (436) • IHFF-C (413)

ISOTURN

TPGX (CBN)

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



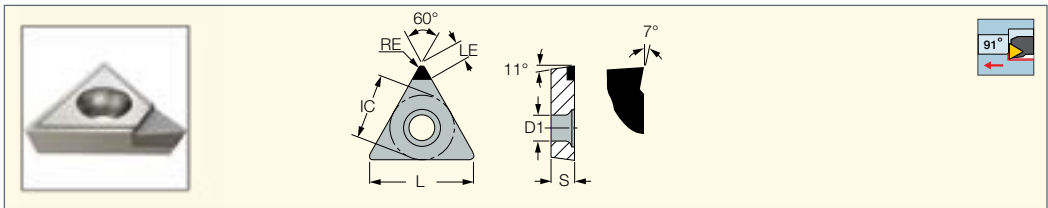
Designation	Dimensions						Tough ↔ Hard		Recommended Machining Data	
	L	IC	S	RE	LE	D1	IB90	IB50	a _p (mm)	f (mm/rev)
TPGX 090202T	9.52	5.56	2.38	0.20	2.5	2.50	●	●	0.05-0.50	0.03-0.20
TPGX 090204T	9.52	5.56	2.38	0.40	2.6	2.50	●	●	0.05-0.50	0.03-0.20
TPGX 110302T	11.00	6.35	3.18	0.20	3.3	3.50	●	●	0.05-0.50	0.03-0.20
TPGX 110304T	11.00	6.35	3.18	0.40	3.0	3.50	●	●	0.05-0.50	0.03-0.20

For tools, see pages: IHAXF (432) • IHAXF-AVI (434) • IHAXF-E (434) • IHFF (436) • IHFF-C (413)

ISOTURN

TPGX (PCD)

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



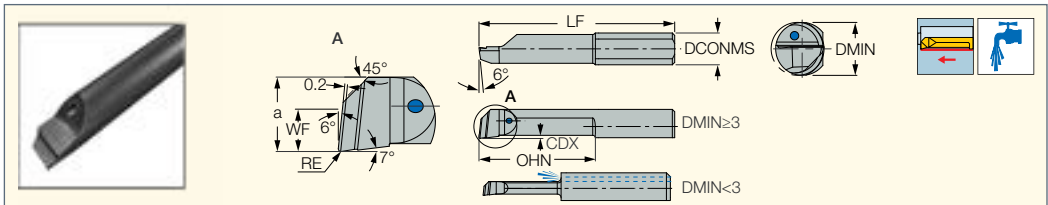
Designation	Dimensions						ID5	Recommended Machining Data	
	L	IC	S	RE	LE	D1		a _p (mm)	f (mm/rev)
TPGX 090202	9.52	5.56	2.38	0.20	3.0	2.50	●	0.10-3.00	0.05-0.30
TPGX 090204	9.52	5.56	2.38	0.40	3.0	2.50	●	0.10-3.00	0.05-0.30
TPGX 110302	11.00	6.35	3.18	0.20	3.4	3.50	●	0.10-3.00	0.05-0.30
TPGX 110304	11.00	6.35	3.18	0.40	3.8	3.50	●	0.10-3.00	0.05-0.30

For tools, see page: AIHAXF (432)

PICCO CUT

PICCO R/LX050

Reinforced Boring Inserts
with Internal Coolant Holes

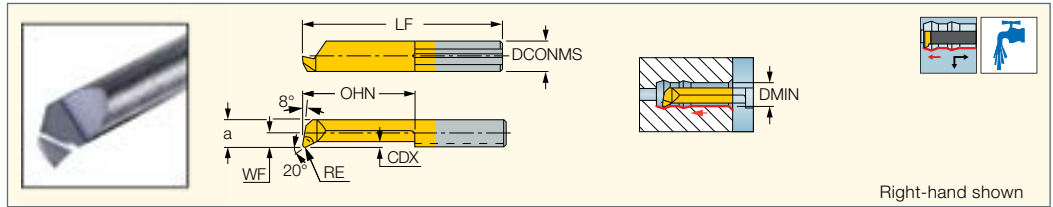


Designation	Dimensions								IC908
	DCONMS	WF	a	RE	LF	OHN ⁽¹⁾	CDX ⁽²⁾	DMIN	
PICCO R/LX050.2-5R15	4.00	-	1.80	0.15	19.00	5.0	0.10	2.00	●
PICCO R/LX050.2-10R05	4.00	-	1.80	0.05	24.00	10.0	0.10	2.00	●
PICCO R/LX050.2-10R15	4.00	-	1.80	0.15	24.00	10.0	0.10	2.00	●
PICCO R/LX050.3-16R10	4.00	0.70	2.70	0.10	30.00	16.0	0.15	3.00	●
PICCO R/LX050.3-16R20	4.00	0.70	2.70	0.20	30.00	16.0	0.15	3.00	●
PICCO R/LX050.4-10R10	4.00	1.60	3.60	0.10	24.00	10.0	0.20	4.00	●
PICCO R/LX050.4-10R20	4.00	1.60	3.60	0.20	24.00	10.0	0.20	4.00	●
PICCO R/LX050.4-16R10	4.00	1.60	3.60	0.10	30.00	16.0	0.20	4.00	●
PICCO R/LX050.4-16R20	4.00	1.60	3.60	0.20	30.00	16.0	0.20	4.00	●
PICCO R/LX050.5-15R10	5.00	2.10	4.60	0.10	30.00	15.0	0.30	5.00	●
PICCO R/LX050.5-15R20	5.00	2.10	4.60	0.20	30.00	15.0	0.30	5.00	●
PICCO R/LX050.5-25R10	5.00	2.10	4.60	0.10	40.00	25.0	0.30	5.00	●
PICCO R/LX050.5-25R20	5.00	2.10	4.60	0.20	40.00	25.0	0.30	5.00	●
PICCO R/LX050.6-15R10	6.00	2.50	5.50	0.10	30.00	15.0	0.40	6.00	●
PICCO R/LX050.6-15R20	6.00	2.50	5.50	0.20	30.00	15.0	0.40	6.00	●
PICCO R/LX050.6-22R20	6.00	2.50	5.50	0.20	37.00	22.0	0.40	6.00	●
PICCO R/LX050.6-35R20	6.00	2.50	5.50	0.20	50.00	35.0	0.40	6.00	●

● Left-hand inserts on request

⁽¹⁾ Minimum overhang

⁽²⁾ Cutting depth maximum



Designation	Dimensions								Tough ↔ Hard	
	DCONMS	WF	a	LF	OHN ⁽²⁾	RE	CDX ⁽³⁾	DMIN	IC228	IC908
PICCO R 050.06-2 ⁽¹⁾	4.00	-	0.50	20.00	2.0	0.04	0.08	0.60	●	●
PICCO R 050.06-3 ⁽¹⁾	4.00	-	0.50	20.00	3.0	0.04	0.08	0.60	●	●
PICCO R 050.08-4	4.00	-	0.70	20.00	4.0	0.04	0.08	0.80		●
PICCO R/L 050.1-5	4.00	-	0.90	20.00	4.5	0.05	0.10	1.00	●	●
PICCO R/L 050.1-7	4.00	-	0.90	22.00	6.5	0.05	0.10	1.00	●	●
PICCO R 050.15-5	4.00	-	1.30	19.00	5.0	0.05	0.10	1.50		●
PICCO R 050.15-10	4.00	-	1.30	24.00	10.0	0.06	0.10	1.50		●
PICCO R/L 050.2-5	4.00	-	1.70	19.00	4.0	0.05	0.10	2.00	●	●
PICCO R 055.2-5	4.00	-	1.70	19.00	5.0	0.05	0.10	2.00		●
PICCO R/L 050.2-10	4.00	-	1.70	24.00	9.0	0.05	0.10	2.00	●	●
PICCO R 055.2-10	4.00	-	1.70	24.00	10.0	0.05	0.10	2.00		●
PICCO L 050.2-15	4.00	-	1.70	29.00	15.0	0.05	0.10	2.00	●	●
PICCO R 050.2-15	4.00	-	1.70	29.00	14.0	0.05	0.10	2.00	●	●
PICCO R 055.2-15	4.00	-	1.70	29.00	15.0	0.05	0.10	2.00		●
PICCO R 050.25-5	4.00	0.20	2.20	19.00	5.0	0.05	0.15	2.50		●
PICCO R 050.25-10	4.00	0.20	2.20	24.00	10.0	0.07	0.15	2.50		●
PICCO R 050.25-16	4.00	0.20	2.20	30.00	16.0	0.07	0.15	2.50		●
PICCO R 053.3-10	4.00	0.60	2.60	24.00	9.0	0.03	0.20	2.80		●
PICCO R 055.3-10	4.00	0.60	2.60	24.00	10.0	0.05	0.20	2.80		●
PICCO R/L 050.3-10	4.00	0.60	2.60	24.00	9.0	0.10	0.20	2.80	●	●
PICCO R 053.3-16	4.00	0.60	2.60	30.00	15.0	0.03	0.20	2.80		●
PICCO R 055.3-16	4.00	0.60	2.60	30.00	16.0	0.05	0.20	2.80		●
PICCO R/L 050.3-16	4.00	0.60	2.60	30.00	15.0	0.10	0.20	2.80	●	●
PICCO R 053.3-20	4.00	0.60	2.60	34.00	19.0	0.03	0.20	2.80		●
PICCO R/L 050.3-20	4.00	0.60	2.60	34.00	19.0	0.10	0.20	2.80	●	●
PICCO R 050.35-10	4.00	1.10	3.10	24.00	10.0	0.10	0.25	3.50		●
PICCO R 050.35-16	4.00	1.10	3.10	30.00	16.0	0.10	0.25	3.50		●
PICCO R 050.35-20	4.00	1.10	3.10	34.00	20.0	0.10	0.25	3.50		●
PICCO R 050.35-24	4.00	1.10	3.10	38.00	24.0	0.10	0.25	3.50		●
PICCO R 053.4-10	4.00	1.50	3.50	24.00	9.0	0.03	0.30	4.00		●
PICCO R 055.4-10	4.00	1.50	3.50	24.00	10.0	0.05	0.30	4.00		●
PICCO R/L 050.4-10	4.00	1.50	3.50	24.00	9.0	0.10	0.30	4.00	●	●
PICCO R 053.4-16	4.00	1.50	3.50	30.00	15.0	0.03	0.30	4.00		●
PICCO R 055.4-16	4.00	1.50	3.50	30.00	16.0	0.05	0.30	4.00		●
PICCO R/L 050.4-16	4.00	1.50	3.50	30.00	15.0	0.10	0.30	4.00	●	●
PICCO R 053.4-20	4.00	1.50	3.50	34.00	19.0	0.03	0.30	4.00		●
PICCO R 055.4-20	4.00	1.50	3.50	34.00	20.0	0.05	0.30	4.00		●
PICCO R/L 050.4-20	4.00	1.50	3.50	34.00	19.0	0.10	0.30	4.00	●	●
PICCO R/L 050.4-24	4.00	1.50	3.50	38.00	23.0	0.10	0.30	4.00	●	●
PICCO R/L 050.4-28	4.00	1.50	3.50	42.00	27.0	0.10	0.30	4.00	●	●
PICCO R 055.4-28	4.00	1.50	3.50	42.00	28.0	0.05	0.50	4.00		●
PICCO R 055.5-10	5.00	1.90	4.40	25.00	9.0	0.05	0.50	5.00		●
PICCO R/L 050.5-10	5.00	1.90	4.40	25.00	9.0	0.15	0.50	5.00	●	●
PICCO R 055.5-15	5.00	1.90	4.40	30.00	14.0	0.05	0.50	5.00		●
PICCO R/L 050.5-15	5.00	1.90	4.40	30.00	14.0	0.15	0.50	5.00	●	●
PICCO R 055.5-20	5.00	1.90	4.40	35.00	19.0	0.05	0.50	5.00		●
PICCO R/L 050.5-20	5.00	1.90	4.40	35.00	19.0	0.15	0.50	5.00	●	●
PICCO R 055.5-25	5.00	1.90	4.40	40.00	24.0	0.05	0.50	5.00		●
PICCO R/L 050.5-25	5.00	1.90	4.40	40.00	24.0	0.15	0.50	5.00	●	●
PICCO R 055.5-30	5.00	1.90	4.40	45.00	29.0	0.05	0.50	5.00		●
PICCO R/L 050.5-30	5.00	1.90	4.40	45.00	29.0	0.15	0.50	5.00	●	●
PICCO R/L 050.5-35	5.00	1.90	4.40	50.00	34.0	0.15	0.50	5.00	●	●
PICCO R 055.6-15	6.00	2.30	5.30	30.00	14.0	0.05	0.50	6.00		●
PICCO R/L 050.6-15	6.00	2.30	5.30	30.00	14.0	0.15	0.50	6.00	●	●
PICCO R 055.6-22	6.00	2.30	5.30	37.00	21.0	0.05	0.50	6.00		●
PICCO R/L 050.6-22	6.00	2.30	5.30	37.00	21.0	0.15	0.50	6.00	●	●
PICCO R 055.6-25	6.00	2.30	5.30	40.00	24.0	0.05	0.50	6.00		●
PICCO R/L 050.6-25	6.00	2.30	5.30	40.00	24.0	0.15	0.50	6.00	●	●
PICCO R 055.6-30	6.00	2.30	5.30	45.00	29.0	0.05	0.50	6.00		●

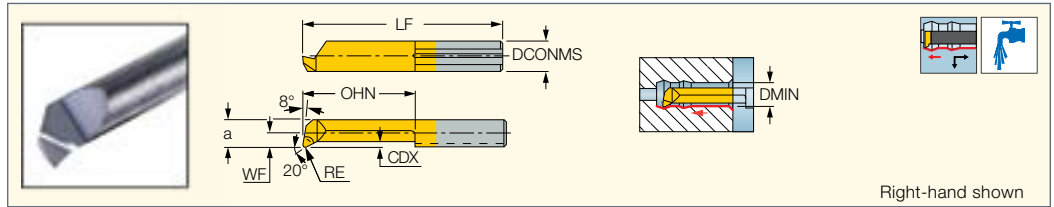
• Specify right- or left-hand bars
⁽¹⁾ Maximum D.O.C.=0.01-0.03 mm, maximum feed=0.01 mm/rev.
⁽²⁾ Minimum overhang
⁽³⁾ Cutting depth maximum

PICCO CUT

PICCO R/L 050, 053, 055

(Continue)

Inserts for Internal Turning and Chamfering



Designation	Dimensions								Tough ↔ Hard	
	DCONMS	WF	a	LF	OHN ⁽²⁾	RE	CDX ⁽³⁾	DMIN	IC228	IC908
PICCO R/L 050.6-30	6.00	2.30	5.30	45.00	29.0	0.15	0.50	6.00	●	●
PICCO R/L 050.6-35	6.00	2.30	5.30	50.00	34.0	0.15	0.50	6.00	●	●
PICCO R/L 050.6-42	6.00	2.30	5.30	57.00	41.0	0.15	0.50	6.00	●	●
PICCO R/L 050.7-20	7.00	2.80	6.30	35.00	19.0	0.15	0.60	6.80	●	●
PICCO R/L 050.7-25	7.00	2.80	6.30	40.00	24.0	0.15	0.60	6.80	●	●
PICCO R/L 050.7-30	7.00	2.80	6.30	45.00	29.0	0.15	0.60	6.80	●	●
PICCO R/L 050.7-35	7.00	2.80	6.30	50.00	34.0	0.15	0.60	6.80	●	●
PICCO R/L 050.7-40	7.00	2.80	6.30	55.00	39.0	0.15	0.60	6.80	●	●
PICCO R/L 050.7-45	7.00	2.80	6.30	60.00	44.0	0.15	0.60	6.80	●	●
PICCO R/L 050.7-50	7.00	2.80	6.30	65.00	49.0	0.15	0.60	6.80	●	●

• Specify right- or left-hand bars

⁽¹⁾ Maximum D.O.C.=0.01-0.03 mm, maximum feed=0.01 mm/rev.

