



**ALLIED MACHINE
& ENGINEERING**

WOHLHAUPTER®

Holemaking Solutions for Today's Manufacturing



Wohlhaupter® Product CATALOG



Drilling



Boring



Reaming



Burnishing



Threading



Specials

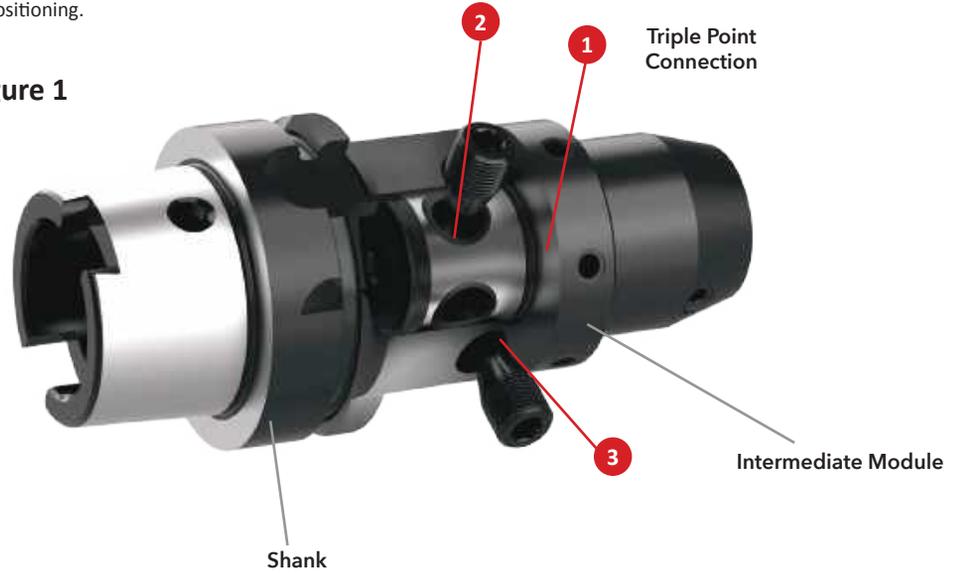
www.alliedmachine.com

The MVS Connection

Wohlhaupter® GmbH developed the world's first modular tooling system called MultiBore® in 1973. The modular tooling system was designed to be compatible with all machine spindles, and its connection features a triple point clamp (Figure 1). The triple point clamp (1, 2, & 3) maximizes rigidity and creates an accuracy less than 3µm when the tool is changed.

- Ensures high axial clamping forces on mating surfaces.
- Provides maximum rigidity.
- Threaded taper pins for precise cutter positioning.

Figure 1



MVS Connection Color Guide

Wohlhaupter® created a unique color-coding system to find the right connections for different tool components quickly and easily. Each Wohlhaupter / MVS connection size has its own color-coding. Simply match the colors to select the correct combination of tool components (Figure 2).



M 8	19.5 - 11	22 - 11	25 - 14	32 - 18	40 - 22	50 - 28	63 - 36	80 - 36	100 - 56	D 40	D 60
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MVS Connection Example - Selecting the Correct MultiBore® Components

Example Machining Parameters

Hole Diameter: 2.942" (75.00 mm)
 Hole Depth: 7.874" (200.00 mm)
 Machine Spindle: HSK-A 100 DIN 69893

1 Select your boring tool.

- Example: 464 Balance Boring Head

2 Select the tool that meets the required boring range.

- MVS connection: **50 - 28**
- A = 2.559" - 3.268" (65.00 mm - 83.00 mm)
- Part No. : **464006**



1 **465 (464) Balance Digital 3E™ Boring Head**

2

D ₁ / D ₂	A	X ₁	Order	Boring Head
50 - 28	65.00 - 83.00	75.00	0	464006
50 - 28	65.00 - 83.00	75.00	3	464006
50 - 28	65.00 - 83.00	75.00	4	464006
55 - 36	81.00 - 103.00	90.00	0	464007
55 - 36	81.00 - 103.00	90.00	3	464007
55 - 36	81.00 - 103.00	90.00	4	464007
90 - 36	100.00 - 130.00	90.00	0	464008
90 - 36	100.00 - 130.00	90.00	3	464008
90 - 36	100.00 - 130.00	90.00	4	464008
90 - 36	125.00 - 167.50	90.00	0	464009
90 - 36	125.00 - 167.50	90.00	3	464009

3 Select the master shank that fits your spindle.

- Machine spindle: DIN 69893 HSK

4 Choose the connection that fits your application.

- MVS connection: **63 - 36**
- Part No. : **245015**



3 **HSK Master Shanks (DIN 69893)**

4

D ₁ / D ₂	A	X ₁	Order	Part No.
63 - 36	80 - 96	80	0	245015
63 - 36	80 - 96	80	3	245009
63 - 36	80 - 96	80	4	252090*
100 - 36	90 - 108	90	0	245014
100 - 36	90 - 108	90	3	246020
100 - 36	90 - 108	90	4	246021
100 - 36	90 - 108	90	0	245015
100 - 36	90 - 108	90	3	246019
100 - 36	90 - 108	90	4	246022
100 - 36	90 - 108	90	0	245016
100 - 36	90 - 108	90	3	246018
100 - 36	90 - 108	90	4	246023

5 Select the correct intermediate module.

Must meet the hole depth requirements and MVS connections for both the boring head and shank

- Hole depth: 7.874" (200.00mm)
- Boring tool 464006 length (X₁): 2.953" (75.00 mm)
- Master shank 245015 length (L₁): 2.008" (51.00 mm)
- Minimum required length of adapter: 2.913" (74.00 mm)
- Boring tool 464006 MVS connection: **50 - 28**
- Master shank 245015 MVS connection: **63 - 36**
- Adapter Part No.: **119025**



5

D ₁ / D ₂	A	X ₁	Order	Part No.
50 - 28	65 - 83	75 - 80	0	119025
50 - 28	65 - 83	75 - 80	3	119026
50 - 28	65 - 83	75 - 80	4	119027
63 - 36	80 - 96	80 - 85	0	119028
63 - 36	80 - 96	80 - 85	3	119029
63 - 36	80 - 96	80 - 85	4	119030
63 - 36	80 - 96	80 - 85	0	119031
63 - 36	80 - 96	80 - 85	3	119032
63 - 36	80 - 96	80 - 85	4	119033
63 - 36	80 - 96	80 - 85	0	119034
63 - 36	80 - 96	80 - 85	3	119035
63 - 36	80 - 96	80 - 85	4	119036
63 - 36	80 - 96	80 - 85	0	119037
63 - 36	80 - 96	80 - 85	3	119038
63 - 36	80 - 96	80 - 85	4	119039
63 - 36	80 - 96	80 - 85	0	119040
63 - 36	80 - 96	80 - 85	3	119041
63 - 36	80 - 96	80 - 85	4	119042

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SECTION

B10-A

Versatile Fine Boring

Wohlhaupter® Versatile Fine Boring

VarioBore | 249 (248) | PrimeBore | Digital 511 (510) | DigiBore

► Diameter Range: 0.016" - 8.189" (0.40 mm - 208.00 mm)



NOTE: Imperial items pictured.

NOTE: 3E^{TECH} adjustment accuracy of 0.00005" or 0.001 mm on diameter.

NOTE: Internal digital and vernier adjustment accuracy of 0.0001" or 0.002 mm on diameter.

WOHLHAUPTER®

Precision boring at its finest.

From high precision to high production, Wohlhaupter has the right solution for your hole finishing applications. With the most reliable digital readout displays, the Wohlhaupter versatile boring product line offers the most precise and flexible modular system on the market.

Your safety and the safety of others is very important. This catalog contains important safety messages. Always read and follow all safety precautions.



This triangle is a safety hazard symbol. It alerts you to potential safety hazards that can cause tool failure and serious injury.

When you see this symbol in the catalog, look for a related safety message that may be near this triangle or referred to in the nearby text.

There are safety signal words also used in the catalog. Safety messages follow these words.

WARNING

WARNING (shown above) means that failure to follow the precautions in this message could result in tool failure and serious injury.

NOTICE means that failure to follow the precautions in this message could result in damage to the tool or machine but not result in personal injury.

NOTE and **IMPORTANT** are also used. These are important that you read and follow but are not safety-related.

Visit www.alliedmachine.com for the most up-to-date information and procedures.

Applicable Industries



Aerospace



Agriculture



Automotive



Firearms



General
Machining



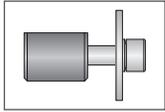
Oil & Gas



Renewable
Energy

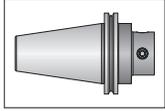
Reference Icons

The following icons will appear throughout the catalog to help you navigate between products.



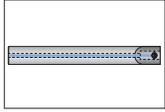
Clamping Elements

For use with insert holders and boring heads



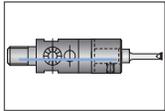
Shanks

A variety of shanks for different machines



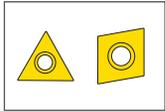
249 (248) Shanks

A variety of shanks for different machines



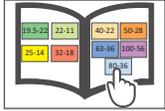
249 (248) Boring Head

249 (248) boring head that connects into the adapter shanks



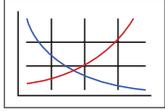
Inserts

For use with insert holder boring heads and boring bars using indexable inserts



MVS Connection Color Guide

Detailed instructions and information regarding the MVS connection(s)



Recommended Cutting Data

Speed and feed recommendations for optimum and safe boring



Coolant-Through Option

Indicates that the product is coolant through

Series	Diameter Range	
	Imperial (inch)	Metric (mm)
VarioBore 563 (536)	0.016 - 5.984	0.40 - 152.00
249 (248) Boring Head	0.118 - 1.189	3.00 - 30.20
PrimeBore 451 (450)	0.118 - 8.189	3.00 - 208.00
Digital 511 (510)	0.016 - 1.339	0.40 - 12.00
DigiBore 504 (501)	0.118 - 8.189	3.00 - 208.00

Versatile Fine Boring Contents

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DigiBore

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VarioBore Product Overview

VarioBore with 3E^{TECH}+ VERSATILE FINE BORING

Need more versatility?

The Wohlhaupter® VarioBore head offers precision and versatility, and the 3E^{TECH}+ docking port provides convenient and simple diameter adjustments.

Experience *precision boring* for yourself.

- Diameter range: 0.016" - 5.984" (0.40 mm - 152.00 mm).
- Offers outside turning capabilities: 0.079" - 2.598" (2.00 mm - 66.00 mm).
- Ease the stress of working on different day-to-day projects with boring kits.
- 3E^{TECH}+ module provides a simple digital readout.
- Max spindle speed: 27,500 RPM.



NOTE: 3E^{TECH}+ adjustment accuracy of 0.00005" or 0.001 mm on diameter.

NOTE: Vernier adjustment accuracy of 0.0001" or 0.002 mm on diameter.

IMPORTANT: Max spindle speed refers to maximum possible speed for an individual boring head and is not a recommended parameter. Refer to page B10-M: 12 for recommended application-specific parameters. Factory technical assistance is available for your specific applications through our Application Engineering department.
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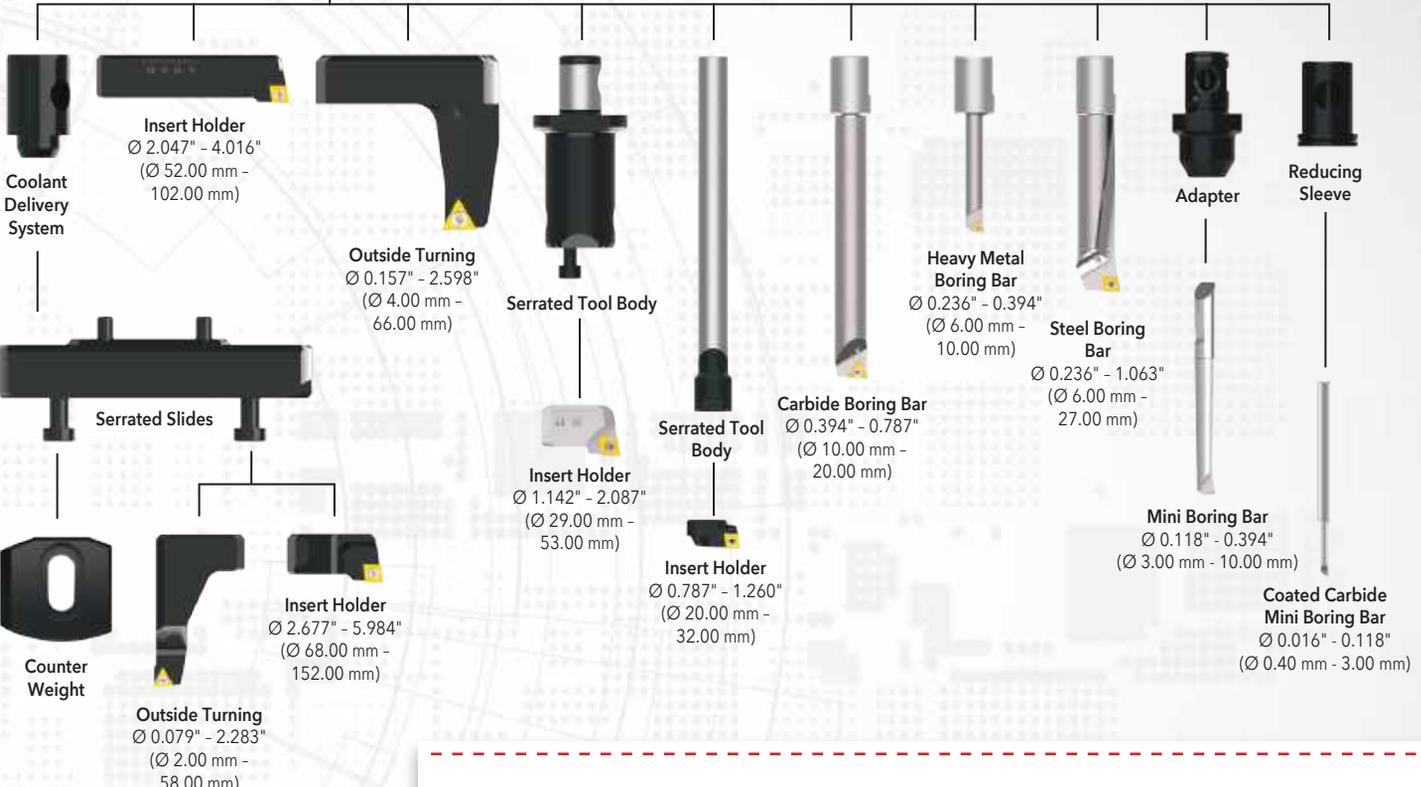
VarioBore Head

VARIO BORE

with **3E TECH+** Universal Digital Readout Module

NOTE: 3E^{TECH+} adjustment accuracy of 0.00005" or 0.001 mm on diameter.

NOTE: Vernier adjustment accuracy of 0.0001" or 0.002 mm on diameter.



OPERATION **VERSATILITY**

from **0.016"** to **5.984"** (0.40 mm to 152.00 mm)
plus outside turning

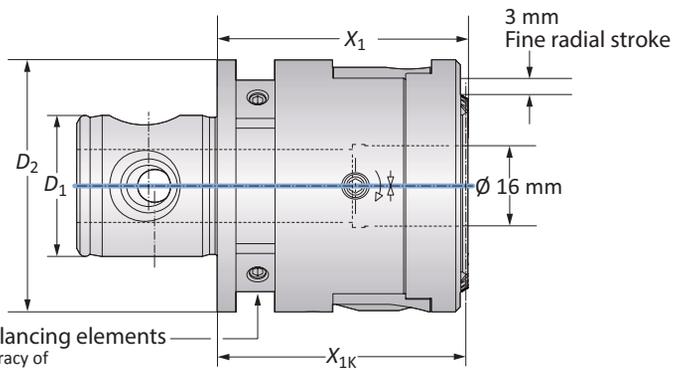


NOTE: 3E^{TECH+} adjustment accuracy of 0.00005" or 0.001 mm on diameter.

NOTE: Vernier adjustment accuracy of 0.0001" or 0.002 mm on diameter.

Digital 3E^{TECH+} Boring Heads

Diameter Range: 0.016" - 5.984" (0.40 mm - 152.00 mm)



NOTE: Vernier adjustment accuracy of 0.0001" or 0.002 mm on diameter.

VarioBore Digital 3E^{TECH+} Boring Head

	MVS Connection		Boring Head		Weight	Part No.
	$D_2 D_1$	Boring Range	X_1	X_{1K}		
i	50 - 28	0.016 - 5.984	1.969	1.949	1.543 (lbs)	563002
m	50 - 28	0.40 - 152.00	50.00	49.50	0.70 (kg)	536002

NOTE: Balancing elements, 3E^{TECH+} digital readout module, and charging unit must be ordered separately.

NOTE: VarioBore heads are compatible with Kaiser® connection.

3E^{TECH+} Digital Readout Module

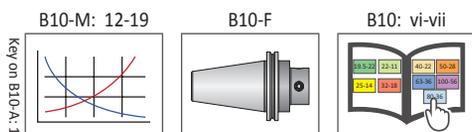
Part No.	Charging Unit*
536015	536016

NOTE: WEEE-Reg.-Nr. DE 15820388

*Charging unit sold separately.



NOTE: 3E^{TECH+} adjustment accuracy of 0.00005" or 0.001 mm on diameter.



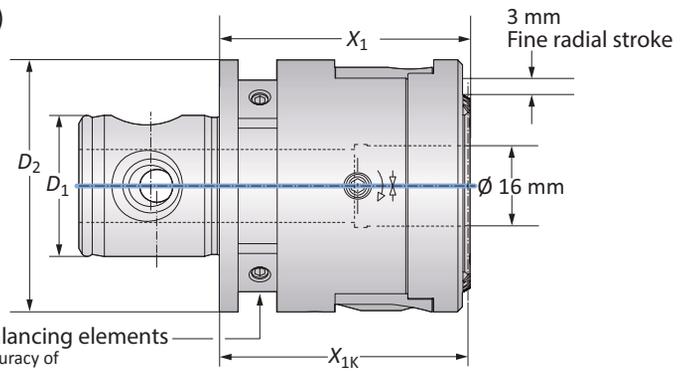
Key on B10-A: 1

i = Imperial (in)
m = Metric (mm)

IMPORTANT: Max spindle speed refers to maximum possible speed for an individual boring head and is not a recommended parameter. Refer to page B10-M: 12 for recommended application-specific parameters. Factory technical assistance is available for your specific applications through our Application Engineering department.
ext: 7611 | email: appeng@alliedmachine.com

Analog Boring Heads

Diameter Range: 0.016" - 5.984" (0.40 mm - 152.00 mm)



NOTE: Vernier adjustment accuracy of 0.0001" or 0.002 mm on diameter.

VarioBore Analog Boring Head

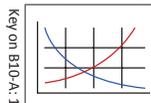
	MVS Connection	Boring Range	Boring Head		Weight	Part No.
	D_2 D_1		X_1	X_{1K}		
i	50 - 28	0.016 - 5.984	1.969	1.949	1.543 (lbs)	563001*
m	50 - 28	0.40 - 152.00	50.00	49.50	0.70 (kg)	536001*

*Not equipped with digital capabilities.

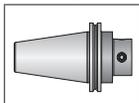
NOTE: Balancing elements must be ordered separately.

NOTE: VarioBore heads are compatible with Kaiser® connection.

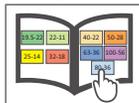
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Key on B10-A-1

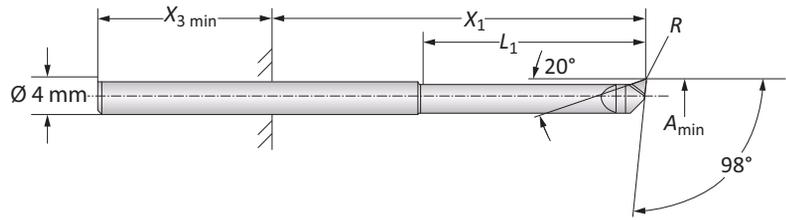
i = Imperial (in)
m = Metric (mm)

IMPORTANT: Max spindle speed refers to maximum possible speed for an individual boring head and is not a recommended parameter. Refer to page B10-M: 12 for recommended application-specific parameters. Factory technical assistance is available for your specific applications through our Application Engineering department.
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Mini Boring Bars

WHC126 Coated Carbide | Diameter Range: 0.016" - 0.118" (0.40 mm - 3.00 mm)



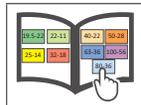
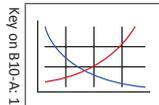
Mini Boring Bars

Boring Range	Boring Bar*					Part No.
	A_{min}	X_1	$X_{3\ min}$	L_1	R	
i	0.016	0.118 - 0.669	0.980	0.079	0.0010	081401WHC126
	0.024	0.157 - 0.709	0.980	0.118	0.0020	081402WHC126
	0.031	0.197 - 0.748	0.980	0.157	0.0020	081403WHC126
	0.039	0.236 - 0.787	0.980	0.197	0.0025	081404WHC126
	0.059	0.335 - 0.886	0.980	0.295	0.0025	081405WHC126
	0.079	0.433 - 0.984	0.980	0.394	0.0025	081406WHC126
	0.098	0.531 - 1.083	0.980	0.492	0.0025	081407WHC126
	0.110	0.591 - 1.142	0.980	0.551	0.0030	081408WHC126
m	0.40	3.00 - 17.00	25.00	2.00	0.03	081401WHC126
	0.60	4.00 - 18.00	25.00	3.00	0.04	081402WHC126
	0.80	5.00 - 19.00	25.00	4.00	0.04	081403WHC126
	1.00	6.00 - 20.00	25.00	5.00	0.05	081404WHC126
	1.50	8.50 - 22.50	25.00	7.50	0.05	081405WHC126
	2.00	11.00 - 25.00	25.00	10.00	0.05	081406WHC126
	2.50	13.50 - 27.50	25.00	12.50	0.05	081407WHC126
	2.80	15.00 - 28.00	25.00	14.00	0.07	081408WHC126

*Fixture-through reducing sleeve (B10-A: 17).

B10-M: 12-19

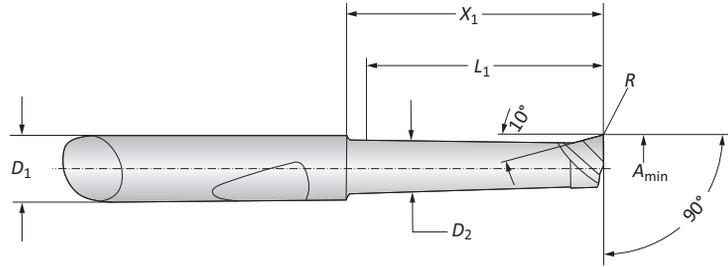
B10: vi-vii



i = Imperial (in)
m = Metric (mm)

Mini Boring Bars

WHC05 | WHW04 | WBN150 | Diameter Range: 0.118" - 0.394" (3.00 mm - 10.00 mm)



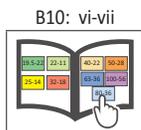
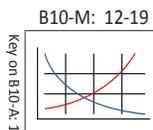
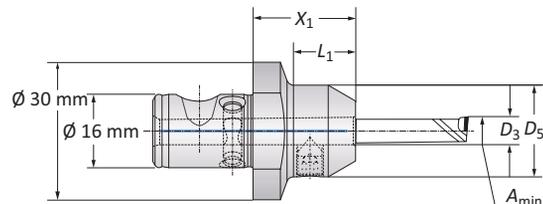
Mini Boring Bars

Boring Range	Boring Bar						Part No.		
	A_{min}	D_1	D_2	X_1	L_1	R	Coated Carbide	Uncoated Carbide	CBN
i	0.118	0.236	0.102	0.452	0.393	0.003	081306WHC05	-	081322WBN150
	0.118	0.236	0.102	0.649	0.590	0.003	081307WHC05	081307WHW04	-
	0.157	0.236	0.141	0.472	0.393	0.007	081308WHC05	-	081317WBN150
	0.157	0.236	0.141	0.669	0.590	0.007	081309WHC05	-	081341WBN150
	0.157	0.236	0.141	0.866	0.787	0.007	081310WHC05	081310WHW04	-
	0.196	0.236	0.181	0.472	0.393	0.007	081311WHC05	-	081318WBN150
	0.196	0.236	0.181	0.866	0.787	0.007	081312WHC05	-	081319WBN150
	0.196	0.236	0.181	1.259	1.181	0.007	081313WHC05	081313WHW04	-
	0.236	0.236	0.220	0.866	0.787	0.007	081314WHC05	-	081320WBN150
	0.236	0.236	0.220	1.259	1.181	0.007	081315WHC05	-	081321WBN150
	0.236	0.236	0.220	1.653	1.574	0.007	081316WHC05	081316WHW04	-
	0.315	0.315	0.229	0.984	0.905	0.007	081323WHC05	-	-
	0.315	0.315	0.229	1.968	1.889	0.007	081324WHC05	-	-
	m	3.00	6.00	2.60	11.50	10.00	0.10	081306WHC05	-
3.00		6.00	2.60	16.50	15.00	0.10	081307WHC05	081307WHW04	-
4.00		6.00	3.60	12.00	10.00	0.20	081308WHC05	-	081317WBN150
4.00		6.00	3.60	17.00	15.00	0.20	081309WHC05	-	081341WBN150
4.00		6.00	3.60	22.00	20.00	0.20	081310WHC05	081310WHW04	-
5.00		6.00	4.60	12.00	10.00	0.20	081311WHC05	-	081318WBN150
5.00		6.00	4.60	22.00	20.00	0.20	081312WHC05	-	081319WBN150
5.00		6.00	4.60	32.00	30.00	0.20	081313WHC05	081313WHW04	-
6.00		6.00	5.60	22.00	20.00	0.20	081314WHC05	-	081320WBN150
6.00		6.00	5.60	32.00	30.00	0.20	081315WHC05	-	081321WBN150
6.00		6.00	5.60	42.00	40.00	0.20	081316WHC05	081316WHW04	-
8.00		8.00	7.60	25.00	23.00	0.20	081323WHC05	-	-
8.00		8.00	7.60	50.00	48.00	0.20	081324WHC05	-	-



Adapters

Boring Range	Adapter				Part No.	
	A_{min}	D_3	D_5	X_1		L_1
m	3.00	6.00	20.00	22.50	14.00	319010
	8.00	8.00	22.00	22.50	14.00	236071



i = Imperial (in)
m = Metric (mm)

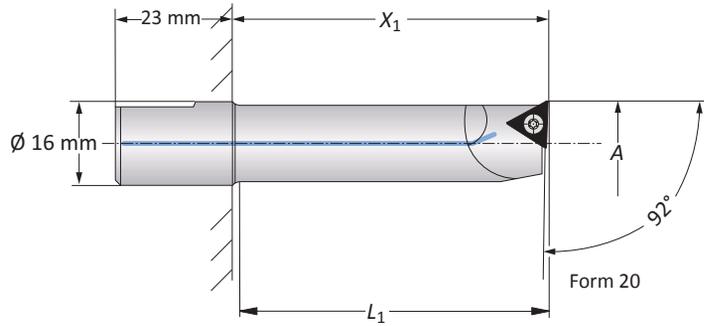
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Boring Bars

Steel | Diameter Range: 0.236" - 1.063" (6.00 mm - 27.00 mm)



Form 101



Boring Range	Boring Bar			Weight	Insert Form	Part No.	Insert Form	Part No.
	A	X ₁	L ₁					
0.236 - 0.315	0.866	0.748	0.070 (lbs)	-	-	211*	081053	
0.315 - 0.394	1.181	1.063	0.090 (lbs)	-	-	211*	218071	
0.394 - 0.472	1.772	1.654	0.110 (lbs)	-	-	20*	081044	
0.394 - 0.472	0.984	0.866	0.090 (lbs)	101	218047	20*	218058	
0.394 - 0.472	1.378	1.260	0.110 (lbs)	101	218048	20*	218059	
0.472 - 0.551	1.181	1.063	0.110 (lbs)	101	218012	20*	218014	
0.472 - 0.551	1.772	1.654	0.130 (lbs)	101	218049	20*	218060	
0.551 - 0.630	1.378	1.260	0.130 (lbs)	101	218050	20*	218061	
i 0.551 - 0.630	1.969	1.850	0.180 (lbs)	101	218051	20*	218062	
0.591 - 0.669	1.457	1.339	0.130 (lbs)	-	-	20*	081048	
0.591 - 0.669	2.362	2.244	0.180 (lbs)	101	081041	20*	081045	
0.630 - 0.786	1.575	1.457	0.180 (lbs)	101	218052	20*	218063	
0.630 - 0.786	2.362	2.244	0.200 (lbs)	101	218053	20*	218064	
0.787 - 0.984	1.457	1.339	0.150 (lbs)	-	-	20*	081049	
0.787 - 0.984	2.756	2.638	0.240 (lbs)	101	081042	20*	081046	
0.984 - 1.063	1.457	1.339	0.150 (lbs)	-	-	20*	081050	
0.984 - 1.063	2.756	2.638	0.240 (lbs)	101	081043	20*	081047	
<hr/>								
6.00 - 8.00	22.00	19.00	0.03 (kg)	-	-	211*	081053	
8.00 - 10.00	30.00	27.00	0.04 (kg)	-	-	211*	218071	
10.00 - 12.00	45.00	42.00	0.05 (kg)	-	-	20*	081044	
10.00 - 12.00	25.00	22.00	0.04 (kg)	101	218047	20*	218058	
10.00 - 12.00	35.00	32.00	0.05 (kg)	101	218048	20*	218059	
12.00 - 14.00	30.00	27.00	0.05 (kg)	101	218012	20*	218014	
12.00 - 14.00	45.00	42.00	0.06 (kg)	101	218049	20*	218060	
14.00 - 16.00	35.00	32.00	0.06 (kg)	101	218050	20*	218061	
m 14.00 - 16.00	50.00	47.00	0.08 (kg)	101	218051	20*	218062	
15.00 - 17.00	37.00	34.00	0.06 (kg)	-	-	20*	081048	
15.00 - 17.00	60.00	57.00	0.08 (kg)	101	081041	20*	081045	
16.00 - 20.00	40.00	37.00	0.08 (kg)	101	218052	20*	218063	
16.00 - 20.00	60.00	57.00	0.09 (kg)	101	218053	20*	218064	
20.00 - 25.00	37.00	34.00	0.07 (kg)	-	-	20*	081049	
20.00 - 25.00	70.00	67.00	0.11 (kg)	101	081042	20*	081046	
25.00 - 27.00	37.00	34.00	0.07 (kg)	-	-	20*	081050	
25.00 - 27.00	70.00	67.00	0.11 (kg)	101	081043	20*	081047	

*Not suitable for indexable inserts with a radius of 0.031" (0.80 mm).

B10-M: 12-19

B10-H

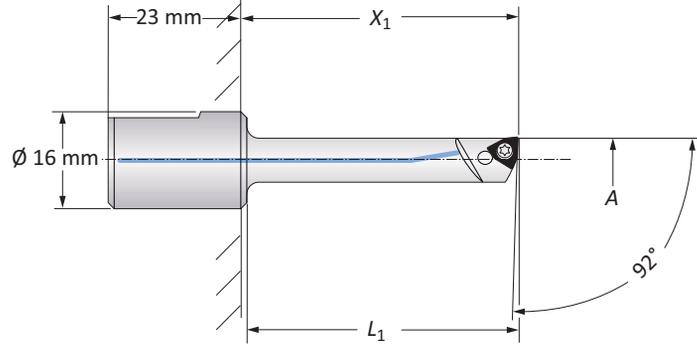
B10: vi-vii

Key on B10-A: 1

i = Imperial (in)
m = Metric (mm)
 Inserts sold separately

Boring Bars

Heavy Metal | Carbide | Diameter Range: 0.236" - 0.787" (6.00 mm - 20.00 mm)



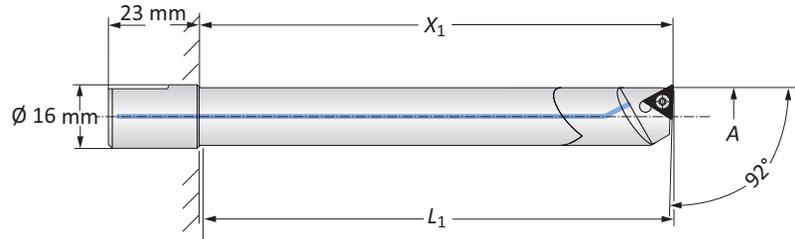
Heavy Metal Boring Bars | Diameter Range: 0.236" - 0.394" (6.00 mm - 10.00 mm)

	Boring Range		Boring Bar		Weight	Insert Form	Part No.
	A	X ₁	L ₁				
i	0.236 - 0.315	1.260	1.142	0.176 (lbs)	211*	081055	
	0.315 - 0.394	1.772	1.654	0.198 (lbs)	211*	218072	
m	6.00 - 8.00	32.00	29.00	0.08 (kg)	211*	081055	
	8.00 - 10.00	45.00	42.00	0.09 (kg)	211*	218072	

*Not suitable for indexable inserts with a radius of 0.031" (0.80 mm).



Form 101

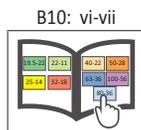
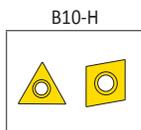
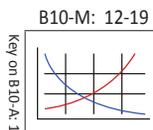


Form 20

Carbide Boring Bars | Diameter Range: 0.394" - 0.787" (10.00 mm - 20.00 mm)

	Boring Range		Boring Bar		Weight	Insert Form	Part No.	Insert Form	Part No.
	A	X ₁	L ₁						
i	0.394 - 0.472	2.165	2.047	0.154 (lbs)	101	218042	20	218037*	
	0.394 - 0.472	2.953	2.835	0.198 (lbs)	101	218032	20	218029*	
	0.472 - 0.551	2.756	2.638	0.220 (lbs)	101	218043	20	218038*	
	0.472 - 0.551	3.543	3.425	0.331 (lbs)	101	218033	20	218030*	
	0.551 - 0.630	2.953	2.835	0.353 (lbs)	101	218044	20	218039*	
	0.551 - 0.630	3.937	3.819	0.441 (lbs)	101	218045	20	218040*	
	0.630 - 0.787	3.543	3.425	0.573 (lbs)	101	218046	20	218041*	
	0.630 - 0.787	4.724	4.606	0.728 (lbs)	101	218034	20	218031*	
m	10.00 - 12.00	55.00	52.00	0.07 (kg)	101	218042	20	218037*	
	10.00 - 12.00	75.00	72.00	0.09 (kg)	101	218032	20	218029*	
	12.00 - 14.00	70.00	67.00	0.10 (kg)	101	218043	20	218038*	
	12.00 - 14.00	90.00	87.00	0.15 (kg)	101	218033	20	218030*	
	14.00 - 16.00	75.00	72.00	0.16 (kg)	101	218044	20	218039*	
	14.00 - 16.00	100.00	97.00	0.20 (kg)	101	218045	20	218040*	
	16.00 - 20.00	90.00	87.00	0.26 (kg)	101	218046	20	218041*	
	16.00 - 20.00	120.00	117.00	0.33 (kg)	101	218034	20	218031*	

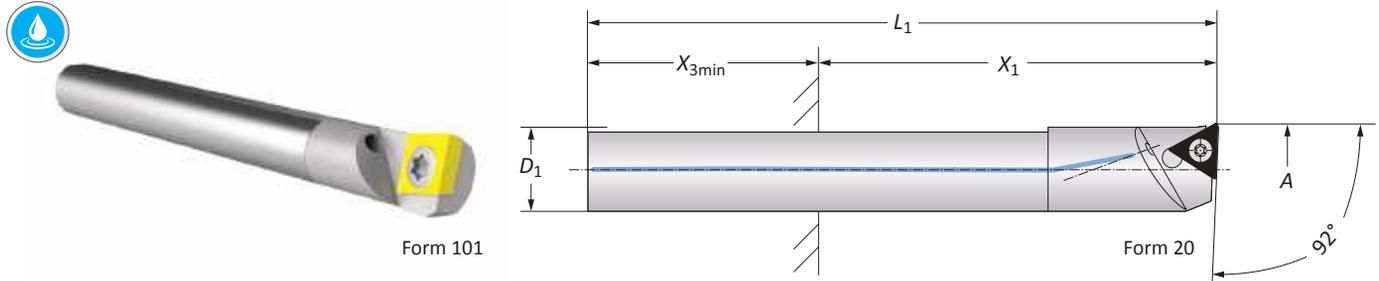
*Not suitable for indexable inserts with a radius of 0.031" (0.80 mm).



i = Imperial (in)
m = Metric (mm)
 Inserts sold separately

Boring Bars

Steel | Carbide | Diameter Range: 0.236" - 0.787" (6.00 mm - 20.00 mm)

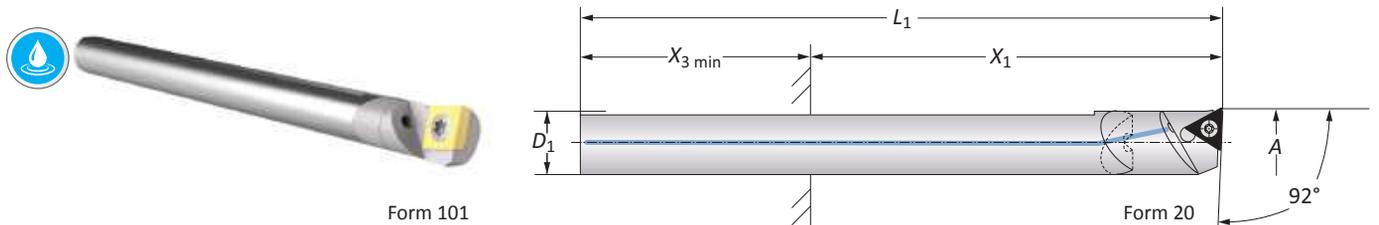


Steel Boring Bars | Diameter Range: 0.236" - 0.787" (6.00 mm - 20.00 mm)

Boring Range	Boring Bar					Weight	Insert Form	Part No.	Insert Form	Part No.
	A	D_1	X_1	X_{3min}	L_1					
0.236 - 0.315	0.197*	0.492 - 0.984	0.984	2.756	0.022 (lbs)	211**	514032	-	-	
0.315 - 0.394	0.276*	0.689 - 1.378	0.984	3.189	0.044 (lbs)	211**	514033	-	-	
0.394 - 0.472	0.315*	0.787 - 1.575	0.984	3.346	0.066 (lbs)	101	514003	20**	514004	
0.472 - 0.551	0.394*	0.984 - 1.969	0.984	3.937	0.110 (lbs)	101	514005	20**	514006	
0.551 - 0.630	0.472*	1.181 - 2.362	1.181	4.488	0.198 (lbs)	101	514007	20**	514008	
0.630 - 0.709	0.551*	2.205 - 2.756	1.181	4.764	0.287 (lbs)	101	514009	20**	514010	
0.709 - 0.787	0.551*	2.205 - 2.756	1.181	4.764	0.287 (lbs)	101	514011	20**	514012	
6.00 - 8.00	5.00*	12.50 - 25.00	25.00	70.00	0.01 (kg)	211**	514032	-	-	
8.00 - 10.00	7.00*	17.50 - 35.00	25.00	81.00	0.02 (kg)	211**	514033	-	-	
10.00 - 12.00	8.00*	20.00 - 40.00	25.00	85.00	0.03 (kg)	101	514003	20**	514004	
12.00 - 14.00	10.00*	25.00 - 50.00	25.00	100.00	0.05 (kg)	101	514005	20**	514006	
14.00 - 16.00	12.00*	30.00 - 60.00	30.00	114.00	0.09 (kg)	101	514007	20**	514008	
16.00 - 18.00	14.00*	56.00 - 70.00	30.00	121.00	0.13 (kg)	101	514009	20**	514010	
18.00 - 20.00	14.00*	56.00 - 70.00	30.00	121.00	0.13 (kg)	101	514011	20**	514012	

*Fixture-through reducing sleeve required (B10-A: 17).

**Not suitable for indexable inserts with a radius of 0.031" (0.80 mm).



Carbide Boring Bars | Diameter Range: 0.236" - 0.787" (6.00 mm - 20.00 mm)

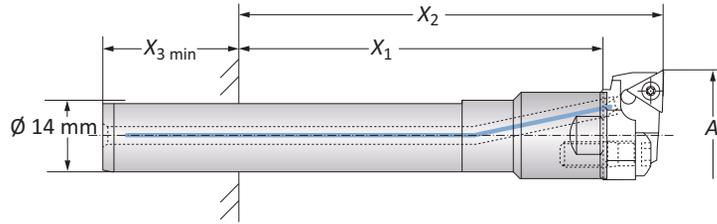
Boring Range	Boring Bar					Weight	Insert Form	Part No.	Insert Form	Part No.
	A	D_1	X_1	X_{3min}	L_1					
0.236 - 0.315	0.197*	0.492 - 1.575	0.984	3.543	0.044 (lbs)	211**	514034	-	-	
0.315 - 0.394	0.276*	0.827 - 2.205	0.984	4.291	0.110 (lbs)	211**	514035	-	-	
0.394 - 0.472	0.315*	0.866 - 2.520	0.984	4.606	0.154 (lbs)	101	514015	20**	514016	
0.472 - 0.551	0.394*	2.008 - 3.150	0.984	5.512	0.287 (lbs)	101	514017	20**	514018	
0.551 - 0.630	0.472*	2.677 - 3.780	1.181	6.378	0.485 (lbs)	101	514019	20**	514020	
0.630 - 0.709	0.551*	3.031 - 4.409	1.181	5.591	0.573 (lbs)	101	514021	20**	514022	
0.630 - 0.709	0.551*	4.409 - 5.787	1.181	6.969	0.728 (lbs)	101	514023	20**	514024	
0.709 - 0.787	0.551*	3.031 - 4.409	1.181	5.591	0.573 (lbs)	101	514025	20**	514026	
0.709 - 0.787	0.551*	4.409 - 5.787	1.181	6.969	0.728 (lbs)	101	514027	20**	514028	
6.00 - 8.00	5.00*	12.50 - 40.00	25.00	90.00	0.02 (kg)	211**	514034	-	-	
8.00 - 10.00	7.00*	21.00 - 56.00	25.00	109.00	0.05 (kg)	211**	514035	-	-	
10.00 - 12.00	8.00*	22.00 - 64.00	25.00	117.00	0.07 (kg)	101	514015	20**	514016	
12.00 - 14.00	10.00*	51.00 - 80.00	25.00	140.00	0.13 (kg)	101	514017	20**	514018	
14.00 - 16.00	12.00*	68.00 - 96.00	30.00	162.00	0.22 (kg)	101	514019	20**	514020	
16.00 - 18.00	14.00*	77.00 - 112.00	30.00	142.00	0.26 (kg)	101	514021	20**	514022	
16.00 - 18.00	14.00*	112.00 - 147.00	30.00	177.00	0.33 (kg)	101	514023	20**	514024	
18.00 - 20.00	14.00*	77.00 - 112.00	30.00	142.00	0.26 (kg)	101	514025	20**	514026	
18.00 - 20.00	14.00*	112.00 - 147.00	30.00	177.00	0.33 (kg)	101	514027	20**	514028	

*Fixture-through reducing sleeve required (B10-A: 17).

**Not suitable for indexable inserts with a radius of 0.031" (0.80 mm).

Serrated Tool Bodies | Insert Holders

Diameter Range: 0.787" - 1.260" (20.00 mm - 32.00 mm)



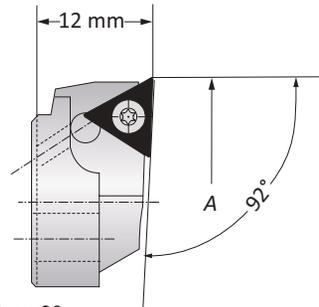
Serrated Tool Bodies

	Substrate	Boring Range	Serrated Tool Body*			Weight	Part No.
		A	X ₁	X ₂	X _{3 min}		
i	Steel	0.787 - 1.260	1.457 - 2.835	1.929 - 3.307	1.181	0.287 (lbs)	514029
	Carbide	0.787 - 1.260	2.550 - 3.937	3.031 - 4.409	1.181	0.551 (lbs)	514030
	Carbide	0.787 - 1.260	3.937 - 5.315	4.409 - 5.787	1.181	0.728 (lbs)	514031
m	Steel	20.00 - 32.00	37.00 - 72.00	49.00 - 84.00	30.00	0.13 (kg)	514029
	Carbide	20.00 - 32.00	65.00 - 100.00	77.00 - 112.00	30.00	0.25 (kg)	514030
	Carbide	20.00 - 32.00	100.00 - 135.00	112.00 - 147.00	30.00	0.33 (kg)	514031

*Fixture-through reducing sleeve (B10-A: 17).



Form 101

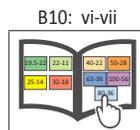
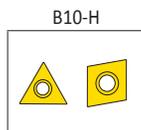
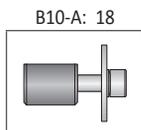
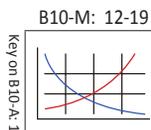


Form 20

Insert Holders

	Boring Range	Weight	Insert Form	Part No.	Insert Form	Part No.
	A					
i	0.787 - 0.866	0.022 (lbs)	101	502052	20	502046*
	0.866 - 0.945	0.022 (lbs)	101	502053	20	502047*
	0.945 - 1.024	0.022 (lbs)	101	502054	20	502048*
	1.024 - 1.102	0.022 (lbs)	101	502055	20	502049*
	1.102 - 1.181	0.022 (lbs)	101	502056	20	502050*
	1.181 - 1.260	0.022 (lbs)	101	502057	20	502051*
m	20.00 - 22.00	0.01 (kg)	101	502052	20	502046*
	22.00 - 24.00	0.01 (kg)	101	502053	20	502047*
	24.00 - 26.00	0.01 (kg)	101	502054	20	502048*
	26.00 - 28.00	0.01 (kg)	101	502055	20	502049*
	28.00 - 30.00	0.01 (kg)	101	502056	20	502050*
	30.00 - 32.00	0.01 (kg)	101	502057	20	502051*

*Not suitable for indexable inserts with a radius of 0.031" (0.80 mm).

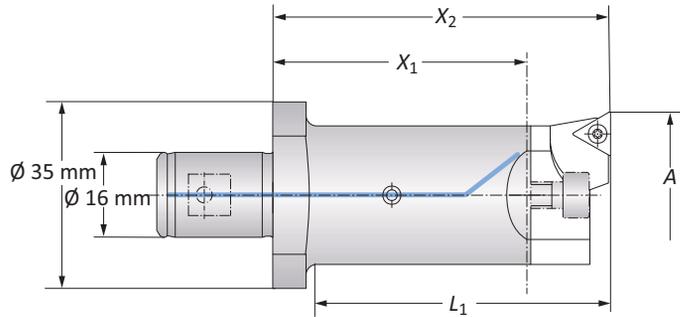


i = Imperial (in)
m = Metric (mm)
 Inserts sold separately

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Serrated Tool Bodies | Insert Holders

Diameter Range: 1.142" - 2.087" (29.00 mm - 53.00 mm)

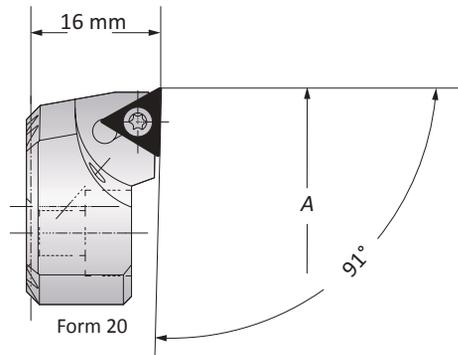


Serrated Tool Bodies

	Boring Range	Serrated Tool Body			Weight	Part No.
	A	X ₁	X ₂	L ₁		
i	1.142 - 2.087	1.890	2.520	2.205	0.441 (lbs)	236021
	1.142 - 2.087	3.307	3.937	3.622	0.661 (lbs)	236031
m	29.00 - 53.00	48.00	64.00	56.00	0.20 (kg)	236021
	29.00 - 53.00	84.00	100.00	92.00	0.30 (kg)	236031



Form 101



Form 20

Insert Holders

	Boring Range	Weight	Insert Form	Part No.
	A			
i	1.142 - 1.614	0.088 (lbs)	101	236023
	1.142 - 1.614	0.088 (lbs)	20*	236022
	1.575 - 2.087	0.132 (lbs)	101	236025
	1.575 - 2.087	0.132 (lbs)	20*	236024
m	29.00 - 41.00	0.04 (kg)	101	236023
	29.00 - 41.00	0.04 (kg)	20*	236022
	40.00 - 53.00	0.06 (kg)	101	236025
	40.00 - 53.00	0.06 (kg)	20*	236024

*Not suitable for indexable inserts with a radius of 0.031" (0.80 mm).

Key on B10-A: 1

B10-M: 12-19

B10-A: 18

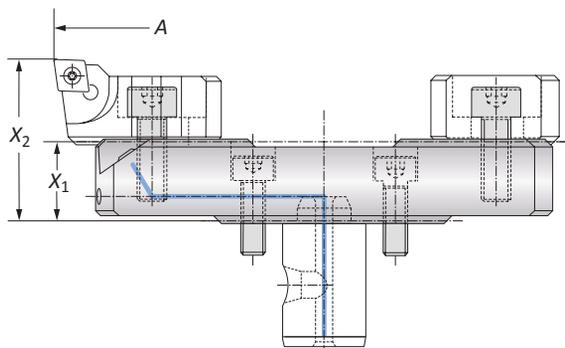
B10-H

B10: vi-vii

i = Imperial (in)
m = Metric (mm)
Inserts sold separately

Alu-Line Serrated Slides | Insert Holders

Diameter Range: 2.677" - 5.984" (68.00 mm - 152.00 mm)

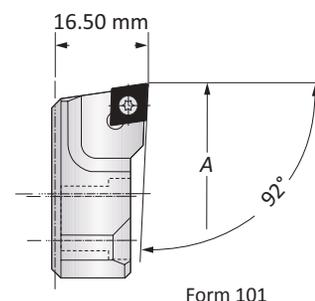


Alu-Line Serrated Slides

	Boring Range		Serrated Slide		Weight	Part No.
	A	X ₁	X ₂			
i	2.677 - 3.780	0.630	1.279		0.220 (lbs)	501054
	3.780 - 4.882	0.630	1.279		0.220 (lbs)	501055
	4.882 - 5.984	0.630	1.279		0.440 (lbs)	501056
m	68.00 - 96.00	16.00	32.50		0.10 (kg)	501054
	96.00 - 124.00	16.00	32.50		0.10 (kg)	501055
	124.00 - 152.00	16.00	32.50		0.20 (kg)	501056

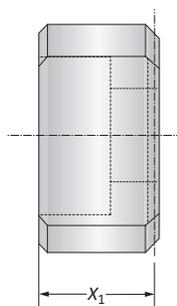
Insert Holders

	Boring Range		Insert Form	Part No.
	A	Weight		
i	2.677 - 5.984	0.110 (lbs)	101	502064
	2.677 - 5.984	0.110 (lbs)	20	502069
m	68.00 - 152.00	0.05 (kg)	101	502064
	68.00 - 152.00	0.05 (kg)	20	502069



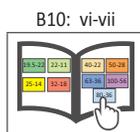
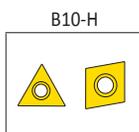
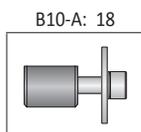
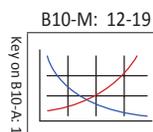
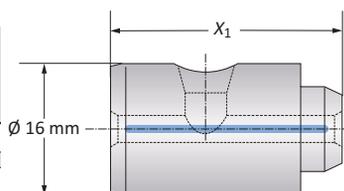
Counterweights

	Counterweight		Part No.
	X ₁	Weight	
i	0.528	0.110 (lbs)	502165
m	13.40	0.05 (kg)	502165



Alu-Line Coolant Delivery Sections

	Coolant Delivery		Part No.
	X ₁	Weight	
i	1.004	0.022 (lbs)	450137
m	25.50	0.01 (kg)	450137



Key on B10-A-1

i = Imperial (in)
m = Metric (mm)
 Inserts sold separately

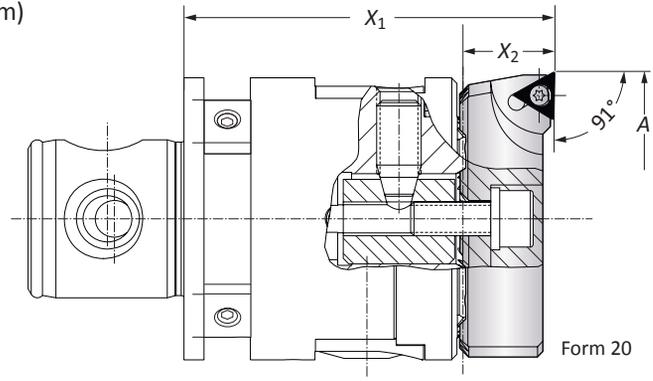
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Insert Holders for Boring Heads

Diameter Range: 2.047" - 4.016" (52.00 mm - 102.00 mm)



Form 101



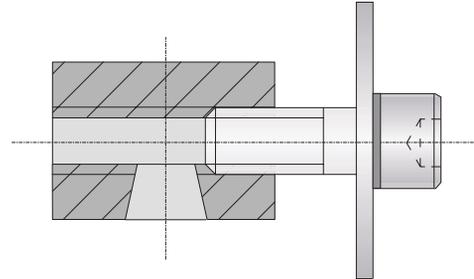
Form 20

Insert Holders for Boring Heads

	Boring Range	Insert Holder		Weight	Insert Form	Part No.	
		A	X ₁				X ₂
i	2.047 - 3.031		2.598	0.650	0.132 (lbs)	101	236027
	2.047 - 3.031		2.598	0.650	0.132 (lbs)	20	236026
	2.992 - 4.016		2.598	0.650	0.220 (lbs)	101	236029
	2.992 - 4.016		2.598	0.650	0.220 (lbs)	20	236028
m	52.00 - 77.00		66.00	16.50	0.06 (kg)	101	236027
	52.00 - 77.00		66.00	16.50	0.06 (kg)	20	236026
	76.00 - 102.00		66.00	16.50	0.10 (kg)	101	236029
	76.00 - 102.00		66.00	16.50	0.10 (kg)	20	236028

Clamping Piece for Insert Holder for Boring Heads

	Boring Range	Service Key	Complete Part No.
m	52.00 - 102.00	s5	236020



Key on B10-A: 1

B10-M: 12-19

B10-A: 18

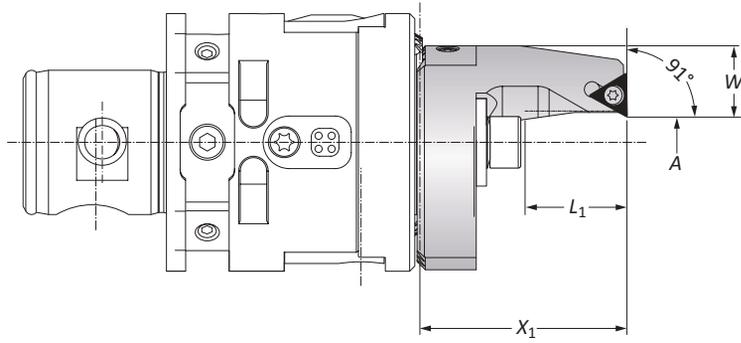
B10-H

B10: vi-vii

i = Imperial (in)
 m = Metric (mm)
 Inserts sold separately

Outside Turning Insert Holders for Boring Heads

Outside Turning | Diameter Range: 0.157" - 2.598" (4.00 mm - 66.00 mm)

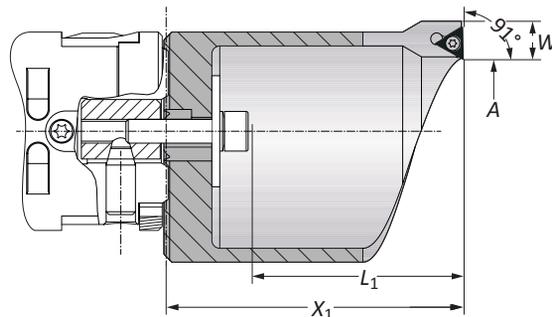


Type A Insert Holders

	Boring Range		Insert Holder			Weight	Type	Insert Form	Part No.
	A	X ₁	L ₁	W					
i	0.157 - 0.689	1.594	0.787	0.653	0.220	A	20*	236081	
	0.650 - 1.181	1.988	1.181	0.437	0.220	A	20*	236082	
m	4.00 - 17.50	40.50	20.00	16.60	0.10	A	20*	236081	
	16.50 - 30.00	50.50	30.00	11.10	0.10	A	20*	236082	

NOTE: Clockwise and neutral execution.

*Not suitable for indexable inserts with a radius of 0.031" (0.80 mm).



Type B Insert Holders

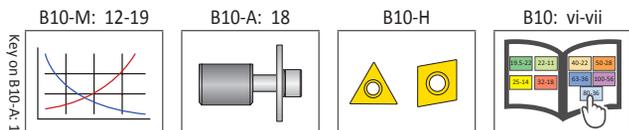
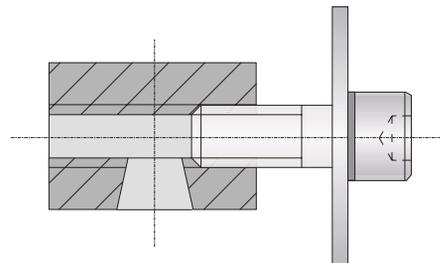
	Boring Range		Insert Holder			Weight	Type	Insert Form	Part No.
	A	X ₁	L ₁	W					
i	1.142 - 1.732	2.952	2.126	0.377	0.661 (lbs)	B	20*	236083	
	1.693 - 2.598	3.956	3.110	0.377	0.882 (lbs)	B	20*	236084	
m	29.00 - 44.00	75.50	54.00	9.60	0.30 (kg)	B	20*	236083	
	43.00 - 66.00	100.50	79.00	9.60	0.40 (kg)	B	20*	236084	

NOTE: Clockwise and neutral execution.

*Not suitable for indexable inserts with a radius of 0.031" (0.80 mm).

Clamping Pieces for Outside Turning Insert Holders

Insert Holder Type	Boring Range	Service Key	Complete Part No.
A	4.00 - 30.00	s5	236088
B	29.00 - 66.00	s5	236089

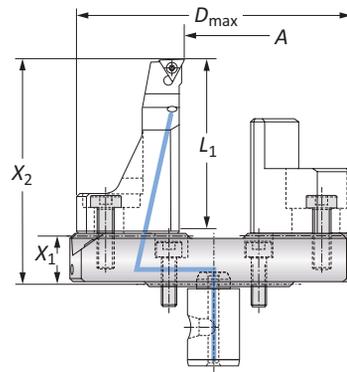


i = Imperial (in)
m = Metric (mm)
Inserts sold separately

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Outside Turning Serrated Slides | Insert Holders

Diameter Range: 0.079" - 2.283" (2.00 mm - 58.00 mm)



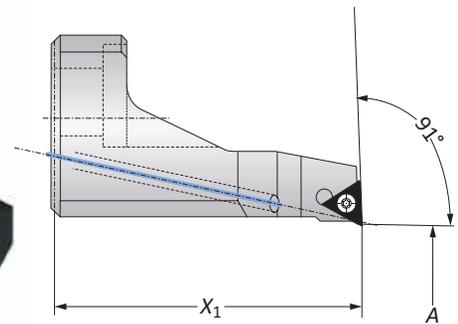
Serrated Slides

	Outside Turning Range		Serrated Slide			Interfering Diameter	
	A	X ₁	X ₂	L ₁	Weight	D _{max}	Part No.
i	0.079 - 1.181	0.630	2.874	2.165	0.771 (lbs)	3.976	501064
	1.181 - 2.283	0.630	2.874	2.165	0.970 (lbs)	5.079	501065
m	2.00 - 30.00	16.00	73.00	55.00	0.35 (kg)	101.00	501064
	30.00 - 58.00	16.00	73.00	55.00	0.44 (kg)	129.00	501065



Insert Holders

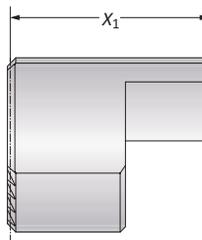
	Boring Range	Insert Holder	Weight	Insert Form	Part No.
	A	X ₁			
i	0.079 - 2.283	2.244	0.331 (lbs)	20*	502082
m	2.00 - 58.00	57.00	0.15 (kg)	20*	502082



*Clockwise and neutral execution.

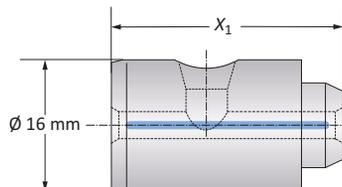
Counterweights

	Counterweight		Part No.
	X ₁	Weight	
i	1.486	0.352 (lbs)	502183
m	37.75	0.16 (kg)	502183



Alu-Line Coolant Delivery Sections

	Coolant Delivery Section		Part No.
	X ₁	Weight	
i	1.004	0.022 (lbs)	450137
m	25.50	0.01 (kg)	450137



B10-M: 12-19

B10-A: 18

B10-H

B10: vi-vii

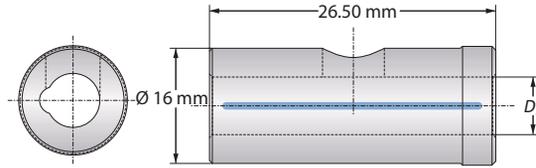
Key on B10-A: 1

i = Imperial (in)
m = Metric (mm)

Inserts sold separately

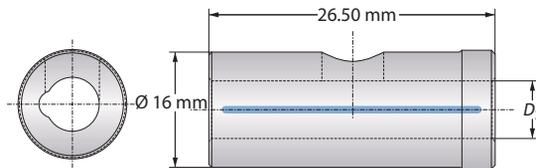
Accessories

Imperial Reducing Sleeves | Metric Reducing Sleeves



Reducing Sleeve

Reducing Sleeve		Weight	Part No.
D_3			
m	4.00	0.05 (kg)	450129
	5.00	0.04 (kg)	450130
	7.00	0.04 (kg)	450132
	8.00	0.04 (kg)	450133
	10.00	0.03 (kg)	450134
	12.00	0.02 (kg)	450135
	14.00	0.01 (kg)	450136



Imperial Reducing Sleeves

Reducing Sleeve		Weight	Part No.
D_3			
i	0.125	0.110 (lbs)	450142
	0.250	0.088 (lbs)	450143
	0.312	0.088 (lbs)	450144
	0.375	0.088 (lbs)	450145
	0.500	0.088 (lbs)	450146

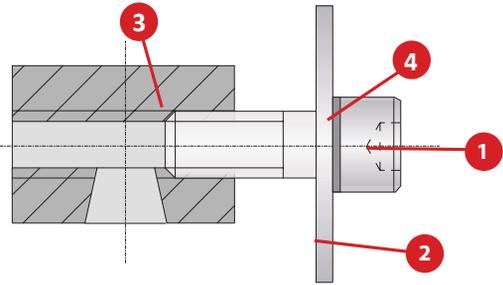
i = Imperial (in)
m = Metric (mm)

Accessories

Clamping Elements | Thread Pin | Balancing Element | 3E^{TECH+} Charging Unit

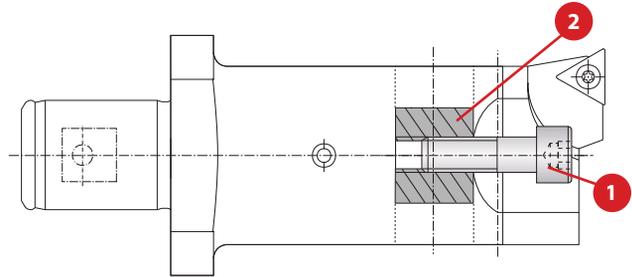
Clamping Elements for Insert Holders

Boring Range	1 Cap Screw	Hex Size	2 Washer	3 Clamping Nut	4 Locking Washer	Complete Part No.
4 - 30	070153	s5	315155	236120	215254	236088
29 - 66	070153	s5	315156	236120	215254	236089
52 - 102	115147	s5	115725	236120	-	236020



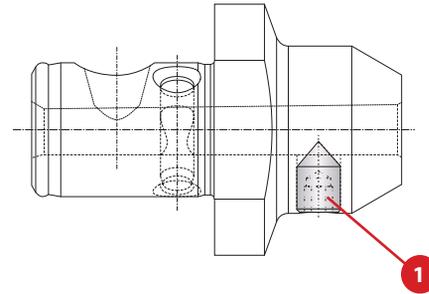
Clamping Elements for Serrated Tool Body

1 Cap Screw	Hex Size	2 Clamping Piece
027154	s4	145184



Thread Pin

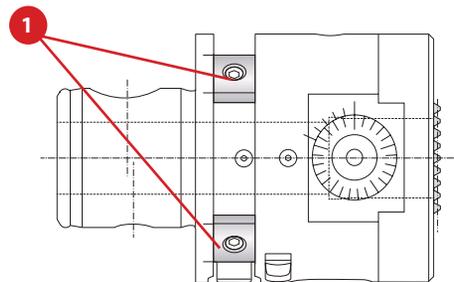
Service Key	1 Part No.
S3 / A	415244



Balancing Element with Screw

Nominal Size	Key Size / Type	1 Part No.
M8 x 1.25 x 8	s2 / A	536005

NOTE: Balancing elements sold separately.



3E^{TECH+} Accessories

1 Charging Unit
Part No.
536016

NOTE: Charging unit sold separately from 3E^{TECH+}.

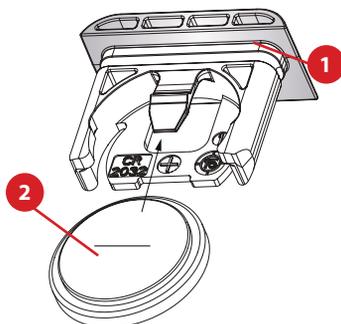


NOTE: 3E^{TECH+} adjustment accuracy of 0.00005" or 0.001 mm on diameter.

3E^{TECH} (Old Display) Accessories

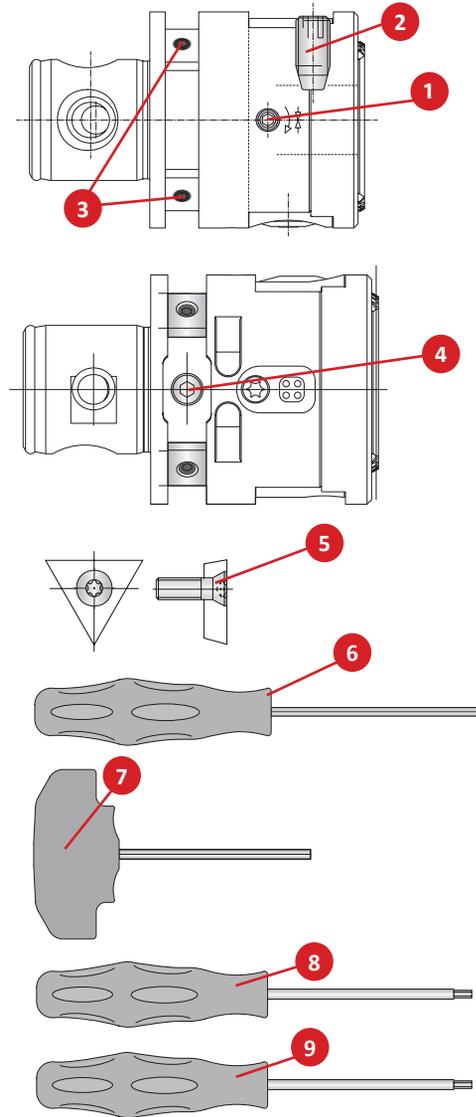
1 Sealing Ring	2 Battery CR2032
Part No.	Part No.
215483	515491

NOTE: Not required for 3E^{TECH+} (new display).