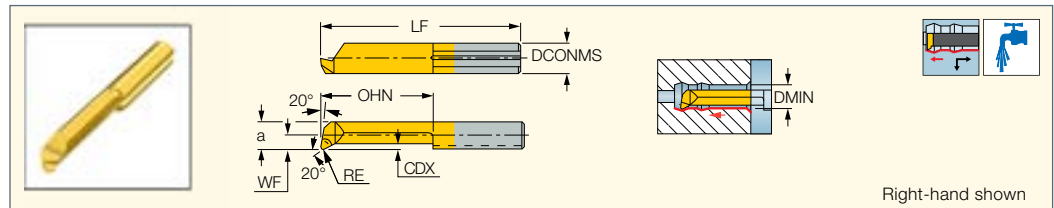
⁽²⁾ Minimum overhang

⁽³⁾ Cutting depth maximum

PICCO CUT

PICCO R 050.20

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

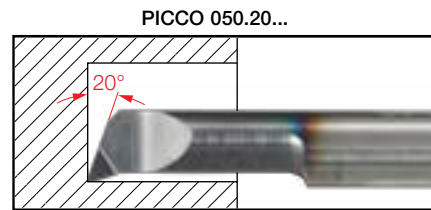
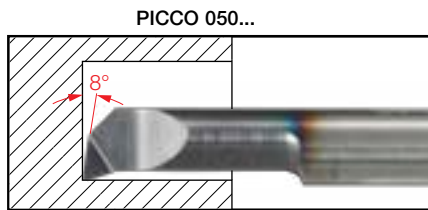


Designation	Dimensions								IC908
	DCONMS	WF	a	LF	OHN ⁽¹⁾	RE	CDX ⁽²⁾	DMIN	
PICCO R 050.20.2-10	4.00	-	1.70	24.00	10.0	0.05	0.10	2.00	●
PICCO R 050.20.3-10	4.00	0.60	2.60	24.00	10.0	0.10	0.20	2.80	●
PICCO R 050.20.4-16	4.00	1.50	3.50	30.00	16.0	0.10	0.30	4.00	●
PICCO R 050.20.5-20	5.00	1.90	4.40	35.00	19.0	0.15	0.50	5.00	●

• Specify right- or left-hand bars

⁽¹⁾ Minimum overhang

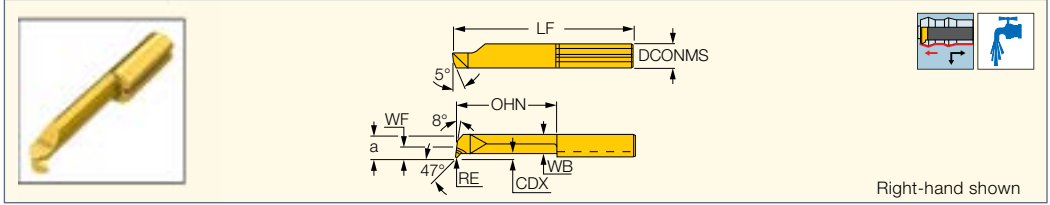
⁽²⁾ Cutting depth maximum



PICCO CUT

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	4.00	1.50	3.50	34.00	20.0	3.00	0.30	4.00	0.15	●
PICCO R/L 047.5-25	5.00	1.90	4.40	40.00	25.0	3.80	0.50	5.00	0.15	●
PICCO R/L 047.6-30	6.00	2.30	5.30	45.00	30.0	4.50	0.50	6.00	0.15	●
PICCO R 047.T6-22	6.00	2.30	5.30	37.00	22.0	3.40	1.80	6.00	0.15	●
PICCO R 047.T6-30	6.00	2.30	5.30	45.00	30.0	3.40	1.80	6.00	0.15	●

• Left hand inserts on request

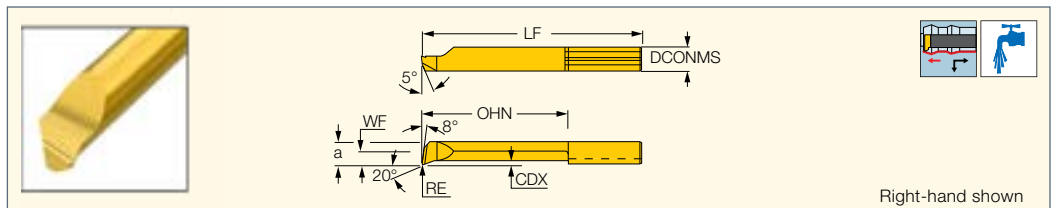
⁽¹⁾ Minimum overhang

⁽²⁾ Cutting depth maximum

PICCO CUT

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	4.00	1.50	3.50	24.00	10.0	0.30	4.00	0.10	●
PICCO R/L 050.4-20C	4.00	1.50	3.50	34.00	20.0	0.30	4.00	0.10	●
PICCO R/L 050.4-24C	4.00	1.50	3.50	38.00	24.0	0.30	4.00	0.10	●
PICCO R/L 050.4-28C	4.00	1.50	3.50	42.00	28.0	0.30	4.00	0.10	●
PICCO R 050.4-16C	4.00	1.50	3.50	30.00	16.0	0.30	4.00	0.10	●
PICCO R/L 050.5-10C	5.00	1.90	4.40	25.00	10.0	0.50	5.00	0.15	●
PICCO R/L 050.5-15C	5.00	1.90	4.40	30.00	15.0	0.50	5.00	0.15	●
PICCO R/L 050.5-20C	5.00	1.90	4.40	35.00	20.0	0.50	5.00	0.15	●
PICCO R/L 050.5-25C	5.00	1.90	4.40	40.00	25.0	0.50	5.00	0.15	●
PICCO R/L 050.5-30C	5.00	1.90	4.40	45.00	30.0	0.50	5.00	0.15	●
PICCO R/L 050.5-35C	5.00	1.90	4.40	50.00	35.0	0.50	5.00	0.15	●
PICCO R/L 050.6-15C	6.00	2.30	5.30	30.00	15.0	0.50	6.00	0.15	●
PICCO R/L 050.6-22C	6.00	2.30	5.30	37.00	22.0	0.50	6.00	0.15	●
PICCO R/L 050.6-25C	6.00	2.30	5.30	40.00	25.0	0.50	6.00	0.15	●
PICCO R/L 050.6-30C	6.00	2.30	5.30	45.00	30.0	0.50	6.00	0.15	●
PICCO R/L 050.6-35C	6.00	2.30	5.30	50.00	35.0	0.50	6.00	0.15	●
PICCO R/L 050.6-42C	6.00	2.30	5.30	57.00	42.0	0.50	6.00	0.15	●
PICCO R/L 050.7-20C	7.00	2.80	6.30	35.00	20.0	0.60	6.80	0.15	●
PICCO R/L 050.7-25C	7.00	2.80	6.30	40.00	25.0	0.60	6.80	0.15	●
PICCO R/L 050.7-30C	7.00	2.80	6.30	45.00	30.0	0.60	6.80	0.15	●
PICCO R/L 050.7-35C	7.00	2.80	6.30	50.00	35.0	0.60	6.80	0.15	●
PICCO R/L 050.7-40C	7.00	2.80	6.30	55.00	40.0	0.60	6.80	0.15	●
PICCO L 050.7-50C	7.00	2.80	6.30	65.00	50.0	0.60	6.80	0.15	●

• All left-hand inserts on request

⁽¹⁾ Minimum overhang

⁽²⁾ Cutting depth maximum

Stainless Steel 316L

PICCO R 050.6-35C with Chipbreaker

f = 0.03 mm/rev

f = 0.05 mm/rev



PICCO R 050.6-35 Standard

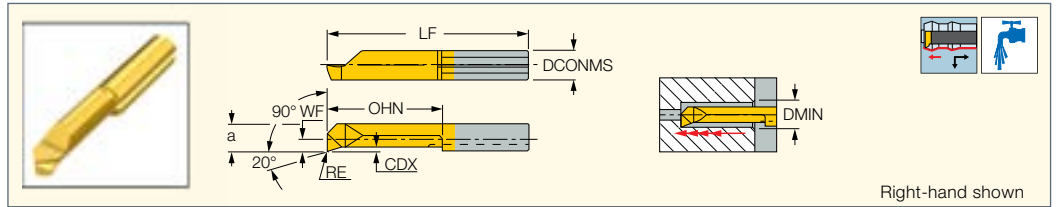
f = 0.03 mm/rev

f = 0.05 mm/rev



PICCO CUT

PICCO R/L 090
Inserts for Internal
Turning and Profiling



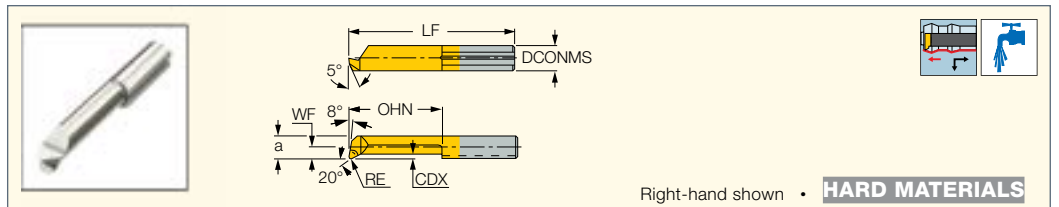
Right-hand shown

Dimensions									
Designation	DCONMS	WF	a	LF	OHN ⁽¹⁾	RE	CDX ⁽²⁾	DMIN	IC228
PICCO R/L 090.3-10	4.00	0.60	2.60	24.00	9.0	0.10	0.20	2.80	●
PICCO R/L 090.3-16	4.00	0.60	2.60	30.00	15.0	0.10	0.20	2.80	●
PICCO R/L 090.4-10	4.00	1.50	3.50	24.00	9.0	0.10	0.30	4.00	●
PICCO R/L 090.4-16	4.00	1.50	3.50	30.00	15.0	0.10	0.30	4.00	●
PICCO R/L 090.5-10	5.00	1.90	4.40	25.00	9.0	0.15	0.50	5.00	●
PICCO R/L 090.5-15	5.00	1.90	4.40	30.00	14.0	0.15	0.50	5.00	●
PICCO R/L 090.5-20	5.00	1.90	4.40	35.00	19.0	0.15	0.50	5.00	●

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

PICCO CUT

PICCO R 050 (CBN)
CBN Tipped Inserts for
Internal Turning, Profiling and
Chamfering of Hard Steel



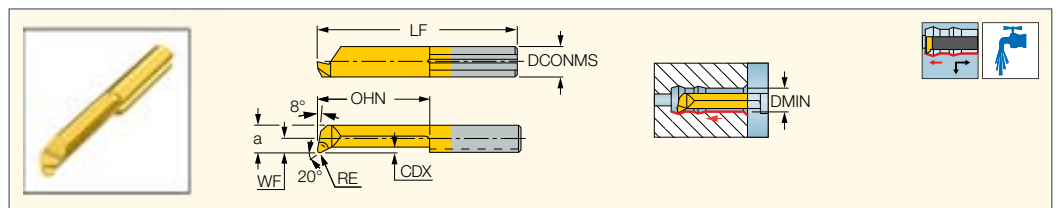
Right-hand shown • **HARD MATERIALS**

Dimensions									
Designation	DCONMS	WF	a	LF	OHN ⁽¹⁾	CDX ⁽²⁾	DMIN	RE	IB55
PICCO R 050.3-10B	4.00	0.60	2.60	25.50	10.0	0.20	2.80	0.10	●
PICCO R 050.4-10B	4.00	1.50	3.50	25.50	10.0	0.30	4.00	0.10	●
PICCO R 050.5-15B	5.00	1.90	4.40	31.50	15.0	0.50	5.00	0.15	●
PICCO R 050.6-15B	6.00	2.30	5.30	31.50	15.0	0.50	6.00	0.15	●
PICCO R 050.7-20B	7.00	2.80	6.30	36.50	20.0	0.60	6.80	0.15	●

- It is not recommended to use coolant when machining with CBN tipped tools • Available on request only
- ⁽¹⁾ Minimum overhang
- ⁽²⁾ Cutting depth maximum

PICCO CUT

PICCO R/LHD 050
Inserts for Internal Turning
and Chamfering of Hard
Steel - Up to 65 HRC



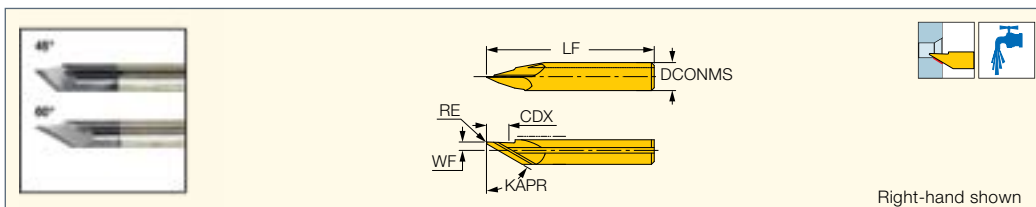
Dimensions									
Designation	DCONMS	WF	a	LF	OHN ⁽¹⁾	RE	CDX ⁽²⁾	DMIN	IC902
PICCO R/LHD 050.2-5	4.00	-	1.70	19.00	4.0	0.05	0.10	2.00	●
PICCO R/LHD 050.3-10	4.00	0.60	2.60	24.00	9.0	0.10	0.20	2.80	●
PICCO R/LHD 050.3-16	4.00	0.60	2.60	30.00	15.0	0.10	0.20	2.80	●
PICCO R/LHD 050.4-10	4.00	1.50	3.50	24.00	9.0	0.10	0.30	4.00	●
PICCO R/LHD 050.4-20	4.00	1.50	3.50	34.00	19.0	0.10	0.30	4.00	●
PICCO R/LHD 050.5-10	5.00	1.90	4.40	25.00	9.0	0.15	0.50	5.00	●
PICCO R/LHD 050.5-15	5.00	1.90	4.40	30.00	14.0	0.15	0.50	5.00	●
PICCO R/LHD 050.6-15	6.00	2.30	5.30	30.00	14.0	0.15	0.50	6.00	●
PICCO R/LHD 050.7-20	7.00	2.80	6.30	35.00	19.0	0.15	0.60	6.80	●
PICCO R/LHD 050.7-25	7.00	2.80	6.30	40.00	24.0	0.15	0.60	6.80	●
PICCO R/LHD 050.7-35	7.00	2.80	6.30	50.00	34.0	0.15	0.60	6.80	●

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

PICCO^{CUT}

PICCO R/L 520

Inserts for Internal Chamfering



Designation	Dimensions							IC908
	DCONMS	WF	KAPR ⁽¹⁾	LF	RE	CDX	DMIN	
PICCO R/L 520.0045-15	5.00	1.50	45.0	30.00	0.20	3.50	1.00	•
PICCO R/L 520.0060-15	5.00	1.50	60.0	30.00	0.20	4.00	1.00	•

• Left hand inserts on request

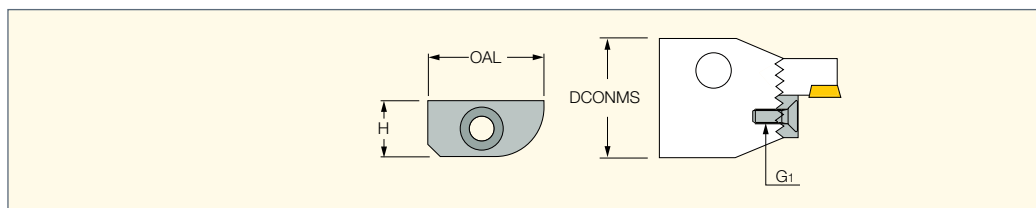
⁽¹⁾ Tool cutting edge angle

ITS^{BORE}

Accessories

PLT

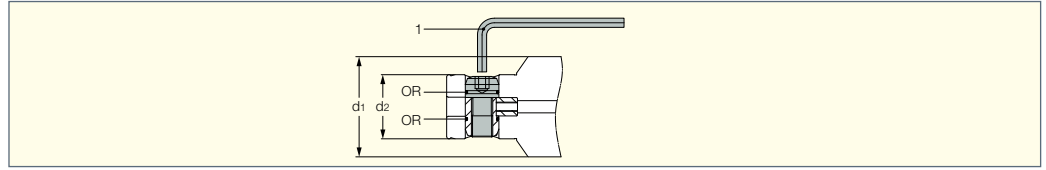
Cover Plate Protects the Serrated Faces When a Single Toolholder is Used



Designation	DCONMS	H	OAL	G1
PLT 16	16.00	7.0	14.00	SR M3x12 DIN912
PLT 20	20.00	8.5	17.00	SR M4x14 DIN912
PLT 25	25.00	10.2	21.00	SR M4x16 DIN7991
PLT 32	32.00	13.9	28.00	SR M5x20 DIN7991
PLT 40	40.00	17.4	35.00	SR M6x25 DIN7991
PLT 50	50.00	21.4	47.50	SR M8x25 DIN7991
PLT 63	63.00	26.4	62.00	SR M10x30 DIN7991
PLT 80	80.00	33.9	82.50	SR M12x35 DIN7991

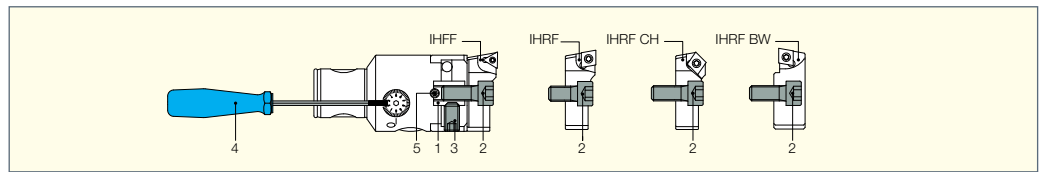


BH MB COUPLING SET



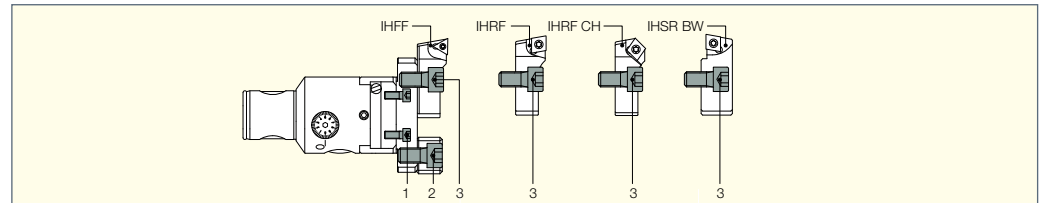
Designation	d1	d2	1	OR
BH MB14 COUPLING SET	14	10	2.5	-
BH MB16 COUPLING SET	16	10	2.5	-
BH MB20 COUPLING SET	20	13	3	-
BH MB25 COUPLING SET	25	16	3	-
BH MB32 COUPLING SET	32	20	4	ORM 0075-10
BH MB40 COUPLING SET	40	25	5	ORM 0100-10
BH MB50 COUPLING SET/M5	50	32	6	ORM 0130-10
BH MB63-80 COUPLING SET	63 - 80	42	8	OR 2075
BH MB110 COUPLING SET	110	76	14	OR 3112