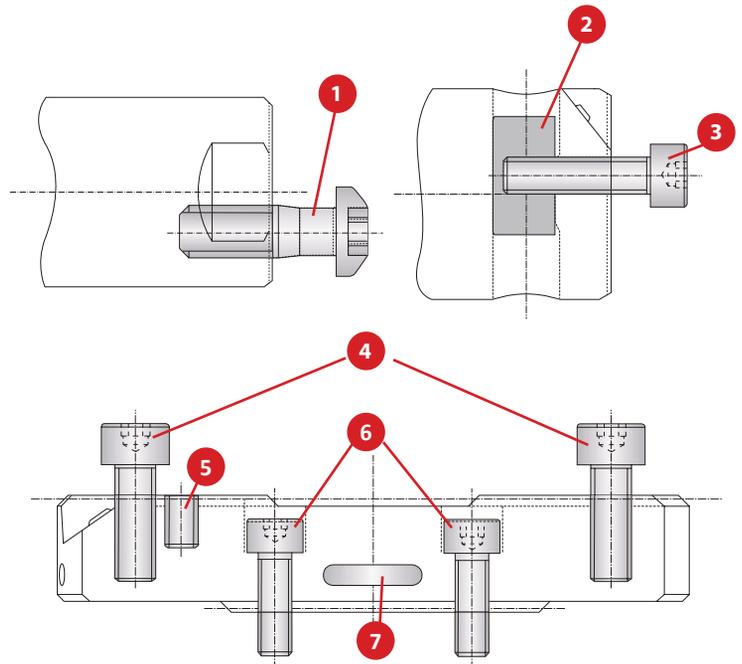


Accessories

No.	Part	Insert Form	Size	Part No.
1	Clamping screw	-	-	070333
2	Thread pin for tool clamping	-	-	215674
3	Clamping screw for balance weight	-	-	115470
4	Balancing screw plug	-	-	115119
5	Insert screws	Form 20 Form 101 Form 211	T7 T8 T6	115535 115676 215377
6	Hex wrench	-	s2.5 s2	115575 215473
7	Hex wrench	-	s4	115576
8	Torx driver	-	T6 T7 T8	115537 115591 115590
9	Torx screwdriver	(0.6 Nm) Form 211 (0.9 Nm) Form 20 (1.2 Nm) Form 101	T6 T7 T8	415507 415508 415514



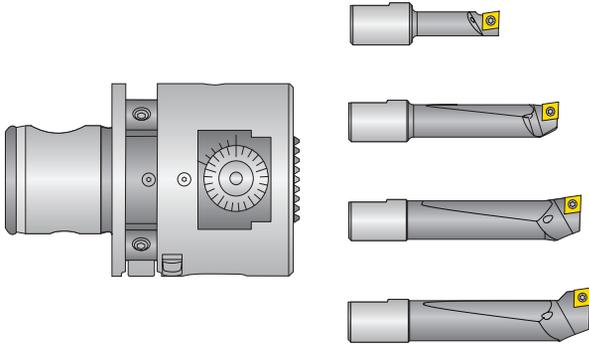
No.	Part	Size	Part No.
1	Screw for securing insert holder	T25	415112
2	Clamping piece	-	145184
3	Cap screw for securing insert holders	s4	027154
4	Cap screw for securing insert holder/counterweight	s4	315248
5	Set screw - coolant	s1.5	114224
6	Cap screw for securing serrated slide	s3	116289
8	Sealing ring for coolant delivery	-	415386



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Kit Components

3E^{TECH+} | Insert Form 101 | Diameter Range: 0.393" - 1.181" (10.00 mm - 30.00 mm)



Diameter Range: 0.393" - 1.181" (10.00 mm - 30.00 mm)

Kit Components					
	Boring Head	Boring Bar Range	Boring Bars	Service Keys	Kit No.
i	563002	0.393 - 0.590	218048	115575 (s2.5)	104046
		0.590 - 0.787	081041	215403 (s4)	
		0.787 - 0.984	081042	115590 (T8)	
		0.984 - 1.181	081043		
m	536002	10.00 - 15.00	218048	115575 (s2.5)	103046
		15.00 - 20.00	081041	215403 (s4)	
		20.00 - 25.00	081042	115590 (T8)	
		25.00 - 30.00	081043		

NOTE: Balancing elements and inserts sold separately.

NOTE: 3E^{TECH+} digital readout module and charging station sold separately.



3E^{TECH+} Digital Readout Module

Part No.	Charging Unit*
536015	536016

NOTE: WEEE-Reg.-Nr. DE 15820388

*Charging unit sold separately.



NOTE: 3E^{TECH+} adjustment accuracy of 0.00005" or 0.001 mm on diameter.

B10-M: 12-19

Key on B10-A: 1

B10-A: 18

B10-H

B10: vi-vii

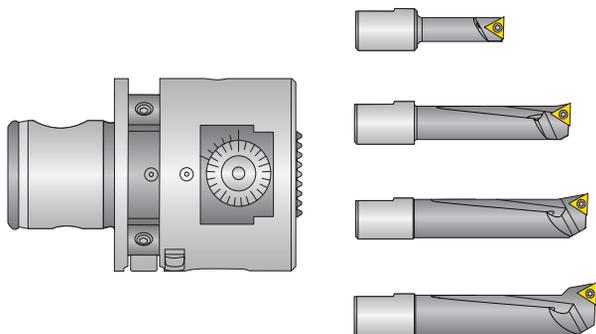
i = Imperial (in)
m = Metric (mm)

Inserts sold separately

IMPORTANT: Max spindle speed refers to maximum possible speed for an individual boring head and is not a recommended parameter. Refer to page B10-M: 12 for recommended application-specific parameters. Factory technical assistance is available for your specific applications through our Application Engineering department.
ext: 7611 | email: appeng@alliedmachine.com

Kit Components

3E^{TECH+} | Insert Form 20 | Diameter Range: 0.393" - 1.181" (10.00 mm - 30.00 mm)



Diameter Range: 0.393" - 1.181" (10.00 mm - 30.00 mm)

Kit Components					
	Boring Head	Boring Bar Range	Boring Bars	Service Keys	Kit No.
i	563002	0.393 - 0.590	218059	115575 (s2.5)	104045
		0.590 - 0.787	081045	215403 (s4)	
		0.787 - 0.984	081046	115591 (T7)	
		0.984 - 1.181	081047		
m	536002	10.00 - 15.00	218059	115575 (s2.5)	103045
		15.00 - 20.00	081045	215403 (s4)	
		20.00 - 25.00	081046	115591 (T7)	
		25.00 - 30.00	081047		

NOTE: Balancing elements and inserts sold separately.

NOTE: 3E^{TECH+} digital readout module and charging station sold separately.



3E^{TECH+} Digital Readout Module

Part No.	Charging Unit*
536015	536016

NOTE: WEEE-Reg.-Nr. DE 15820388

*Charging unit sold separately.



NOTE: 3E^{TECH+} adjustment accuracy of 0.00005" or 0.001 mm on diameter.

B10-M: 12-19

B10-A: 18

B10-H

B10: vi-vii

i = Imperial (in)
m = Metric (mm)

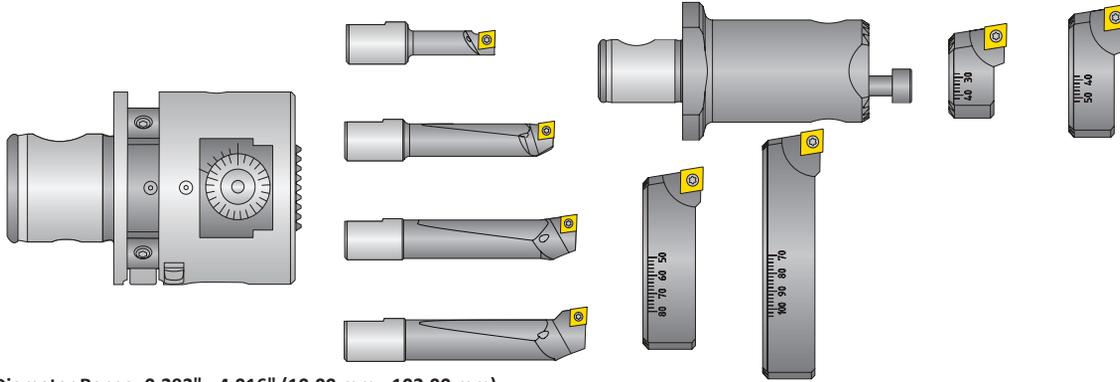
Inserts sold separately

IMPORTANT: Max spindle speed refers to maximum possible speed for an individual boring head and is not a recommended parameter. Refer to page B10-M: 12 for recommended application-specific parameters. Factory technical assistance is available for your specific applications through our Application Engineering department.
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Kit Components

3E^{TECH+} | Insert Form 101 | Diameter Range: 0.393" - 4.016" (10.00 mm - 102.00 mm)



Diameter Range: 0.393" - 4.016" (10.00 mm - 102.00 mm)

Kit Components

Boring Head	Boring Bars		Serrated Tool Body and Insert Holders			Insert Holders for Boring Head			Service Keys	Kit No.		
	Boring Bar Range	Part No.	Serrated Tool Body	Insert Holder Range	Part No.	Insert Holder Range	Part No.	Clamping Piece				
i	0.393 - 0.590	218048	236021	1.142 - 1.614	236023	2.047 - 3.031	236027	236020	115575 (s2.5)	104048		
	0.590 - 0.787	081041		1.575 - 2.087	236025				2.992 - 4.016		236029	215403 (s4)
	0.787 - 0.984	081042										215521 (s5)
	0.984 - 1.181	081043										115590 (T8)
m	10.00 - 15.00	218048	236021	29.00 - 41.00	236023	52.00 - 77.00	236027	236020	115575 (s2.5)	103048		
	15.00 - 20.00	081041		40.00 - 53.00	236025				76.00 - 102.00		236029	215403 (s4)
	20.00 - 25.00	081042										215521 (s5)
	25.00 - 30.00	081043										115590 (T8)

NOTE: Balancing elements and inserts sold separately.

NOTE: 3E^{TECH+} digital readout module and charging station sold separately.



3E^{TECH+} Digital Readout Module

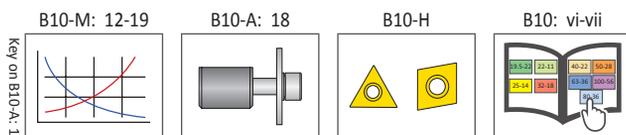
Part No.	Charging Unit*
536015	536016

NOTE: WEEE-Reg.-Nr. DE 15820388

*Charging unit sold separately.



NOTE: 3E^{TECH+} adjustment accuracy of 0.00005" or 0.001 mm on diameter.



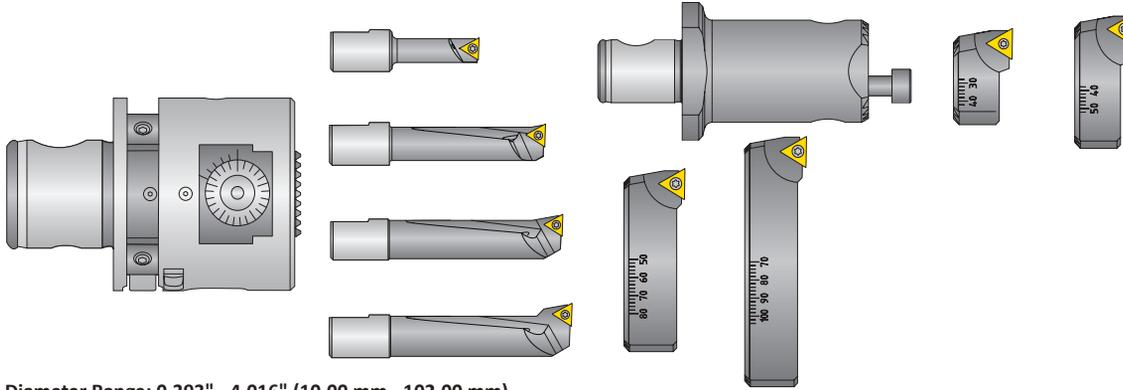
i = Imperial (in)
m = Metric (mm)

Inserts sold separately

IMPORTANT: Max spindle speed refers to maximum possible speed for an individual boring head and is not a recommended parameter. Refer to page B10-M: 12 for recommended application-specific parameters. Factory technical assistance is available for your specific applications through our Application Engineering department.
ext: 7611 | email: appeng@alliedmachine.com

Kit Components

3E^{TECH+} | Insert Form 20 | Diameter Range: 0.393" - 4.016" (10.00 mm - 102.00 mm)



Diameter Range: 0.393" - 4.016" (10.00 mm - 102.00 mm)

Kit Components										
Boring Head	Boring Bars		Serrated Tool Body and Insert Holders			Insert Holders for Boring Head			Service Keys	Kit No.
	Boring Bar Range	Part No.	Serrated Tool Body	Insert Holder Range	Part No.	Insert Holder Range	Part No.	Clamping Piece		
i	0.393 - 0.590	218059	236021	1.142 - 1.614	236026	2.047 - 3.031	236022	236020	115575 (s2.5)	104047
	0.590 - 0.787	081045		1.575 - 2.087	236028	2.992 - 4.016	236024		215403 (s4)	
	0.787 - 0.984	081046							215521 (s5)	
	0.984 - 1.181	081047							115591 (T7)	
m	10.00 - 15.00	218059	236021	29.00 - 41.00	236026	52.00 - 77.00	236022	236020	115575 (s2.5)	103047
	15.00 - 20.00	081045		40.00 - 53.00	236028	76.00 - 102.00	236024		215403 (s4)	
	20.00 - 25.00	081046							215521 (s5)	
	25.00 - 30.00	081047							115591 (T7)	

NOTE: Balancing elements and inserts sold separately.

NOTE: 3E^{TECH+} digital readout module and charging station sold separately.



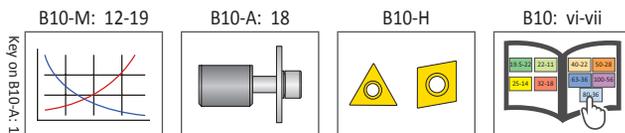
3E^{TECH+} Digital Readout Module

Part No.	Charging Unit*
536015	536016

NOTE: WEEE-Reg.-Nr. DE 15820388
*Charging unit sold separately.



NOTE: 3E^{TECH+} adjustment accuracy of 0.00005" or 0.001 mm on diameter.



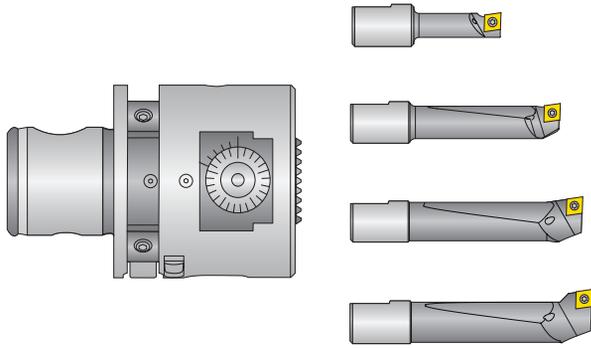
i = Imperial (in)
m = Metric (mm)

Inserts sold separately

IMPORTANT: Max spindle speed refers to maximum possible speed for an individual boring head and is not a recommended parameter. Refer to page B10-M: 12 for recommended application-specific parameters. Factory technical assistance is available for your specific applications through our Application Engineering department.
ext: 7611 | email: appeng@alliedmachine.com

Kit Components

Nondigital | Insert Form 101 | Diameter Range: 0.393" - 1.181" (10.00 mm - 30.00 mm)



Diameter Range: 0.393" - 1.181" (10.00 mm - 30.00 mm)

Kit Components					
	Boring Head	Boring Bar Range	Boring Bars	Service Keys	Kit No.
i	563001	0.393 - 0.590	218048	115575 (s2.5)	104050
		0.590 - 0.787	081041	215403 (s4)	
		0.787 - 0.984	081042	115590 (T8)	
		0.984 - 1.181	081043		
m	536001	10.00 - 15.00	218048	115575 (s2.5)	103050
		15.00 - 20.00	081041	215403 (s4)	
		20.00 - 25.00	081042	115590 (T8)	
		25.00 - 30.00	081043		

NOTE: Balancing elements and inserts sold separately.



B10-M: 12-19 B10-A: 18 B10-H B10: vi-vii

Key on B10-A: 1

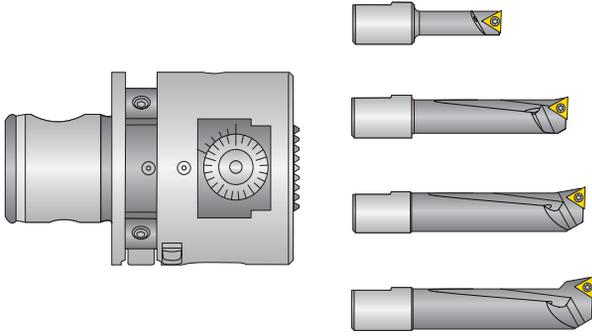
i = Imperial (in)
m = Metric (mm)

Inserts sold separately

IMPORTANT: Max spindle speed refers to maximum possible speed for an individual boring head and is not a recommended parameter. Refer to page B10-M: 12 for recommended application-specific parameters. Factory technical assistance is available for your specific applications through our Application Engineering department.
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Kit Components

Nondigital | Insert Form 20 | Diameter Range: 0.393" - 1.181" (10.00 mm - 30.00 mm)



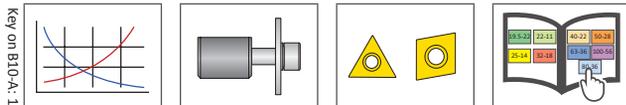
Diameter Range: 0.393" - 1.181" (10.00 mm - 30.00 mm)

Kit Components					
	Boring Head	Boring Bar Range	Boring Bars	Service Keys	Kit No.
i	563001	0.393 - 0.590	218059	115575 (s2.5)	104049
		0.590 - 0.787	081045	215403 (s4)	
		0.787 - 0.984	081046	115591 (T7)	
		0.984 - 1.181	081047		
m	536001	10.00 - 15.00	218059	115575 (s2.5)	103049
		15.00 - 20.00	081045	215403 (s4)	
		20.00 - 25.00	081046	115591 (T7)	
		25.00 - 30.00	081047		

NOTE: Balancing elements and inserts sold separately.



B10-M: 12-19 **B10-A: 18** **B10-H** **B10: vi-vii**



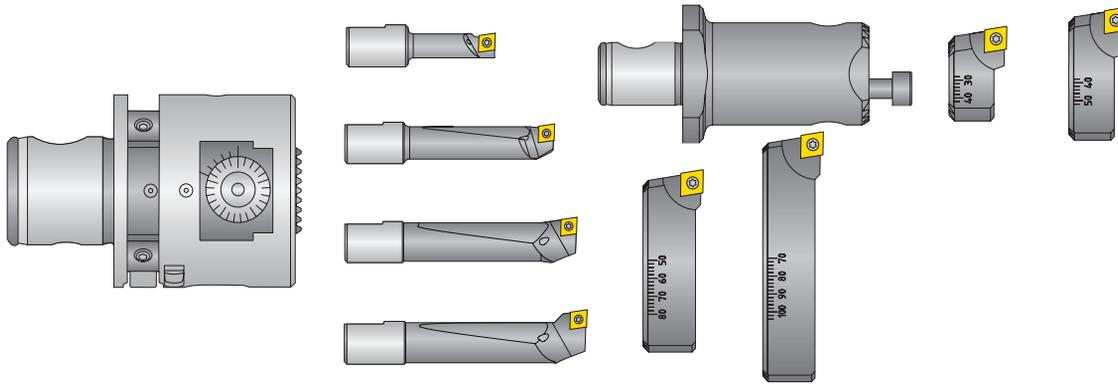
i = Imperial (in)
m = Metric (mm)
 Inserts sold separately

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Kit Components

Nondigital | Insert Form 101 | Diameter Range: 0.393" - 4.016" (10.00 mm - 102.00 mm)



Diameter Range: 0.393" - 4.016" (10.00 mm - 102.00 mm)

Kit Components											
Boring Head	Boring Bars		Serrated Tool Body and Insert Holders			Insert Holders for Boring Head			Service Keys	Kit No.	
	Boring Bar Range	Part No.	Serrated Tool Body	Insert Holder Range	Part No.	Insert Holder Range	Part No.	Clamping Piece			
i	0.393 - 0.590	218048	236021	1.142 - 1.614	236023	2.047 - 3.031	236027	236020	115575 (s2.5)	104052	
	0.590 - 0.787	081041		1.575 - 2.087	236025	2.992 - 4.016			236029		215403 (s4)
	0.787 - 0.984	081042									215521 (s5)
	0.984 - 1.181	081043									115590 (T8)
m	10.00 - 15.00	218048	236021	29.00 - 41.00	236023	52.00 - 77.00	236027	236020	115575 (s2.5)	103052	
	15.00 - 20.00	081041		40.00 - 53.00	236025	76.00 - 102.00			236029		215403 (s4)
	20.00 - 25.00	081042									215521 (s5)
	25.00 - 30.00	081043									115590 (T8)

NOTE: Balancing elements and inserts sold separately.



Key on B10-A:1

B10-M: 12-19

B10-A: 18

B10-H

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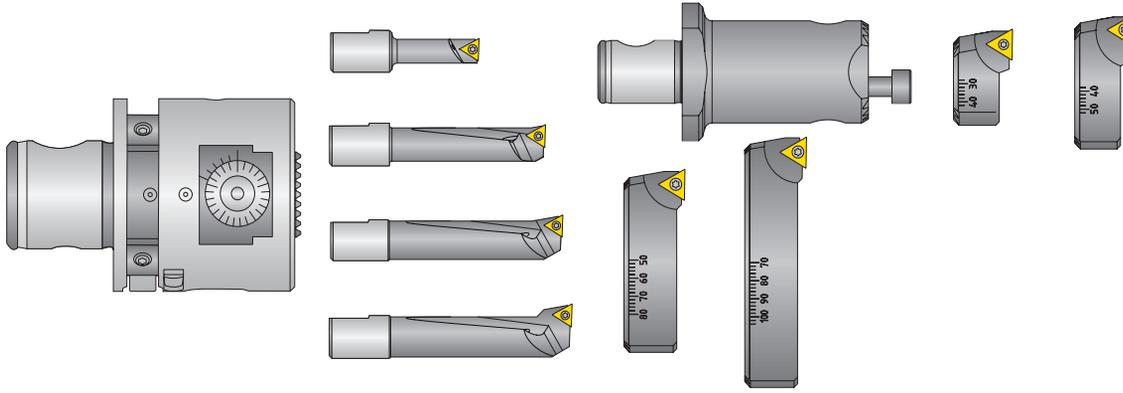
i = Imperial (in)
m = Metric (mm)

Inserts sold separately

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Kit Components

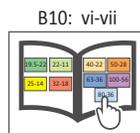
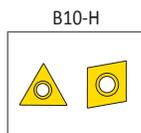
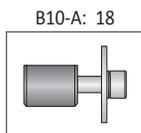
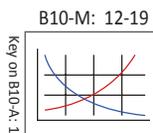
Nondigital | Insert Form 20 | Diameter Range: 0.393" - 4.016" (10.00 mm - 102.00 mm)



Diameter Range: 0.393" - 4.016" (10.00 mm - 102.00 mm)

Kit Components										
Boring Head	Boring Bars		Serrated Tool Body and Insert Holders			Insert Holders for Boring Head			Service Keys	Kit No.
	Boring Bar Range	Part No.	Serrated Tool Body	Insert Holder Range	Part No.	Insert Holder Range	Part No.	Clamping Piece		
i	0.393 - 0.590	218059	236021	1.142 - 1.614	236022	2.047 - 3.031	236026	236020	115575 (s2.5)	104051
	0.590 - 0.787	081045		1.575 - 2.087	236024	2.992 - 4.016	236028		215403 (s4)	
	0.787 - 0.984	081046							215521 (s5)	
	0.984 - 1.181	081047							115591 (T7)	
m	10.00 - 15.00	218059	236021	29.00 - 41.00	236022	52.00 - 77.00	236026	236020	115575 (s2.5)	103051
	15.00 - 20.00	081045		40.00 - 53.00	236024	76.00 - 102.00	236028		215403 (s4)	
	20.00 - 25.00	081046							215521 (s5)	
	25.00 - 30.00	081047							115591 (T7)	

NOTE: Balancing elements and inserts sold separately.



i = Imperial (in)

m = Metric (mm)

Inserts sold separately

IMPORTANT: Max spindle speed refers to maximum possible speed for an individual boring head and is not a recommended parameter. Refer to page B10-M: 12 for recommended application-specific parameters. Factory technical assistance is available for your specific applications through our Application Engineering department.
ext: 7611 | email: appeng@alliedmachine.com

249 (248) Product Overview

249 (248) VERSATILE FINE BORING

Compact design. Precision boring.

The Wohlhaupter® 249 (248) compact boring head allows for higher spindle speeds and achieves long-reach boring jobs. Its cylindrical shank provides variable length adjustments up to 10xD.

Test this *compact design* for finish machining today.

- Diameter range: 0.118" - 1.189" (3.00 mm - 30.20 mm).
- Length adjustment up to 10xD.
- Coolant-through boring tool.
- 0.0005" (0.01 mm) adjust on diameter.
- Max spindle speed: 20,000 RPM.



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249 (248) Head



Insert Holder
Ø 0.626" - 1.189"
(Ø 15.90 mm - 30.20 mm)



Adapter



Boring Bar
Ø 0.146" - 0.630"
(Ø 3.70 mm - 16.00 mm)



Adapter



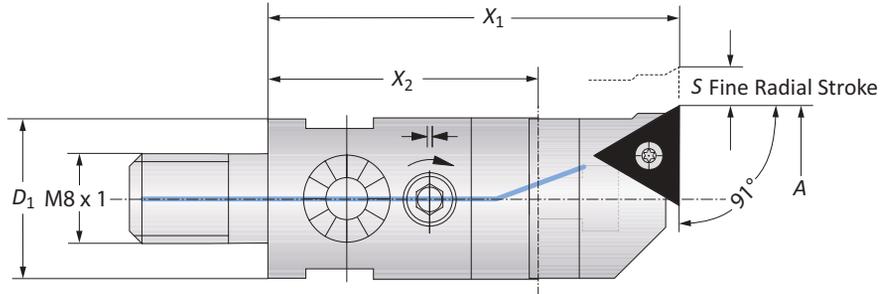
Mini Boring Bar
Ø 0.118" - 0.236"
(Ø 3.00 mm - 6.00 mm)

OPERATION **VERSATILITY**

from **0.118"** to **1.187"** (3.00 mm to 30.20 mm)

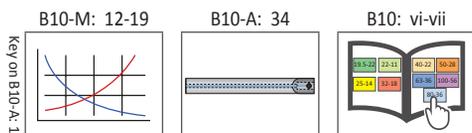
Boring Heads

Diameter Range: 0.626" - 1.189" (15.90 mm - 30.20 mm)



Boring Connection	Boring Range	Boring Head					Weight	Insert Form	Part No.	
		A	X ₁	X ₂	D ₁	S			Insert Holder	Boring Head
i	M8 x 1	0.626 - 0.791	1.654	1.024	0.591	0.025	0.132 (lbs)	20*	248051	249001
	M8 x 1	0.626 - 0.791	1.654	1.024	0.591	0.055	0.132 (lbs)	101	248054	249001
	M8 x 1	0.783 - 0.976	1.811	1.181	0.709	0.071	0.198 (lbs)	20*	248052	249002
	M8 x 1	0.783 - 0.976	1.811	1.181	0.709	0.071	0.198 (lbs)	101	248055	249002
	M8 x 1	0.965 - 1.189	1.811	1.181	0.906	0.091	0.287 (lbs)	20*	248053	249003
	M8 x 1	0.965 - 1.189	1.811	1.181	0.906	0.091	0.287 (lbs)	101	248056	249003
m	M8 x 1	15.90 - 20.10	42.00	26.00	15.00	1.40	0.06 (kg)	20*	248051	248001
	M8 x 1	15.90 - 20.10	42.00	26.00	15.00	1.40	0.06 (kg)	101	248054	248001
	M8 x 1	19.90 - 24.80	46.00	30.00	18.00	1.80	0.09 (kg)	20*	248052	248002
	M8 x 1	19.90 - 24.80	46.00	30.00	18.00	1.80	0.09 (kg)	101	248055	248002
	M8 x 1	24.50 - 30.20	46.00	30.00	23.00	2.30	0.13 (kg)	20*	248053	248003
	M8 x 1	24.50 - 30.20	46.00	30.00	23.00	2.30	0.13 (kg)	101	248056	248003

*Not suitable for indexable inserts with a radius of 0.031" (0.80 mm).



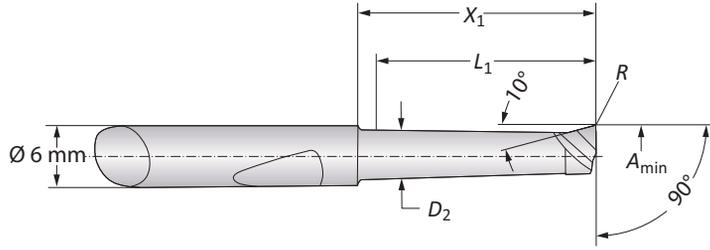
i = Imperial (in)
m = Metric (mm)

Inserts sold separately

IMPORTANT: Max spindle speed refers to maximum possible speed for an individual boring head and is not a recommended parameter. Refer to page B10-M: 12 for recommended application-specific parameters. Factory technical assistance is available for your specific applications through our Application Engineering department.
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Mini Boring Bars

WHC05 | WHW04 | WBN150 | Diameter Range: 0.118" - 0.236" (3.00 mm - 6.00 mm)

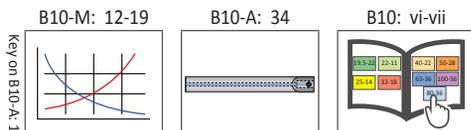
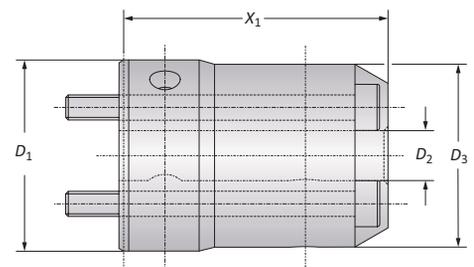


Mini Boring Bars

Boring Range	Boring Bar						Part No.		
	A _{min}	D ₁	D ₂	X ₁	L ₁	R	Coated Carbide	Uncoated Carbide	CBN
i	0.118	0.236	0.102	0.452	0.393	0.003	081306WHC05	-	081322WBN150
	0.118	0.236	0.102	0.649	0.590	0.003	081307WHC05	081307WHW04	-
	0.157	0.236	0.141	0.472	0.393	0.007	081308WHC05	-	081317WBN150
	0.157	0.236	0.141	0.669	0.590	0.007	081309WHC05	-	081341WBN150
	0.157	0.236	0.141	0.866	0.787	0.007	081310WHC05	081310WHW04	-
	0.196	0.236	0.181	0.472	0.393	0.007	081311WHC05	-	081318WBN150
	0.196	0.236	0.181	0.866	0.787	0.007	081312WHC05	-	081319WBN150
	0.196	0.236	0.181	1.259	1.181	0.007	081313WHC05	081313WHW04	-
	0.236	0.236	0.220	0.866	0.787	0.007	081314WHC05	-	081320WBN150
	0.236	0.236	0.220	1.259	1.181	0.007	081315WHC05	-	081321WBN150
0.236	0.236	0.220	1.653	1.574	0.007	081316WHC05	081316WHW04	-	
m	3.00	6.00	2.60	11.50	10.00	0.10	081306WHC05	-	081322WBN150
	3.00	6.00	2.60	16.50	15.00	0.10	081307WHC05	081307WHW04	-
	4.00	6.00	3.60	12.00	10.00	0.20	081308WHC05	-	081317WBN150
	4.00	6.00	3.60	17.00	15.00	0.20	081309WHC05	-	081341WBN150
	4.00	6.00	3.60	22.00	20.00	0.20	081310WHC05	081310WHW04	-
	5.00	6.00	4.60	12.00	10.00	0.20	081311WHC05	-	081318WBN150
	5.00	6.00	4.60	22.00	20.00	0.20	081312WHC05	-	081319WBN150
	5.00	6.00	4.60	32.00	30.00	0.20	081313WHC05	081313WHW04	-
	6.00	6.00	5.60	22.00	20.00	0.20	081314WHC05	-	081320WBN150
	6.00	6.00	5.60	32.00	30.00	0.20	081315WHC05	-	081321WBN150
6.00	6.00	5.60	42.00	40.00	0.20	081316WHC05	081316WHW04	-	

Adapter

Boring Head	Adapter				Part No.
	X ₁	D ₁	D ₂	D ₃	
i 249003	1.260	0.906	0.236	0.866	248071
m 248003	32.00	23.00	6.00	22.00	248071

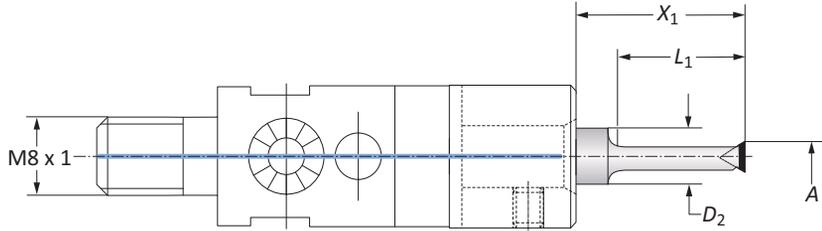


i = Imperial (in)
m = Metric (mm)

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Boring Bars

Diameter Range: 0.146" - 0.630" (3.70 mm - 16.00 mm)



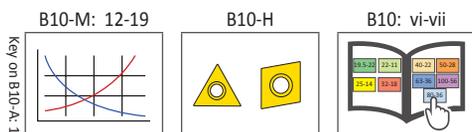
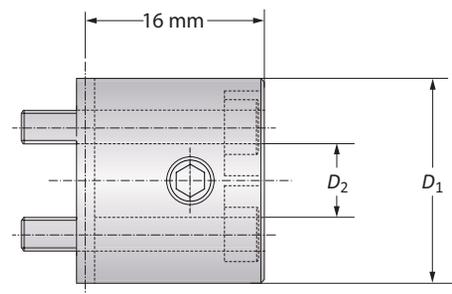
Boring Bars

Boring Range	Boring Bar				Insert Form	Part No.
	A	D ₂	X ₁	L ₁		
0.146 - 0.197	0.315	0.819	0.709	325*	218074	
0.193 - 0.236	0.315	1.024	0.906	47*	218075	
0.232 - 0.315	0.315	1.063	0.984	211*	218076	
0.311 - 0.394	0.315	1.201	1.181	211*	218077	
0.390 - 0.472	0.315	1.378	1.378	20*	218079	
0.390 - 0.472	0.315	1.378	1.378	101	218082	
0.469 - 0.551	0.394	1.772	1.772	20*	218080	
0.469 - 0.551	0.394	1.772	1.772	101	218083	
0.547 - 0.630	0.394	1.969	1.968	20*	218081	
0.547 - 0.630	0.394	1.969	1.968	101	218084	
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3.70 - 5.00	8.00	20.80	18.00	325*	218074	
4.90 - 6.00	8.00	26.00	23.00	47*	218075	
5.90 - 8.00	8.00	27.00	25.00	211*	218076	
7.90 - 10.00	8.00	30.50	30.00	211*	218077	
9.90 - 12.00	8.00	35.00	35.00	20*	218079	
9.90 - 12.00	8.00	35.00	35.00	101	218082	
11.90 - 14.00	10.00	45.00	45.00	20*	218080	
11.90 - 14.00	10.00	45.00	45.00	101	218083	
13.90 - 16.00	10.00	50.00	50.00	20*	218081	
13.90 - 16.00	10.00	50.00	50.00	101	218084	

*Not suitable for indexable inserts with a radius of 0.031" (0.80 mm).