BHF - SPARE PARTS



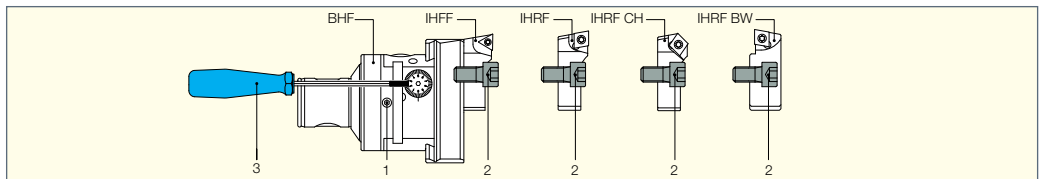
Designation	1	2	3	4	5
BHF...-16...	-	SR M3X6 DIN 912	-	BH HW 1.5 HANDLE	SR M3X4.5 DIN 913
BHF...-20...	-	SR M4X8 DIN 912	-	BH HW 1.5 HANDLE	SR M3X4.5 DIN 913
BHF...-25...	-	SR M5X10 DIN 912	-	BH HW 2.0 HANDLE	SR M4X4 DIN 913
BHF...-32...	-	SR M6X12 DIN 912	-	BH HW 2.0 HANDLE	SR M4X5 DIN 913
BHF...-40...	-	SR M8X14 DIN 912	-	BH HW 2.5 HANDLE	SR M5X6 DIN 913 SR
BHF...-50-60	BH NUT 10	SR M10X25 DIN 912	SR M10X16 DIN 913	BH HW 2.5 HANDLE	SR M5X8 DIN 913

BHF - SPARE PARTS



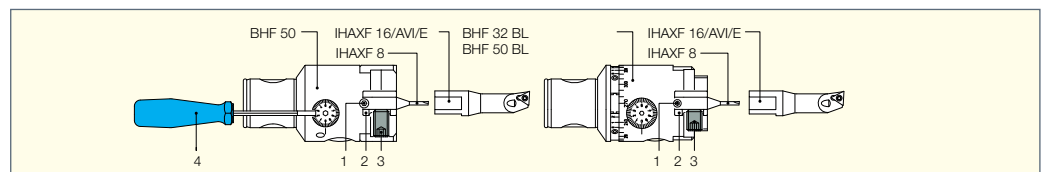
Designation	1	2	3
BHF...-50...	SR M5X12 DIN 912	SR M10X20 DIN 912	SR M10X25 DIN 912

BHF - SPARE PARTS



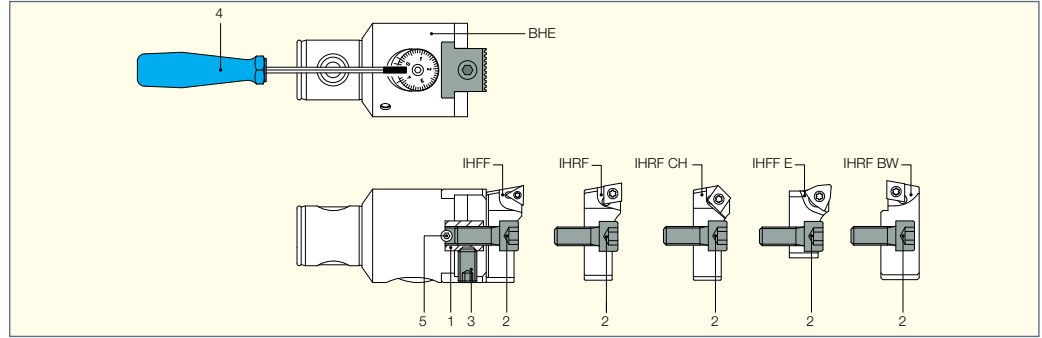
Designation	1	2	3
BHF...-63...	SR M6X10 DIN 915		
BHF...-80...	SR M6X14 DIN 915	SR M10X25 DIN 912	BH HW 3.0 HANDLE
BHF...-125...	SR M6X22 DIN 915		

BHF - SPARE PARTS



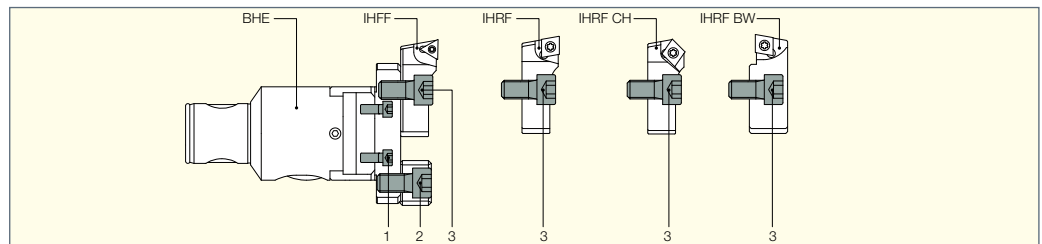
Designation	1	2	3	4
BHF...-50...	SR M5X8 DIN 913	SLEEVE D 8-D16	SR M10X10 DIN 913	BH HW 2.5 HANDLE
BHF...-32... BL	SR M4X5 DIN 913	-	SR M5X8 DIN 913	BH HW 2.0 HANDLE
BHF...-50... BL	SR M5X8 DIN 913	SLEEVE D 8-D16	SR M10X10 DIN 913	BH HW 2.5 HANDLE

BHE MB - SPARE PARTS



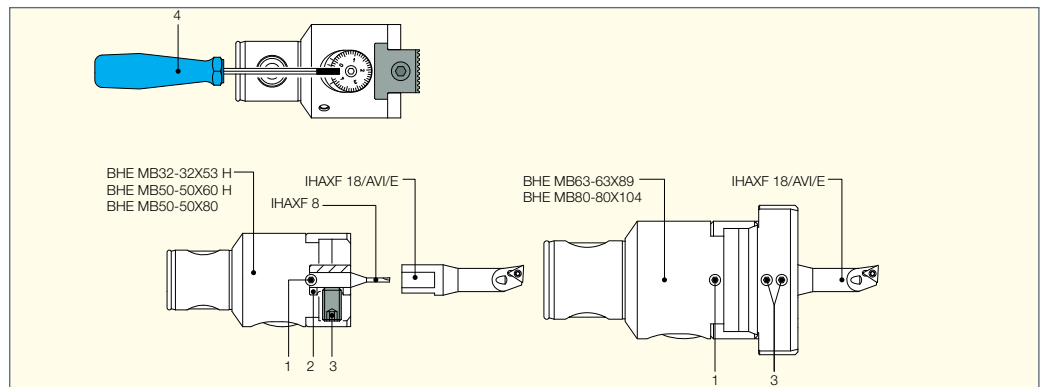
Designation	1	2	3	4	5
BHE MB14-14X30	-	SR M3X6 DIN 912	-	BH HW 1.5 HANDLE	SR M3X3.5 DIN 913
BHE MB16-16X34	-	SR M3X6 DIN 912	-	BH HW 1.5 HANDLE	SR M3X4.5 DIN 913
BHE MB20-20X40	-	SR M4X8 DIN 912	-	BH HW 1.5 HANDLE	SR M3X4.5 DIN 913
BHE MB25-25X50	-	SR M5X10 DIN 912	-	BH HW 1.5 HANDLE	SR M4X4 DIN 913
BHE MB32-32X63	-	SR M6X12 DIN 912	-	BH HW 2.5 HANDLE	SR M5X5 DIN 913
BHE MB40-40X80	-	SR M8X14 DIN 912	-	BH HW 3.0 HANDLE	SR M6X6 DIN 913
BHE MB50-50X80	BH NUT 10	SR M10X25 DIN 912	SR M10X16 DIN 913	BH HW 3.0 HANDLE	SR M6X8 DIN 913
BHE MB63-63X89	-	SR M10X20 DIN 912	-	BH HW 3.0 HANDLE	SR M6X8 DIN 913
BHE MB80-80X104	-	SR M10X25 DIN 912	-	BH HW 3.0 HANDLE	SR M6X12 DIN 913

BHE - SPARE PARTS



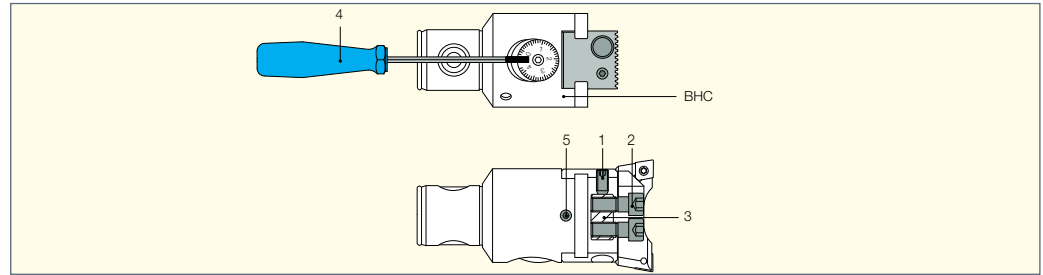
Designation	1	2	3
BHE MB50-50X80	SR M5X12 DIN 912		
BHE MB63-63X89		SR M10X20 DIN 912	SR M10X25 DIN 912
BHE MB80-80X104	SR M5X25 DIN 912		

BHE - SPARE PARTS



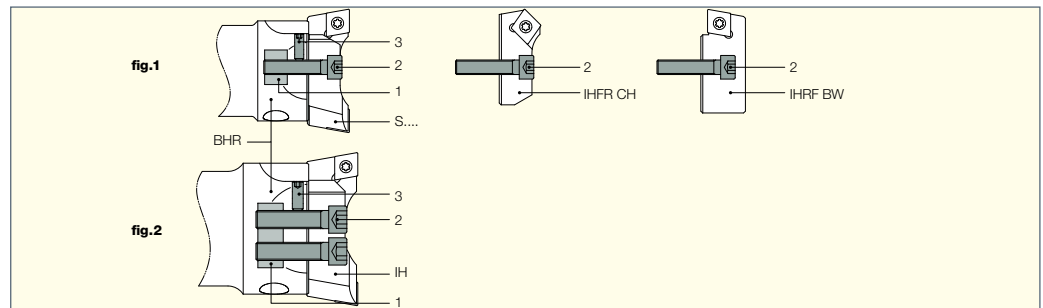
Designation	1	2	3	4
BHE MB32-32X53 H	SR M5X5 DIN 913	-	SR M5X8 DIN 913	BH HW 2.5 HANDLE
	SR M5X5 DIN 913	-	SR M5X12 DIN 913	
BHE MB50-50X60 H	SR M6X8 DIN 913	SLEEVE D 8-D16	SR M10X10 DIN 913	
BHE MB50-50X80	SR M6X8 DIN 913	SLEEVE D 8-D16	SR M10X10 DIN 913	BH HW 3.0 HANDLE
BHE MB63-63X89	SR M6X8 DIN 913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

BHC - SPARE PARTS



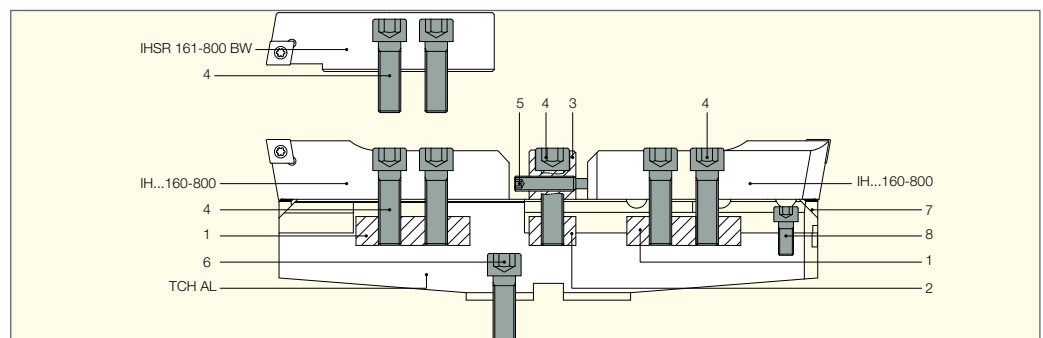
Designation	1	2	3	4	5
BHC MB25-25X57	SR M4X8 DIN 913	BH SR M4X11 DIN 912 PT	BH NUT-BHC MB25	BH HW 2.0 HANDLE	SR M4X5 DIN 913
BHC MB32-32X71	SR M5X10 DIN 913	BH SR M5X12.5 DIN 912 PT	BH NUT-BHC MB32	BH HW 2.5 HANDLE	SR M5X5 DIN 913
BHC MB40-40X90	SR M6X12 DIN 913	BH SR M6X16 DIN 912 PT	BH NUT-BHC MB40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

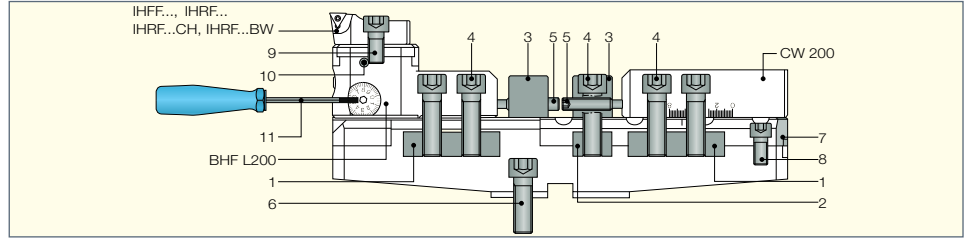
**TCH AL - SPARE PARTS
(Rough Boring)**



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

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

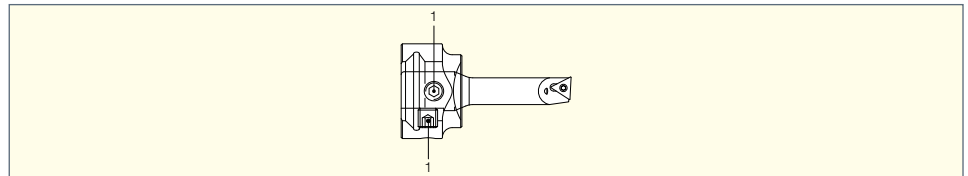
TCH AL - SPARE PARTS
(Fine Boring)



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

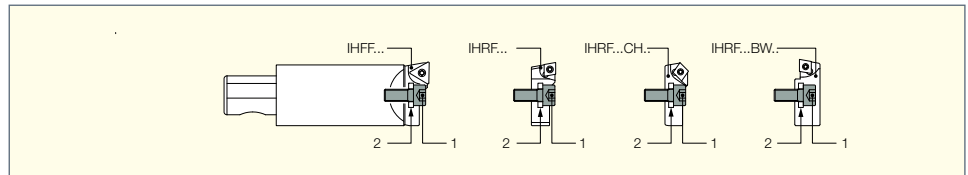
Designation	6	7	8	9	10	11
TCH AL 200	SR M12X35 DIN 912	BH SERRATED PLATE 200	SR M8X25 DIN 912	SR M10X20 DIN 912	SR M6X8 DIN 915	BH HW 3.0 HANDLE
TCH AL 300	SR M12X35 DIN 912	BH SERRATED PLATE 300	SR M8X25 DIN 912	SR M10X20 DIN 912	SR M6X8 DIN 915	BH HW 3.0 HANDLE
TCH AL 400	SR M12X35 DIN 912	BH SERRATED PLATE 400-700	SR M8X20 DIN 912	SR M10X20 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 M10X20 DIN 912	SR M6X8 DIN 915	BH HW 3.0 HANDLE

ADBH - SPARE PARTS



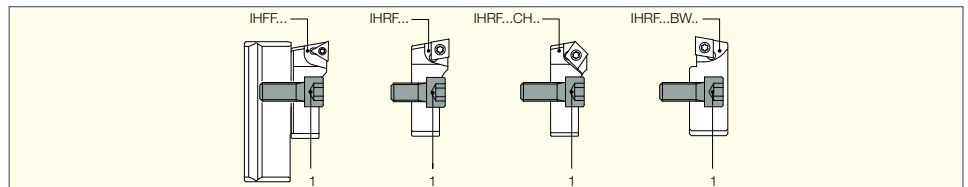
Designation	1
ADBH 30XD16	TSR M8X8 DIN 915

BBH-D - SPARE PARTS



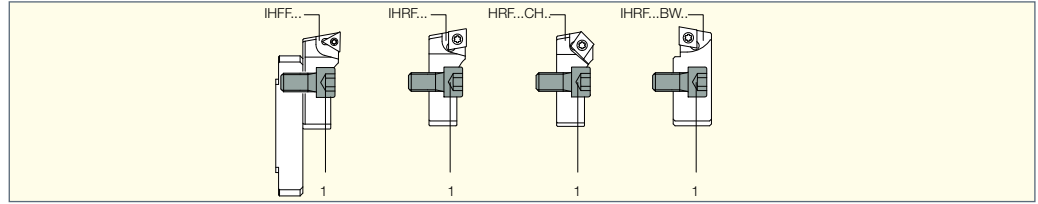
Designation	1	2
BBH D16-53	SR M5X12 DIN 912	WASHER DIN 125A M5
BBH D16-105	SR M5X12 DIN 912	WASHER DIN 125A M5

BHFH - SPARE PARTS



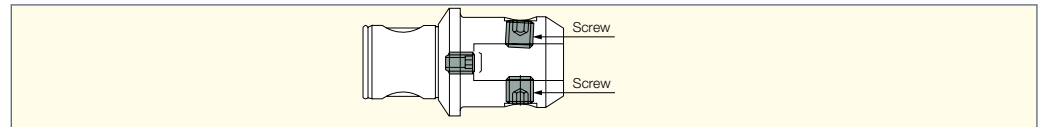
Designation	1
BHFH 30X75	
BHFH 40X133	SR M10X18 DIN 912
BHFH 30X93	
BHFH 40X200	
BHFH 30X135	
BHFH 40X300	SR M10X25 DIN 912
BHFH 40X400	

BHEH - SPARE PARTS



Designation	1
BHEH 24x75	SR M10X20 DIN 912
BHEH 28x80	
BHEH 28x108	SR M10X25 DIN 912
BHEH 28x148	

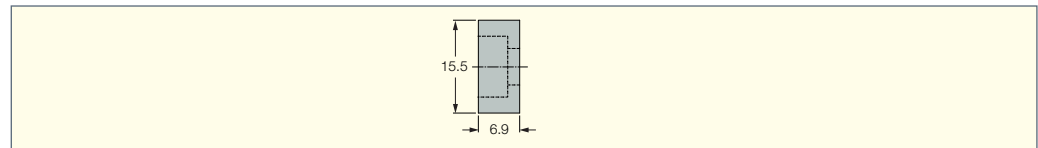
EMH - SPARE PARTS



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	EMH 63-32 SCREW	M18x20 EM SCREW
EMH MB 80-40	EMH 80-40 SCREW	M20x20 EM SCREW

BH WASHER - SPARE PARTS

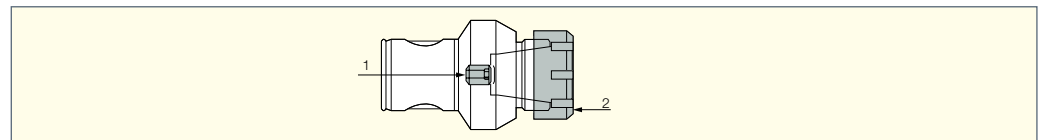
For Kit BHE



Designation	For Kit BHE
BH WASHER IH...50	KIT BHE MB50-50X80
	KIT BHE MB63-63X89
	KIT BHE MB80-80X104
	KIT BHF 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

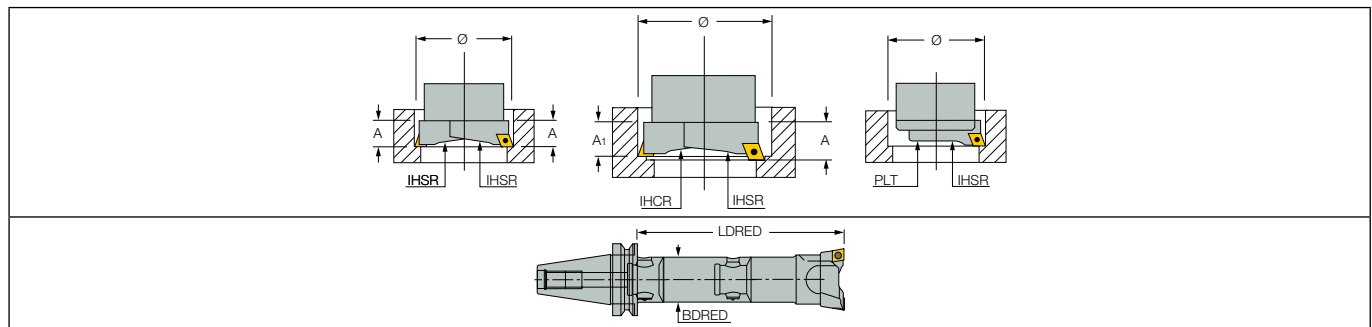
ISO	Workpiece Material	Hardness HB	Overhang LDRED/BDRED	a _p (mm) RE (Radius)	Boring Range 18-28		Boring Range 28-50		Boring Range 50-68	
					0.5-1.2	1.2-2.5	0.8-1.5	1.5-2.5	0.8-1.5	1.5-3.0
					0.2	0.4	0.2-0.4	0.4	0.2-0.4	0.4-0.8
P	Carbon Steel	HB<200	2.5 ●●●	V _c (m/min)	150-180	120-150	160-200	140-170	160-200	140-180
				f (mm/rev)	0.1-0.2	0.08-0.2	0.15-0.2	0.15-0.2	0.15-0.25	0.08-0.2
			4 ●●	V _c (m/min)	140-160	100-140	160-180	120-150	160-180	120-150
	f (mm/rev)	0.1-0.18		0.08-0.15	0.1-0.12	0.08-0.1	0.1-0.12	0.08-0.1		
	6.3 ●	V _c (m/min)	60-80	40-60	60-90	50-60	70-90	50-70		
		f (mm/rev)	0.06-0.12	0.06-0.1	0.06-0.12	0.06-0.1	0.06-0.1	0.06-0.1		
P	Carbon Steel	HB>200	2.5 ●●●	V _c (m/min)	130-160	100-130	140-180	120-160	140-180	120-160
				f (mm/rev)	0.08-0.15	0.08-0.12	0.08-0.2	0.06-0.12	0.08-0.25	0.08-0.18
			4 ●●	V _c (m/min)	110-140	80-110	100-140	80-120	100-140	80-120
	f (mm/rev)	0.08-0.12		0.08-0.1	0.08-0.15	0.06-0.15	0.08-0.2	0.06-0.15		
	6.3 ●	V _c (m/min)	70-90	60-70	80-100	60-80	80-100	60-80		
		f (mm/rev)	0.08-0.1	0.06-0.08	0.06-0.1	0.06-0.08	0.08-0.15	0.06-0.1		

ISO	Workpiece Material	Hardness HB	Overhang LDRED/BDRED	a _p (mm) RE (Radius)	Boring Range 68-120		Boring Range 120-200		Boring Range 200-500	
					0.8-1.5	1.5-3.5	0.8-2.0	2.0-3.5	0.8-2.0	2.0-4.0
					0.2-0.4	0.4-0.8	0.2-0.4	R=0.4-0.8	R=0.2-0.4	R=0.4-0.8
P	Carbon Steel	HB<200	2.5 ●●●	V _c (m/min)	160-220	150-180	180-250	160-200	220-280	200-220
				f (mm/rev)	0.15-0.25	0.08-0.2	0.15-0.3	0.1-0.2	0.15-0.3	0.1-0.15
			4 ●●	V _c (m/min)	140-180	120-150	160-200	140-180	N.R.	N.R.
	f (mm/rev)	0.08-0.2		0.08-0.15	0.1-0.2	0.08-0.15				
	6.3 ●	V _c (m/min)	70-100	50-70	N.R.	N.R.	N.R.	N.R.		
		f (mm/rev)	0.06-0.1	0.06-0.1						
P	Carbon Steel	HB>200	2.5 ●●●	V _c (m/min)	140-180	120-160	150-170	100-140	100-140	80-120
				f (mm/rev)	0.15-0.3	0.12-0.2	0.15-0.25	0.1-0.2	0.15-0.3	0.1-0.2
			4 ●●	V _c (m/min)	120-150	100-140	100-130	80-110	N.R.	N.R.
	f (mm/rev)	0.1-0.2		0.1-0.18	0.08-0.2	0.08-0.12				
	6.3 ●	V _c (m/min)	80-100	60-80	N.R.	N.R.	N.R.	N.R.		
		f (mm/rev)	0.08-0.12	0.08-0.12						

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

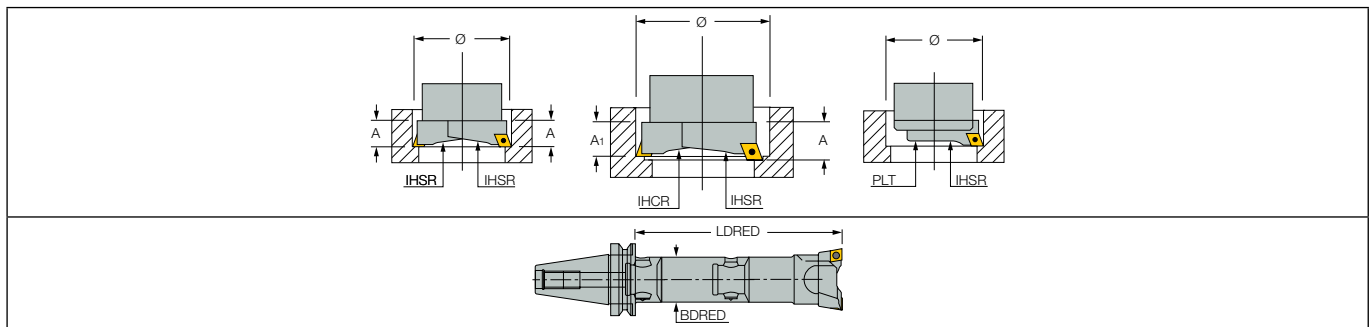
ISO	Workpiece Material	Hardness HB	Overhang LDRED/BDRED	a _p (mm) RE (Radius)	Boring Range 18-28		Boring Range 28-50		Boring Range 50-68	
					0.5-1.0	1.0-1.8	0.5-1.0	1.0-1.8	0.5-1.2	1.2-2.0
					0.2	0.4	0.2-0.4	0.4	0.2-0.4	0.4-0.8
P	Carbon Steel	HB<200	2.5 ●●●	V _c (m/min)	140-160	90-120	150-180	100-130	160-200	140-180
				f (mm/rev)	0.08-0.18	0.08-0.15	0.08-0.2	0.08-0.18	0.1-0.25	0.1-0.15
			4 ●●	V _c (m/min)	100-130	70-100	110-150	90-120	140-180	100-130
				f (mm/rev)	0.08-0.15	0.06-0.12	0.08-0.18	0.08-0.15	0.8-0.18	0.08-0.12
			6.3 ●	V _c (m/min)	80-100	60-90	80-100	70-90	100-140	80-120
				f (mm/rev)	0.08-0.15	0.06-0.1	0.06-0.12	0.06-0.12	0.6-0.15	0.08-0.1
P	Carbon Steel	HB>200	2.5 ●●●	V _c (m/min)	130-150	120-140	130-150	120-140	140-170	120-150
				f (mm/rev)	0.08-0.18	0.06-0.15	0.08-0.18	0.06-0.15	0.08-0.2	0.08-0.18
			4 ●●	V _c (m/min)	100-130	100-120	100-130	100-120	120-150	100-120
				f (mm/rev)	0.08-0.15	0.06-0.13	0.08-0.15	0.06-0.13	0.08-0.18	0.08-0.15
			6.3 ●	V _c (m/min)	80-100	70-90	80-100	70-90	100-120	70-90
				f (mm/rev)	0.08-0.12	0.06-0.11	0.08-0.12	0.06-0.11	0.08-0.12	0.06-0.11

ISO	Workpiece Material	Hardness HB	Overhang LDRED/BDRED	a _p (mm) RE (Radius)	Boring Range 68-120		Boring Range 120-200		Boring Range 200-500	
					1.8	2.5	0.8-2.0	2.0-3.5	0.8-2.0	2.0-4.0
					0.2-0.4	0.4-0.8	0.2-0.4	0.4-0.8	0.2-0.4	0.4-0.8
P	Carbon Steel	HB<200	2.5 ●●●	V _c (m/min)	160-220	140-180	160-220	140-180	160-220	140-180
				f (mm/rev)	0.1-0.3	0.1-0.25	0.1-0.3	0.1-0.25	0.1-0.35	0.1-0.3
			4 ●●	V _c (m/min)	150-200	120-160	120-160	120-160	N.R.	N.R.
				f (mm/rev)	0.1-0.2	0.08-0.18	0.1-0.2	0.08-0.18	N.R.	N.R.
			6.3 ●	V _c (m/min)	100-140	100-140	N.R.	N.R.	N.R.	N.R.
				f (mm/rev)	0.08-0.18	0.08-0.15	N.R.	N.R.	N.R.	N.R.
P	Carbon Steel	HB>200	2.5 ●●●	V _c (m/min)	160-200	140-180	140-200	140-180	140-200	140-180
				f (mm/rev)	0.1-0.3	0.01-0.25	0.01-0.35	0.01-0.3	0.01-0.35	0.01-0.3
			4 ●●	V _c (m/min)	140-160	120-140	150-180	120-140	N.R.	N.R.
				f (mm/rev)	0.08-0.2	0.08-0.15	0.08-0.12	0.08-0.12	N.R.	N.R.
			6.3 ●	V _c (m/min)	100-120	70-90	N.R.	N.R.	N.R.	N.R.
				f (mm/rev)	0.08-0.16	0.08-0.12	N.R.	N.R.	N.R.	N.R.

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Stability

- Good
- Normal
- Poor



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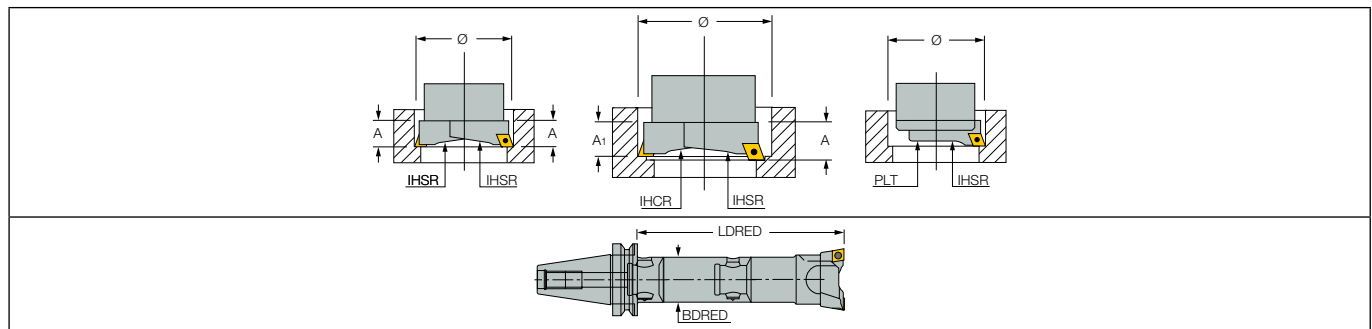
BHR Rough Boring Cutting Data

ISO	Workpiece Material	Hardness HB	Overhang LDRED/BDRED	a _p (mm) RE (Radius)	Boring Range 18-28		Boring Range 28-50		Boring Range 50-68	
					0.5-1.0	1.0-1.8	0.5-1.0	1.0-1.8	0.5-1.2	1.2-2.0
					0.2	0.4	0.2-0.4	0.4	0.2-0.4	0.4-0.8
M	Stainless Steel	Ferritic & Martensitic	2.5 ●●●	V _c (m/min)	100-150	110-130	120-160	100-150	120-160	110-160
				f (mm/rev)	0.08-0.15	0.06-0.12	0.08-0.18	0.06-0.12	0.08-0.25	0.08-0.18
			4 ●●	V _c (m/min)	90-130	90-120	100-140	90-140	100-150	80-120
				f (mm/rev)	0.08-0.12	0.06-0.1	0.08-0.12	0.06-0.1	0.08-0.18	0.08-0.12
			6.3 ●	V _c (m/min)	60-90	50-70	60-90	50-70	70-100	50-70
				f (mm/rev)	0.06-0.1	0.06-0.1	0.06-0.12	0.06-0.1	0.06-0.15	0.08-0.1
	Stainless Steel	Austenitic	2.5 ●●●	V _c (m/min)	110-130	100-130	120-150	110-140	110-160	100-150
				f (mm/rev)	0.08-0.15	0.06-0.12	0.08-0.18	0.06-0.12	0.08-0.25	0.06-0.12
			4 ●●	V _c (m/min)	80-110	80-110	90-130	90-120	100-150	90-130
				f (mm/rev)	0.08-0.12	0.06-0.1	0.08-0.12	0.06-0.1	0.08-0.18	0.06-0.1
			6.3 ●	V _c (m/min)	60-90	50-70	60-90	50-70	70-100	50-70
				f (mm/rev)	0.06-0.1	0.06-0.1	0.06-0.12	0.06-0.1	0.06-0.15	0.06-0.1
	Cast Stainless Steel	Ferritic & Martensitic	2.5 ●●●	V _c (m/min)	90-130	100-130	120-150	110-140	120-160	100-150
				f (mm/rev)	0.08-0.15	0.06-0.12	0.08-0.18	0.06-0.12	0.08-0.25	0.06-0.12
			4 ●●	V _c (m/min)	70-110	80-110	90-130	90-120	100-150	90-130
				f (mm/rev)	0.08-0.12	0.06-0.1	0.08-0.12	0.06-0.1	0.08-0.18	0.06-0.1
			6.3 ●	V _c (m/min)	60-90	50-70	60-90	50-70	70-100	50-70
				f (mm/rev)	0.06-0.1	0.06-0.1	0.06-0.12	0.06-0.1	0.06-0.15	0.06-0.1
	Cast Stainless Steel	Austenitic	2.5 ●●●	V _c (m/min)	80-120	70-110	100-150	90-140	110-150	100-150
				f (mm/rev)	0.08-0.15	0.06-0.12	0.08-0.18	0.06-0.1	0.08-0.25	0.06-0.12
			4 ●●	V _c (m/min)	70-100	70-100	80-130	70-120	90-140	90-130
				f (mm/rev)	0.08-0.12	0.06-0.1	0.08-0.12	0.06-0.1	0.08-0.18	0.06-0.1
			6.3 ●	V _c (m/min)	60-90	50-70	60-90	50-70	70-100	50-70
				f (mm/rev)	0.06-0.1	0.06-0.1	0.06-0.12	0.06-0.1	0.06-0.15	0.06-0.1

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.