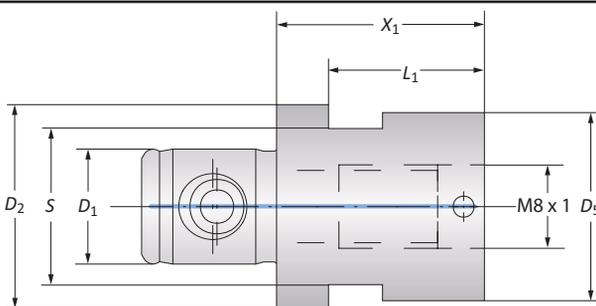
Adapters

Boring Head	Adapter		Part No.
	D ₁	D ₂	
249002	0.709	0.315	248063
249003	0.906	0.315	248064
249003	0.906	0.394	248065
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248002	18.00	8.00	248063
248003	23.00	8.00	248064
248003	23.00	10.00	248065



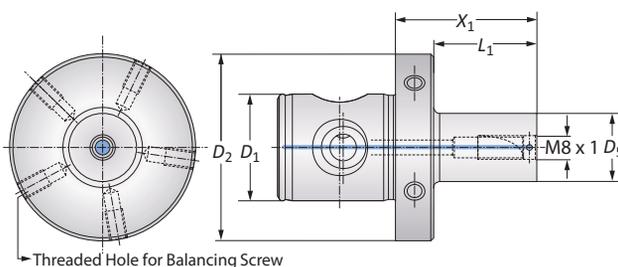
i = Imperial (in)
m = Metric (mm)
Inserts sold separately

Adapters



Adapters

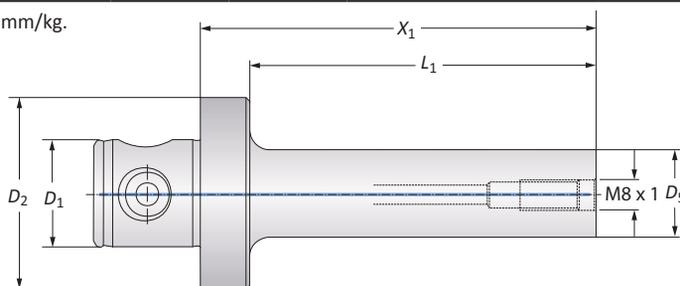
	MVS Connection		Adapter				Weight	Service Key	Part No.
	D ₂ D ₁	Boring Connection	X ₁	L ₁	S	D ₅			
i	19.5 - 11	M8 x 1	0.787	0.590	15/P	0.708	0.110 (lbs)	15 S / P	219168
	23 - 11	M8 x 1	0.787	-	19/P	0.905	0.154 (lbs)	19 S / P	219169
m	19.5 - 11	M8 x 1	20.00	15.00	15/P	18.00	0.05 (kg)	15 S / P	219168
	23 - 11	M8 x 1	20.00	-	19/P	23.00	0.07 (kg)	19 S / P	219169



Balanced Adapters

	MVS Connection		Adapter				Balancing Screw	Part No.
	D ₂ D ₁	Boring Connection	X ₁	L ₁	D ₅	Weight		
i	50 - 28	M8 x 1	1.259	0.748	0.590	0.771 (lbs)	M6 x 1 x 10	219185
	50 - 28	M8 x 1	1.890	1.377	0.708	0.881 (lbs)	M6 x 1 x 10	219176
	50 - 28	M8 x 1	1.890	1.377	0.905	0.992 (lbs)	M6 x 1 x 10	219177
m	50 - 28	M8 x 1	32.00	19.00	15.00	0.35 (kg)	M6 x 1 x 10	219185
	50 - 28	M8 x 1	48.00	35.00	18.00	0.40 (kg)	M6 x 1 x 10	219176
	50 - 28	M8 x 1	48.00	35.00	23.00	0.45 (kg)	M6 x 1 x 10	219177

NOTE: Balance refers to a specific residual imbalance of ≤ 10 g mm/kg.



Vibration Reducing Heavy Metal Adapters

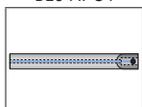
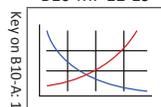
	MVS Connection		Adapter				Weight	Part No.
	D ₂ D ₁	Boring Connection	X ₁	L ₁	D ₅			
i	50 - 28	M8 x 1	2.677	2.165	0.590	1.763 (lbs)	248147	
	50 - 28	M8 x 1	3.307	2.795	0.748	2.204 (lbs)	248148	
	50 - 28	M8 x 1	4.094	3.582	0.905	2.866 (lbs)	248149	
m	50 - 28	M8 x 1	68.00	55.00	15.00	0.80 (kg)	248147	
	50 - 28	M8 x 1	84.00	71.00	19.00	1.00 (kg)	248148	
	50 - 28	M8 x 1	104.00	91.00	23.00	1.30 (kg)	248149	

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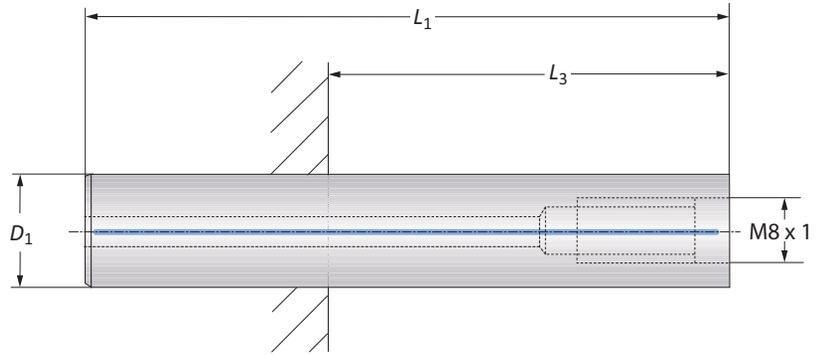


i = Imperial (in)
m = Metric (mm)

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Shanks

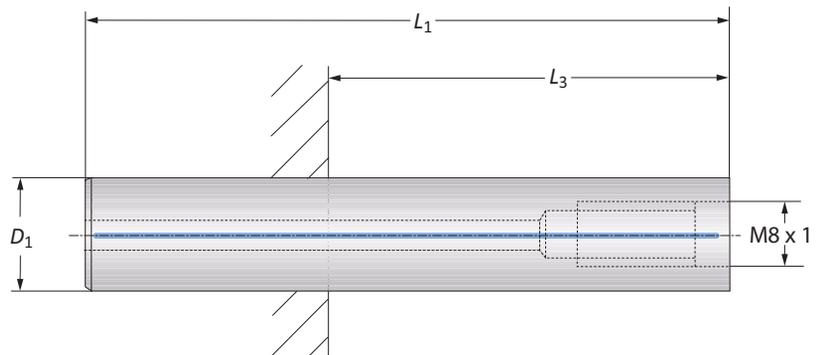
Steel | Carbide



Steel Shanks

Connection	Shank			L_3 min*			Weight	Part No.
	D_1	L_1	L_3 max*	SK 40+50	HSK-A 63	HSK-A 100		
i	M8 x 1	0.591	3.346	1.456	-	-	0.220 (lbs)	248136
	M8 x 1	0.709	3.937	2.047	-	0.196	0.440 (lbs)	248137
	M8 x 1	0.906	4.606	2.716	-	0.866	0.881 (lbs)	248138
m	M8 x 1	15.00	85.00	37.00	-	-	0.10 (kg)	248136
	M8 x 1	18.00	100.00	52.00	-	5.00	0.20 (kg)	248137
	M8 x 1	23.00	117.00	69.00	-	22.00	0.40 (kg)	248138

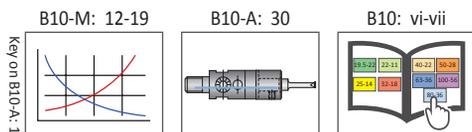
* L_3 dimensions apply to collet chucks.



Carbide Shanks

Connection	Shank			L_3 min*				Weight	Part No.	
	D_1	L_1	L_3 max*	SK 40	SK 50	HSK-A 63	HSK-A 100			
i	M8 x 1	0.591	5.118	3.228	0.787	0.787	1.377	1.653	0.661 (lbs)	248142
	M8 x 1	0.709	6.102	4.212	1.535	0.826	2.362	2.637	1.322 (lbs)	248143
	M8 x 1	0.906	7.086	5.196	2.519	1.811	3.346	3.622	2.425 (lbs)	248144
	M8 x 1	0.906	9.527	7.637	4.960	4.251	5.787	6.062	3.086 (lbs)	248145
m	M8 x 1	15.00	130.00	82.00	20.00	20.00	35.00	42.00	0.30 (kg)	248142
	M8 x 1	18.00	155.00	107.00	39.00	21.00	60.00	67.00	0.60 (kg)	248143
	M8 x 1	23.00	180.00	132.00	64.00	46.00	85.00	92.00	1.10 (kg)	248144
	M8 x 1	23.00	242.00	194.00	126.00	108.00	147.00	154.00	1.40 (kg)	248145

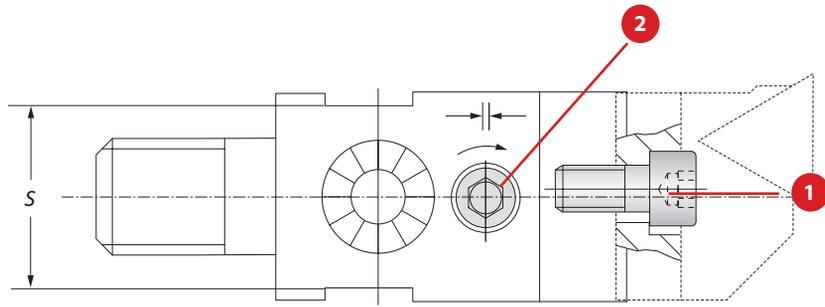
* L_3 dimensions apply to collet chucks.



i = Imperial (in)
m = Metric (mm)

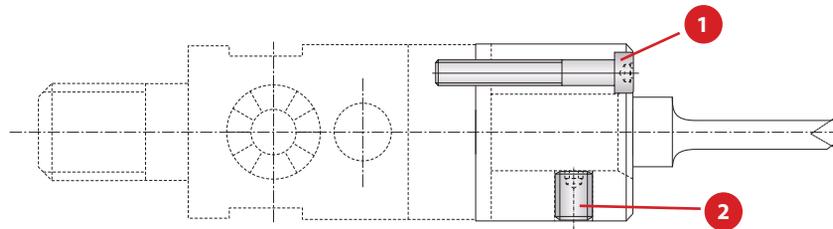
Accessories

Clamping Elements



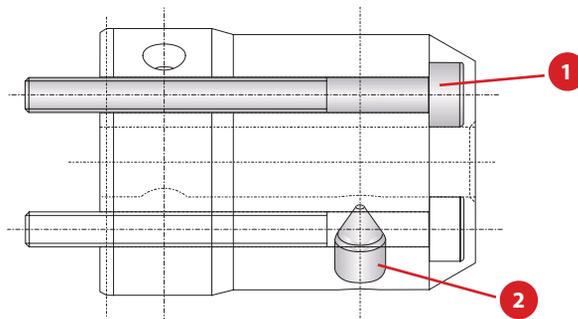
Clamping Elements for Boring Heads

Boring Head	Service Key S / Type	1 Cap Screw		2 Set Screw	
		Part No.	Service Key	Part No.	Service Key
i	249001	315631	s3 / A	315629	s2 / A
	249002	315631	s3 / A	315684	s2 / A
	249003	315631	s3 / A	315687	s2 / A
m	248001	315631	s3 / A	315629	s2 / A
	248002	315631	s3 / A	315684	s2 / A
	248003	315631	s3 / A	315687	s2 / A



Clamping Elements for Adapters

Adapters	1 Cap Screw		2 Set Screw	
	Part No.	Service Key	Part No.	Service Key
m	248063	315801	115136	S 2.5 / A
	248064	315801	031141	S 2.5 / A
	248065	315801	031141	S 2.5 / A



Screws for Adapter

Adapters	1 Cap Screw		2 Set Screw	
	Part No.	Service Key	Part No.	Service Key
m	248071	515166	415244	S 3 / A

i = Imperial (in)
m = Metric (mm)

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PrimeBore Product Overview

PrimeBore VERSATILE FINE BORING

Advancing versatile technology.

With over 30 years of development, the Wohlhaupter® PrimeBore boring head offers versatility and precision. The PrimeBore head can bore multiple hole sizes ranging from 0.118" - 8.189" (3.00 mm - 208.00 mm) with our broad range of compatible boring bars.

Complete your boring job with *technology that continues to advance.*

- Diameter range: 0.118" - 8.189" (3.00 mm - 208.00 mm).
- Ease the stress of working on different day-to-day projects with boring kits.
- 0.0001" (0.002 mm) adjust on diameter.
- Economical precision and versatility.
- Max spindle speed: 12,000 RPM.
- Coolant through.

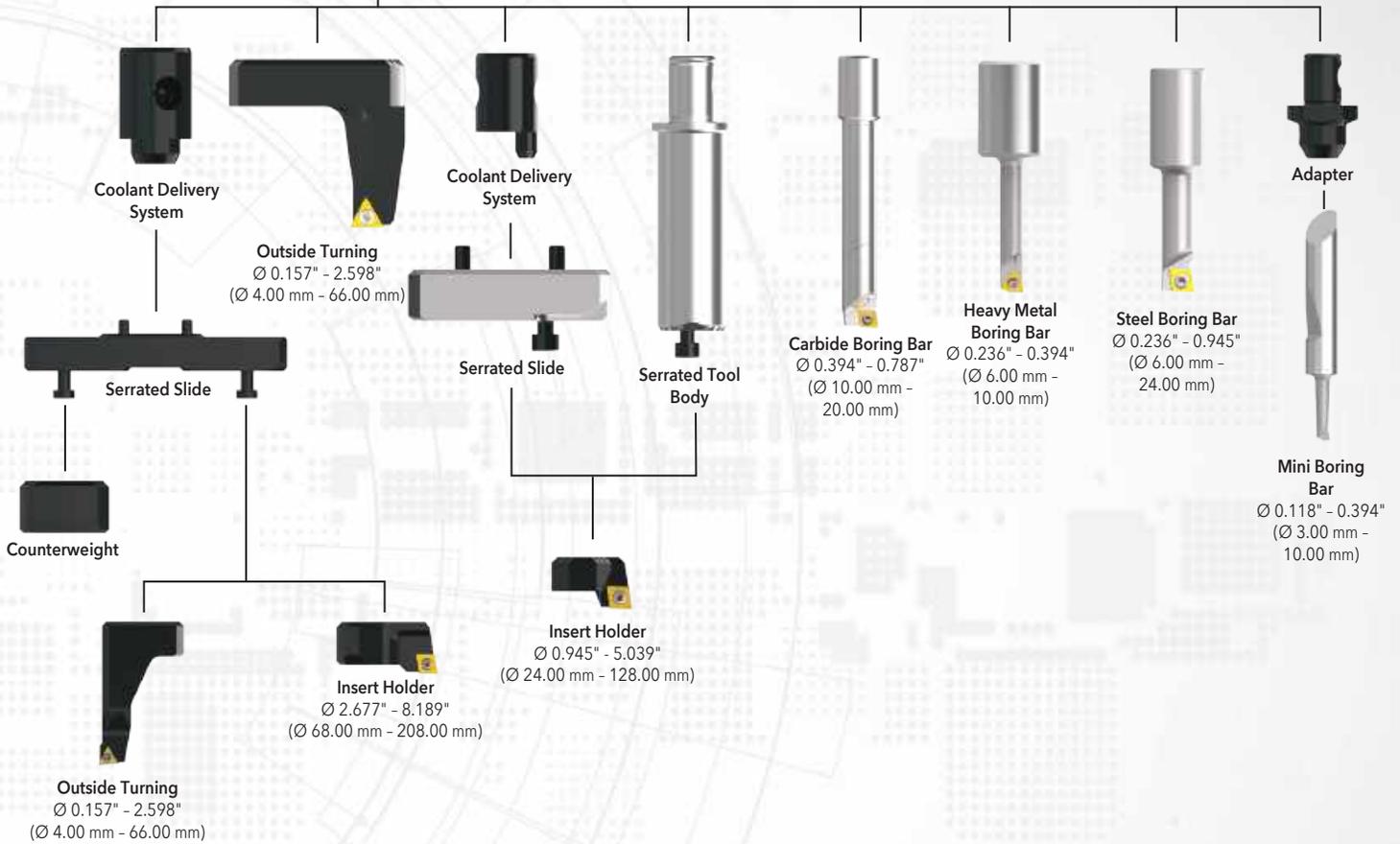


IMPORTANT: Max spindle speed refers to maximum possible speed for an individual boring head and is not a recommended parameter. Refer to page B10-M: 12 for recommended application-specific parameters. Factory technical assistance is available for your specific applications through our Application Engineering department.
ext: 7611 | email: appeng@alliedmachine.com

PRIME BORE



PrimeBore Head



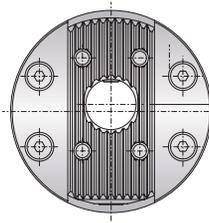
OPERATION **VERSATILITY**

from **0.118"** to **8.189"** (3.00 mm to 208.00 mm)
plus outside turning

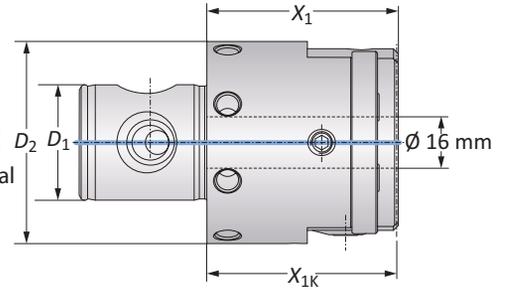


Boring Heads

Diameter Range: 0.118" - 8.189" (3.00 mm - 208.00 mm)



$\pm 4.5 \text{ mm}$
 $- 0.1 \text{ mm}$
 Fine Radial Stroke

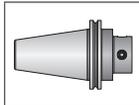
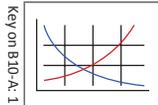


	MVS Connection		Boring Head		Weight	Part No.
	D_2 D_1	Boring Range	X_1	X_{1K}		
i	63 - 36	0.118 - 8.189	2.362	2.343	2.866 (lbs)	451001
m	63 - 36	3.00 - 208.00	60.00	59.50	1.30 (kg)	450001

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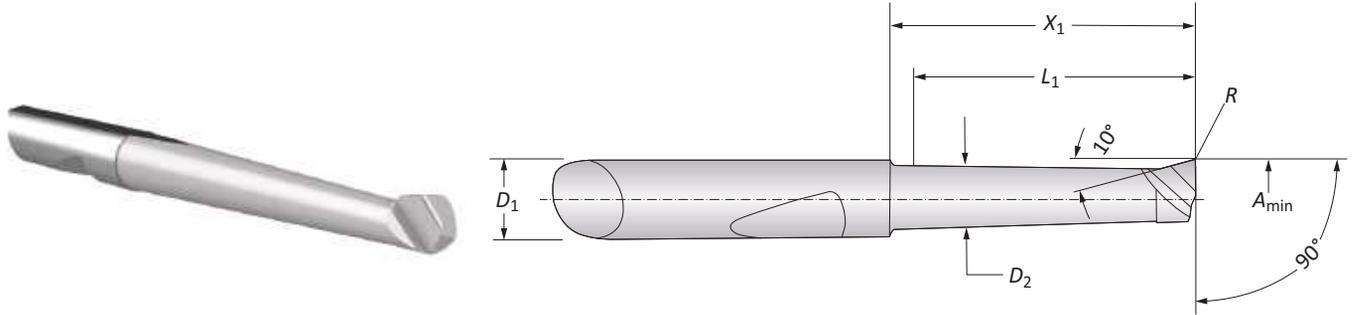


i = Imperial (in)
m = Metric (mm)

IMPORTANT: Max spindle speed refers to maximum possible speed for an individual boring head and is not a recommended parameter. Refer to page B10-M: 12 for recommended application-specific parameters. Factory technical assistance is available for your specific applications through our Application Engineering department.
 ext: 7611 | email: appeng@alliedmachine.com

Mini Boring Bars

WHC05 | WHW04 | WBN150 | Diameter Range: 0.118" - 0.394" (3.00 mm - 10.00 mm)



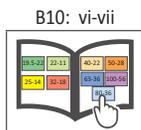
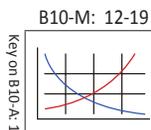
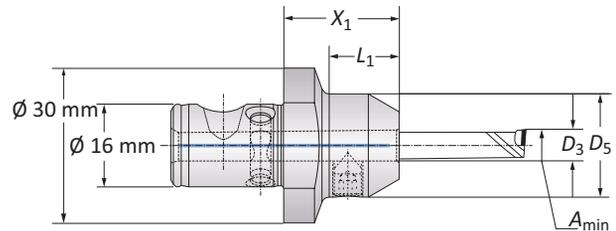
Mini Boring Bars

Boring Range	Boring Bar					Part No.			
	A_{min}	D_1	D_2	X_1	L_1	R	Coated Carbide	Uncoated Carbide	CBN
i	0.118	0.236	0.102	0.452	0.393	0.003	081306WHC05	-	081322WBN150
	0.118	0.236	0.102	0.649	0.590	0.003	081307WHC05	081307WHW04	-
	0.157	0.236	0.141	0.472	0.393	0.007	081308WHC05	-	081317WBN150
	0.157	0.236	0.141	0.669	0.590	0.007	081309WHC05	-	081341WBN150
	0.157	0.236	0.141	0.866	0.787	0.007	081310WHC05	081310WHW04	-
	0.196	0.236	0.181	0.472	0.393	0.007	081311WHC05	-	081318WBN150
	0.196	0.236	0.181	0.866	0.787	0.007	081312WHC05	-	081319WBN150
	0.196	0.236	0.181	1.259	1.181	0.007	081313WHC05	081313WHW04	-
	0.236	0.236	0.220	0.866	0.787	0.007	081314WHC05	-	081320WBN150
	0.236	0.236	0.220	1.259	1.181	0.007	081315WHC05	-	081321WBN150
	0.236	0.236	0.220	1.653	1.574	0.007	081316WHC05	081316WHW04	-
	0.315	0.315	0.229	0.984	0.905	0.007	081323WHC05	-	-
	0.315	0.315	0.229	1.968	1.889	0.007	081324WHC05	-	-
	m	3.00	6.00	2.60	11.50	10.00	0.10	081306WHC05	-
3.00		6.00	2.60	16.50	15.00	0.10	081307WHC05	081307WHW04	-
4.00		6.00	3.60	12.00	10.00	0.20	081308WHC05	-	081317WBN150
4.00		6.00	3.60	17.00	15.00	0.20	081309WHC05	-	081341WBN150
4.00		6.00	3.60	22.00	20.00	0.20	081310WHC05	081310WHW04	-
5.00		6.00	4.60	12.00	10.00	0.20	081311WHC05	-	081318WBN150
5.00		6.00	4.60	22.00	20.00	0.20	081312WHC05	-	081319WBN150
5.00		6.00	4.60	32.00	30.00	0.20	081313WHC05	081313WHW04	-
6.00		6.00	5.60	22.00	20.00	0.20	081314WHC05	-	081320WBN150
6.00		6.00	5.60	32.00	30.00	0.20	081315WHC05	-	081321WBN150
6.00		6.00	5.60	42.00	40.00	0.20	081316WHC05	081316WHW04	-
8.00		8.00	7.60	25.00	23.00	0.20	081323WHC05	-	-
8.00		8.00	7.60	50.00	48.00	0.20	081324WHC05	-	-



Adapters

	Adapter				Part No.
	D_3	D_5	X_1	L_1	
m	6.00	20.00	22.50	14.00	319010
	8.00	22.00	22.50	14.00	236071



i = Imperial (in)
m = Metric (mm)

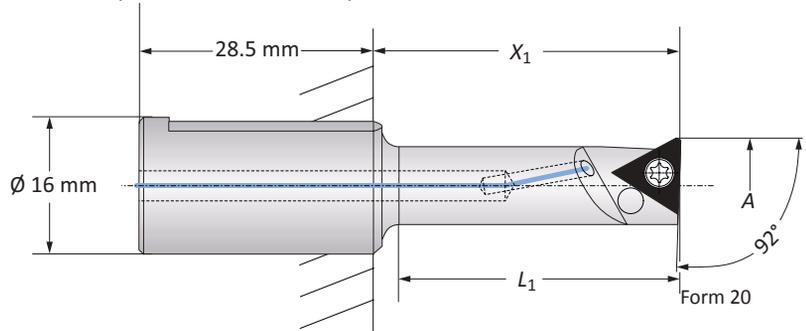
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Boring Bars

Steel | Heavy Metal | Diameter Range: 0.236" - 0.945" (6.00 mm - 24.00 mm)



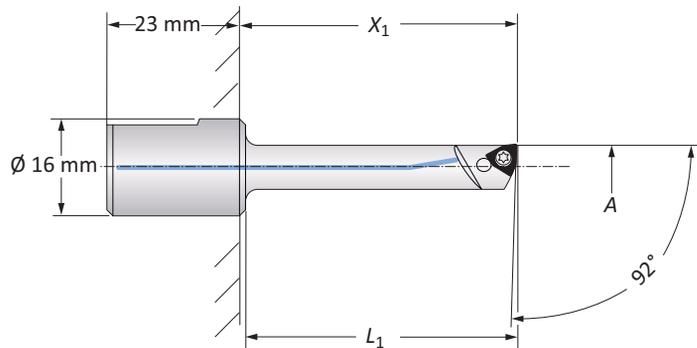
Form 101



Steel Boring Bars | Diameter Range: 0.236" - 0.945" (6.00 mm - 24.00 mm)

	Boring Range		Boring Bar		Weight	Insert Form	Part No.
	A	X ₁	L ₁				
i	0.236 - 0.394	0.866 - 1.260	0.787		0.090 (lbs)	211*	450026
	0.394 - 0.630	1.378 - 1.772	1.299		0.130 (lbs)	101	450027
	0.394 - 0.630	1.378 - 1.772	1.299		0.130 (lbs)	20*	450038
	0.630 - 0.945	2.362 - 2.756	2.283		0.220 (lbs)	101	450028
	0.630 - 0.945	2.362 - 2.756	2.283		0.220 (lbs)	20*	450039
m	6.00 - 10.00	22.00 - 32.00	20.00		0.04 (kg)	211*	450026
	10.00 - 16.00	35.00 - 45.00	33.00		0.06 (kg)	101	450027
	10.00 - 16.00	35.00 - 45.00	33.00		0.06 (kg)	20*	450038
	16.00 - 24.00	60.00 - 70.00	58.00		0.10 (kg)	101	450028
	16.00 - 24.00	60.00 - 70.00	58.00		0.10 (kg)	20*	450039

*Not suitable for indexable inserts with a radius of 0.031" (0.80 mm).



Heavy Metal Boring Bars | Diameter Range: 0.236" - 0.394" (6.00 mm - 10.00 mm)

	Boring Range		Boring Bar		Weight	Insert Form	Part No.
	A	X ₁	L ₁				
i	0.236 - 0.315	1.260	1.142		0.176 (lbs)	211*	081055
	0.315 - 0.394	1.772	1.654		0.198 (lbs)	211*	218072
m	6.00 - 8.00	32.00	29.00		0.08 (kg)	211*	081055
	8.00 - 10.00	45.00	42.00		0.09 (kg)	211*	218072

*Not suitable for indexable inserts with a radius of 0.031" (0.80 mm).

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B10-H

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Key on B10-A: 1

i = Imperial (in)
m = Metric (mm)

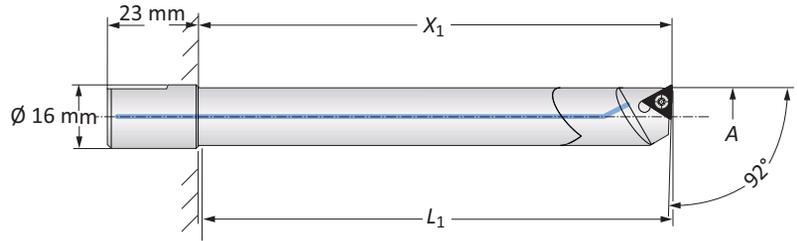
Inserts sold separately

Boring Bars

Carbide | Diameter Range: 0.393" - 0.787" (10.00 mm - 20.00 mm)



Form 101



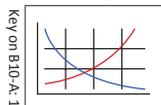
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Carbide Boring Bars

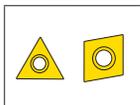
	Boring Range		Boring Bar		Weight	Insert Form	Part No.	Insert Form	Part No.
	A	X ₁	L ₁						
i	0.394 - 0.472	2.165	2.047		0.154 (lbs)	101	218042	20*	218037
	0.394 - 0.472	2.953	2.835		0.198 (lbs)	101	218032	20*	218029
	0.472 - 0.551	2.756	2.638		0.220 (lbs)	101	218043	20*	218038
	0.472 - 0.551	3.543	3.425		0.331 (lbs)	101	218033	20*	218030
	0.551 - 0.630	2.953	2.835		0.353 (lbs)	101	218044	20*	218039
	0.551 - 0.630	3.937	3.819		0.441 (lbs)	101	218045	20*	218040
	0.630 - 0.787	3.543	3.425		0.573 (lbs)	101	218046	20*	218041
	0.630 - 0.787	4.724	4.606		0.728 (lbs)	101	218034	20*	218031
m	10.00 - 12.00	55.00	52.00		0.07 (kg)	101	218042	20*	218037
	10.00 - 12.00	75.00	72.00		0.09 (kg)	101	218032	20*	218029
	12.00 - 14.00	70.00	67.00		0.10 (kg)	101	218043	20*	218038
	12.00 - 14.00	90.00	87.00		0.15 (kg)	101	218033	20*	218030
	14.00 - 16.00	75.00	72.00		0.16 (kg)	101	218044	20*	218039
	14.00 - 16.00	100.00	97.00		0.20 (kg)	101	218045	20*	218040
	16.00 - 20.00	90.00	87.00		0.26 (kg)	101	218046	20*	218041
	16.00 - 20.00	120.00	117.00		0.33 (kg)	101	218034	20*	218031

*Not suitable for indexable inserts with a radius of 0.031" (0.80 mm).