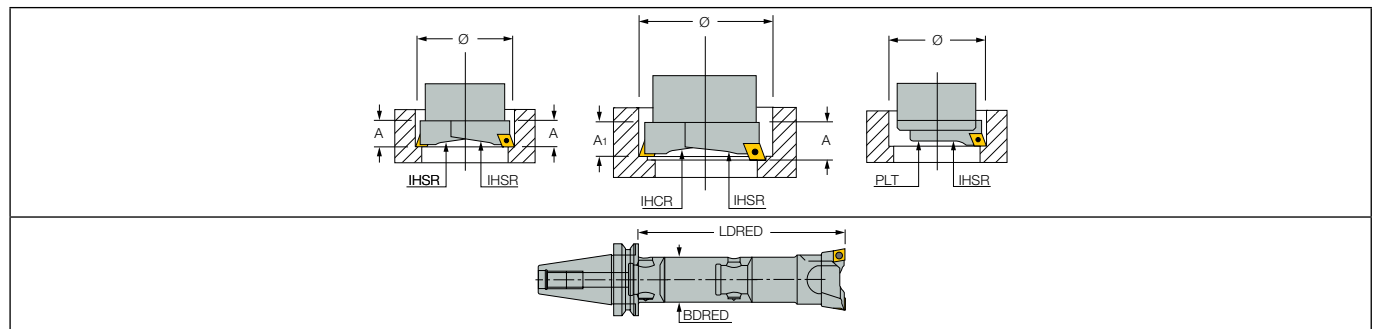
BHR Rough Boring Cutting Data

ISO	Workpiece Material	Hardness HB	Overhang LDRED/BDRED	ap (mm) RE (Radius)	Boring Range 68-120		Boring Range 120-200		Boring Range 200-500	
					0.8-1.8	1.8-2.5	0.8-2.0	2.0-3.0	0.8-2.0	2.0-3.5
					0.2-0.4	0.4-0.8	0.2-0.4	0.4-0.8	0.2-0.4	0.4-0.8
M	Stainless Steel	Ferritic & Martensitic	2.5 ●●●	Vc (m/min)	130-220	120-200	140-220	120-180	150-220	120-20
				f (mm/rev)	0.08-0.3	0.08-0.25	0.08-0.3	0.08-0.25	0.08-0.3	0.08-0.25
			4 ●●	Vc (m/min)	100-160	90-140	120-180	90-140	N.R.	N.R.
				f (mm/rev)	0.08-0.25	0.08-0.18	0.08-0.25	0.08-0.18		
			6.3 ●	Vc (m/min)	70-100	50-70	N.R.	N.R.	N.R.	N.R.
				f (mm/rev)	0.08-0.2	0.08-0.15				
	Stainless Steel	Austenitic	2.5 ●●●	Vc (m/min)	120-200	100-160	120-200	100-160	120-200	100-180
				f (mm/rev)	0.08-0.3	0.08-0.25	0.08-0.3	0.08-0.25	0.08-0.3	0.08-0.25
			4 ●●	Vc (m/min)	100-150	90-140	100-160	90-140	N.R.	N.R.
				f (mm/rev)	0.08-0.25	0.08-0.18	0.08-0.25	0.08-0.18		
			6.3 ●	Vc (m/min)	70-100	50-70	N.R.	N.R.	N.R.	N.R.
				f (mm/rev)	0.08-0.2	0.08-0.15				
	Cast Stainless Steel	Ferritic & Martensitic	2.5 ●●●	Vc (m/min)	130-200	120-180	140-200	120-160	140-200	120-180
				f (mm/rev)	0.08-0.3	0.08-0.25	0.08-0.3	0.08-0.25	0.08-0.3	0.08-0.25
			4 ●●	Vc (m/min)	110-150	90-150	100-160	90-140	N.R.	N.R.
				f (mm/rev)	0.08-0.25	0.08-0.18	0.08-0.25	0.08-0.18		
			6.3 ●	Vc (m/min)	70-100	50-70	N.R.	N.R.	N.R.	N.R.
				f (mm/rev)	0.08-0.2	0.08-0.15				
	Cast Stainless Steel	Austenitic	2.5 ●●●	Vc (m/min)	130-180	120-180	120-200	100-160	120-200	100-180
				f (mm/rev)	0.08-0.3	0.08-0.25	0.08-0.3	0.08-0.25	0.08-0.3	0.08-0.25
			4 ●●	Vc (m/min)	100-140	90-140	100-160	90-140	N.R.	N.R.
				f (mm/rev)	0.08-0.25	0.08-0.18	0.08-0.25	0.08-0.18		
			6.3 ●	Vc (m/min)	70-190	50-70	N.R.	N.R.	N.R.	N.R.
				f (mm/rev)	0.08-0.2	0.08-0.15				

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Stability

- Good
- Normal
- Poor



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BHR Rough Boring Cutting Data

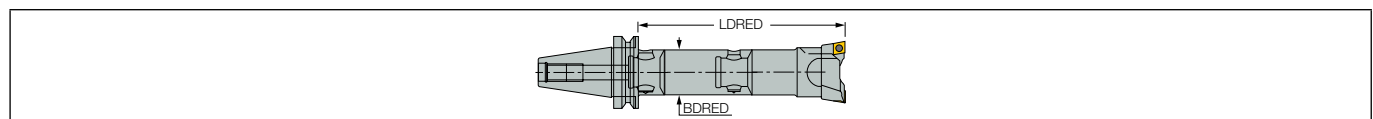
ISO	Workpiece Material	Hardness HB	Overhang LDRED/BDRED	a _p (mm) RE (Radius)	Boring Range 18-28		Boring Range 28-50		Boring Range 50-68	
					0.5-1.0	1.0-1.8	0.5-1.0	1.0-1.8	0.5-1.2	1.2-2.0
					0.2-0.4	0.4	0.2-0.4	0.4	0.2-0.4	0.4-0.8
K	Gray Cast Iron GG 10-25	HB<200	2.5 ●●●	V _c (m/min)	120-160	100-140	120-180	110-150	120-180	110-150
				f (mm/rev)	0.06-0.15	0.06-0.18	0.06-0.15	0.06-0.12	0.08-0.2	0.08-0.12
			4 ●●	V _c (m/min)	100-140	80-120	100-150	80-120	100-150	80-120
				f (mm/rev)	0.06-0.12	0.06-0.1	0.06-0.12	0.06-0.1	0.08-0.12	0.08-0.1
			6.3 ●	V _c (m/min)	70-100	60-90	70-100	60-90	70-100	60-90
				f (mm/rev)	0.06-0.1	0.06-0.1	0.06-0.1	0.06-0.1	0.08-0.1	0.08-0.1
	Gray Cast Iron GG 25-40		2.5 ●●●	V _c (m/min)	140-200	140-200	140-220	160-250	180-220	200-280
				f (mm/rev)	0.06-0.15	0.06-0.18	0.06-0.15	0.06-0.18	0.08-0.2	0.1-0.25
			4 ●●	V _c (m/min)	120-160	120-160	120-180	140-200	140-180	180-220
				f (mm/rev)	0.06-0.12	0.06-0.14	0.06-0.12	0.06-0.14	0.08-0.12	0.08-0.2
			6.3 ●	V _c (m/min)	70-100	60-90	70-100	60-90	60-100	60-120
				f (mm/rev)	0.06-0.1	0.06-0.1	0.06-0.1	0.06-0.1	0.08-0.1	0.08-0.1
	Cast Iron GGG	Spheroidal & Graphite	2.5 ●●●	V _c (m/min)	120-180	120-180	120-200	140-220	180-220	180-240
				f (mm/rev)	0.06-0.15	0.06-0.18	0.06-0.15	0.06-0.18	0.08-0.18	0.1-0.2
			4 ●●	V _c (m/min)	120-160	120-160	120-180	140-200	140-200	160-220
				f (mm/rev)	0.06-0.12	0.06-0.14	0.06-0.12	0.06-0.14	0.08-0.12	0.08-0.18
			6.3 ●	V _c (m/min)	60-100	60-90	60-100	60-90	60-90	60-100
				f (mm/rev)	0.06-0.1	0.06-0.1	0.06-0.1	0.06-0.1	0.08-0.1	0.08-0.1

ISO	Workpiece Material	Hardness HB	Overhang LDRED/BDRED	a _p (mm) RE (Radius)	Boring Range 68-120		Boring Range 120-200		Boring Range 50-68	
					0.8-1.8	1.8-2.5	0.8-2.0	2.0-3.0	0.8-2.0	2.0-3.5
					0.2-0.4	0.4-0.8	0.2-0.4	0.4-0.8	0.2-0.4	0.4-0.8
K	Gray Cast Iron GG 10-25	HB<200	2.5 ●●●	V _c (m/min)	120-200	110-150	150-250	180-280	150-250	180-280
				f (mm/rev)	0.08-0.25	0.08-0.3	0.08-0.25	0.08-0.35	0.08-0.25	0.08-0.35
			4 ●●	V _c (m/min)	100-150	80-120	120-170	120-170	N.R	N.R
				f (mm/rev)	0.08-0.18	0.08-0.2	0.08-0.18	0.08-0.25		
			6.3 ●	V _c (m/min)	70-100	60-90	N.R	N.R	N.R	N.R
				f (mm/rev)	0.08-0.15	0.08-0.12				
	Gray Cast Iron GG 25-40		2.5 ●●●	V _c (m/min)	250-300	250-350	250-350	250-350	250-350	250-350
				f (mm/rev)	0.12-0.35	0.12-0.35	0.15-0.3	0.15-0.4	0.15-0.3	0.15-0.4
			4 ●●	V _c (m/min)	200-270	230-300	200-300	200-270	N.R	N.R
				f (mm/rev)	0.1-0.25	0.12-0.3	0.15-0.3	0.15-0.35		
			6.3 ●	V _c (m/min)	70-150	60-120	N.R	N.R	N.R	N.R
				f (mm/rev)	0.1-0.15	0.12-0.25				
	Cast Iron GGG	Spheroidal & Graphite	2.5 ●●●	V _c (m/min)	200-240	200-280	200-280	220-300	220-300	220-300
				f (mm/rev)	0.12-0.3	0.12-0.3	0.15-0.3	0.15-0.35	0.15-0.3	0.15-0.35
			4 ●●	V _c (m/min)	160-220	180-240	180-250	200-270	N.R	N.R
				f (mm/rev)	0.1-0.2	0.12-0.25	0.12-0.2	0.15-0.35		
			6.3 ●	V _c (m/min)	60-100	60-100	N.R	N.R	N.R	N.R
				f (mm/rev)	0.1-0.15	0.12-0.2				

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Stability

- Good
- Normal
- Poor



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BHR Rough Boring Cutting Data

ISO	Workpiece Material	Hardness HB	Overhang LDRED/BDRED	a _p (mm) RE (Radius)	Boring Range 18-28		Boring Range 28-50		Boring Range 50-68	
					0.5-1.5	1.5-2.5	0.5-1.5	1.5-2.5	0.5-2.0	1.2-3.0
					0.2-0.4	0.4	0.2-0.4	0.4	0.2-0.4	0.4-0.8
N	Aluminum / Cast	>12si	2.5	V _c (m/min)	200-300	240-350	200-300	240-350	200-300	240-35
				f (mm/rev)	0.06-0.2	0.06-0.25	0.06-0.2	0.06-0.25	0.06-0.25	0.06-0.3
			4	V _c (m/min)	150-220	150-220	150-220	150-220	150-220	150-220
				f (mm/rev)	0.06-0.2	0.06-0.2	0.06-0.2	0.06-0.2	0.06-0.2	0.06-0.2
			6.3	V _c (m/min)	60-100	60-100	60-100	60-100	60-100	60-100
				f (mm/rev)	0.06-0.1	0.06-0.1	0.06-0.1	0.06-0.1	0.06-0.1	0.06-0.1
	Aluminum / Cast	<12si	2.5	V _c (m/min)	180-250	220-280	180-250	220-280	180-250	220-280
				f (mm/rev)	0.06-0.2	0.06-0.25	0.06-0.25	0.06-0.25	0.06-0.25	0.06-0.3
			4	V _c (m/min)	120-220	120-220	120-220	120-220	120-220	120-220
				f (mm/rev)	0.06-0.2	0.06-0.2	0.06-0.2	0.06-0.2	0.06-0.2	0.06-0.25
			6.3	V _c (m/min)	60-100	60-100	60-100	60-100	60-100	60-100
				f (mm/rev)	0.06-0.1	0.06-0.1	0.06-0.1	0.06-0.1	0.06-0.1	0.06-0.1

ISO	Workpiece Material	Hardness HB	Overhang LDRED/BDRED	a _p (mm) RE (Radius)	Boring Range 68-120		Boring Range 120-200		Boring Range 200-500	
					0.8-3.0	1.8-4.0	0.8-3.0	2.0-4.0	0.8-3.0	2.0-4.5
					0.2-0.4	0.4-0.8	0.2-0.4	0.4-0.8	0.2-0.4	0.4-0.8
N	Aluminum / Cast	>12si	2.5	V _c (m/min)	200-300	240-350	200-300	240-350	200-300	240-350
				f (mm/rev)	0.06-0.25	0.06-0.3	0.06-0.25	0.06-0.4	0.06-0.25	0.06-0.4
			4	V _c (m/min)	150-220	150-220	150-220	150-220	N.R.	N.R.
				f (mm/rev)	0.06-0.2	0.06-0.2	0.06-0.2	0.06-0.2	N.R.	N.R.
			6.3	V _c (m/min)	60-100	60-100	N.R.	N.R.	N.R.	N.R.
				f (mm/rev)	0.06-0.1	0.06-0.1	N.R.	N.R.	N.R.	N.R.
	Aluminum / Cast	<12si	2.5	V _c (m/min)	180-250	220-280	180-250	220-280	180-250	220-280
				f (mm/rev)	0.06-0.25	0.06-0.3	0.06-0.3	0.06-0.4	0.06-0.3	0.06-0.4
			4	V _c (m/min)	120-220	120-220	120-220	120-220	N.R.	N.R.
				f (mm/rev)	0.06-0.2	0.06-0.2	0.06-0.2	0.06-0.2	N.R.	N.R.
			6.3	V _c (m/min)	60-100	60-100	N.R.	N.R.	N.R.	N.R.
				f (mm/rev)	0.06-0.1	0.06-0.1	N.R.	N.R.	N.R.	N.R.

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
	18-28	a _p - 1.5-2	a _p - 2-2.5
28-50	a _p - 2-3	a _p - 2.5-3.5	
50-68	a _p - 3-4	a _p - 3.5-5	
68-200	a _p - 4-5	a _p - 5-7	
200-500	a _p - 5-6	a _p - 6-8	

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

Cutting Conditions for Boring Operations with BHC Combi Rough and Fine

ISO	Material	Boring Depth to Diameter Ratio	Working Conditions	Cutting Speed V _c =m/min	Feed f _n =mm/rev		Carbide Grade	Cutting Depth mm			
					RE=0.2	RE=0.4		Finishing	Roughing		
									Ø28-Ø46	Ø46-Ø75	Ø75-Ø160
P	Carbon Steel HB < 200	LDRED/BDRED = 2.5	good	160-250	0.1-0.2	0.1-0.2	IC807, IC908, IC520N, IC20N,	0.15-0.3	1.5	2	2.5
		LDRED/BDRED = 4	normal	120-180	0.1-0.2	0.1-0.2					
		LDRED/BDRED = 6.3	difficult	70-100	*0.1-0.15	0.1-0.2					
	Carbon Steel HB > 200	LDRED/BDRED = 2.5	good	140-200	0.1-0.2	0.1-0.2	IC30N, IC8150, IC8250, IC3028	0.15-0.3	1.5	2	2.5
LDRED/BDRED = 4		normal	100-160	0.1-0.2	0.1-0.2						
LDRED/BDRED = 6.3		difficult	70-100	*0.1-0.15	0.1-0.2						
M	Stainless Steel AISI 304-316	LDRED/BDRED = 2.5	good	100-140	0.1-0.2	0.1-0.2	IC807, IC30N, IC3028	0.15-0.3	1.5	2	2.5
		LDRED/BDRED = 4	normal	80-110	0.1-0.2	0.1-0.2					
		LDRED/BDRED = 6.3	difficult	60-90	*0.1-0.15	0.1-0.2					
K	Cast Iron	LDRED/BDRED = 2.5	good	120-160	0.1-0.2	0.1-0.2	IB55, IC908, IC5005, IC428	0.15-0.3	2	2.5	3
		LDRED/BDRED = 4	normal	90-120	0.1-0.2	0.1-0.2					
		LDRED/BDRED = 6.3	difficult	60-90	*0.1-0.15	0.1-0.2					
N	Aluminum	LDRED/BDRED = 2.5	good	250-350	0.1-0.2	0.1-0.2	ID5, IC20	0.15-0.3	2	2.5	3
		LDRED/BDRED = 4	normal	160-250	0.1-0.2	0.1-0.2					
		LDRED/BDRED = 6.3	difficult	100-150	*0.1-0.15	0.1-0.2					

* Only for finishing Inserts.