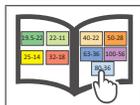
B10-M: 12-19



B10-H



B10: vi-vii



i = Imperial (in)

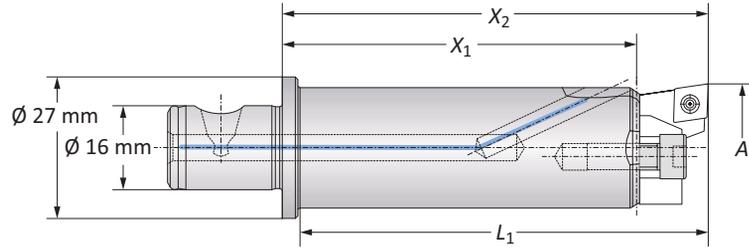
m = Metric (mm)

Inserts sold separately

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Serrated Tool Bodies | Insert Holders

Diameter Range: 0.945" - 2.559" (24.00 mm - 65.00 mm)

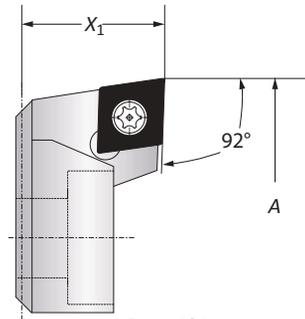


Serrated Tool Bodies

	Boring Range	Serrated Tool Body			Weight	Part No.
	A	X ₁	X ₂	L ₁		
i	0.945 - 2.559	2.667	3.228	3.110	0.441 (lbs)	450021
m	24.00 - 65.00	68.00	82.00	79.00	0.20 (kg)	450021



Form 20

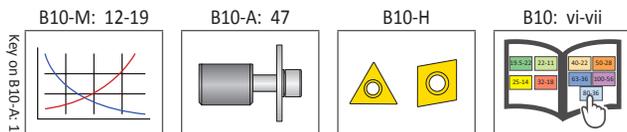


Form 101

Insert Holders

	Boring Range	Insert Holder	Weight	Insert Form	Part No.
	A	X ₁			
i	0.945 - 1.575	0.551	0.044 (lbs)	101	450022
	0.945 - 1.575	0.551	0.044 (lbs)	20*	450040
	1.575 - 2.559	0.551	0.066 (lbs)	101	450023
	1.575 - 2.559	0.551	0.066 (lbs)	20*	450041
m	24.00 - 40.00	14.00	0.02 (kg)	101	450022
	24.00 - 40.00	14.00	0.02 (kg)	20*	450040
	40.00 - 65.00	14.00	0.03 (kg)	101	450023
	40.00 - 65.00	14.00	0.03 (kg)	20*	450041

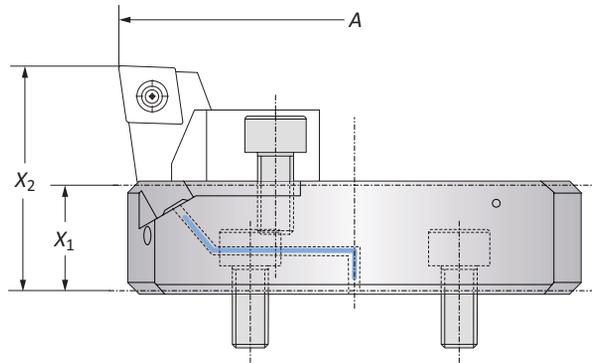
*Not suitable for indexable inserts with a radius of 0.031" (0.80 mm).



i = Imperial (in)
m = Metric (mm)
 Inserts sold separately

Serrated Slides | Insert Holders

Diameter Range: 2.559" - 5.039" (65.00 mm - 128.00 mm)

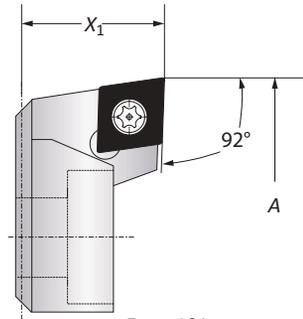


Serrated Slides

	Boring Range	Serrated Slide		Weight	Part No.
	A	X ₁	X ₂		
i	2.559 - 5.039	0.571	1.161	0.176 (lbs)	450024
m	65.00 - 128.00	14.50	29.50	0.08 (kg)	450024



Form 20



Form 101

Insert Holders

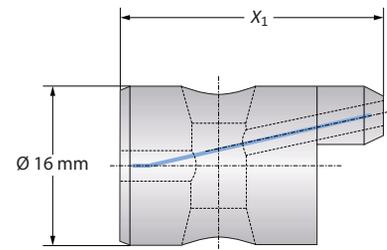
	Boring Range	Insert Holder	Weight	Insert Form	Part No.
	A	X ₁			
i	2.559 - 5.039	0.551	0.066 (lbs)	101	450023
	2.559 - 5.039	0.551	0.066 (lbs)	20*	450041
m	65.00 - 128.00	14.00	0.03 (kg)	101	450023
	65.00 - 128.00	14.00	0.03 (kg)	20*	450041

*Not suitable for indexable inserts with a radius of 0.031" (0.80 mm).



Alu-Line Coolant Delivery Sections

	Coolant Delivery Section		Part No.
	X ₁	Weight	
m	26.75	0.01 (kg)	450125

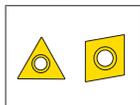
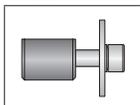
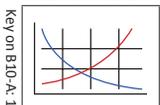


B10-M: 12-19

B10-A: 47

B10-H

B10: vi-vii



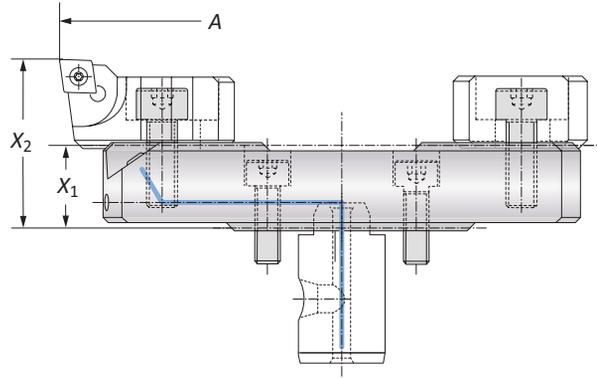
Key on B10-A-1

i = Imperial (in)
m = Metric (mm)
 Inserts sold separately

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Alu-Line Serrated Slides | Insert Holders

Diameter Range: 2.667" - 8.189" (68.00 mm - 208.00 mm)



Alu-Line Serrated Slides

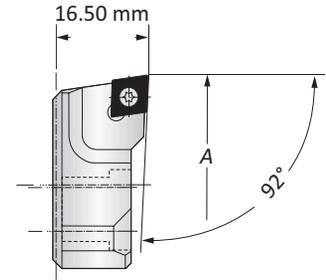
	Boring Range		Serrated Slide		Weight	Part No.
	A		X ₁	X ₂		
i	2.667 - 3.780		0.630	1.280	0.220 (lbs)	501054
	3.780 - 4.882		0.630	1.280	0.220 (lbs)	501055
	4.882 - 5.984		0.630	1.280	0.441 (lbs)	501056
	5.984 - 7.087		0.866	1.516	0.551 (lbs)	501058
	7.087 - 8.189		0.866	1.516	0.661 (lbs)	501059
m	68.00 - 96.00		16.00	32.50	0.10 (kg)	501054
	96.00 - 124.00		16.00	32.50	0.10 (kg)	501055
	124.00 - 152.00		16.00	32.50	0.20 (kg)	501056
	152.00 - 180.00		22.00	38.50	0.25 (kg)	501058
	180.00 - 208.00		22.00	38.50	0.30 (kg)	501059

Insert Holders

	Boring Range		Insert Form	Part No.
	A	Weight		
i	2.677 - 8.189	0.110 (lbs)	101	502064
	2.677 - 8.189	0.110 (lbs)	20	502069
m	68.00 - 208.00	0.05 (kg)	101	502064
	68.00 - 208.00	0.05 (kg)	20	502069



Form 20

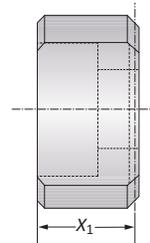


Form 101

NOTE: Other insert holders available upon request.

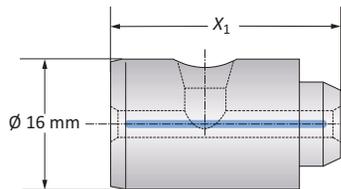
Counterweights

	Counterweights		Part No.
	X ₁	Weight	
i	0.528	0.110 (lbs)	502165
m	13.40	0.05 (kg)	502165



Alu-Line Coolant Delivery Sections

	Coolant Delivery Section		Part No.
	X ₁	Weight	
i	1.004	0.022 (lbs)	450137
m	25.50	0.01 (kg)	450137



B10-M: 12-19

B10-A: 47

B10-H

B10: vi-vii

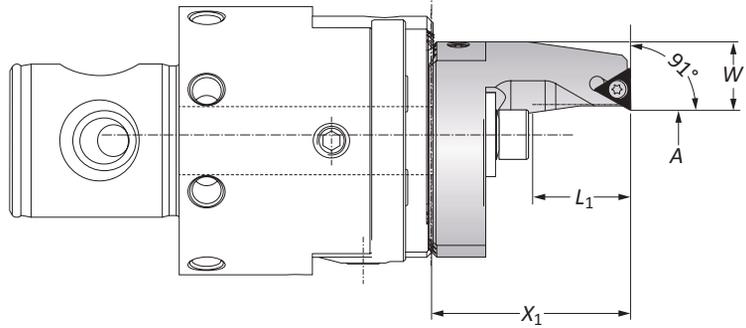
Key on B10-A: 1

i = Imperial (in)
m = Metric (mm)

Inserts sold separately

Outside Turning Insert Holders for Boring Heads

Diameter Range: 0.157" - 2.598" (4.00 mm - 66.00 mm)

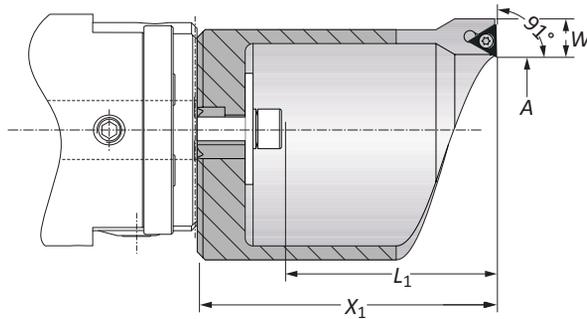


Type A Insert Holders | Diameter Range: 0.157" - 1.181" (4.00 mm - 30.00 mm)

	Boring Range		Insert Holder			Weight	Type	Insert Form	Part No.
	A	X ₁	L ₁	W					
i	0.157 - 0.689	1.594	0.787	0.653	0.220 (lbs)	A	20*	236081	
	0.650 - 1.181	1.988	1.181	0.437	0.220 (lbs)	A	20*	236082	
m	4.00 - 17.50	40.50	20.00	16.60	0.10 (kg)	A	20*	236081	
	16.50 - 30.00	50.50	30.00	11.10	0.10 (kg)	A	20*	236082	

NOTE: Clockwise and neutral execution.

*Not suitable for indexable inserts with a radius of 0.031" (0.80 mm).



Type B Insert Holders | Diameter Range: 1.142" - 2.598" (29.00 mm - 66.00 mm)

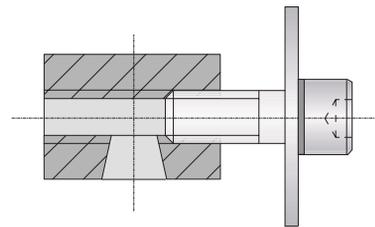
	Boring Range		Insert Holder			Weight	Type	Insert Form	Part No.
	A	X ₁	L ₁	W					
i	1.142 - 1.732	2.952	2.126	0.377	0.661 (lbs)	B	20*	236083	
	1.693 - 2.598	3.956	3.110	0.377	0.882 (lbs)	B	20*	236084	
m	29.00 - 44.00	75.50	54.00	9.60	0.30 (kg)	B	20*	236083	
	43.00 - 66.00	100.50	79.00	9.60	0.40 (kg)	B	20*	236084	

NOTE: Clockwise and neutral execution.

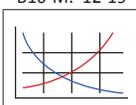
*Not suitable for indexable inserts with a radius of 0.031" (0.80 mm).

Clamping Pieces for Outside Turning Insert Holders

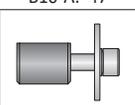
	Insert Holder Type	Boring Range	Service Key	Complete Part No.
m	A	4.00 - 30.00	s5	236088
	B	29.00 - 66.00	s5	236089



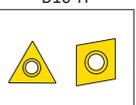
B10-M: 12-19



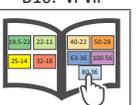
B10-A: 47



B10-H



B10: vi-vii

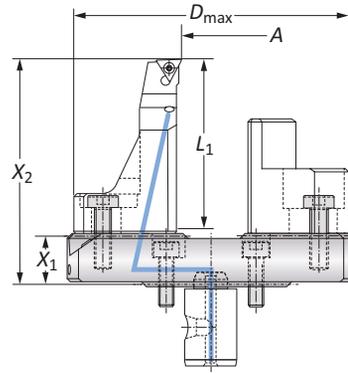


i = Imperial (in)
m = Metric (mm)
Inserts sold separately

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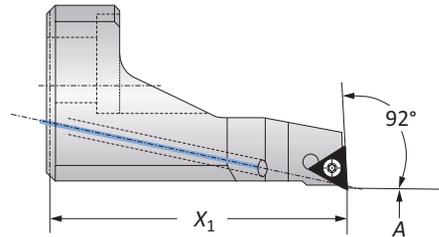
Outside Turning Serrated Slides | Insert Holders

Diameter Range: 0.078" - 4.488" (2.00 mm - 114.00 mm)



Outside Turning Serrated Slides

	Boring Range		Serrated Slide			Weight	Part No.
	A	X ₁	X ₂	L ₁	D _{max}		
i	0.078 - 1.181	0.630	2.874	2.165	3.396	0.771 (lbs)	501064
	1.181 - 2.283	0.630	2.874	2.165	5.078	0.970 (lbs)	501065
	2.283 - 3.386	0.866	3.110	2.165	6.181	1.322 (lbs)	501066
	3.386 - 4.488	0.866	3.110	2.165	7.283	1.609 (lbs)	501067
m	2.00 - 30.00	16.00	73.00	55.00	101.00	0.35 (kg)	501064
	30.00 - 58.00	16.00	73.00	55.00	129.00	0.44 (kg)	501065
	58.00 - 86.00	22.00	79.00	55.00	157.00	0.60 (kg)	501066
	86.00 - 114.00	22.00	79.00	55.00	185.00	0.73 (kg)	501067



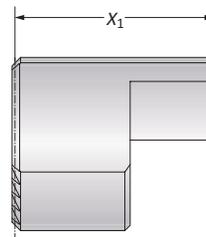
Insert Holders

	Outside Turning Range		Insert Holder		Weight	Insert Form	Part No.
	A	X ₁					
i	0.079 - 4.488	2.244	0.331 (lbs)	20	502082		
m	2.00 - 114.00	57.00	0.15 (kg)	20	502082		

NOTE: Clockwise and neutral execution.

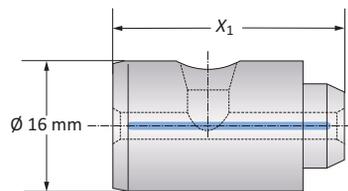
Counterweights

	Counterweight		Part No.
	X ₁	Weight	
i	1.486	0.350 (lbs)	502183
m	37.75	0.16 (kg)	502183



Coolant Delivery Sections

	Coolant Delivery Section		Part No.
	X ₁	Weight	
i	1.004	0.022 (lbs)	450137
m	25.50	0.01 (kg)	450137



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B10-A: 47

B10-H

B10: vi-vii

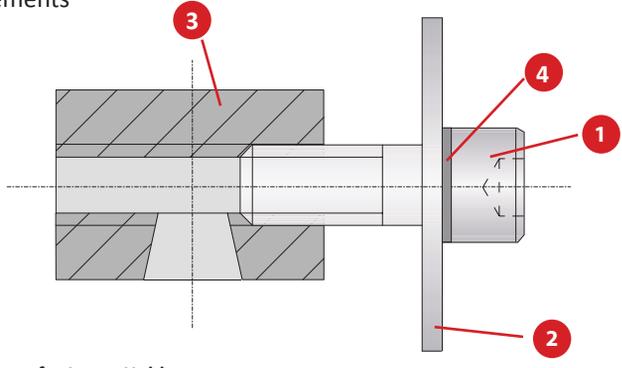
Key on B10-A: 1

i = Imperial (in)
m = Metric (mm)

Inserts sold separately

Accessories

Clamping Elements

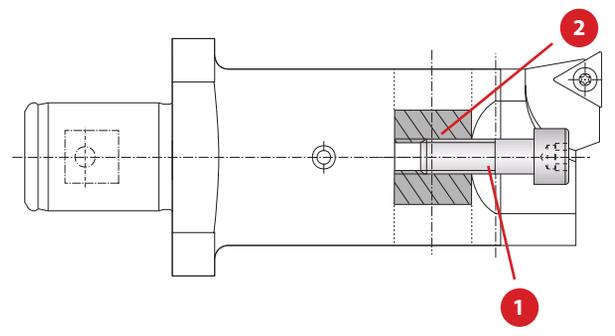


Clamping Elements for Insert Holders

	1	2	3	4		
Boring Range	Cap Screw	Hex Size	Washer	Clamping Nut	Locking Washer	Complete Part No.
m 4.00 - 30.00	070153	s5	315155	236120	215254	236088
29.00 - 66.00	070153	s5	315156	236120	215254	236089

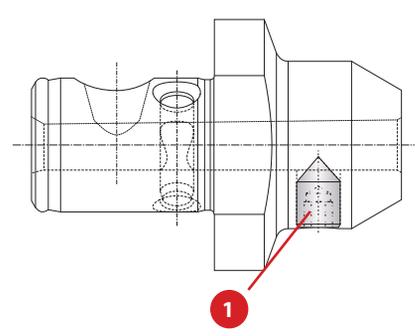
Clamping Elements for Serrated Tool Body

1	2
Cap Screw	Clamping Piece
027154	145184



Thread Pin

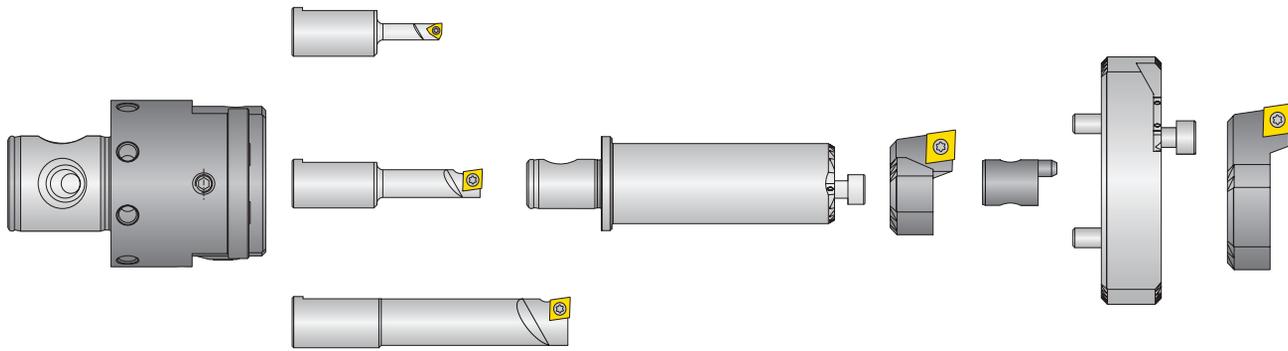
	1
Service Key	Part No.
S3 / A	415244



i = Imperial (in)
m = Metric (mm)

Kit Components

Form 101 | Diameter Range: 0.236" - 5.039" (6.00 mm - 128.00 mm)



Diameter Range: 0.236" - 5.039" (6.00 mm - 128.00 mm)

Kit Components									
Boring Head	Boring Bars		Insert Holders		Serrated Tool Body	Serrated Slide	Coolant Delivery Section	Service Keys	Kit No.
	Boring Range	Part No.	Boring Range	Part No.					
i	0.236 - 0.394	450026 (Form 211)	0.945 - 1.575	450022	450021	450024	450125	003195 (s4) 515451 (T6) 515452 (T8)	104088
	0.394 - 0.630	450027 (Form 101)	1.575 - 2.559	450023					
	0.630 - 0.945	450028 (Form 101)							
m	6.00 - 10.00	450026 (Form 211)	24.00 - 40.00	450022	450021	450024	450125	003195 (s4) 515451 (T6) 515452 (T8)	103088
	10.00 - 16.00	450027 (Form 101)	40.00 - 65.00	450023					
	16.00 - 24.00	450028 (Form 101)							

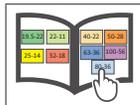
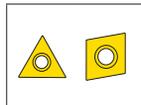
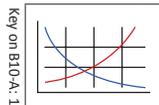
NOTE: Inserts sold separately.



B10-M: 12-19

B10-H

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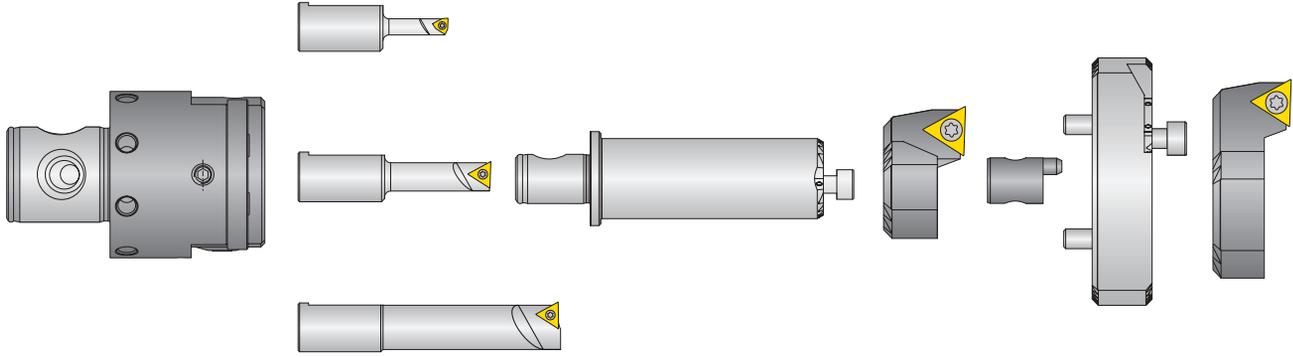
i = Imperial (in)
m = Metric (mm)

Inserts sold separately

IMPORTANT: Max spindle speed refers to maximum possible speed for an individual boring head and is not a recommended parameter. Refer to page B10-M: 12 for recommended application-specific parameters. Factory technical assistance is available for your specific applications through our Application Engineering department.
ext: 7611 | email: appeng@alliedmachine.com

Kit Components

Form 20 | Diameter Range: 0.236" - 5.039" (6.00 mm - 128.00 mm)



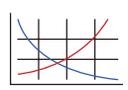
Diameter Range: 0.236" - 5.039" (6.00 mm - 128.00 mm)

Kit Components									
Boring Head	Boring Bars		Insert Holders		Serrated Tool Body	Serrated Slide	Coolant Delivery Section	Service Keys	Kit No.
	Boring Range	Part No.	Boring Range	Part No.					
i	0.236 - 0.394	450026 (Form 211)	0.945 - 1.575	450040	450021	450024	450125	003195 (s4) 515451 (T6) 515453 (T7)	104089
	0.394 - 0.630	450038 (Form 20)	1.575 - 2.559	450041					
	0.630 - 0.945	450039 (Form 20)							
m	6.00 - 10.00	450026 (Form 211)	24.00 - 40.00	450040	450021	450024	450125	003195 (s4) 515451 (T6) 515453 (T7)	103089
	10.00 - 16.00	450038 (Form 20)	40.00 - 65.00	450041					
	16.00 - 24.00	450039 (Form 20)							

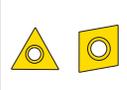
NOTE: Inserts sold separately.



B10-M: 12-19



B10-H



B10: vi-vii



i = Imperial (in)
m = Metric (mm)

Inserts sold separately

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ext: 7611 | email: appeng@alliedmachine.com

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Digital 511 (510) Product Overview

Digital 511 (510) VERSATILE FINE BORING

Improve your boring job with the Digital 511 (510) boring head.

The Wohlhaupter® Digital 511 (510) boring head offers precision, quality, and efficiency. Our integrated digital display makes the 511 (510) the smallest precision boring tool available and allows for easy optoelectronic adjusting.

Experience *precision boring* for yourself.

- Diameter range: 0.016" - 1.339" (0.40 mm - 12.00 mm).
- Easy-to-read digital display.
- Coolant through.
- External counterweight for balancing.
- Protected against coolant and dust according to IP65.
- Fine adjustments of 0.0001" (0.002 mm).
- Ideal for CAT40, BT30, HSK40.
- 511001 (510001) max spindle speed: 35,000 RPM.
- 511021 max spindle speed: 30,000 RPM.



NOTE: Imperial item pictured.

NOTE: Adjustment accuracy of 0.0001" or 0.002 mm on diameter.

IMPORTANT: Max spindle speed refers to maximum possible speed for an individual boring head and is not a recommended parameter. Refer to page B10-M: 12 for recommended application-specific parameters. Factory technical assistance is available for your specific applications through our Application Engineering department.
ext: 7611 | email: appeng@alliedmachine.com

DIGITAL



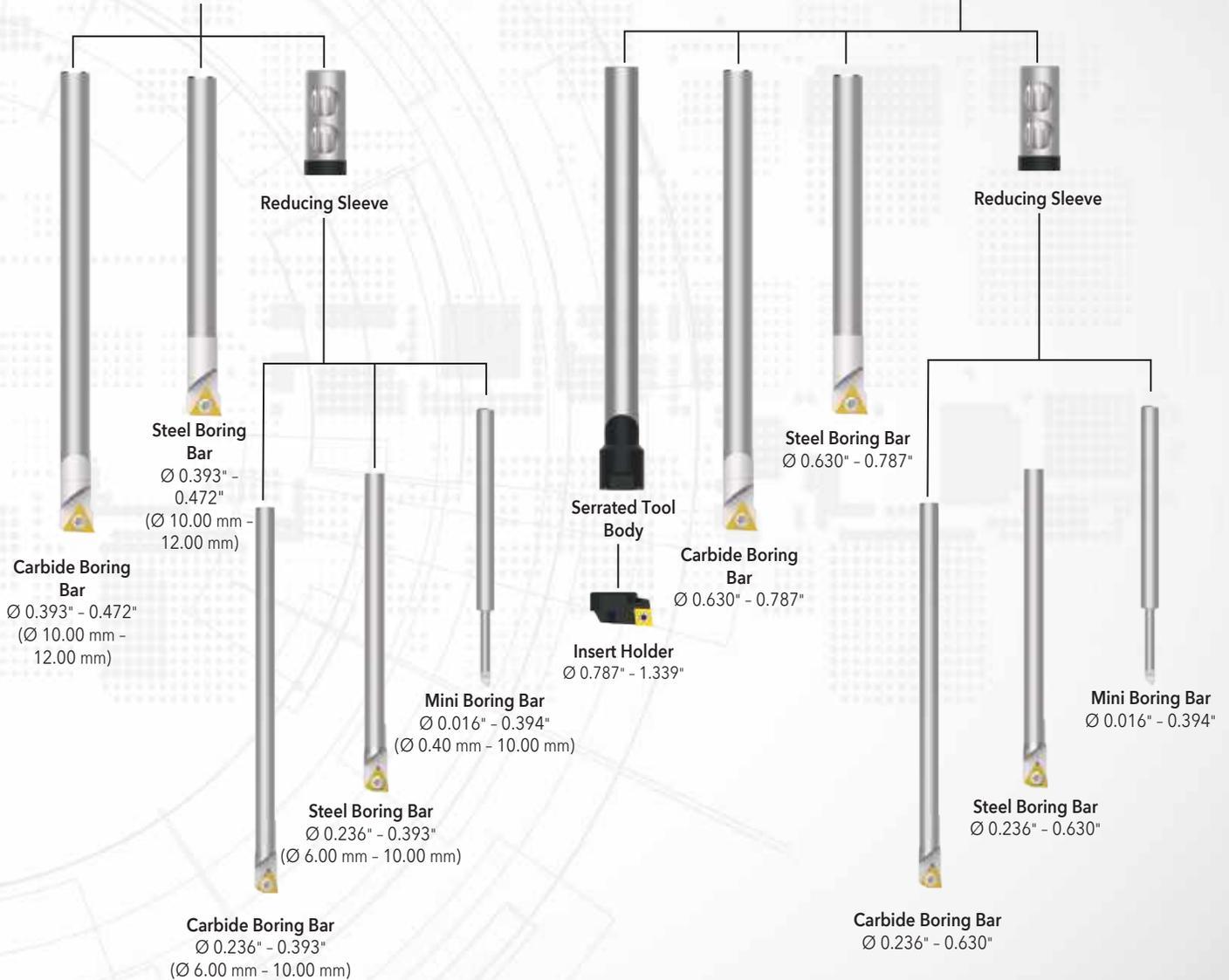
NOTE: Imperial item pictured.
NOTE: Adjustment accuracy of 0.0001" or 0.002 mm on diameter.

Digital 511001 (510001) Boring Head
 Ø 0.016" - 0.472" (0.40 mm - 12.00 mm)



NOTE: Imperial item pictured.
NOTE: Adjustment accuracy of 0.0001" or 0.002 mm on diameter.

Digital 511021 Boring Head
 Ø 0.016" - 1.339"

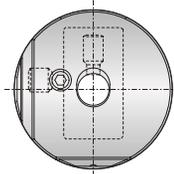


OPERATION **VERSATILITY**

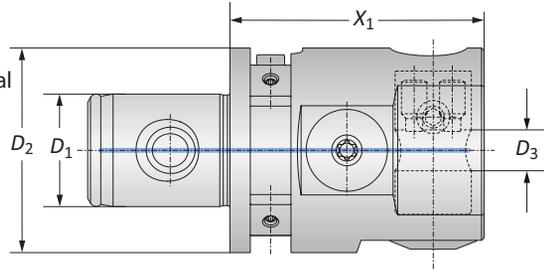
from **0.016"** to **1.339"** (0.40 mm to 12.00 mm)

Boring Heads

Diameter Range: 0.016" - 1.339" (0.40 mm - 12.00 mm)



Fine Radial Stroke
+1.1 mm
-0.1 mm

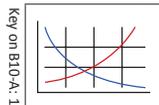


NOTE: Imperial item pictured.
NOTE: Adjustment accuracy of 0.0001" or 0.002 mm on diameter.

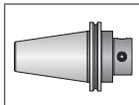
Boring Heads

	MVS Connection	Boring Range	Boring Head		Weight	Part No.
	D_2 D_1		D_3	X_1		
i	40 - 22	0.016 - 0.472	0.315	1.969	0.926 (lbs)	511001
	50 - 28	0.016 - 1.339	0.551	2.165	1.565 (lbs)	511021
m	40 - 22	0.40 - 12.00	8.00	50.00	0.42 (kg)	510001

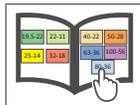
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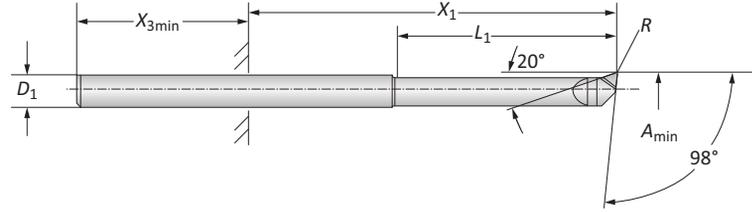


i = Imperial (in)
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Mini Boring Bars

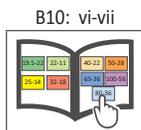
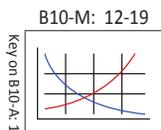
Diameter Range: 0.016" - 0.197" (0.40 mm - 5.00 mm)



Mini Boring Bars

Boring Head	Boring Range	Boring Bar					Part No.	
		A_{min}	D_1	X_1	$X_{3\ min}$	L_1		R
i	511001	0.016	0.157*	0.118 - 1.042	0.630	0.079	0.001	081401WHC126
		0.024	0.157*	0.157 - 1.063	0.630	0.118	0.002	081402WHC126
		0.031	0.157*	0.197 - 1.102	0.630	0.157	0.002	081403WHC126
		0.039	0.157*	0.236 - 1.142	0.630	0.197	0.002	081404WHC126
		0.059	0.157*	0.335 - 1.220	0.630	0.295	0.002	081405WHC126
		0.079	0.157*	0.433 - 1.339	0.630	0.394	0.002	081406WHC126
		0.098	0.157*	0.531 - 1.437	0.630	0.492	0.002	081407WHC126
		0.110	0.157*	0.591 - 1.496	0.630	0.551	0.003	081408WHC126
	511021	0.016	0.157*	0.118 - 0.669	0.980	0.079	0.001	081401WHC126
		0.024	0.157*	0.157 - 0.709	0.980	0.118	0.002	081402WHC126
		0.031	0.157*	0.197 - 0.748	0.980	0.157	0.002	081403WHC126
		0.039	0.157*	0.236 - 0.787	0.980	0.197	0.002	081404WHC126
		0.059	0.157*	0.335 - 0.886	0.980	0.295	0.002	081405WHC126
		0.079	0.157*	0.433 - 0.984	0.980	0.394	0.002	081406WHC126
0.098		0.157*	0.531 - 1.083	0.980	0.492	0.002	081407WHC126	
0.110		0.157*	0.591 - 1.142	0.980	0.551	0.003	081408WHC126	
m	510001	0.40	4.00*	3.00 - 26.00	16.00	2.00	0.03	081401WHC126
		0.60	4.00*	4.00 - 27.00	16.00	3.00	0.04	081402WHC126
		0.80	4.00*	5.00 - 28.00	16.00	4.00	0.04	081403WHC126
		1.00	4.00*	6.00 - 29.00	16.00	5.00	0.05	081404WHC126
		1.50	4.00*	8.50 - 31.50	16.00	7.50	0.05	081405WHC126
		2.00	4.00*	11.00 - 34.00	16.00	10.00	0.05	081406WHC126
		2.50	4.00*	13.50 - 36.50	16.00	12.50	0.05	081407WHC126
		2.80	4.00*	15.00 - 38.00	16.00	14.00	0.07	081408WHC126

*Fixture-through reducing sleeve required (B10-A: 58).