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

V_c Cutting speed (m/min)

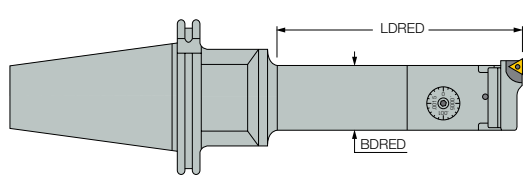
D Diameter of workpiece (mm)

n Number of revolutions / min' (rev./min)

V_f Feed rate (mm/min.)

f_n Feed / rev/ (mm/rev)

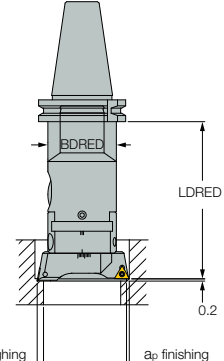
□ 3.14



$$V_c = \frac{\square \cdot D \cdot n}{1000}$$

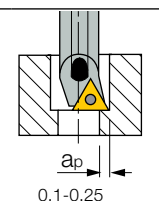
$$n = \frac{V_c \cdot 1000}{\square \cdot D}$$

$$V_f = n \cdot f_n$$



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

Cutting Conditions for BHD / BHF / BHE Fine Boring Heads



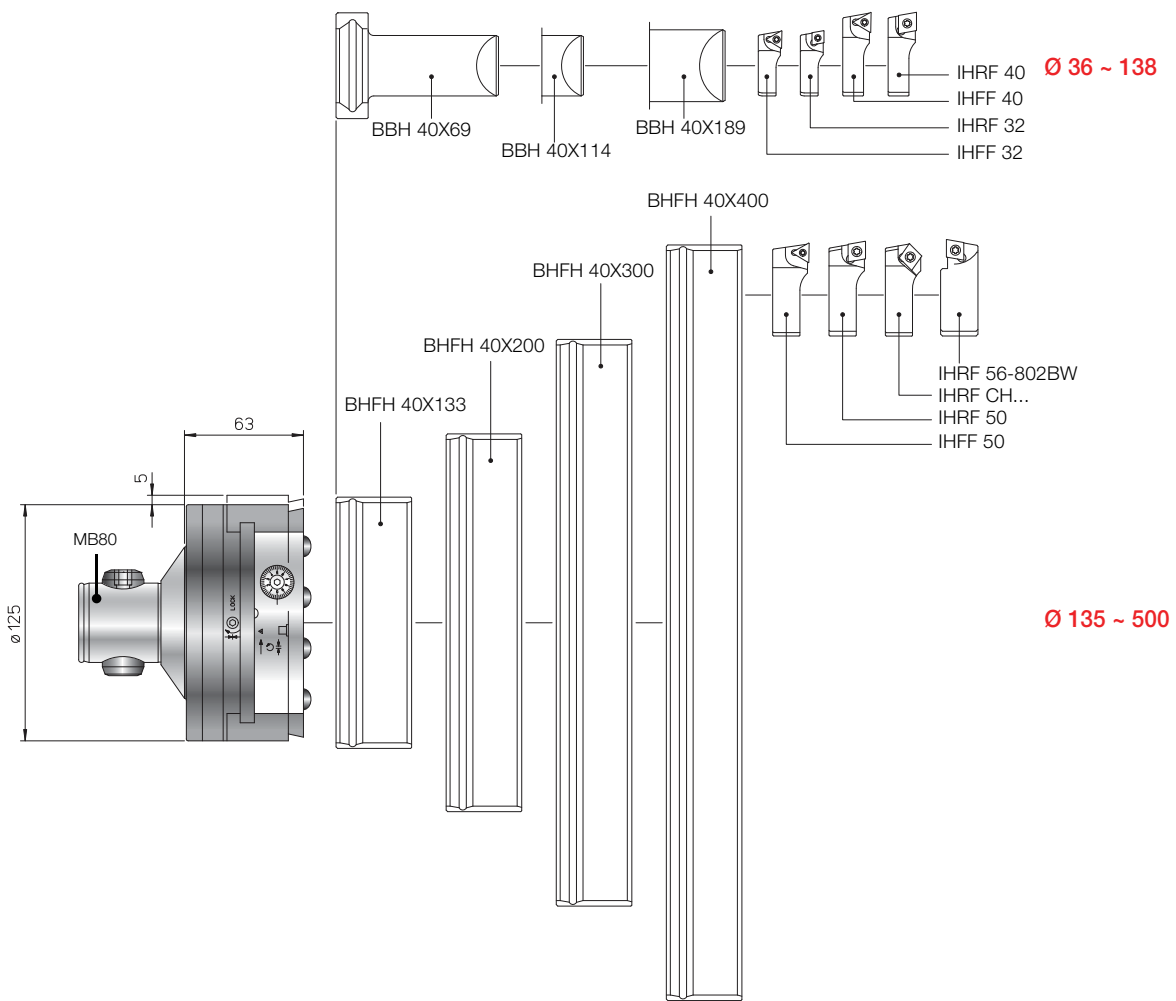
a_p
0.1-0.25

ISO	Material	LDRED/BDRED	Stability	Cutting Speed V _c =m/min	Feed f=mm/rev		Insert Grade
					Insert Radius		
					RE=0.2	RE=0.4	
P	Carbon Steel HB<200	LDRED/BDRED=2.5	good	200-300	0.05-0.08	0.08-0.10	IC20N
		LDRED/BDRED=4	normal	160-250	0.05-0.08	0.08-0.10	IC30N
		LDRED/BDRED=6.3	difficult	70-100	0.05-0.08	-	IC54
P	Carbon Steel HB<200	LDRED/BDRED=2.5	good	160-250	0.05-0.08	0.08-0.10	IC20N
		LDRED/BDRED=4	normal	150-200	0.05-0.08	0.08-0.10	IC30N
		LDRED/BDRED=6.3	difficult	70-100	0.05-0.08	-	
M	Stainless Steel AISI 304-316	LDRED/BDRED=2.5	good	120-160	0.05-0.08	0.08-0.10	IC54
		LDRED/BDRED=4	normal	100-140	0.05-0.08	0.08-0.10	
		LDRED/BDRED=6.3	difficult	70-100	0.05-0.08	-	
K	Cast Iron	LDRED/BDRED=2.5	good	120-160	0.05-0.08	0.08-0.10	IC20
		LDRED/BDRED=4	normal	100-140	0.05-0.08	0.08-0.10	
		LDRED/BDRED=6.3	difficult	70-100	0.05-0.08	-	
N	Aluminum	LDRED/BDRED=2.5	good	300-400	0.05-0.08	0.08-0.10	IC20
		LDRED/BDRED=4	normal	250-350	0.05-0.08	0.08-0.10	
		LDRED/BDRED=6.3	difficult	100-150	0.05-0.08	-	

(1) a_p=0.1 min

Fine Boring Head Range
2 µm Direct Diametric Adjustment

BHF MB80-125x114
ø36-500

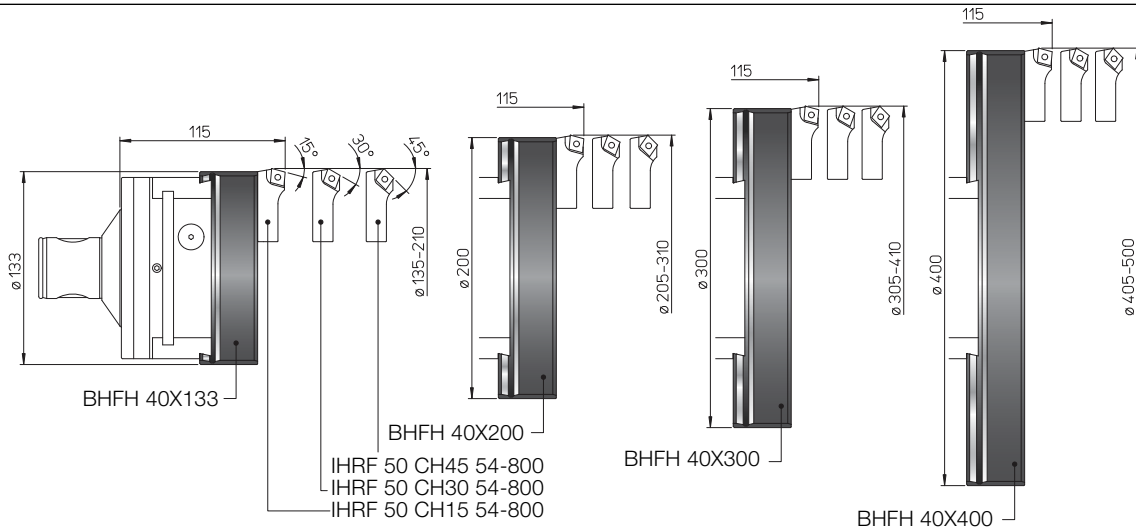
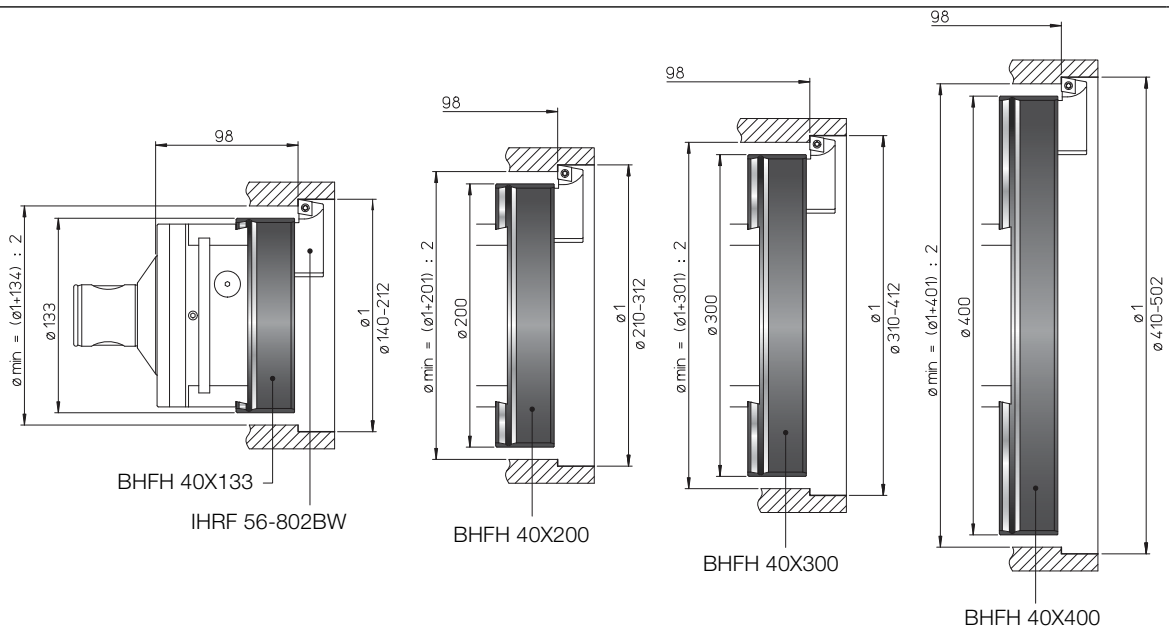
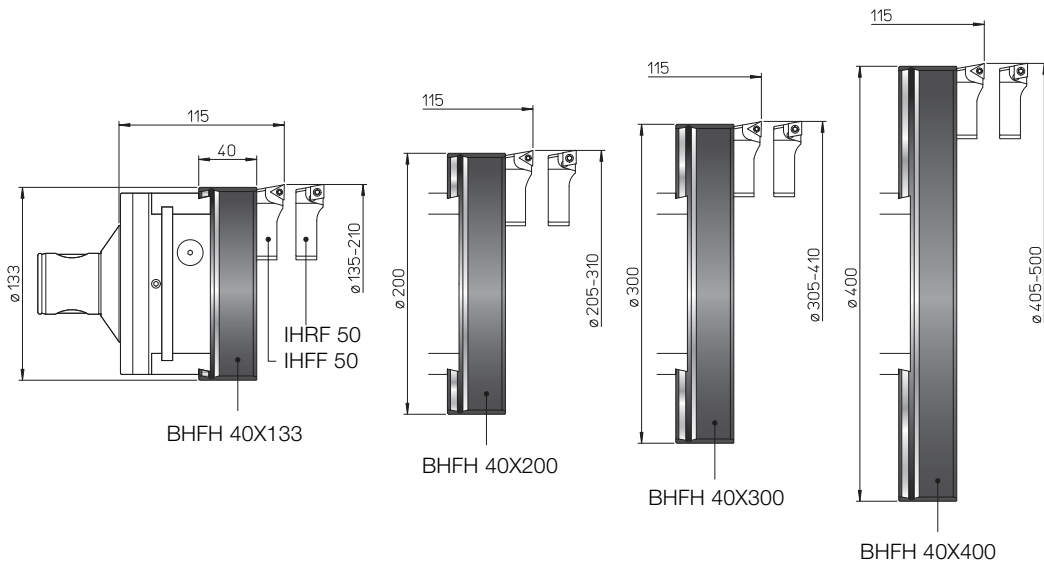


Fine Boring Head Range

2 µm Direct Diametric Adjustment

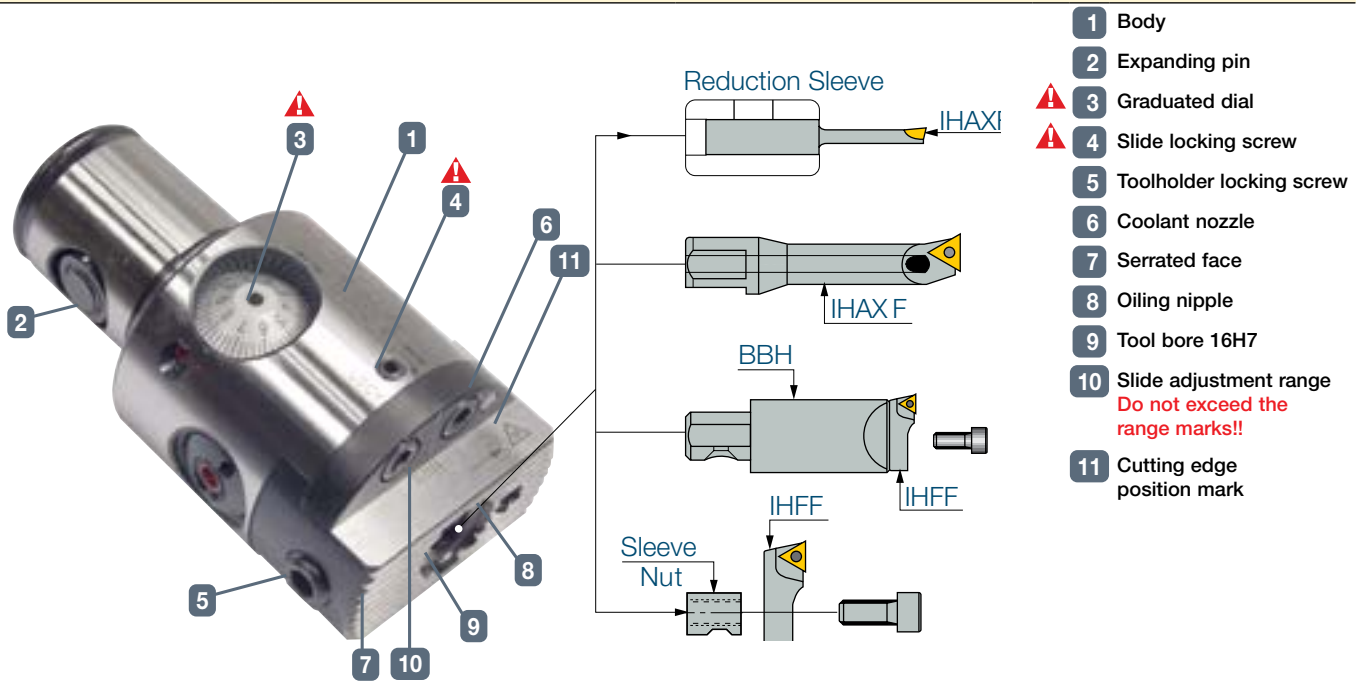
**BHF MB80-125x114
ø2.5-160**

2 µm



Fine Boring Head BHF 16-50
Operating Instructions

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

Recommended torque:	(N.m)
BHF MB16-16x34	2.0 - 2.5
BHF MB20-20x40	4.0 - 4.5
BHF MB25-25x50	6.5 - 7.5
BHF MB32-32x63	7.0 - 8.0
BHF MB40-40x80	16.0 - 18.0
BHF MB50-50x60	30.0 - 35.0

- 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 BHF from the shank, loosen the expanding pin [2] by turning counterclockwise.

Positioning

- The tool slide [7] allows for a 4 mm 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.

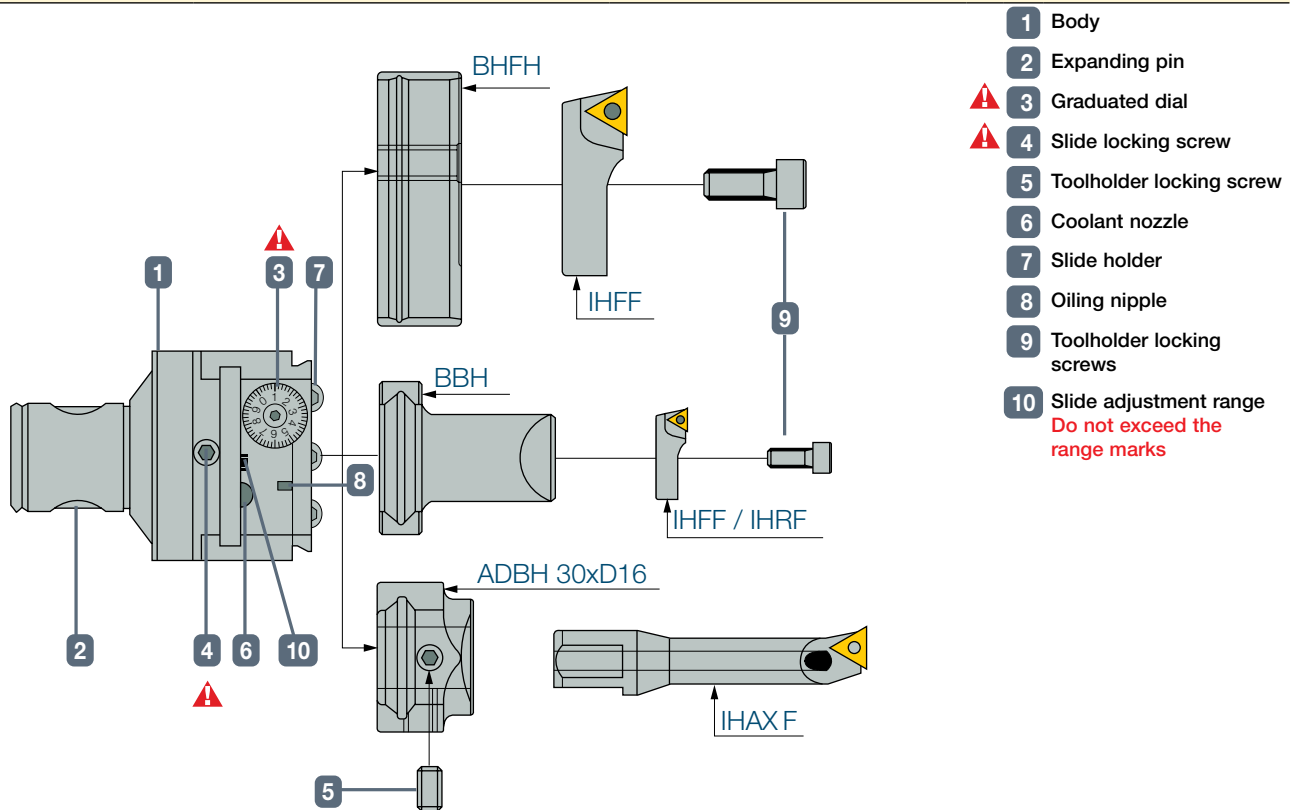
Important Note:

Toolholder should be firmly affixed to the slide.