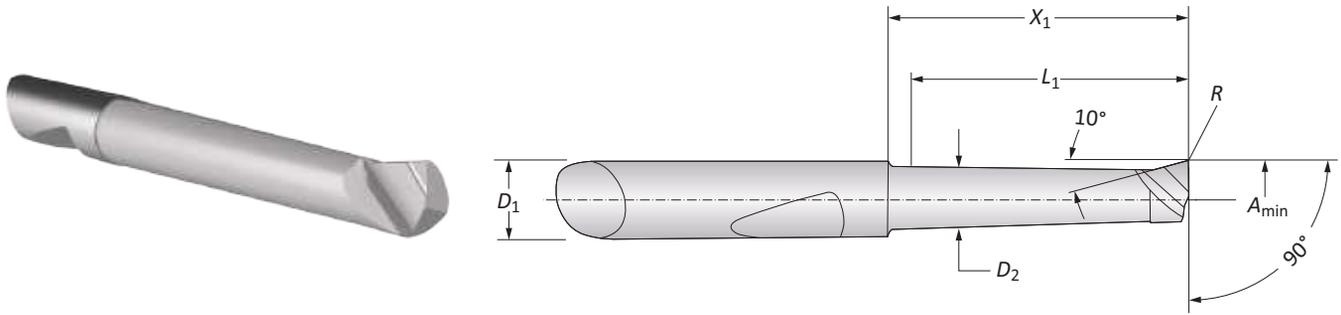


i = Imperial (in)
m = Metric (mm)

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Mini Boring Bars

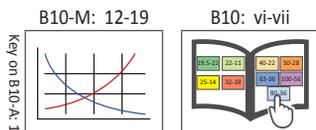
WHC05 | WHW04 | WBN150 | Diameter Range: 0.118" - 0.394" (3.00 mm - 10.00 mm)



Boring Range	Boring Bar						Part No.		
	A_{min}	D_1	D_2	X_1	L_1	R	Coated Carbide	Uncoated Carbide	CBN
	0.118	0.236*	0.102	0.452	0.393	0.003	081306WHC05	-	081322WBN150
	0.118	0.236*	0.102	0.649	0.590	0.003	081307WHC05	081307WHW04	-
	0.157	0.236*	0.141	0.472	0.393	0.007	081308WHC05	-	081317WBN150
	0.157	0.236*	0.141	0.669	0.590	0.007	081309WHC05	-	081341WBN150
	0.157	0.236*	0.141	0.866	0.787	0.007	081310WHC05	081310WHW04	-
	0.196	0.236*	0.181	0.472	0.393	0.007	081311WHC05	-	081318WBN150
i	0.196	0.236*	0.181	0.866	0.787	0.007	081312WHC05	-	081319WBN150
	0.196	0.236*	0.181	1.259	1.181	0.007	081313WHC05	081313WHW04	-
	0.236	0.236*	0.220	0.866	0.787	0.007	081314WHC05	-	081320WBN150
	0.236	0.236*	0.220	1.259	1.181	0.007	081315WHC05	-	081321WBN150
	0.236	0.236*	0.220	1.653	1.574	0.007	081316WHC05	081316WHW04	-
	0.315	0.315**	0.229	0.984	0.905	0.007	081323WHC05	-	-
	0.315	0.315**	0.229	1.968	1.889	0.007	081324WHC05	-	-
	3.00	6.00*	2.60	11.50	10.00	0.10	081306WHC05	-	081322WBN150
	3.00	6.00*	2.60	16.50	15.00	0.10	081307WHC05	081307WHW04	-
	4.00	6.00*	3.60	12.00	10.00	0.20	081308WHC05	-	081317WBN150
	4.00	6.00*	3.60	17.00	15.00	0.20	081309WHC05	-	081341WBN150
	4.00	6.00*	3.60	22.00	20.00	0.20	081310WHC05	081310WHW04	-
	5.00	6.00*	4.60	12.00	10.00	0.20	081311WHC05	-	081318WBN150
m	5.00	6.00*	4.60	22.00	20.00	0.20	081312WHC05	-	081319WBN150
	5.00	6.00*	4.60	32.00	30.00	0.20	081313WHC05	081313WHW04	-
	6.00	6.00*	5.60	22.00	20.00	0.20	081314WHC05	-	081320WBN150
	6.00	6.00*	5.60	32.00	30.00	0.20	081315WHC05	-	081321WBN150
	6.00	6.00*	5.60	42.00	40.00	0.20	081316WHC05	081316WHW04	-
	8.00	8.00**	7.60	25.00	23.00	0.20	081323WHC05	-	-
	8.00	8.00**	7.60	50.00	48.00	0.20	081324WHC05	-	-

*Fixture-through reducing sleeve required (B10-A: 58).

**For 511021 fixture-through reducing sleeve required.



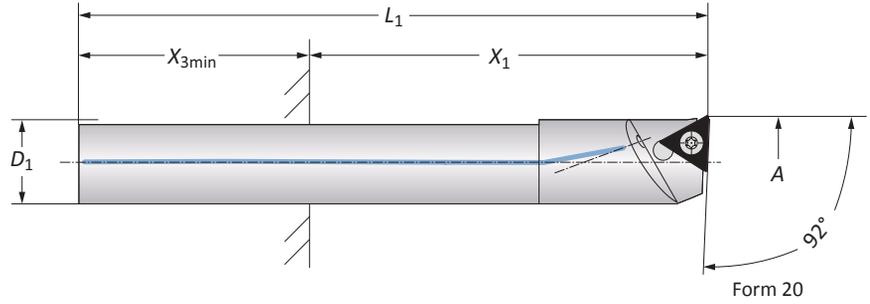
i = Imperial (in)
m = Metric (mm)

Boring Bars

Steel | Diameter Range: 0.236" - 0.787" (6.00 mm - 12.00 mm)



Form 101

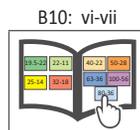
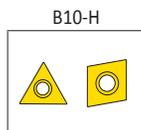
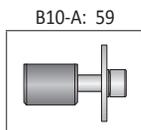
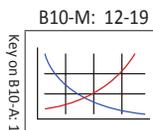


Form 20

Boring Head	Boring Range	Boring Bar				Weight	Part No.				
		A	D ₁	X ₁	X _{3 min}		L ₁	Insert Form	Boring Bar	Insert Form	Boring Bar
i	511001	0.236 - 0.315	0.197*	0.492 - 0.984	0.63	2.756	0.022 (lbs)	211**	514032	-	-
		0.315 - 0.394	0.276*	0.689 - 1.378	0.63	3.189	0.044 (lbs)	211**	514033	-	-
		0.394 - 0.472	0.315	0.787 - 1.575	0.748	3.346	0.066 (lbs)	101	514003	20**	514004
i	511021	0.236 - 0.315	0.197*	0.492 - 0.984	0.984	2.756	0.022 (lbs)	211**	514032	-	-
		0.315 - 0.394	0.276*	0.689 - 1.378	0.984	3.189	0.044 (lbs)	211**	514033	-	-
		0.394 - 0.472	0.315*	0.787 - 1.575	0.984	3.346	0.066 (lbs)	101	514003	20**	514004
		0.472 - 0.551	0.394*	0.984 - 1.969	0.984	3.937	0.110 (lbs)	101	514005	20**	514006
		0.551 - 0.630	0.472*	1.181 - 2.362	1.181	4.488	0.198 (lbs)	101	514007	20**	514008
		0.630 - 0.709	0.551	2.205 - 2.756	1.181	4.764	0.287 (lbs)	101	514009	20**	514010
m	510001	6.00 - 8.00	5.00*	12.50 - 25.00	16.00	70.00	0.01 (kg)	211**	514032	-	-
		8.00 - 10.00	7.00*	17.50 - 35.00	16.00	81.00	0.02 (kg)	211**	514033	-	-
		10.00 - 12.00	8.00	20.00 - 40.00	19.00	85.00	0.03 (kg)	101	514003	20**	514004

*Fixture-through reducing sleeve required (B10-A: 58).

**Not suitable for indexable inserts with a radius of 0.031" (0.8 mm).



i = Imperial (in)
m = Metric (mm)
Inserts sold separately

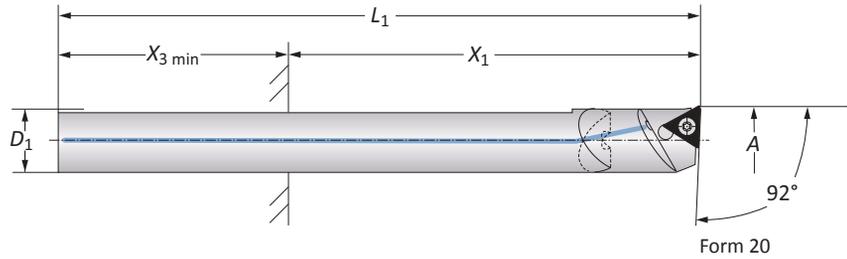
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Boring Bars

Carbide | Diameter Range: 0.236" - 0.787" (6.00 mm - 12.00 mm)



Form 101



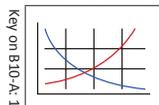
Form 20

Boring Head	Boring Range	Boring Bar					Weight	Part No.			
		A	D ₁	X ₁	X _{3 min}	L ₁		Insert Form	Boring Bar	Insert Form	Boring Bar
511001	0.236 - 0.315	0.197*	0.492 - 1.575	0.63	3.543	0.044 (lbs)	211**	514034	-	-	
	0.315 - 0.394	0.276*	0.827 - 2.205	0.63	4.291	0.110 (lbs)	211**	514035	-	-	
	0.394 - 0.472	0.315	0.866 - 2.520	0.748	4.606	0.154 (lbs)	101	514015	20**	514016	
i 511021	0.236 - 0.315	0.197*	0.492 - 1.575	0.984	3.543	0.044 (lbs)	211**	514034	-	-	
	0.315 - 0.394	0.276*	0.827 - 2.205	0.984	4.291	0.110 (lbs)	211**	514035	-	-	
	0.394 - 0.472	0.315*	0.866 - 2.520	0.984	4.606	0.154 (lbs)	101	514015	20**	514016	
	0.472 - 0.551	0.394*	2.008 - 3.150	1.181	5.512	0.287 (lbs)	101	514017	20**	514018	
	0.551 - 0.630	0.472*	2.677 - 3.780	1.181	6.378	0.485 (lbs)	101	514019	20**	514020	
	0.630 - 0.709	0.551	3.031 - 4.409	1.181	5.591	0.573 (lbs)	101	514021	20**	514022	
	0.630 - 0.709	0.551	4.409 - 5.787	1.181	6.969	0.728 (lbs)	101	514023	20**	514024	
	0.709 - 0.787	0.551	3.031 - 4.409	1.181	5.591	0.573 (lbs)	101	514025	20**	514026	
0.709 - 0.787	0.551	4.409 - 5.787	1.181	6.969	0.728 (lbs)	101	514027	20**	514028		
m 510001	6.00 - 8.00	5.00*	12.50 - 40.00	16.00	90.00	0.02 (kg)	211**	514034	-	-	
	8.00 - 10.00	7.00*	21.00 - 56.00	16.00	109.00	0.05 (kg)	211**	514035	-	-	
	10.00 - 12.00	8.00	22.00 - 64.00	19.00	117.00	0.07 (kg)	101	514015	20**	514016	

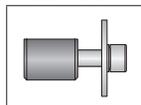
*Fixture-through reducing sleeve required (B10-A: 58).

**Not suitable for indexable inserts with a radius of 0.031" (0.80 mm).

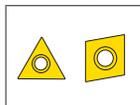
B10-M: 12-19



B10-A: 59



B10-H



B10: vi-vii



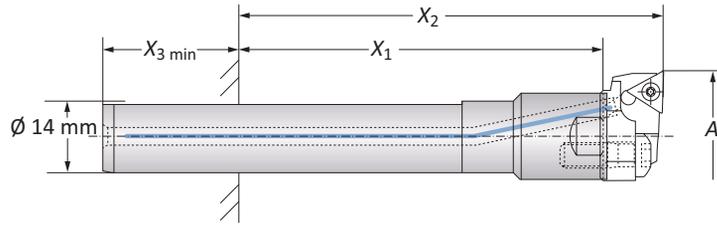
Key on B10-A: 1

i = Imperial (in)
m = Metric (mm)

Inserts sold separately

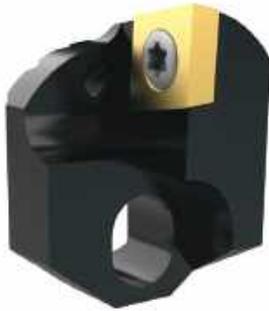
Serrated Tool Bodies | Insert Holders

Diameter Range: 0.787" - 1.339"

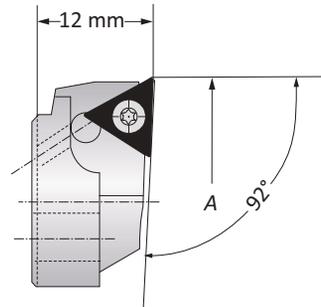


Serrated Tool Bodies

	Substrate	Boring Range	Serrated Tool Body			Weight	Part No.
		A	X ₁	X ₂	X _{3 min}		
i	Steel	0.787 - 1.339	1.457 - 2.835	1.929 - 3.307	1.181	0.287 (lbs)	514029
	Carbide	0.787 - 1.339	2.550 - 3.937	3.031 - 4.409	1.181	0.551 (lbs)	514030
	Carbide	0.787 - 1.339	3.937 - 5.315	4.409 - 5.787	1.181	0.728 (lbs)	514031



Form 101

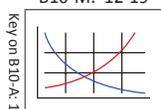
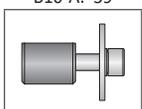
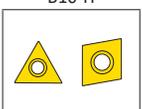
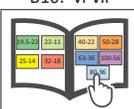


Form 20

Insert Holders

	Boring Range		Insert Form	Part No.	Insert Form	Part No.
	A	Weight				
i	0.787 - 0.866	0.022 (lbs)	101	502052	20*	502046
	0.866 - 0.945	0.022 (lbs)	101	502053	20*	502047
	0.945 - 1.024	0.022 (lbs)	101	502054	20*	502048
	1.024 - 1.102	0.022 (lbs)	101	502055	20*	502049
	1.102 - 1.181	0.022 (lbs)	101	502056	20*	502050
	1.181 - 1.260	0.022 (lbs)	101	502057	20*	502051

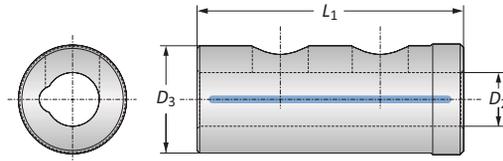
*Not suitable for indexable inserts with a radius of 0.031" (0.80 mm).

i = Imperial (in)
m = Metric (mm)
Inserts sold separately

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Reducing Sleeves



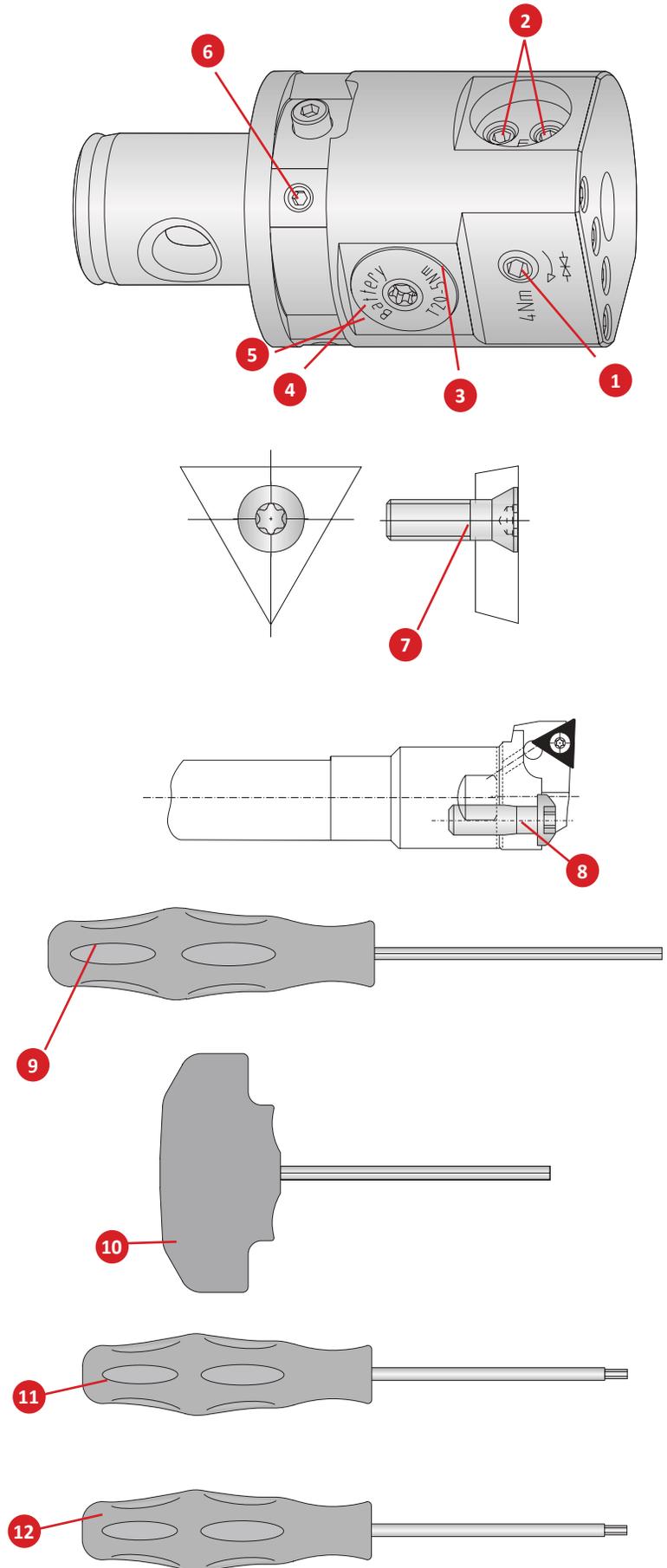
Metric Reducing Sleeves

Reducing Sleeve				Part No.
D_3	D_2	L_1		
8.00	4.00	20.00		514201
8.00	5.00	20.00		514202
8.00	6.00	20.00		514210
8.00	7.00	20.00		514203
14.00	4.00	32.00		514204
14.00	5.00	32.00		514205
14.00	6.00	32.00		514211
14.00	7.00	32.00		514206
14.00	8.00	32.00		514207
14.00	10.00	32.00		514208
14.00	12.00	32.00		514209

Boring Head Accessories

No.	Part	Insert Form	Size	Part No.	
				511001 (510001)	511021
1	Clamping screw	-	-	115985	315943
2	Thread pin for tool clamping	-	-	070333	115181
3	Sealing ring for battery cover	-	-	415895	415895
4	Battery*	-	-	415896	415896
5	Battery cover with sealing ring	-	-	501016	501016
6	Thread pin	-	-	510114	510114
7	Insert screws	Form 20	T7	115535	115535
		Form 101	T8	115676	115676
		Form 211	T6	515286	515286
8	Clamping screw	-	T25	-	415112
9	Hex wrench	-	s2	215473	215473
10	Hex wrench	-	s2.5	415577	415577
		-	s3.0	415578	415578
		-	s4.0	115576	115576
11	Torx driver	-	T6	115537	115537
		-	T7	115591	115591
		-	T8	115590	115590
		-	T20	215150	215150
12	Torx screwdriver	(0.6 Nm) Form 211	T6	415507	415507
		(0.9 Nm) Form 20	T7	415508	415508
		(1.2 Nm) Form 101	T8	415514	415514

*Always change two batteries.
NOTE: Please use VARTA batteries.



DigiBore Product Overview



DigiBore VERSATILE FINE BORING

Advanced versatile technology.

The Wohlhaupter® DigiBore boring head provides internal balancing, which makes this tool the stress-free choice to meet your required surface finish. Its digital display allows for quick and accurate diameter corrections at the machine.

Engineered with the *future in mind*.

- Diameter range: 0.118" - 8.189" (3.00 mm - 208.00 mm).
- Offers outside turning capabilities: 0.157" - 4.488" (4.00 mm - 114.00 mm).
- Digital readout for simple 0.0001" (0.002 mm) diameter adjustments.
- Ease the stress of working on different day-to-day projects with boring kits.
- Automatic internal balancing improves surface finish, tool life, and accuracy.
- Max spindle speed: 16,000 RPM.
- Max coolant pressure: 580 PSI (40 bar).



NOTE: Imperial items pictured.

NOTE: Adjustment accuracy of 0.0001" or 0.002 mm on diameter.

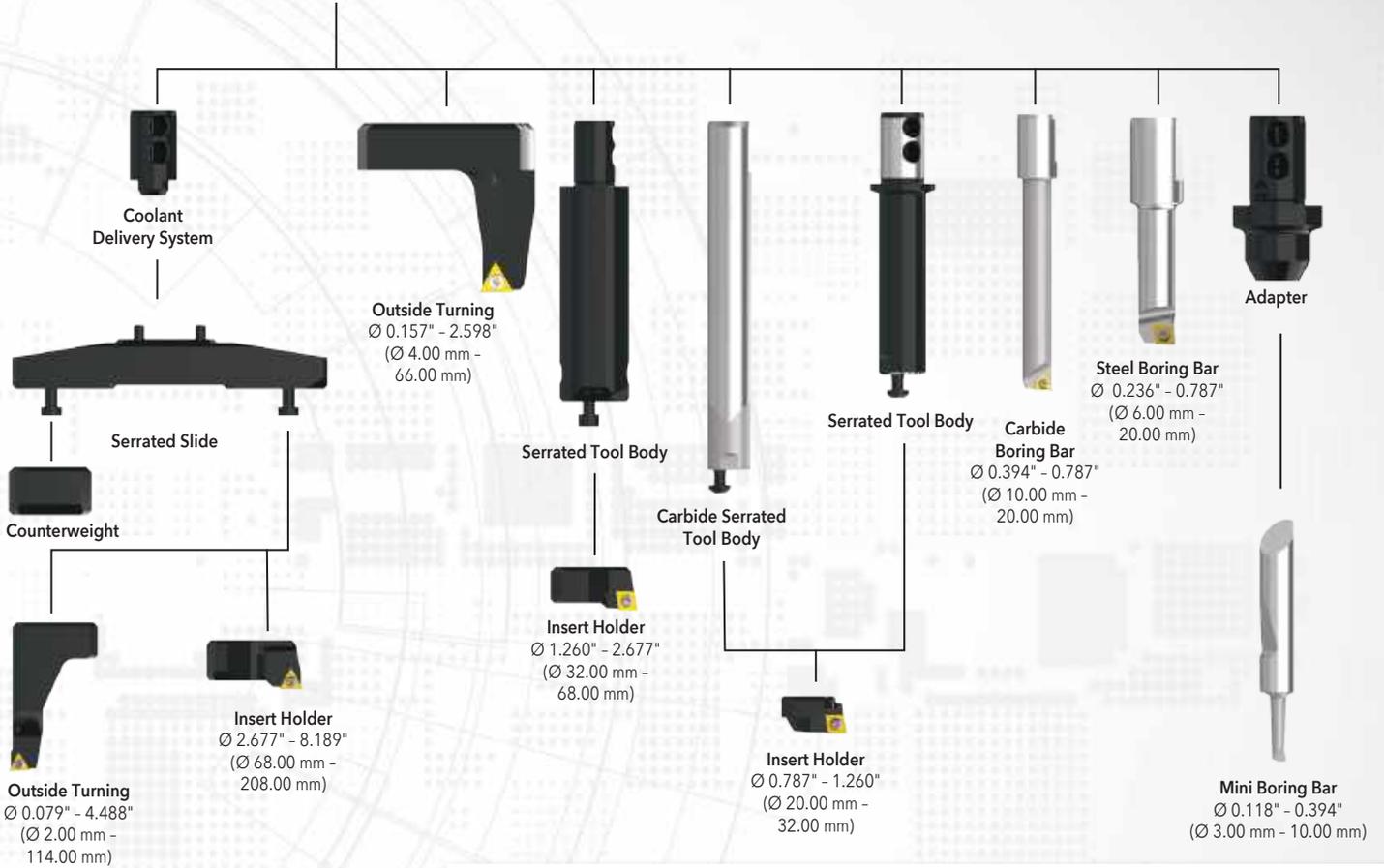
IMPORTANT: Max spindle speed refers to maximum possible speed for an individual boring head and is not a recommended parameter. Refer to page B10-M: 12 for recommended application-specific parameters. Factory technical assistance is available for your specific applications through our Application Engineering department.
ext: 7611 | email: appeng@alliedmachine.com



DigiBore Head

NOTE: Imperial items pictured.
NOTE: Adjustment accuracy of 0.0001" or 0.002 mm on diameter.

DIGI BORE



OPERATION **VERSATILITY**

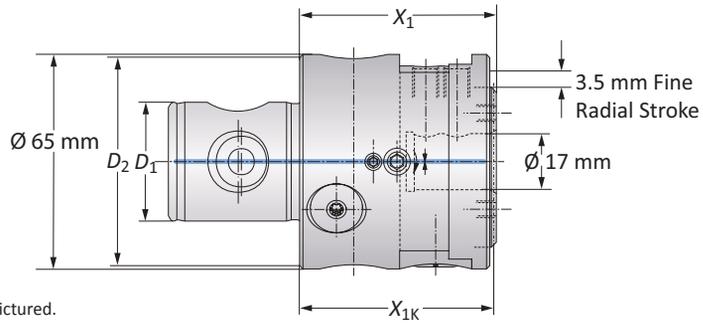
from **0.118"** to **8.189"** (3.00 mm to 208.00 mm)
plus outside turning



NOTE: Imperial items pictured.
NOTE: Adjustment accuracy of 0.0001" or 0.002 mm on diameter.

Boring Heads

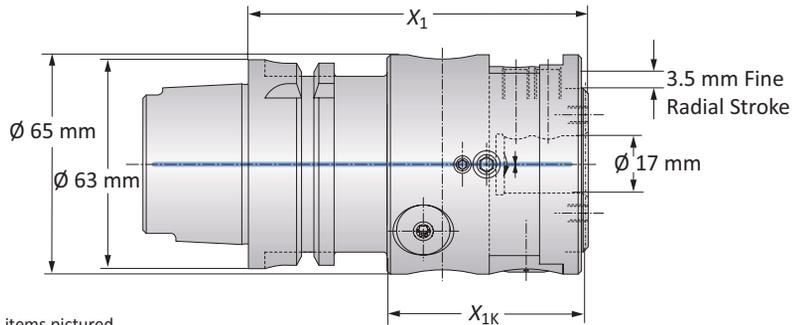
Diameter Range: 0.118" - 8.189" (3.00 mm - 208.00 mm)



NOTE: Imperial items pictured.
NOTE: Adjustment accuracy of 0.0001" or 0.002 mm on diameter.

DigiBore Boring Heads

	MVS Connection		Boring Head		Weight	Part No.
	D_2 D_1	Boring Range	X_1	X_{1K}		
i	50 - 28	0.118 - 8.189	2.362	2.342	2.866 (lbs)	504003
	63 - 36	0.118 - 8.189	2.362	2.342	3.307 (lbs)	504001
m	50 - 28	3.00 - 208.00	60.00	59.50	1.30 (kg)	501005
	63 - 36	3.00 - 208.00	60.00	59.50	1.50 (kg)	501001



NOTE: Imperial items pictured.
NOTE: Adjustment accuracy of 0.0001" or 0.002 mm on diameter.

DigiBore Boring Heads

	Connection		Boring Head		Weight	Part No.
	Connection	Boring Range	X_1	X_{1K}		
i	HSK-A 63	0.118 - 8.189	4.015	2.342	4.630 (lbs)	504004
	PSC 63 (Polygon Shank)	0.118 - 8.189	4.015	2.342	4.630 (lbs)	504019
m	HSK-A 63	3.00 - 208.00	102.00	59.50	2.10 (kg)	501004
	PSC 63 (Polygon Shank)	3.00 - 208.00	102.00	59.50	2.10 (kg)	501019

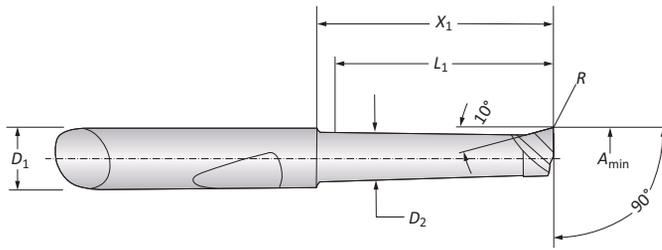
B10-M: 12-19 | B10-F | B10: vi-vii

i = Imperial (in)
m = Metric (mm)

IMPORTANT: Max spindle speed refers to maximum possible speed for an individual boring head and is not a recommended parameter. Refer to page B10-M: 12 for recommended application-specific parameters. Factory technical assistance is available for your specific applications through our Application Engineering department.
ext: 7611 | email: appeng@alliedmachine.com

Mini Boring Bars

WHC05 | WHW04 | WBN150 | Diameter Range: 0.118" - 0.394" (3.00 mm - 10.00 mm)



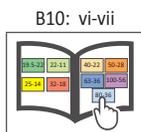
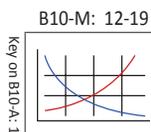
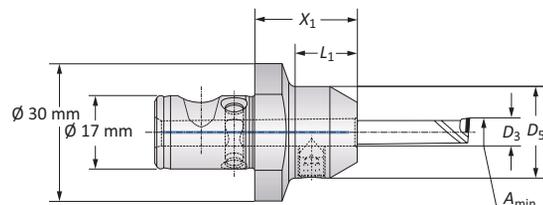
Mini Boring Bars

	Boring Range	Boring Bar					Part No.		
		A _{min}	D ₁	D ₂	X ₁	L ₁	R	Coated Carbide	Uncoated Carbide
i	0.118	0.236	0.102	0.452	0.393	0.003	081306WHC05	-	081322WBN150
	0.118	0.236	0.102	0.649	0.590	0.003	081307WHC05	081307WHW04	-
	0.157	0.236	0.141	0.472	0.393	0.007	081308WHC05	-	081317WBN150
	0.157	0.236	0.141	0.669	0.590	0.007	081309WHC05	-	081341WBN150
	0.157	0.236	0.141	0.866	0.787	0.007	081310WHC05	081310WHW04	-
	0.196	0.236	0.181	0.472	0.393	0.007	081311WHC05	-	081318WBN150
	0.196	0.236	0.181	0.866	0.787	0.007	081312WHC05	-	081319WBN150
	0.196	0.236	0.181	1.259	1.181	0.007	081313WHC05	081313WHW04	-
	0.236	0.236	0.220	0.866	0.787	0.007	081314WHC05	-	081320WBN150
	0.236	0.236	0.220	1.259	1.181	0.007	081315WHC05	-	081321WBN150
	0.236	0.236	0.220	1.653	1.574	0.007	081316WHC05	081316WHW04	-
	0.315	0.315	0.229	0.984	0.905	0.007	081323WHC05	-	-
0.315	0.315	0.229	1.968	1.889	0.007	081324WHC05	-	-	
m	3.00	6.00	2.60	11.50	10.00	0.10	081306WHC05	-	081322WBN150
	3.00	6.00	2.60	16.50	15.00	0.10	081307WHC05	081307WHW04	-
	4.00	6.00	3.60	12.00	10.00	0.20	081308WHC05	-	081317WBN150
	4.00	6.00	3.60	17.00	15.00	0.20	081309WHC05	-	081341WBN150
	4.00	6.00	3.60	22.00	20.00	0.20	081310WHC05	081310WHW04	-
	5.00	6.00	4.60	12.00	10.00	0.20	081311WHC05	-	081318WBN150
	5.00	6.00	4.60	22.00	20.00	0.20	081312WHC05	-	081319WBN150
	5.00	6.00	4.60	32.00	30.00	0.20	081313WHC05	081313WHW04	-
	6.00	6.00	5.60	22.00	20.00	0.20	081314WHC05	-	081320WBN150
	6.00	6.00	5.60	32.00	30.00	0.20	081315WHC05	-	081321WBN150
	6.00	6.00	5.60	42.00	40.00	0.20	081316WHC05	081316WHW04	-
	8.00	8.00	7.60	25.00	23.00	0.20	081323WHC05	-	-
8.00	8.00	7.60	50.00	48.00	0.20	081324WHC05	-	-	



Adapters

	Boring Range	Adapter				Weight	Part No.
		X ₁	L ₁	D ₃	D ₅		
m	3.00 - 8.00	22.50	14.00	6.00	20.00	0.04 (kg)	501050
	8.00 - 10.00	22.50	14.00	8.00	22.00	0.04 (kg)	501051



i = Imperial (in)
m = Metric (mm)

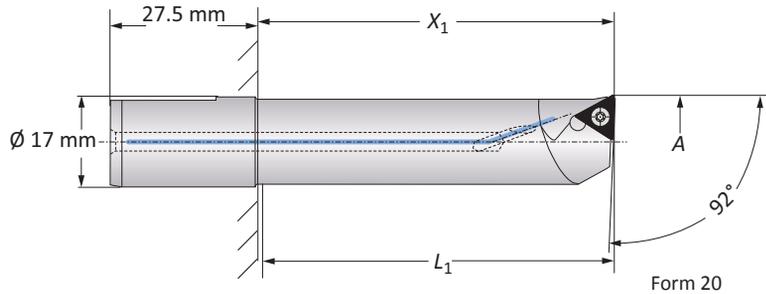
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Boring Bars

Steel | Diameter Range: 0.236" - 0.787" (6.00 mm - 20.00 mm)



Form 101



Boring Range	Boring Bar		Weight	Insert Form	Part No.	Insert Form	Part No.
	A	X ₁					
0.236 - 0.315	0.866	0.748	0.110 (lbs)	211*	502068	-	-
0.315 - 0.394	1.181	1.063	0.110 (lbs)	211*	502066	-	-
0.394 - 0.433	1.181	1.063	0.132 (lbs)	101	502012	20*	502001
0.433 - 0.472	1.181	1.063	0.132 (lbs)	101	502075	20*	502070
0.472 - 0.512	1.772	1.654	0.154 (lbs)	101	502013	20*	502002
0.512 - 0.551	1.772	1.654	0.176 (lbs)	101	502076	20*	502071
0.551 - 0.591	1.968	1.850	0.176 (lbs)	101	502014	20*	502003
0.591 - 0.630	1.968	1.850	0.198 (lbs)	101	502077	20*	502072
0.630 - 0.669	2.362	2.244	0.220 (lbs)	101	502015	20*	502004
0.669 - 0.709	2.362	2.244	0.265 (lbs)	101	502078	20*	502073
0.709 - 0.748	2.677	2.559	0.287 (lbs)	101	502016	20*	502005
0.748 - 0.787	2.677	2.559	0.309 (lbs)	101	502079	20*	502074
<hr/>							
6.00 - 8.00	22.00	19.00	0.05 (kg)	211*	502068	-	-
8.00 - 10.00	30.00	27.00	0.05 (kg)	211*	502066	-	-
10.00 - 11.00	30.00	27.00	0.06 (kg)	101	502012	20*	502001
11.00 - 12.00	30.00	27.00	0.06 (kg)	101	502075	20*	502070
12.00 - 13.00	45.00	42.00	0.07 (kg)	101	502013	20*	502002
13.00 - 14.00	45.00	42.00	0.08 (kg)	101	502076	20*	502071
14.00 - 15.00	50.00	47.00	0.08 (kg)	101	502014	20*	502003
15.00 - 16.00	50.00	47.00	0.09 (kg)	101	502077	20*	502072
16.00 - 17.00	60.00	57.00	0.10 (kg)	101	502015	20*	502004
17.00 - 18.00	60.00	57.00	0.12 (kg)	101	502078	20*	502073
18.00 - 19.00	68.00	65.00	0.13 (kg)	101	502016	20*	502005
19.00 - 20.00	68.00	65.00	0.14 (kg)	101	502079	20*	502074

*Not suitable for indexable inserts with a radius of 0.031" (0.80 mm).

B10-M: 12-19

B10-H

B10: vi-vii

Key on B10-A: 1

i = Imperial (in)
m = Metric (mm)
 Inserts sold separately

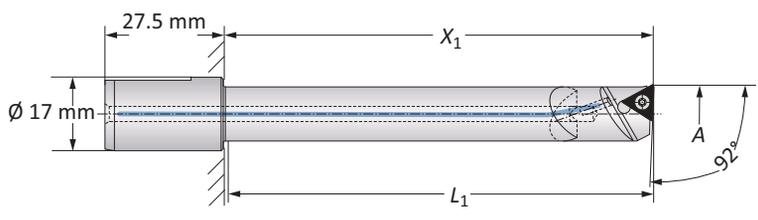
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Boring Bars

Carbide | Diameter Range: 0.394" - 0.787" (10.00 mm - 20.00 mm)



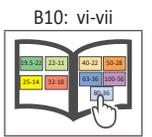
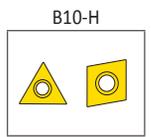
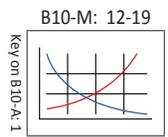
Form 101



Form 20

Boring Range	Boring Bar		Weight	Insert Form	Part No.	Insert Form	Part No.	
	A	X ₁						L ₁
i	0.394 - 0.472	2.165	2.047	0.265 (lbs)	101	502093	20*	502088
	0.394 - 0.472	2.756	2.638	0.309 (lbs)	101	502034	20*	502023
	0.472 - 0.551	2.559	2.441	0.287 (lbs)	101	502094	20*	502089
	0.472 - 0.551	3.346	3.228	0.375 (lbs)	101	502035	20*	502024
	0.551 - 0.630	2.953	2.835	0.375 (lbs)	101	502095	20*	502090
	0.551 - 0.630	3.543	3.425	0.485 (lbs)	101	502036	20*	502025
	0.630 - 0.709	3.346	3.228	0.573 (lbs)	101	502096	20*	502091
	0.630 - 0.709	4.331	4.213	0.706 (lbs)	101	502037	20*	502026
	0.709 - 0.787	3.740	3.622	0.617 (lbs)	101	502097	20*	502092
0.709 - 0.787	4.724	4.606	0.882 (lbs)	101	502038	20*	502027	
m	10.00 - 12.00	55.00	52.00	0.12 (kg)	101	502093	20*	502088
	10.00 - 12.00	70.00	67.00	0.14 (kg)	101	502034	20*	502023
	12.00 - 14.00	65.00	62.00	0.13 (kg)	101	502094	20*	502089
	12.00 - 14.00	85.00	82.00	0.18 (kg)	101	502035	20*	502024
	14.00 - 16.00	75.00	72.00	0.17 (kg)	101	502095	20*	502090
	14.00 - 16.00	90.00	87.00	0.22 (kg)	101	502036	20*	502025
	16.00 - 18.00	85.00	82.00	0.26 (kg)	101	502096	20*	502091
	16.00 - 18.00	110.00	107.00	0.32 (kg)	101	502037	20*	502026
	18.00 - 20.00	95.00	92.00	0.28 (kg)	101	502097	20*	502092
18.00 - 20.00	120.00	117.00	0.40 (kg)	101	502038	20*	502027	

*Not suitable for indexable inserts with a radius of 0.031" (0.80 mm).

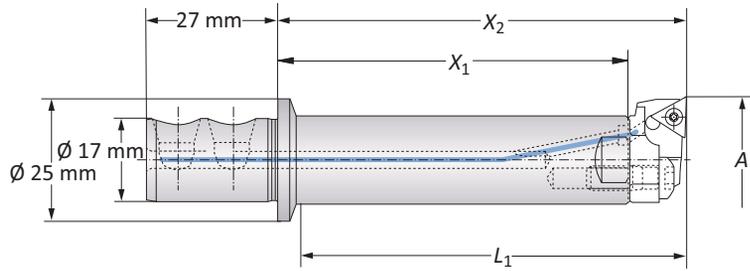


i = Imperial (in)
m = Metric (mm)
Inserts sold separately

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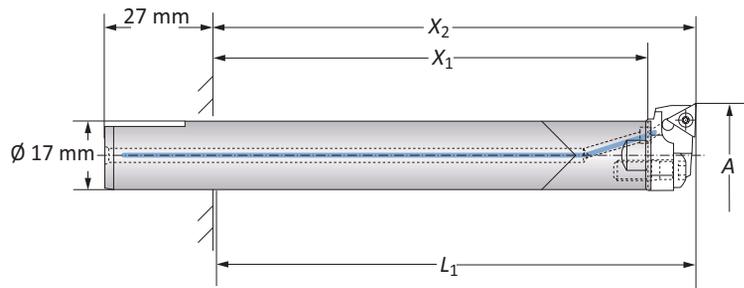
Serrated Tool Bodies | Insert Holders

Steel | Carbide | Diameter Range: 0.787" - 1.260" (20.00 mm - 32.00 mm)



Steel Serrated Tool Bodies

	Boring Range	Serrated Tool Body			Weight	Part No.
	A	X ₁	X ₂	L ₁		
i	0.787 - 1.260	2.835	3.307	3.031	0.441 (lbs)	502045
m	20.00 - 32.00	72.00	84.00	77.00	0.20 (kg)	502045



Carbide Serrated Tool Bodies

	Boring Range	Serrated Tool Body			Weight	Part No.
	A	X ₁	X ₂	L ₁		
i	0.787 - 1.260	4.252	4.724	4.606	0.882 (lbs)	502062
m	20.00 - 32.00	108.00	120.00	117.00	0.40 (kg)	502062

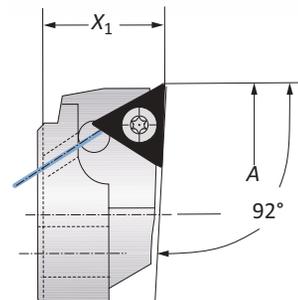
Insert Holders

	Boring Range	Insert Holder	Weight	Insert Form	Part No.	Insert Form	Part No.
	A	X ₁					
i	0.787 - 0.866	0.472	0.022 (lbs)	101	502052	20*	502046
	0.866 - 0.945	0.472	0.022 (lbs)	101	502053	20*	502047
	0.945 - 1.024	0.472	0.022 (lbs)	101	502054	20*	502048
	1.024 - 1.102	0.472	0.022 (lbs)	101	502055	20*	502049
	1.102 - 1.181	0.472	0.022 (lbs)	101	502056	20*	502050
	1.181 - 1.260	0.472	0.022 (lbs)	101	502057	20*	502051
m	20.00 - 22.00	12.00	0.01 (kg)	101	502052	20*	502046
	22.00 - 24.00	12.00	0.01 (kg)	101	502053	20*	502047
	24.00 - 26.00	12.00	0.01 (kg)	101	502054	20*	502048
	26.00 - 28.00	12.00	0.01 (kg)	101	502055	20*	502049
	28.00 - 30.00	12.00	0.01 (kg)	101	502056	20*	502050
	30.00 - 32.00	12.00	0.01 (kg)	101	502057	20*	502051

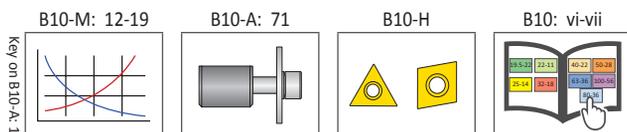
*Not suitable for indexable inserts with a radius of 0.031" (0.80 mm).



Form 101



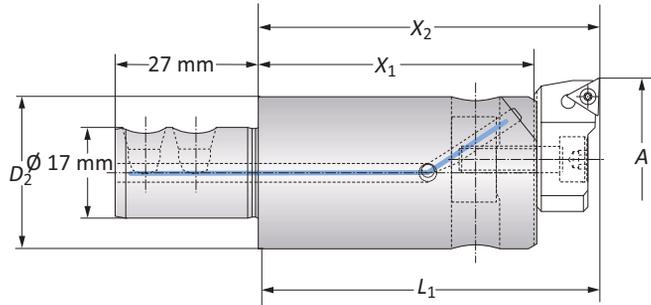
Form 20



i = Imperial (in)
m = Metric (mm)
 Inserts sold separately

Alu-Line Serrated Tool Bodies | Insert Holders

Diameter Range: 1.260" - 2.677" (32.00 mm - 68.00 mm)

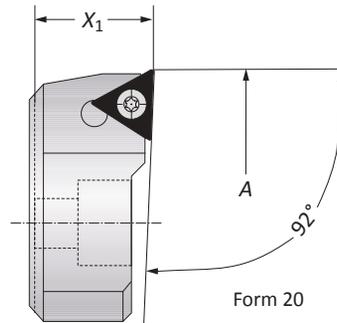


Alu-Line Serrated Tool Bodies

	Boring Range	Serrated Tool Body				Weight	Part No.
	A	D ₂	X ₁	X ₂	L ₁		
i	1.260 - 1.968	1.122	2.047	2.598	2.480	0.220 (lbs)	501052
	1.260 - 1.968	1.122	3.465	4.016	3.898	0.441 (lbs)	501060
	1.968 - 2.677	1.811	2.402	2.953	2.835	0.441 (lbs)	501053
	1.968 - 2.677	1.811	4.173	4.724	4.606	0.661 (lbs)	501061
m	32.00 - 50.00	28.50	52.00	66.00	63.00	0.10 (kg)	501052
	32.00 - 50.00	28.50	88.00	102.00	99.00	0.20 (kg)	501060
	50.00 - 68.00	46.00	61.00	75.00	72.00	0.20 (kg)	501053
	50.00 - 68.00	46.00	106.00	120.00	117.00	0.30 (kg)	501061



Form 101

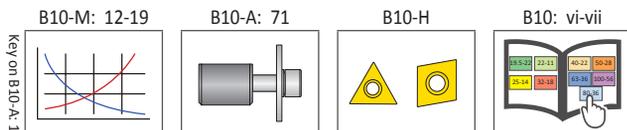


Form 20

Insert Holders

	Serrated Tool Body	Boring Range	Insert Holder	Weight	Insert Form	Part No.
		A	X ₁			
i	501052 / 501060	1.260 - 1.614	0.551	0.066 (lbs)	20*	502060
		1.614 - 1.968	0.551	0.088 (lbs)	20*	502061
		1.260 - 1.614	0.551	0.066 (lbs)	101	502058
		1.614 - 1.968	0.551	0.088 (lbs)	101	502059
	501053 / 501061	1.968 - 2.323	0.551	0.066 (lbs)	20*	502060
		2.323 - 2.677	0.551	0.088 (lbs)	20*	502061
		1.968 - 2.323	0.551	0.066 (lbs)	101	502058
		2.323 - 2.677	0.551	0.088 (lbs)	101	502059
m	501052 / 501060	32.00 - 41.00	14.00	0.03 (kg)	20*	502060
		41.00 - 50.00	14.00	0.04 (kg)	20*	502061
		32.00 - 41.00	14.00	0.03 (kg)	101	502058
		41.00 - 50.00	14.00	0.04 (kg)	101	502059
	501053 / 501061	50.00 - 59.00	14.00	0.03 (kg)	20*	502060
		59.00 - 68.00	14.00	0.04 (kg)	20*	502061
		50.00 - 59.00	14.00	0.03 (kg)	101	502058
		59.00 - 68.00	14.00	0.04 (kg)	101	502059

*Not suitable for indexable inserts with a radius of 0.031" (0.80 mm).

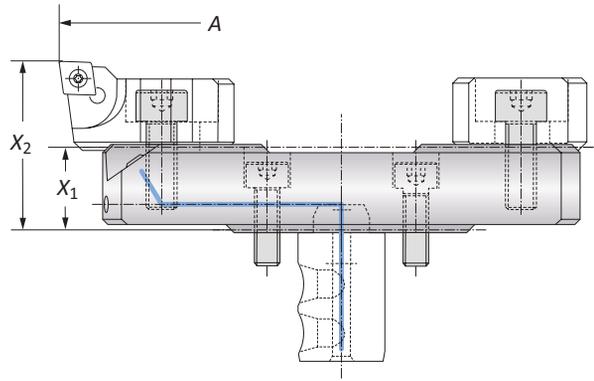


i = Imperial (in)
m = Metric (mm)
 Inserts sold separately

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Alu-Line Serrated Slides | Insert Holders

Diameter Range: 2.667" - 8.189" (68.00 mm - 208.00 mm)



Alu-Line Serrated Slides

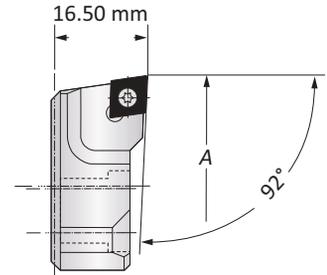
	Boring Range		Serrated Slide		Weight	Part No.
	A	X ₁	X ₂			
i	2.667 - 3.780	0.630	1.280	0.220 (lbs)	501054	
	3.780 - 4.881	0.630	1.280	0.220 (lbs)	501055	
	4.881 - 5.984	0.630	1.280	0.441 (lbs)	501056	
	5.984 - 7.088	0.866	1.516	0.551 (lbs)	501058	
	7.088 - 8.189	0.866	1.516	0.661 (lbs)	501059	
m	68.00 - 96.00	16.00	32.50	0.10 (kg)	501054	
	96.00 - 124.00	16.00	32.50	0.10 (kg)	501055	
	124.00 - 152.00	16.00	32.50	0.20 (kg)	501056	
	152.00 - 180.00	22.00	38.50	0.25 (kg)	501058	
	180.00 - 208.00	22.00	38.50	0.30 (kg)	501059	

Insert Holders

	Boring Range		Insert Form	Part No.
	A	Weight		
i	2.677 - 8.189	0.110 (lbs)	101	502064
	2.677 - 8.189	0.110 (lbs)	20	502069
m	68.00 - 208.00	0.05 (kg)	101	502064
	68.00 - 208.00	0.05 (kg)	20	502069



Form 20

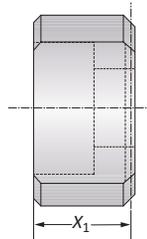


Form 101

NOTE: Other insert holders available upon request.

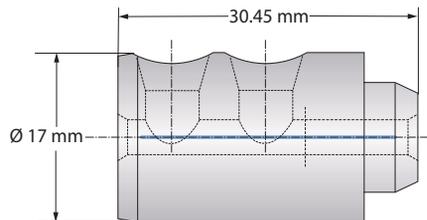
Counterweights

	Counterweight		Part No.
	X ₁	Weight	
i	0.528	0.110 (lbs)	502165
m	13.40	0.05 (kg)	502165



Coolant Delivery Systems

	Coolant Delivery System	
	Weight	Part No.
i	0.044 (lbs)	501157
m	0.02 (kg)	501157



B10-M: 12-19

B10-A: 71

B10-H

B10: vi-vii

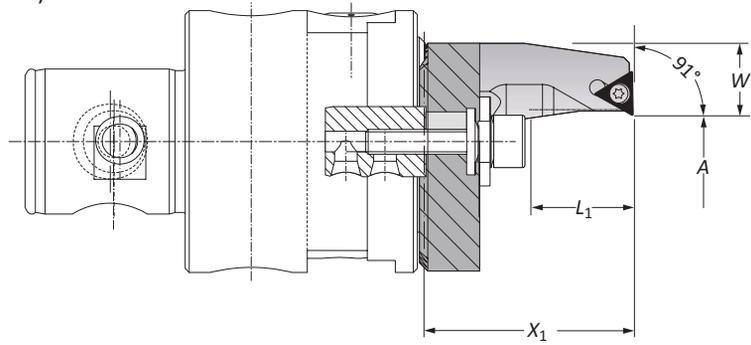
Key on B10-A: 1

i = Imperial (in)
m = Metric (mm)

Inserts sold separately

Outside Turning Insert Holders for Boring Heads

Diameter Range: 0.157" - 2.598" (4.00 mm - 66.00 mm)

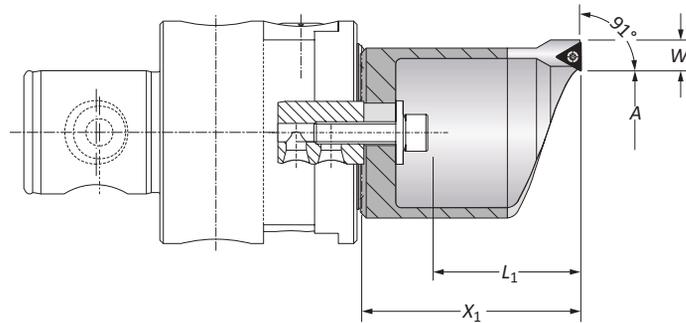


Type A Insert Holders | Diameter Range: 0.157" - 1.181" (4.00 mm - 30.00 mm)

	Boring Range		Insert Holder			Weight	Insert Form	Part No.
	A	X ₁	L ₁	W				
i	0.157 - 0.689	1.594	0.787	0.653	0.220 (lbs)	20*	236081	
	0.650 - 1.181	1.988	1.181	0.437	0.220 (lbs)	20*	236082	
m	4.00 - 17.50	40.50	20.00	16.60	0.10 (kg)	20*	236081	
	16.50 - 30.00	50.50	30.00	11.10	0.10 (kg)	20*	236082	

NOTE: Clockwise and neutral execution.

*Not suitable for indexable inserts with a radius of 0.031" (0.80 mm).



Type B Insert Holders | Diameter Range: 1.142" - 2.598" (29.00 mm - 66.00 mm)

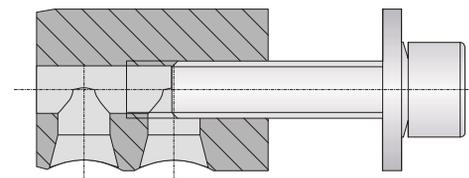
	Boring Range		Insert Holder			Weight	Insert Form	Part No.
	A	X ₁	L ₁	W				
i	1.142 - 1.732	2.952	2.126	0.377	0.661 (lbs)	20*	236083	
	1.693 - 2.598	3.956	3.110	0.377	0.882 (lbs)	20*	236084	
m	29.00 - 44.00	75.50	54.00	9.60	0.30 (kg)	20*	236083	
	43.00 - 66.00	100.50	79.00	9.60	0.40 (kg)	20*	236084	

NOTE: Clockwise and neutral execution.

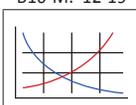
*Not suitable for indexable inserts with a radius of 0.031" (0.80 mm).

Clamping Pieces for Outside Turning Insert Holders

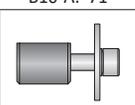
Insert Holder Type	Boring Range	Service Key	Complete Part No.
m	A	s5	502080
	B	s5	502081



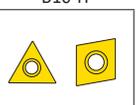
B10-M: 12-19



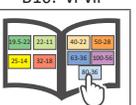
B10-A: 71



B10-H



B10: vi-vii

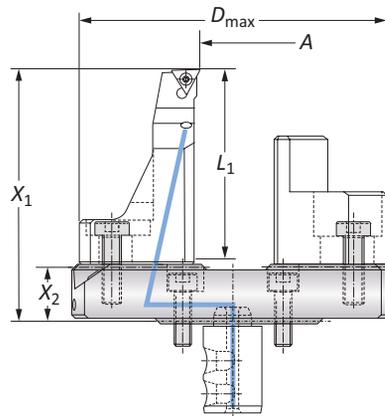


i = Imperial (in)
 m = Metric (mm)
 Inserts sold separately

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Outside Turning Serrated Slides | Insert Holders

Diameter Range: 0.078" - 4.488" (2.00 mm - 114.00 mm)



Outside Turning Serrated Slides

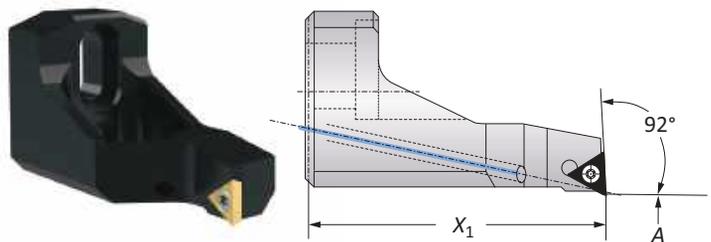
	Boring Range		Serrated Slide				Weight	Part No.
	A	X ₁	X ₂	L ₁	D _{max}			
i	0.078 - 1.181	2.874	0.630	2.165	3.396	0.771 (lbs)	501064	
	1.181 - 2.283	2.874	0.630	2.165	5.078	0.970 (lbs)	501065	
	2.283 - 3.385	3.110	0.866	2.165	6.181	1.322 (lbs)	501066	
	3.385 - 4.488	3.110	0.866	2.165	7.283	1.609 (lbs)	501067	
m	2.00 - 30.00	73.00	16.00	55.00	101.00	0.35 (kg)	501064	
	30.00 - 58.00	73.00	16.00	55.00	129.00	0.44 (kg)	501065	
	58.00 - 86.00	79.00	22.00	55.00	157.00	0.60 (kg)	501066	
	86.00 - 114.00	79.00	22.00	55.00	185.00	0.73 (kg)	501067	



Outside Turning Insert Holders

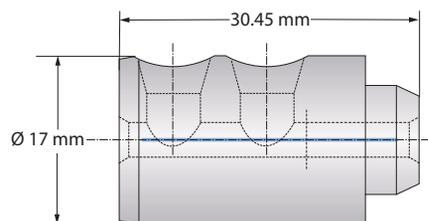
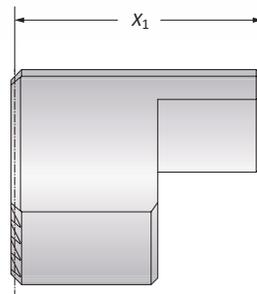
	Outside Turning Range	Insert Holder	Weight	Insert Form	Part No.
	A	X ₁			
i	0.079 - 4.488	2.244	0.331 (lbs)	20	502082
m	2.00 - 114.00	57.00	0.15 (kg)	20	502082

NOTE: Clockwise and neutral execution.



Counterweights

	Counterweight		Part No.
	X ₁	Weight	
i	1.486	0.352 (lbs)	502183
m	37.75	0.16 (kg)	502183



Key on B10-A: 1

B10-M: 12-19

B10-A: 71

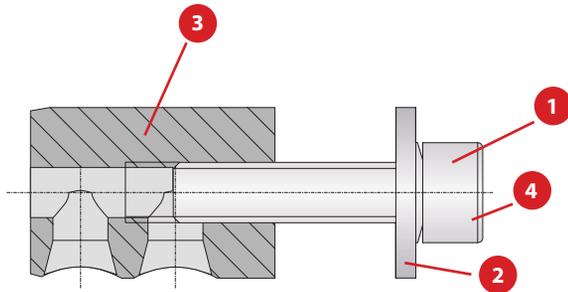
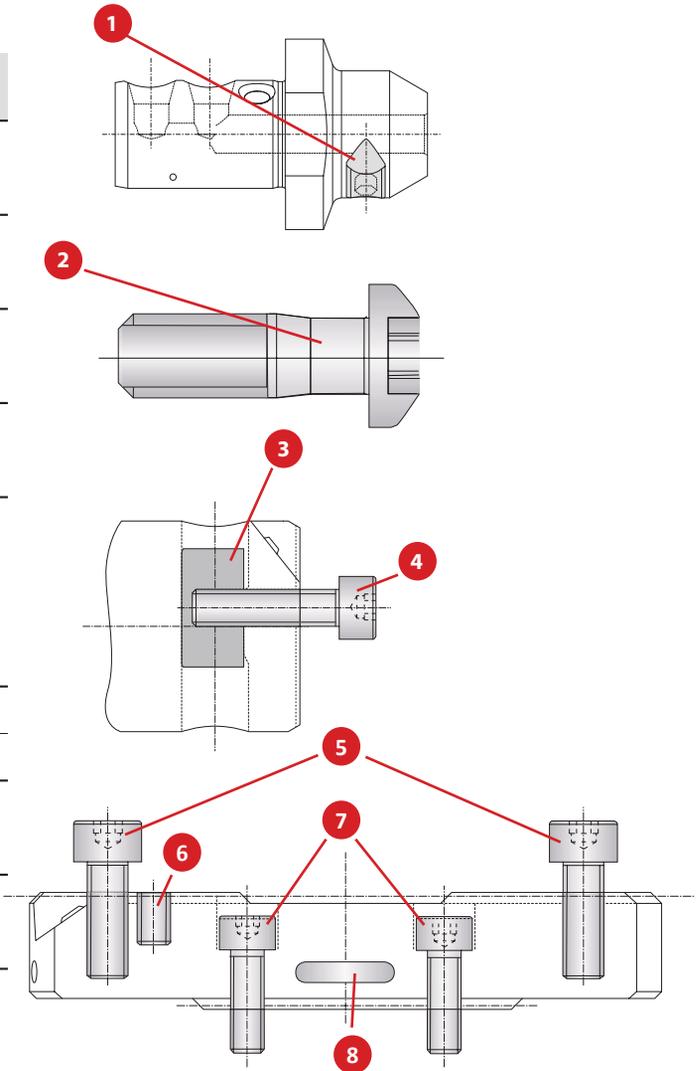
B10-H

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i = Imperial (in)
m = Metric (mm)
Inserts sold separately

Accessories

No.	Part	Size	Part No.
1	Set screw	s3	415244
2	Screw for securing insert holder	T25	415112
3	Clamping piece	-	145184
4	Cap screw for securing insert holders	s4	027154
5	Cap screw for securing insert holder/ counterweight	s4	315248
6	Set screw - coolant	501054, 501055, 501056	s1.5 114224
		501058, 501059	s1.5 115303
7	Cap screw for securing serrated slide	s4	115166
8	Sealing ring for coolant delivery	-	415386

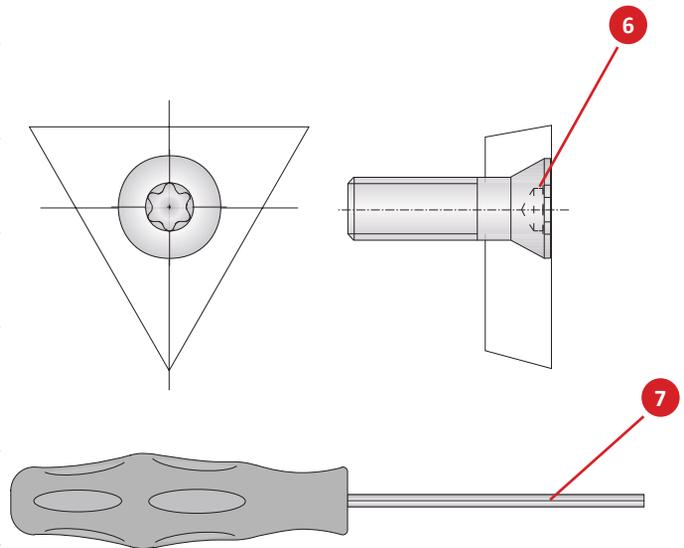
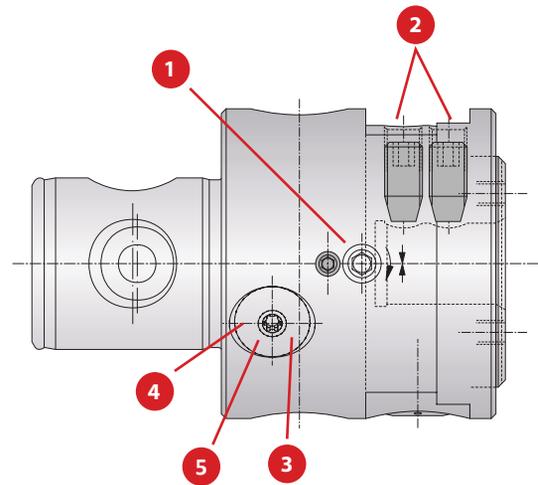


	Boring Range	Type	Hex Size	Clamping Screw Parts				Complete Part No.
				1 Cap Screw	2 Washer	3 Clamping Piece	4 Locking Washer	
i	0.157 - 1.181	A	s5	070153	315155	502180	215254	502080
	1.142 - 2.598	B	s5	070153	315156	502180	215254	502081
m	4.00 - 30.00	A	s5	070153	315155	502180	215254	502080
	29.00 - 66.00	B	s5	070153	315156	502180	215254	502081

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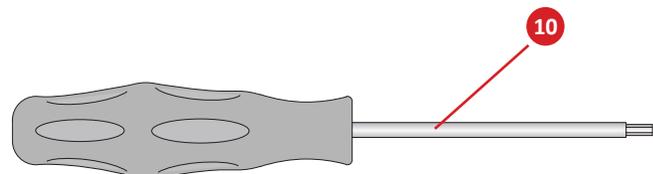
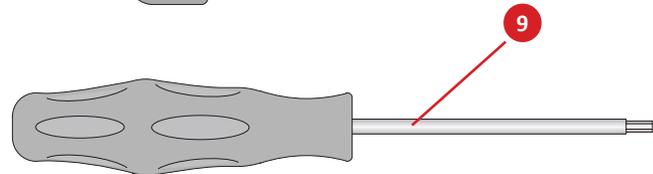
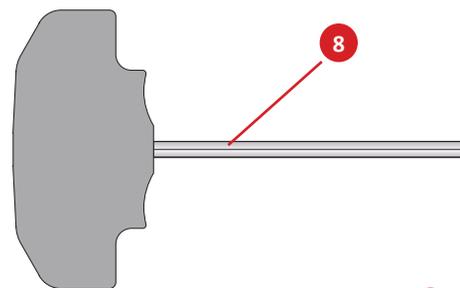
Accessories

No.	Part	Insert Form	Size	Part No.
1	Clamping screw	-	-	415353
2	Set screw for clamping tool	-	-	215674
3	Battery cover	-	-	415895
4	Battery*	-	-	415896
5	Battery access cover with sealing ring	-	-	501016
6	Insert screws	Form 211 Form 20 Form 101	T6 T7 T8	215377 115535 115676
7	Hex driver	-	s1.5 s3	215472 115630
8	Hex driver	-	s4	115576
9	Torx® driver	-	T6 T7 T8 T20	115537 115591 115590 215150
10	Torque screwdriver, Torx	(0.6 Nm) Form 211 (0.9 Nm) Form 20 (1.2 Nm) Form 101	T6 T7 T8	415507 415508 415514



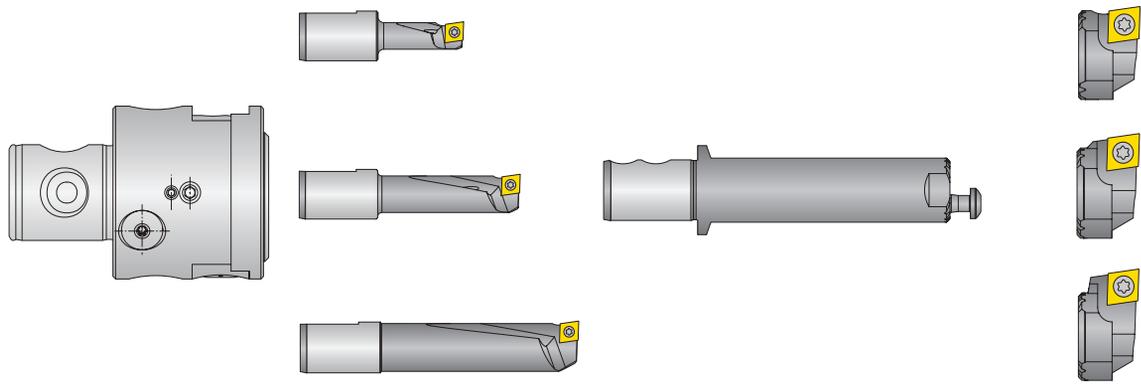
*Always change two batteries.

NOTE: Please use VARTA batteries (V392 SR41).



Kit Components

Insert Form 101 | Diameter Range: 0.394" - 1.260" (10.00 mm - 32.00 mm)



Diameter Range: 0.394" - 1.260" (10.00 mm - 32.00 mm)

		Kit Components						
	Boring Head	Boring Range	Boring Bars	Boring Range	Serrated Tool Body	Insert Holders	Service Keys	Kit No.
i	504001	0.394 - 0.433 0.551 - 0.591 0.709 - 0.748	502012 502014 502016	0.787 - 1.260	502045	502052 502054 502056	115576 (s4) 415121 (T25) 115590 (T8)	104061
m	501001	10.00 - 11.00 14.00 - 15.00 18.00 - 19.00	502012 502014 502016	20.00 - 32.00	502045	502052 502054 502056	115576 (s4) 415121 (T25) 115590 (T8)	103061

NOTE: Inserts sold separately.



B10-M: 12-19 B10-H B10: vi-vii

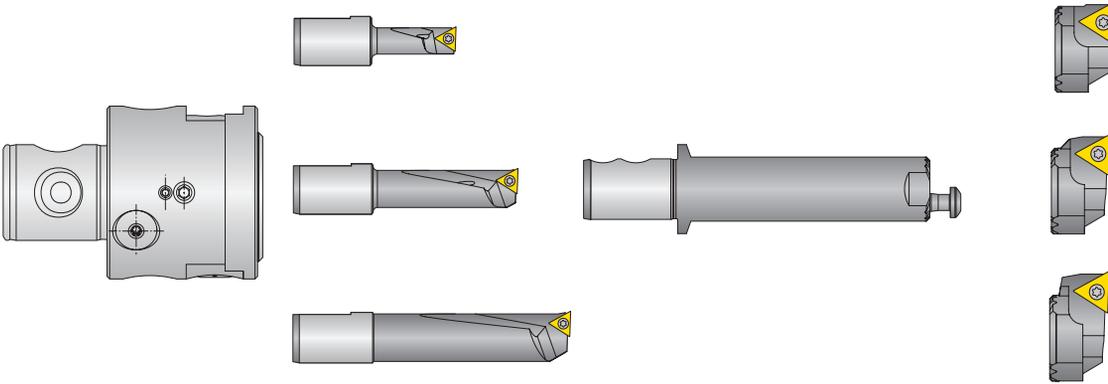
i = Imperial (in)
m = Metric (mm)
 Inserts sold separately

IMPORTANT: Max spindle speed refers to maximum possible speed for an individual boring head and is not a recommended parameter. Refer to page B10-M: 12 for recommended application-specific parameters. Factory technical assistance is available for your specific applications through our Application Engineering department.
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Kit Components

Insert Form 20 | Diameter Range: 0.394" - 1.260" (10.00 mm - 32.00 mm)



Diameter Range: 0.394" - 1.260" (10.00 mm - 32.00 mm)

		Kit Components						
	Boring Head	Boring Range	Boring Bars	Boring Range	Serrated Tool Body	Insert Holders	Service Keys	Kit No.
i	504001	0.394 - 0.433 0.551 - 0.591 0.709 - 0.748	502001 502003 502005	0.787 - 1.260	502045	502046 502048 502050	115576 (s4) 415121 (T25) 115591 (T7)	104062
m	501001	10.00 - 11.00 14.00 - 15.00 18.00 - 19.00	502001 502003 502005	20.00 - 32.00	502045	502046 502048 502050	115576 (s4) 415121 (T25) 115591 (T7)	103062

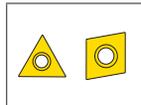
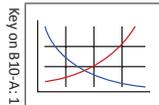
NOTE: Inserts sold separately.