Fine Boring Head BHF 63-125

Operating Instructions

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

Recommended torque: (N.m)

BHF MB50- 63x87	30-35
BHF MB50- 80x94	30-35
BHF MB63- 63x87	80-90
BHF MB80- 80x94	80-90
BHF MB80-125x94	80-90

- 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 BHF from the shank, loosen the expanding pin [2] by turning counterclockwise.

Positioning

- The tool slide [7] allows for a 5 mm 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.

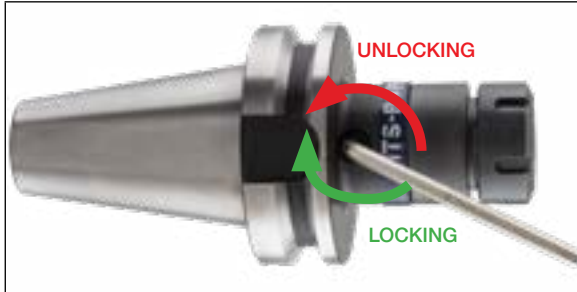
Operation and Maintenance

MB Connection

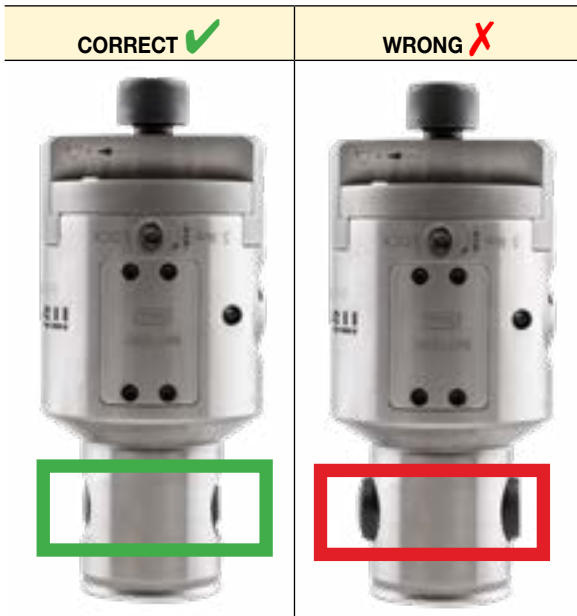
To **LOCK**, rotate the radial pin clockwise

To **UNLOCK**, rotate the radial pin counter-clockwise

Table shows the recommended tightening torques:

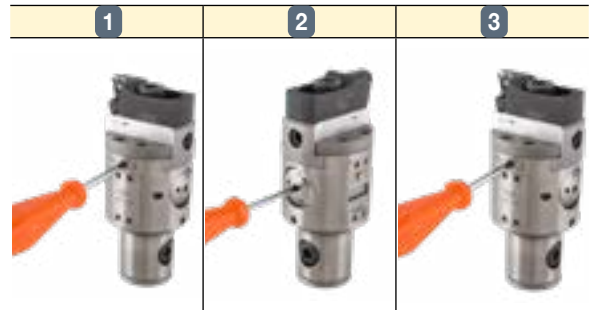


Before assembling the MB connection elements, make sure the radial pin is not projected from the cylindrical parts.



Stages for adjusting boring heads with dial:

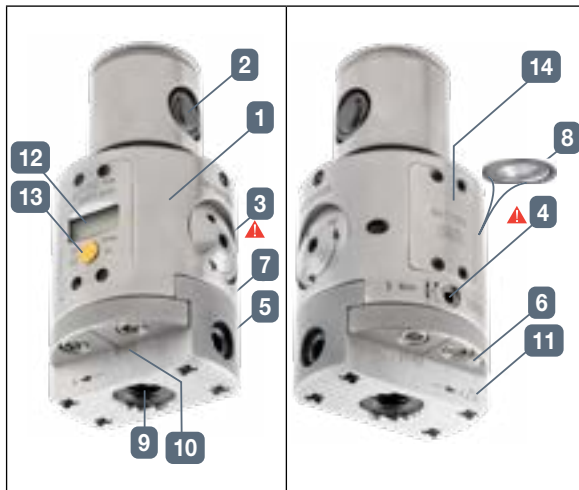
- 1 Loosen slide adjustment screw
- 2 Adjust the dial screw
- 3 Tighten slide adjustment screw



Driving Torque	
MB	Nm
MB14	2-2.5
MB16	2-2.5
MB20	4-4.5
MB25	6.5-7.5
MB32	7-8
MB40	16-18
MB50	30-35
MB63	70-80
MB80	70-80
MB110	200-220

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

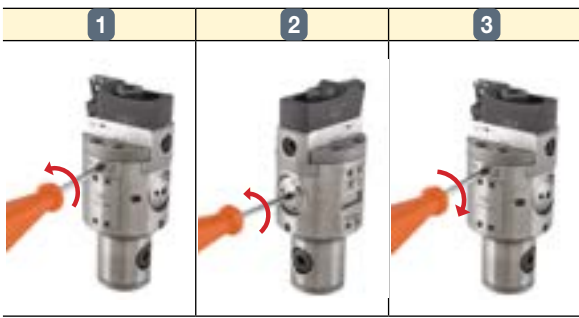


Fig. 3

Locking Screw Tightening Torques (Nm)

Designation:	(Nm)
BHD MB32-32-83	2.0
BHD MB40-40-90	2.5
BHD MB50-50-60	3.0
BHD MB63-63-89	3.5
BHD MB80-80-104	4.0

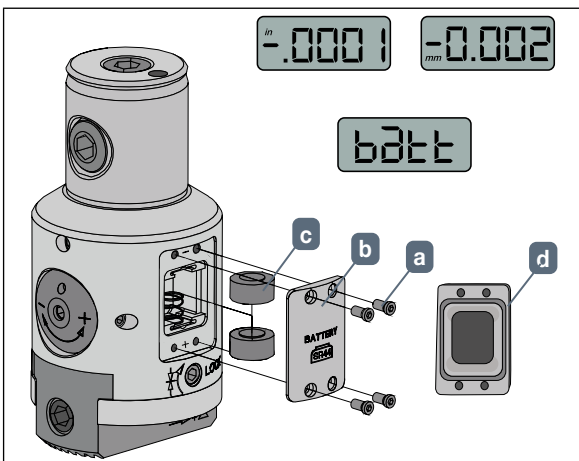


Fig. 4

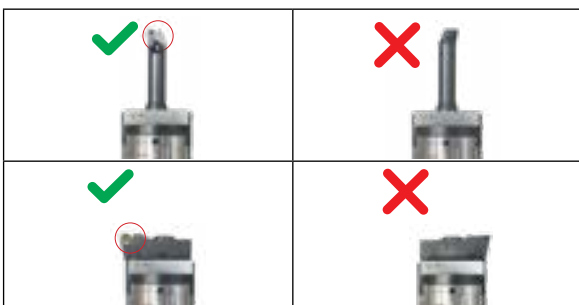


Fig. 5

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.

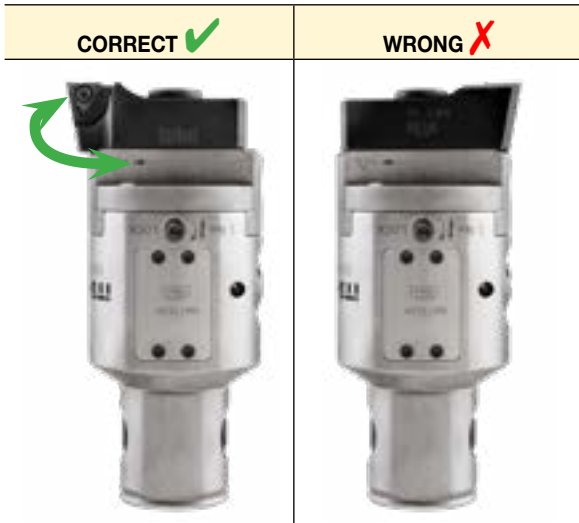
WARNING

- 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.

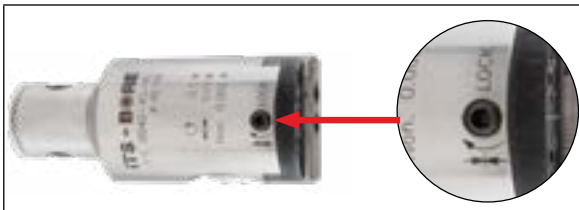
Inserts

We advise you to use the inserts proposed by ISCAR. The use of different inserts can affect ultimate machining results.

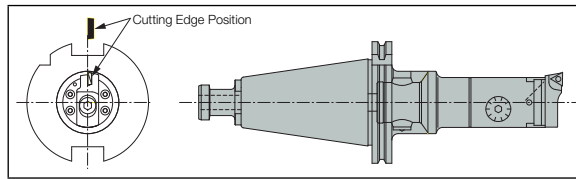
Cartridge should be mounting according to the insert symbol direction



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



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

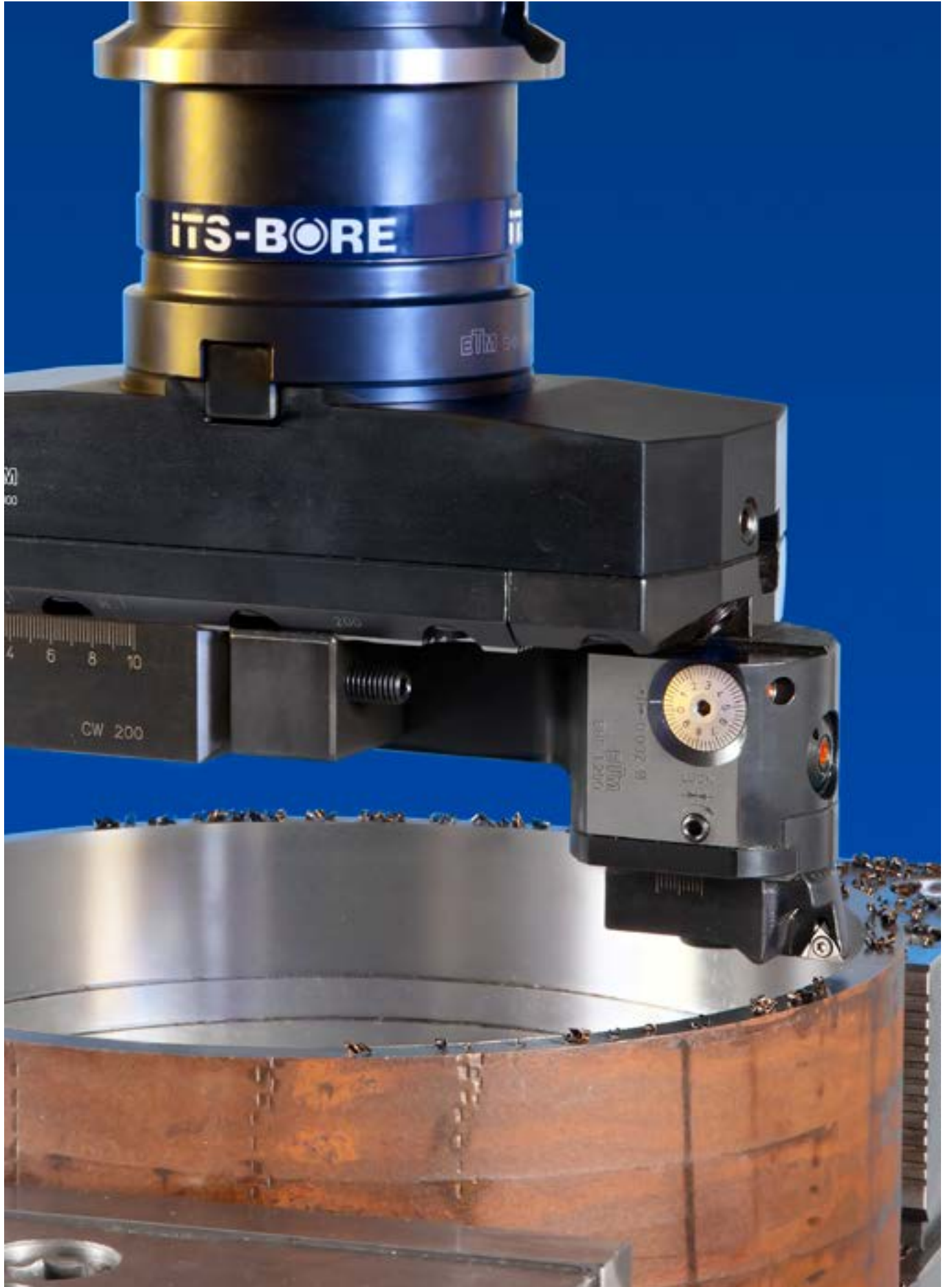


Maintenance

Boring heads should be lubricated with ISO UN G220 oil weekly



ITSBORE



Complete Machining Solutions

MATERIALS AND GRADES


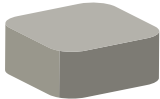
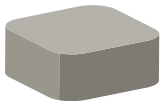


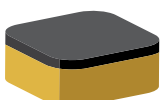
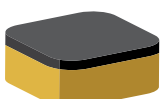




ISCAR Hole Making Grades Chart

Grade	ISO	Grade Description	Coating Layers	*Coating Color
IC328	P25-P40	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.		
	M30-M40			
	S20-S30			
IC508	P20-P40	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.		
	M20-M30			
	K20-K30			
	N10-N30			
	S10-S25			
H20-H30				
IC520	M10-M20	A hard substrate PVD coated grade. Intended mainly for machining austenitic stainless steel, high-temperature alloys and Titanium.		
	N10-N15			
	S10-S20			
IC806	P10-P20	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.		
	M10-M20			
	K10-K25			
IC808	P15-P30	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.		
	M20-M30			
	K20-K30			
	S10-S25			
	H20-H30			
IC808G	P15-P30	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.		
	M20-M30			
	K15-K25			
	S10-S25			
	H10-H20			
IC830	P20-P40	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.		
	M25-M35			
	S15-S30			
IC903	P10-P20	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.		
	M15-M25			
	K10-K20			
	S10-S20			
IC907	P10-P20	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.		
	M05-M15			
	K15-K30			
	S10-S20			
H05-H15				




* For coated grades

ISCAR Hole Making Grades Chart

	Grade	ISO	Grade Description	Coating Layers	*Coating Color
PVD COATED	IC908	P15-P30	A tough submicron grain size substrate with PVD coating, recommended for general use in a large variety of operations and materials such as steels, alloy steels, austenitic stainless steel and high temperature alloys at moderate cutting speeds. Features high wear resistance and chipping durability.	TiAlN Base	
		M20-M30			
		K20-K30			
		S10-S25			
		H20-H30			
	IC920	K10-K20	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	
		N10-N25			
	IC928	P20-P40	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	
		M25-M35			
S15-S30					
IC950	P15-P35	A PVD coated grade with excellent wear resistance. Generally used for heavy machining alloy steel and cast iron.	TiAlN Base		
	K15-K35				
IC1008	P10-P20	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		
	M05-M15				
	K15-K30				
	S10-S20				
	H05-H15				
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 ₂ O ₃ TiCN Base	
	IC8080	P10-P20	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 ₂ O ₃ TiCN Base	
		K10-K20			
IC9025	P20-P30	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 ₂ O ₃ TiCN Base		
	M15-M30				
IC9080	P10-P20	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 ₂ O ₃ TiCN Base		
	K10-K20				

* For coated grades

ISCAR Hole Making Grades Chart

	Grade	ISO	Grade Description	Uncoated Layers	Uncoated
UNCOATED	IC03		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	
		S10-S20			
		H15-H25			
	IC07	M10-M20	A hard-uncoated submicron grain size carbide grade, suitable for machining aluminum alloys and other non-ferrous materials at high cutting speeds.	Base	
		N05-N20			
		S10-S30			
	IC08	M10-M30	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	
		N10-N25			
S10-S30					

MATERIAL GROUPS

Based on ISO 513 and VDI 3323 standards

ISO	Material	Condition	Tensile Strength [N/mm ²]	Kc1 ⁽¹⁾ [N/mm ²]	mc ⁽²⁾	Hardness HB	Material Group No.	
P	Non-alloy steel and cast steel, free cutting steel	< 0.25 %C	Annealed	420	1350	0.21	125	1
		≥ 0.25 %C	Annealed	650	1500	0.22	190	2
		< 0.55 %C	Quenched and tempered	850	1675	0.24	250	3
		≥ 0.55 %C	Annealed	750	1700	0.24	220	4
			Quenched and tempered	1000	1900	0.24	300	5
	Low alloy and cast steel (less than 5% of alloying elements)	Quenched and tempered	Annealed	600	1775	0.24	200	6
				930	1675	0.24	275	7
				1000	1725	0.24	300	8
	High alloyed steel, cast steel and tool steel	Quenched and tempered		1200	1800	0.24	350	9
			Annealed	680	2450	0.23	200	10
	Stainless steel and cast steel	Ferritic/martensitic	Quenched and tempered	1100	2500	0.23	325	11
				680	1875	0.21	200	12
	Stainless steel and cast steel	Martensitic		820	1875	0.21	240	13
Austenitic, duplex			600	2150	0.20	180	14	
K	Gray cast iron (GG)	Ferritic / pearlitic		1150	0.20	180	15	
		Pearlitic / martensitic		1350	0.28	260	16	
	Nodular cast iron (GGG)	Ferritic		1225	0.25	160	17	
		Pearlitic		1350	0.28	250	18	
	Malleable cast iron	Ferritic		1225	0.25	130	19	
		Pearlitic		1420	0.3	230	20	
N	Aluminum-wrought alloys	Not hardenable		700	0.25	60	21	
		Hardenable		800	0.25	100	22	
	Aluminum-cast alloys	≤12% Si	Not hardenable		700	0.25	75	23
			Hardenable		700	0.25	90	24
	Copper alloys	>12% Si	High temperature		750	0.25	130	25
		>1% Pb	Free cutting		700	0.27	110	26
			Brass		700	0.27	90	27
			Electrolytic copper		700	0.27	100	28
	Non metallic	Duroplastics, fiber plastics					29	
		Hard rubber					30	
S	High temperature alloys	Fe based	Annealed		2600	0.24	200	31
			Hardened		3100	0.24	280	32
		Ni or Co based	Annealed		3300	0.24	250	33
			Hardened		3300	0.24	350	34
			Cast		3300	0.24	320	35
	Titanium alloys	Pure	400	1160	0.24		36	
		Alpha+beta alloys, hardened	1050	1245	0.24		37	
H	Hardened steel	Hardened		4600		55 HRC	38	
		Hardened		4700		60 HRC	39	
	Chilled cast iron	Cast		4600		400	40	
	Cast iron	Hardened		4500		55 HRC	41	

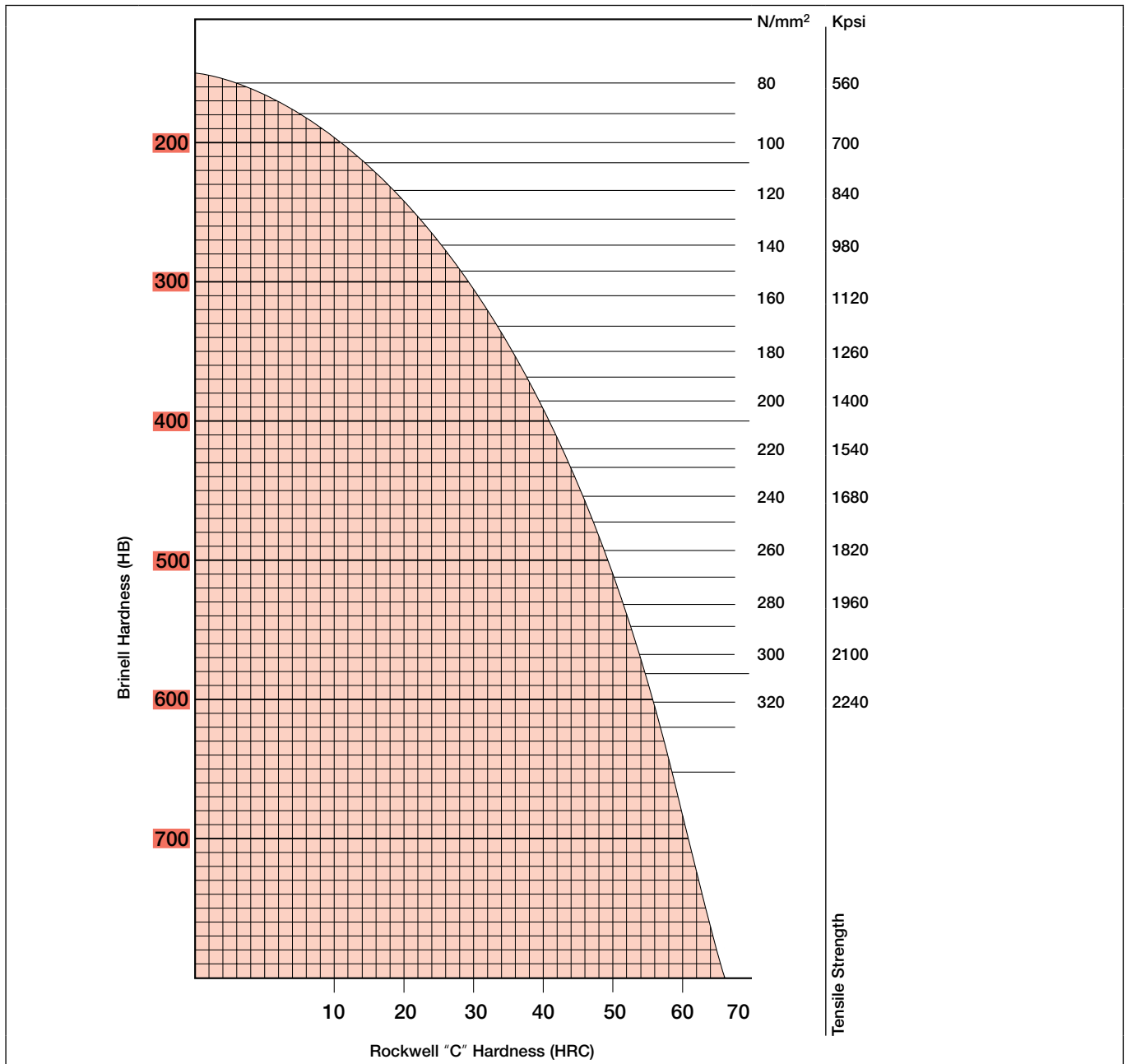
- Steel
- Stainless Steel
- Cast Iron
- Non-ferrous
- High Temp. and Titanium Alloys
- Hardened Steel and Cast Iron

⁽¹⁾ Specific cutting force for 1 mm² chip section.











⁽²⁾ Chip thickness factor.


MATERIAL GROUPS











Hardness Conversion Table













According to 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; USW 23		2 C		FeP 12	AP 12	SPHD	10kp	
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)











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	K01700; K02001; K02200; K02201; K02203; K02503; K02601; K02801	1.0345	P235GH; H1; 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
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

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	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
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











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	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; StE 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
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 AV1; 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











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; 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; 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
1		1.0347	DC03; 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











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	AISI/SAE/ UNS/ ASTM/AA	Werkstoff	DIN	BS	AFNOR	SS	UNI	UNE	JIS	GOST	EN
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			
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











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	AISI/SAE/ UNS/ ASTM/AA	Werkstoff	DIN	BS	AFNOR	SS	UNI	UNE	JIS	GOST	EN
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
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











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	AISI/SAE/ UNS/ ASTM/AA	Werkstoff	DIN	BS	AFNOR	SS	UNI	UNE	JIS	GOST	EN
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
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	56Si7; 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	SCM4E; SCM 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 WCrV 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











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	AISI/SAE/ UNS/ ASTM/AA	Werkstoff	DIN	BS	AFNOR	SS	UNI	UNE	JIS	GOST	EN
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
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











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	AISI/SAE/ UNS/ ASTM/AA	Werkstoff	DIN	BS	AFNOR	SS	UNI	UNE	JIS	GOST	EN
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
6		1.7262	15CrMo5; 15 CrMo 5		12 CD 4			12 CrMo 4; F.150.J; F.155; 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	16MnCr5
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; TUL	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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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; SFCVCM 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
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	











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	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
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
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











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	AISI/SAE/ UNS/ ASTM/AA	Werkstoff	DIN	BS	AFNOR	SS	UNI	UNE	JIS	GOST	EN
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											
8											
8		1.8705	21MnCr6-5								
8											
9		1.6659	31NiCrMo13-4	830 M 31		2534		F.270			
9		1.5864	35NiCr18								
9											
9											
9											
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
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	X165CrMoV 12KU				X165CrMoV12
10		1.2316	X38CrMo17; 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











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
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			
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 DKCWW 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 DCWW 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 WDKCV 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











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	AISI/SAE/ UNS/ ASTM/AA	Werkstoff	DIN	BS	AFNOR	SS	UNI	UNE	JIS	GOST	EN
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											
11											
11											
11											
11											
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
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











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	AISI/SAE/ UNS/ ASTM/AA	Werkstoff	DIN	BS	AFNOR	SS	UNI	UNE	JIS	GOST	EN
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
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











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	AISI/SAE/ UNS/ ASTM/AA	Werkstoff	DIN	BS	AFNOR	SS	UNI	UNE	JIS	GOST	EN
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				
14	347; J92640; J82710	1.4552	GX5CrNiNb19-11; G-X 5 CrNiNb 18 9	347 C 17; 821 grade Nb	Z 4 CENNb 19.10 M; Z 6 CENNb 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











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	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	
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	03Ch17N14M3	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 CrNiCuNb 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











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	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	X4CrNiSi18-10; X 4 CrNiSi 18 10			2372					X4CrNiSi 18-10
14	S30815	1.4893	X9CrNiSiNCo21-11-2; X 8 CrNiSiN 21 11			2368					X9CrNiSiNCo 21-11-2
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	X8CrNiSi18-9; X 10 CrNiSi 18 9	303 S 31	Z 8 CNF 18-09	2346	X 10 CrNiSi 18 09	F.310.C; F.3508; X 10 CrNiSi 18-09	SUS 303	30Ch18N11	X8CrNiSi18-9; 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











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; 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				
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











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	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	A48-45 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
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
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







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	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
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	AlZnMgCu0.5; AlZnMgCu0.5								AlZnMgCu0.5; AlZnMgCu0.5; 7022
22		3.1655	AlCu6BiPb; AlCuBiPb	FC1	A-U5PbBi	144355	9002/5	L-3192	A2011		AlCu6BiPb; 2011
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

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	AISI/SAE/ UNS/ ASTM/AA	Werkstoff	DIN	BS	AFNOR	SS	UNI	UNE	JIS	GOST	EN
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-AISI12(Cu); G-AISI12(Cu); AISi12(Cu); VDS 231 D		A-S12U		3048				EN AC-47100; EN AC-AISI12C; G-AISI12Cu; AISi12Cu; AISi12Cu1(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-AICu5Ni1.5; G-AICu5Ni1.5		AU5NKZr						
23	ER4047; A94047	3.2585	SG-AISI12	4047A; NG2		144262					SG-AISI12; EL-AISI12
23	712.0; AA 712.0; A07120		G-AIZn10Si8Mg; GK-AIZn10Si8Mg; ALZn10Si8Mg; VDS 108		A-Z5GF		3602				EN AC-71100; EN AC-AIZn10Si8Mg; G-AIZn10Si8Mg; 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-AISI12; GK-AISI12; GD-AISI12; AISi12	LM6	A-S13	144261	4514	L-2520	AC3		EN AC-44200; EN AC-AISI12; G-AISI12; GD-AISI12; AISi12
23		3.2211	G-AISI11; GK-AISI11; AISi11								EN AC-44000; EN AC-AISI11; G-AISI11
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
24	515.0; AA 515.0; A05150	3.3241	G-ALMg3Si; GK-ALMg3Si; GF-ALMg3Si; ALMg3Si; ALMg3Si1								G-ALMg3Si1; ALMg3Si
24		3.2373	G-AISI9Mg; GK-AISI9Mg; AISi9Mg		A-S9G		3051		AC4A	AK9	G-AISI9Mg; AISi9Mg
24	A356.0; AA A356.0; A13560; A356.2; AA A356.2; A13562	3.2371	G-AISI7Mg; GK-AISI7Mg; GF-AISI7Mg; AISi7Mg	2L99	A-S7G03			L-2651	AC4CH	AL9	G-AISI7Mg; AISi7Mg
24	204.0; AA 204.0; A02040	3.1371	G-AICu4TiMg; GK-AICu4TiMg; GF-AICu4TiMg; AICu4TiMg		AU5GT			L-2140	AC1B		EN AC-21000; EN AC-AICu4TiMg; G-AICu4TiMg
24	A333.0; AA A333.0; A13330	3.2161	G-AISI8Cu3; GK-AISI8Cu3			144163				AL13	EN AC-AISI8Cu3; EN AC-AISI8Cu3; G-AISI8Cu3











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	AISI/SAE/ UNS/ ASTM/AA	Werkstoff	DIN	BS	AFNOR	SS	UNI	UNE	JIS	GOST	EN
24	380.0; AA 380.0; A03800	3.2163	G-AISI9Cu3; GD-AISI9Cu3; AISI9Cu3; VDS 226	LM24	A-S9U3	144252	3610	L-2630	AC4B	AK8M3; AK8	EN AC-46200; EN AC-AISI8Cu3; G-AISI9Cu3; AISI8Cu3
24	365.0; AA 365.0; A03650		G-AISI10MnMg								EN AC-43500; EN AC-AISI10MnMg; G-AISI10MnMg
24	319.0; AA 319.0; A03190	3.2151	G-AISI6Cu4; GK-AISI6Cu4; AISI6Cu4; VDS 225	LM21	A-S5UZ	144230	7369/4	L-2620	AC2B	AK5M	EN AC-45000; EN AC-AISI6Cu4; G-AISI6Cu4; AISI6Cu4
24		3.2383	G-AISI10MgCu; GK-AISI10MgCu; G-AISI10Mg(Cu); GK-AISI10Mg(Cu); AISI10MgCu; AISI10Mg(Cu)		A-S10UG						
24		3.2381; 3.2385	G-AISI10Mg; GK-AISI10Mg; GD-AISI10Mg; AISI10Mg; VDS 239		A-S10G	144253					EN AC-43000; EN AC-AISI10Mg; G-AISI10Mg; AISI10Mg
24		3.1841	G-AICu4Ti; AICu4Ti							AL19	EN AC-21100; EN AC-AICu4Ti; G-AICu4Ti; AICu4Ti
25	390.0; AA 390.0; A03900		G-AISI17Cu4Mg	LM30		4282					EN AB-48100; EN AC-48100; G-AISI17Cu4Mg; AISI17Cu4Mg
25	393.0; AA 393.0; A03930		G-AISI20CuMgNi; AISI20CuMgNi	LM29						AK21M2N2	
25			G-AISI18Cu1MgNi; AISI18Cu1MgNi	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
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; Lts23A6Zn3MTs2	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











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	AISI/SAE/ UNS/ ASTM/AA	Werkstoff	DIN	BS	AFNOR	SS	UNI	UNE	JIS	GOST	EN
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
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	CuAlNi3Fe2		UA9					BrA10Zn4N4L	
28	C61000	2.0920	CuAl8; Cu Al 8		CuAl8					BrA7	CuAl8
29											
29											
30											
30											
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

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	AISI/SAE/ UNS/ ASTM/AA	Werkstoff	DIN	BS	AFNOR	SS	UNI	UNE	JIS	GOST	EN
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	NiCr29Fe		NC 30 Fe						
33	Monel 400; N04400	2.4360; 2.4361	NiCu30Fe	NA 13	NU 30						
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; N07214	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-NiMo29; 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

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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
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

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
36	Titanium Grade 2; R50400; AMS 4902; AMS 4941; ASTM 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
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

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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											
38											
38											
38											
38		1.8721	26MnCr6-3								26MnCr6-3
38											
38											
38											
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
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 DCWW 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											
39											
39											
39											
39											
39	440C; S44004; S44025	1.4125	X105CrMo17; X105 CrMo 17		Z 100 CD 17 C; 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					

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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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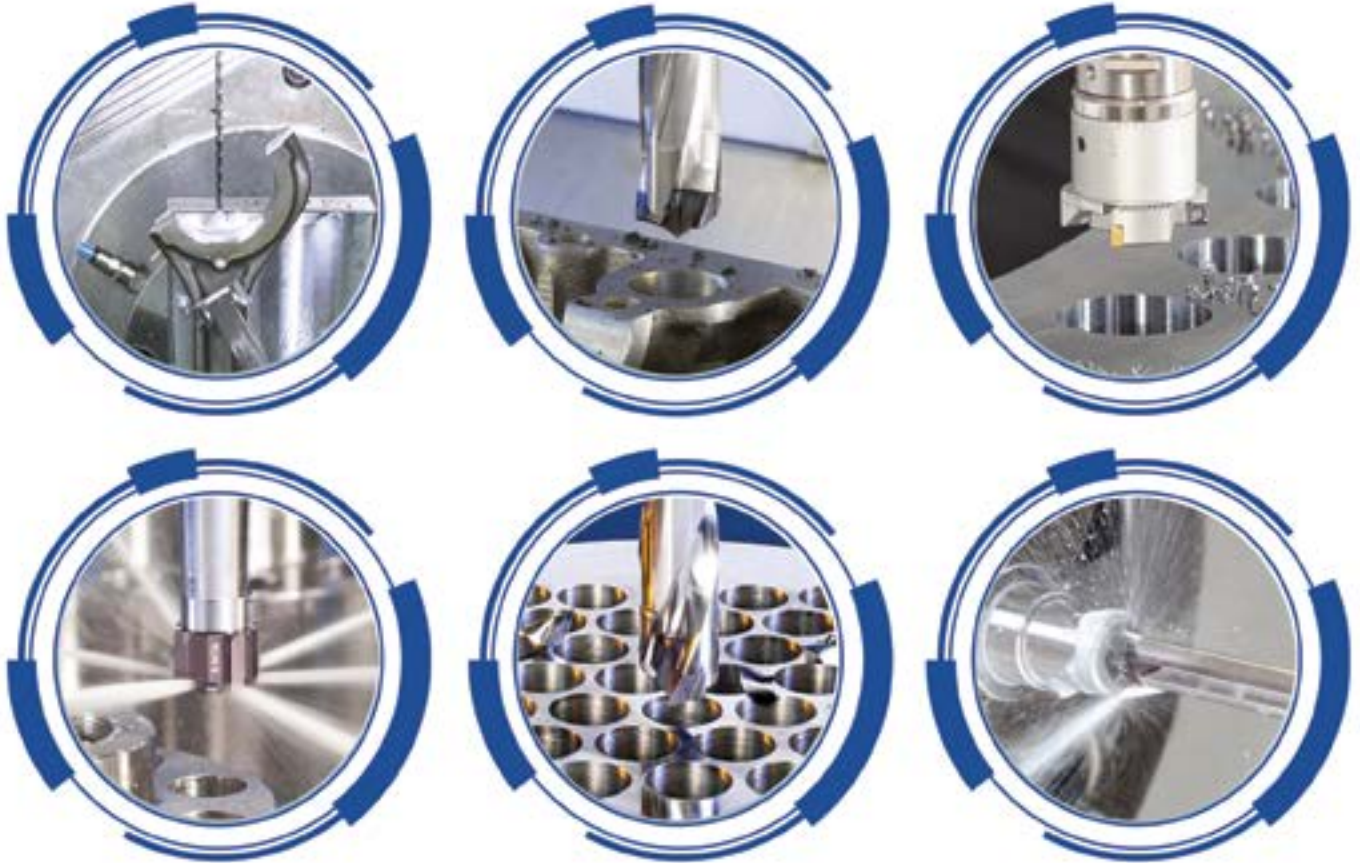
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