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55-52	22-15	40-22	50-28
75-44	12-14	65-36	100-50

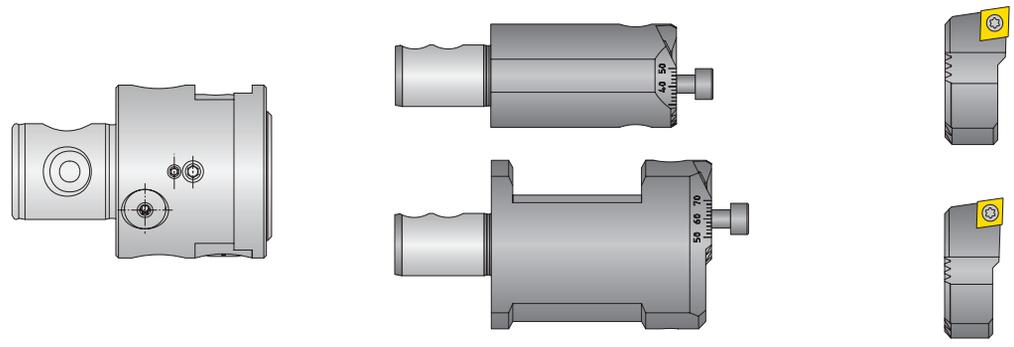
i = Imperial (in)
m = Metric (mm)

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Kit Components

Insert Form 101 | Diameter Range: 1.260" - 2.677" (32.00 mm - 68.00 mm)



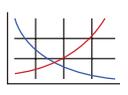
Diameter Range: 1.260" - 2.677" (32.00 mm - 68.00 mm)

	Boring Head	Boring Range	Kit Components			Kit No.
			Serrated Tool Body	Insert Holders	Service Keys	
i	504001	1.260 - 1.968	501052	502058	115576 (s4)	104063
		1.968 - 2.677	501053	502059	115590 (T8)	
m	501001	32.00 - 50.00	501052	502058	115576 (s4)	103063
		50.00 - 68.00	501053	502059	115590 (T8)	

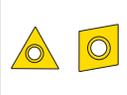
NOTE: Inserts sold separately.



B10-M: 12-19



B10-H



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i = Imperial (in)
m = Metric (mm)

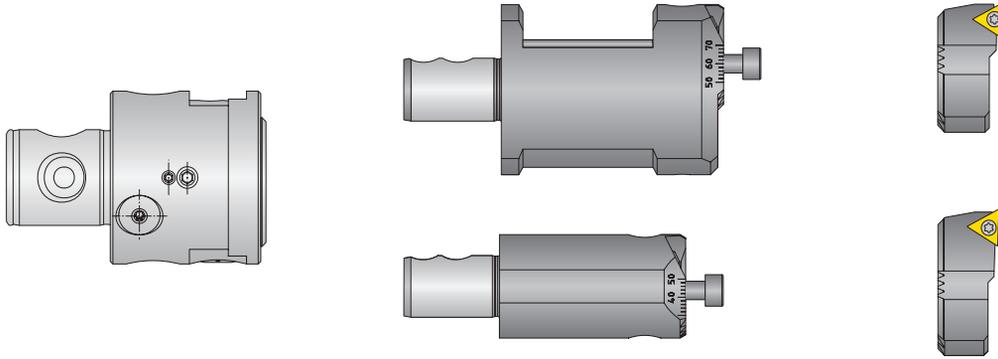
Inserts sold separately

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Kit Components

Insert Form 20 | Diameter Range: 1.260" - 2.677" (32.00 mm - 68.00 mm)



Diameter Range: 1.260" - 2.677" (32.00 mm - 68.00 mm)

		Kit Components				
	Boring Head	Boring Range	Serrated Tool Body	Insert Holders	Service Keys	Kit No.
i	504001	1.260 - 1.968	501052	502060	115576 (s4)	104064
		1.968 - 2.677	501053	502061	115591 (T7)	
m	501001	32.00 - 50.00	501052	502060	115576 (s4)	103064
		50.00 - 68.00	501053	502061	115591 (T7)	

NOTE: Inserts sold separately.

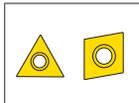
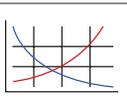


B10-M: 12-19

B10-H

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Key on B10-A: 1



55.52	22.15	40.22	50.28
75.44	12.14	65.36	108.58

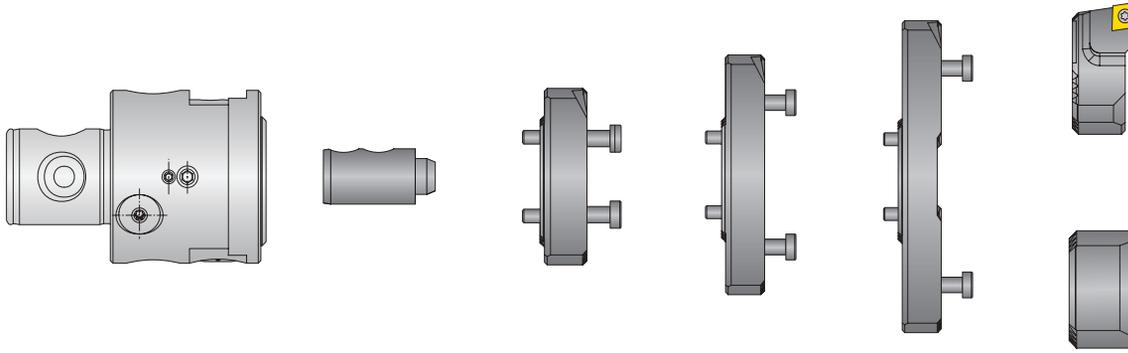
i = Imperial (in)
 m = Metric (mm)

Inserts sold separately

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Kit Components

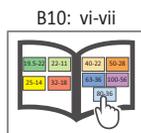
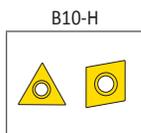
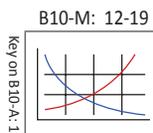
Insert Form 101 | Diameter Range: 2.667" - 5.984" (68.00 mm - 152.00 mm)



Diameter Range: 2.667" - 5.984" (68.00 mm - 152.00 mm)

		Kit Components						
	Boring Head	Boring Range	Serrated Slides	Insert Holder	Counterweight	Coolant Delivery	Service Keys	Kit No.
i	504001	2.667 - 3.780	501054	502064	502165	501157	115576 (s4)	104065
		3.780 - 4.881	501055				115590 (T8)	
		4.881 - 5.984	501056					
m	501001	68.00 - 96.00	501054	502064	502165	501157	115576 (s4)	103065
		96.00 - 124.00	501055				115590 (T8)	
		124.00 - 152.00	501056					

NOTE: Inserts sold separately.



i = Imperial (in)

m = Metric (mm)

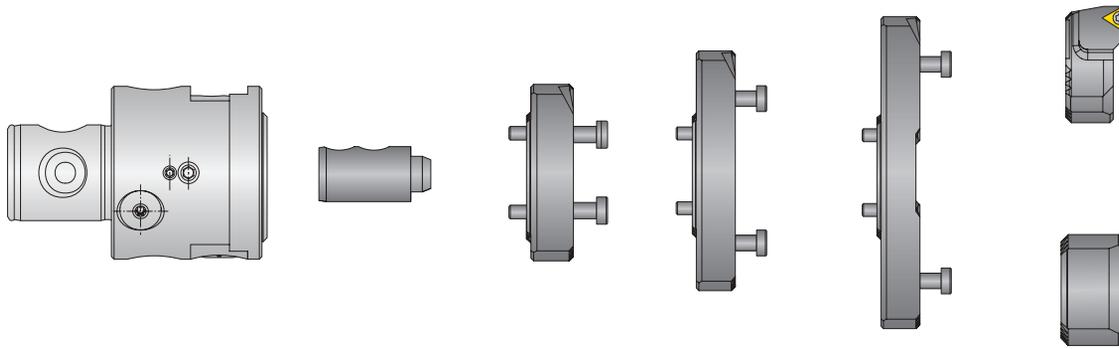
Inserts sold separately

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Kit Components

Insert Form 20 | Diameter Range: 2.667" - 5.984" (68.00 mm - 152.00 mm)



Diameter Range: 2.667" - 5.984" (68.00 mm - 152.00 mm)

		Kit Components						
	Boring Head	Boring Range	Serrated Slides	Insert Holder	Counterweight	Coolant Delivery	Service Keys	Kit No.
i	504001	2.667 - 3.780	501054	502069	502165	501157	115576 (s4)	104066
		3.780 - 4.881	501055				115591 (T7)	
		4.881 - 5.984	501056					
m	501001	68.00 - 96.00	501054	502069	502165	501157	115576 (s4)	103066
		96.00 - 124.00	501055				115591 (T7)	
		124.00 - 152.00	501056					

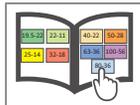
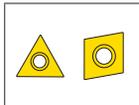
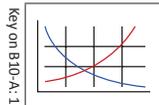
NOTE: Inserts sold separately.



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B10-H

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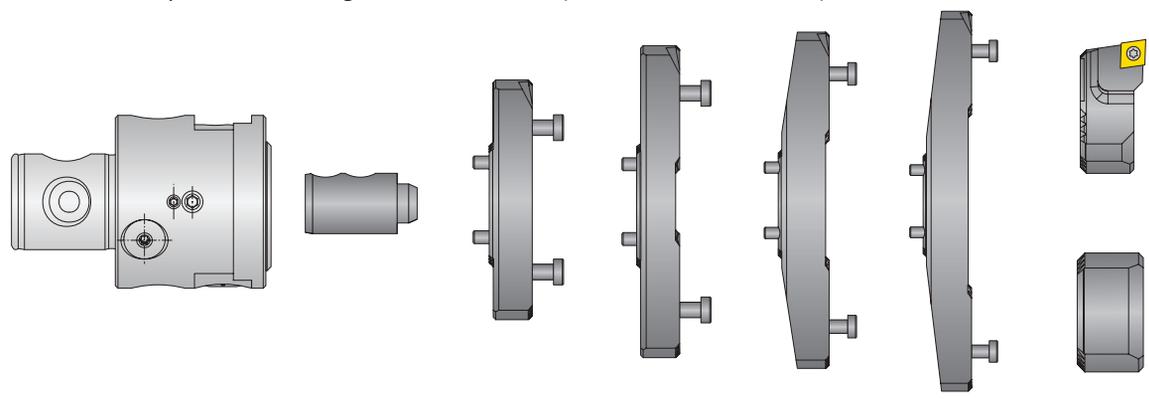
i = Imperial (in)
m = Metric (mm)

Inserts sold separately

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Kit Components

Insert Form 101 | Diameter Range: 3.780" - 8.189" (96.00 mm - 208.00 mm)



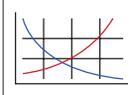
Diameter Range: 3.780" - 8.189" (96.00 mm - 208.00 mm)

		Kit Components						
	Boring Head	Boring Range	Serrated Slides	Insert Holder	Counterweight	Coolant Delivery	Service Keys	Kit No.
i	504001	3.780 - 4.881	501055	502064	502165	501157	115576 (s4) 115590 (T8)	104081
		4.881 - 5.984	501056					
		5.984 - 7.088	501058					
		7.088 - 8.189	501059					
m	501001	96.00 - 124.00	501055	502064	502165	501157	115576 (s4) 115590 (T8)	103081
		124.00 - 152.00	501056					
		152.00 - 180.00	501058					
		180.00 - 208.00	501059					

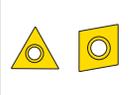
NOTE: Inserts sold separately.



B10-M: 12-19



B10-H



B10: vi-vii



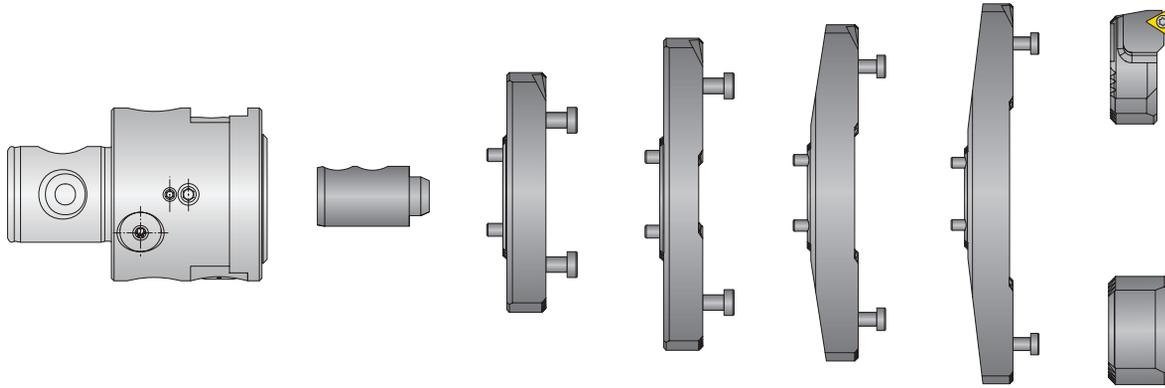
i = Imperial (in)
m = Metric (mm)
Inserts sold separately

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Kit Components

Insert Form 20 | Diameter Range: 3.780" - 8.189" (96.00 mm - 208.00 mm)



Diameter Range: 3.780" - 8.189" (96.00 mm - 208.00 mm)

		Kit Components						
Boring Head		Boring Range	Serrated Slides	Insert Holder	Counterweight	Coolant Delivery	Service Keys	Kit No.
i	504001	3.780 - 4.881	501055	502069	502165	501157	115576 (s4) 115591 (T7)	104080
		4.881 - 5.984	501056					
		5.984 - 7.088	501058					
		7.088 - 8.189	501059					
m	501001	96.00 - 124.00	501055	502069	502165	501157	115576 (s4) 115591 (T7)	103080
		124.00 - 152.00	501056					
		152.00 - 180.00	501058					
		180.00 - 208.00	501059					

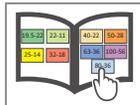
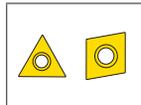
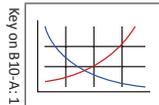
NOTE: Inserts sold separately.



B10-M: 12-19

B10-H

B10: vi-vii



Key on B10-A: 1

i = Imperial (in)
m = Metric (mm)

Inserts sold separately

IMPORTANT: Max spindle speed refers to maximum possible speed for an individual boring head and is not a recommended parameter. Refer to page B10-M: 12 for recommended application-specific parameters. Factory technical assistance is available for your specific applications through our Application Engineering department.
ext: 7611 | email: appeng@alliedmachine.com

SECTION

B10-B

Fine Boring

Wohlhaupter® Fine Boring

420 (410) | 465 (464) | 365 (364) | 565 (564) | 320 (310) | 538 (537)

► **Diameter Range:** 0.787" - 8.071" (20.00 mm - 205.00 mm)



NOTE: Imperial items pictured.

NOTE: 3E^{TECH+} adjustment accuracy of 0.00005" or 0.001 mm on diameter.

NOTE: Internal digital and vernier adjustment accuracy of 0.0001" or 0.002 mm on diameter.

Boring has never been more exciting.

Wohlhaupter's fine boring systems are offered in both vernier and easy-to-read digital readout boring heads and cassettes. The lightweight Alu-Line serrated tool bodies reduce weight on the machine spindle.

Digital 3E^{TECH+} Boring Heads

- 420 (410) / 465 (464) balance fine boring heads
- 420 (410) \varnothing 0.787" - 1.142" (20.00 mm - 29.00 mm)
- 465 (464) \varnothing 1.142" - 8.071" (29.00 mm - 205.00 mm)

Balance Analog Boring Heads

- 365 (364) / 465 (464) fine boring heads
- 365 (364) \varnothing 0.787" - 1.161" (20.00 mm - 29.50 mm)
- 465 (464) \varnothing 1.142" - 8.071" (29.00 mm - 205.00 mm)

Balance Digital Boring Heads

- 565 (564) fine boring heads
- \varnothing 1.969" - 8.071" (50.00 mm - 205.00 mm)

Analog Boring Heads

- 320 (310) fine boring heads
- \varnothing 0.787" - 8.071" (20.00 mm - 205.00 mm)

Analog and Digital Cassettes

- 538 (537) fine boring cassettes
- \varnothing 3.937" - 8.071" (100.00 mm - 205.00 mm)

Applicable Industries



Aerospace



Agriculture



Automotive



Firearms



General
Machining



Oil & Gas



Renewable
Energy

Your safety and the safety of others is very important. This catalog contains important safety messages. Always read and follow all safety precautions.



This triangle is a safety hazard symbol. It alerts you to potential safety hazards that can cause tool failure and serious injury.

When you see this symbol in the catalog, look for a related safety message that may be near this triangle or referred to in the nearby text.

There are safety signal words also used in the catalog. Safety messages follow these words.

WARNING

WARNING (shown above) means that failure to follow the precautions in this message could result in tool failure and serious injury.

NOTICE means that failure to follow the precautions in this message could result in damage to the tool or machine but not result in personal injury.

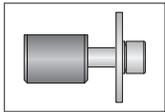
NOTE and **IMPORTANT** are also used. These are important that you read and follow but are not safety-related.

Visit www.alliedmachine.com for the most up-to-date information and procedures.

Fine Boring Table of Contents

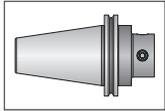
Reference Icons

The following icons will appear throughout the catalog to help you navigate between products.



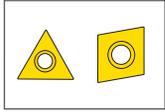
Clamping Elements

For use with insert holders and boring heads



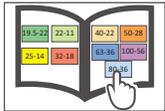
Shanks

A variety of shanks for different machines



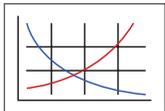
Inserts

For use with insert holder boring heads and boring bars using indexable inserts



MVS Connection Color Guide

Detailed instructions and information regarding the MVS connection(s)



Recommended Cutting Data

Speed and feed recommendations for optimum and safe boring



Coolant-Through Option

Indicates that the product is coolant through

420 (410) Digital 3E^{TECH+} / 465 (464) Balance Digital 3E^{TECH+}	
Product Overview	2 - 3
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465 (464) Boring Heads	5 - 7
Insert Holders	8
Accessories	9

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365 (364) / 465 (464) Boring Heads	12
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538 (537) Cassettes	
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538 (537) 3E ^{TECH+} Digital Cassettes	31
Serrated Tool Bodies Insert Holders	32
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Series	Diameter Range	
	Imperial (inch)	Metric (mm)
420 (410)	0.787 - 1.142	20.00 - 29.00
465 (464)	1.142 - 8.071	29.00 - 205.00
365 (364)	0.787 - 1.161	20.00 - 29.50
565 (564)	1.969 - 8.071	50.00 - 205.00
320 (310)	0.787 - 8.071	20.00 - 205.00
538 (537)	3.937 - 8.071	100.00 - 205.00

420 (410) and 465 (464) Balance Product Overview

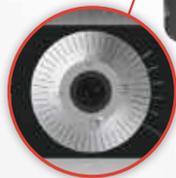
420 (410) and 465 (464) Digital 3E^{TECH+} FINE BORING

Make easy diameter adjustments with our 3E^{TECH+} digital readout module.

Wohlhaupter® 420 (410) and 465 (464) balance digital boring heads are equipped with a 3E^{TECH+} docking port for easy digital adjustments. Boring heads from 1.142" (29.00 mm) and up offer precision boring with automatic balancing. Our boring heads are specifically engineered to minimize the residual imbalance produced by insert holder displacement. Wohlhaupter Alu-Line boring heads, ranging from 2.559" (65.00 mm) and up, offer a lightweight aluminum design with a wear-resistant coating that reduces weight on the spindle up to 50%. The insert holder can also be rotated for reverse machining jobs.

- 420 (410) diameter range: 0.787" - 1.142" (20.00 mm - 29.00 mm).
- 465 (464) balance diameter range: 1.142" - 8.071" (29.00 mm - 205.00 mm).
- 465 (464) balance Alu-Line diameter range: 2.559" - 8.071" (65.00 mm - 205.00 mm).
 - Special coating on Alu-Line for wear-resistant surface.
 - Alu-Line body reduces tool weight by 50%, reducing stress on the spindle.
- Coolant through.
- 3E^{TECH+} diameter adjustment of 0.0001" (0.001 mm).
- Vernier diameter adjustment of 0.0001" (0.002 mm).
- Internal balancing improves tool life and surface finish.
- Insert holder can be rotated for back boring jobs.
- Max cutting speed: 5,577 SFM (1,700 m/min).

Highly accurate
adjustments through
vernier
scale



NOTE: 3E^{TECH+} adjustment accuracy of 0.00005" or 0.001 mm on diameter.
NOTE: Vernier adjustment accuracy of 0.0001" or 0.002 mm on diameter.

Versatile 3E^{TECH+} digital readout compatible with other boring tools



IMPORTANT: Max spindle speed refers to maximum possible speed for an individual boring head and is not a recommended parameter. Refer to page B10-M: 12 for recommended application-specific parameters. Factory technical assistance is available for your specific applications through our Application Engineering department.
ext: 7611 | email: appeng@alliedmachine.com

WOHLHAUPTER® 420 (410) and 465 (464) 3E^{TECH+} DIGITAL BORING HEADS

Wohlhaupter 3E^{TECH+}

Improve productivity and quality with the Wohlhaupter 3E^{TECH+} external digital readout module. The 3E^{TECH+} docks onto boring heads and cassettes that offer the 3E^{TECH+} port to make easy diameter adjustments at the machine.

- Make quick and easy micron-accurate diameter adjustments.
- Backlit OLED digital display shows exact diameter adjustments.
- 3E^{TECH+} screen will auto-rotate to match orientation of the display module.
- Toggle between imperial and metric to accommodate all applications.
- 3E^{TECH+} adjustments of 0.0001" (0.001 mm) on diameter.
- Designed to be removed from boring tool before operation (if forgotten 3E^{TECH+} module will fall off at 500 RPM).
- Water and dust resistant IP 56.
- Coolant and chip resistant.
- 3E^{TECH+} will automatically turn off after 30 seconds of not using.
- Adjustment setting is saved directly in the respective tool, even if the digital display is removed.
- WEEE-Reg.-Nr. DE 15820388.

- ✓ High-production fine boring
- ✓ Easy diameter adjustment with 3E^{TECH+}
- ✓ Self-balancing 465 (464) boring heads
- ✓ Imperial and metric

420 (410) and 465 (464) BORING HEADS WITH 3E ^{TECH+}		
	Diameter Range	Part No.
i	0.787 - 0.965	420001
	0.965 - 1.142	420002
	1.142 - 1.496	465003
	1.496 - 1.969	465004
	1.969 - 2.579	465005
	2.559 - 3.268	465006
	3.228 - 4.055	465007
	3.937 - 5.118	465008
	4.921 - 6.594	465009
	6.398 - 8.071	465010
m	20.00 - 24.50	410001
	24.50 - 29.00	410002
	29.00 - 38.00	464003
	38.00 - 50.00	464004
	50.00 - 65.50	464005
	65.00 - 83.00	464006
	82.00 - 103.00	464007
	100.00 - 130.00	464008
	125.00 - 167.50	464009
	162.50 - 205.00	464010



NOTE: 3E^{TECH+} adjustment accuracy of 0.00005" or 0.001 mm on diameter.
NOTE: Vernier adjustment accuracy of 0.0001" or 0.002 mm on diameter.

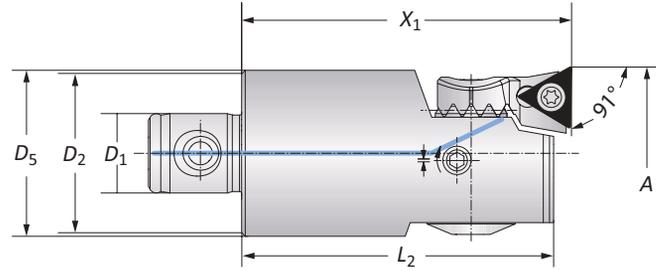
IMPORTANT: Max spindle speed refers to maximum possible speed for an individual boring head and is not a recommended parameter. Refer to page B10-M: 12 for recommended application-specific parameters. Factory technical assistance is available for your specific applications through our Application Engineering department.
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420 (410) Digital 3E^{TECH+} Boring Heads

Diameter Range: 0.787" - 1.142" (20.00 mm - 29.00 mm)



Form 101



Form 20

NOTE: Vernier adjustment accuracy of 0.0001" or 0.002 mm on diameter.

420 Digital 3E^{TECH+} Boring Heads

	MVS Connection	Boring Range	Boring Head			Weight	Insert Form	Part No.	
	D ₂ D ₁		A	X ₁	L ₂			D ₅	Insert Holder
i	19 - 11	0.787 - 0.965	1.811	1.693	–	0.198 (lbs)	20*	364077	420001
	22 - 11	0.965 - 1.142	1.811	1.713	0.906	0.286 (lbs)	20	210059	420002
	22 - 11	0.965 - 1.142	1.811	1.713	0.906	0.286 (lbs)	101	210069	420002

*Not suitable for indexable inserts with a radius of 0.031" (0.80 mm).

NOTE: 3E^{TECH+} module, charging unit, insert holders, and inserts sold separately.

410 Digital 3E^{TECH+} Boring Heads

	MVS Connection	Boring Range	Boring Head			Weight	Insert Form	Part No.	
	D ₂ D ₁		A	X ₁	L ₂			D ₅	Insert Holder
m	19 - 11	20.00 - 24.50	46.00	43.00	–	0.09 (kg)	20*	364077	410001
	22 - 11	24.50 - 29.00	46.00	43.50	23.00	0.13 (kg)	20	210059	410002
	22 - 11	24.50 - 29.00	46.00	43.50	23.00	0.13 (kg)	101	210069	410002

*Not suitable for indexable inserts with a radius of 0.031" (0.80 mm).

NOTE: 3E^{TECH+} module, charging unit, insert holders, and inserts sold separately.

3E^{TECH+} Digital Readout Module

Part No.	Charging Unit*
536015	536016

NOTE: WEEE-Reg.-Nr. DE 15820388

*Charging unit sold separately.



NOTE: 3E^{TECH+} adjustment accuracy of 0.00005" or 0.001 mm on diameter.

Key on B10-B: 1

B10-M: 12-19

B10-F

B10-H

B10: vi-vii

i = Imperial (in)
m = Metric (mm)

Inserts sold separately

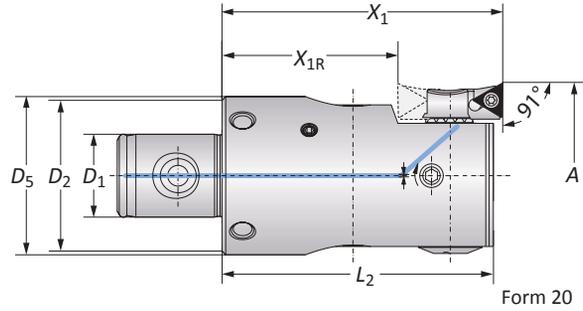
IMPORTANT: Max spindle speed refers to maximum possible speed for an individual boring head and is not a recommended parameter. Refer to page B10-M: 12 for recommended application-specific parameters. Factory technical assistance is available for your specific applications through our Application Engineering department.
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465 (464) Balance Digital 3E^{TECH+} Boring Heads

Diameter Range: 1.142" - 2.579" (29.00 mm - 65.50 mm)



Form 101



Form 20

NOTE: Vernier adjustment accuracy of 0.0001" or 0.002 mm on diameter.

465 Balance Digital 3E^{TECH+} Boring Heads

	MVS Connection		Boring Range				Boring Head		Part No.	
	D ₂ D ₁	A	X ₁	X _{1R}	L ₂	D ₅	Weight	Insert Form	Insert Holder	Boring Head
i	25 - 14	1.142 - 1.496	2.205	-	2.106	1.063	0.463 (lbs)	20	210059	465003
	25 - 14	1.142 - 1.496	2.205	-	2.106	1.063	0.463 (lbs)	101	210069	465003
	32 - 18	1.496 - 1.969	2.598	1.496	2.500	1.339	0.904 (lbs)	20	264051	465004
	32 - 18	1.496 - 1.969	2.598	1.496	2.500	1.339	0.904 (lbs)	101	264077	465004
	40 - 22	1.969 - 2.579	2.953	1.850	2.854	1.654	1.764 (lbs)	20	210052	465005
	40 - 22	1.969 - 2.579	2.953	1.850	2.854	1.654	1.764 (lbs)	101	210062	465005

NOTE: X_{1R} = rotated insert holder for reverse machining.

NOTE: 3E^{TECH+} module, charging unit, insert holders, and inserts sold separately.

464 Balance Digital 3E^{TECH+} Boring Heads

	MVS Connection		Boring Range				Boring Head		Part No.	
	D ₂ D ₁	A	X ₁	X _{1R}	L ₂	D ₅	Weight	Insert Form	Insert Holder	Boring Head
m	25 - 14	29.00 - 38.00	56.00	-	53.50	27.00	0.21 (kg)	20	210059	464003
	25 - 14	29.00 - 38.00	56.00	-	53.50	27.00	0.21 (kg)	101	210069	464003
	32 - 18	38.00 - 50.00	66.00	38.00	63.50	34.00	0.41 (kg)	20	264051	464004
	32 - 18	38.00 - 50.00	66.00	38.00	63.50	34.00	0.41 (kg)	101	264077	464004
	40 - 22	50.00 - 65.50	75.00	47.00	72.50	42.00	0.80 (kg)	20	210052	464005
	40 - 22	50.00 - 65.50	75.00	47.00	72.50	42.00	0.80 (kg)	101	210062	464005

NOTE: X_{1R} = rotated insert holder for reverse machining.

NOTE: 3E^{TECH+} module, charging unit, insert holders, and inserts sold separately.

3E^{TECH+} Digital Readout Module

Part No.	Charging Unit*
536015	536016

NOTE: WEEE-Reg.-Nr. DE 15820388

*Charging unit sold separately.



NOTE: 3E^{TECH+} adjustment accuracy of 0.00005" or 0.001 mm on diameter.

Key on B10-B: I

B10-M: 12-19

B10-F

B10-H

B10: vi-vii

i = Imperial (in)

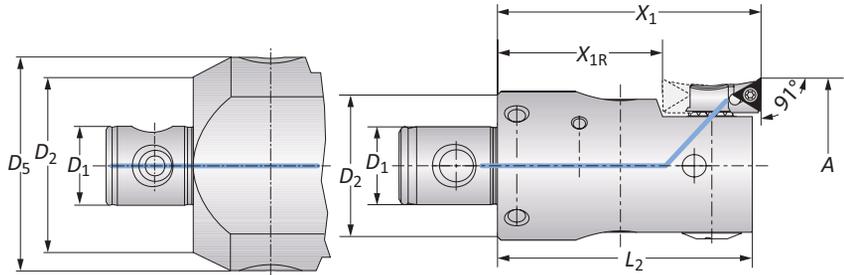
m = Metric (mm)

Inserts sold separately

IMPORTANT: Max spindle speed refers to maximum possible speed for an individual boring head and is not a recommended parameter. Refer to page B10-M: 12 for recommended application-specific parameters. Factory technical assistance is available for your specific applications through our Application Engineering department.
ext: 7611 | email: appeng@alliedmachine.com

465 Balance Digital 3E^{TECH+} Boring Heads

Imperial | Alu-Line | Diameter Range: 2.559" - 8.071"



NOTE: Vernier adjustment accuracy of 0.0001" or 0.002 mm on diameter.

Form 101

Form 20

465 Balance Digital 3E^{TECH+} Alu-Line Boring Heads

MVS Connection	Boring Range	Boring Head					Weight	Insert Form	Part No.	
		$D_2 D_1$	A	X_1	X_{1R}	L_2			D_5	Insert Holder
	50 - 28	2.559 - 3.268	2.953	1.535	2.874	-	1.323 (lbs)	20	210020	465006
	50 - 28	2.559 - 3.268	2.953	1.535	2.874	-	1.323 (lbs)	101	210063	465006
	50 - 28	2.559 - 3.268	2.953	1.535	2.874	-	1.323 (lbs)	103	210064	465006
	63 - 36	3.228 - 4.055	3.543	2.126	3.464	-	2.205 (lbs)	20	210020	465007
	63 - 36	3.228 - 4.055	3.543	2.126	3.464	-	2.205 (lbs)	101	210063	465007
	63 - 36	3.228 - 4.055	3.543	2.126	3.464	-	2.205 (lbs)	103	210064	465007
	80 - 36	3.937 - 5.118	3.543	2.126	3.464	-	3.307 (lbs)	20	210020	465008
i	80 - 36	3.937 - 5.118	3.543	2.126	3.464	-	3.307 (lbs)	101	210063	465008
	80 - 36	3.937 - 5.118	3.543	2.126	3.464	-	3.307 (lbs)	103	210064	465008
	80 - 36	4.921 - 6.594	3.543	2.126	3.464	3.937	3.307 (lbs)	20	210020	465009
	80 - 36	4.921 - 6.594	3.543	2.126	3.464	3.937	4.189 (lbs)	101	210063	465009
	80 - 36	4.921 - 6.594	3.543	2.126	3.464	3.937	4.189 (lbs)	103	210064	465009
	80 - 36	6.398 - 8.071	3.543	2.126	3.464	5.315	4.189 (lbs)	20	210020	465010
	80 - 36	6.398 - 8.071	3.543	2.126	3.464	5.315	4.189 (lbs)	101	210063	465010
	80 - 36	6.398 - 8.071	3.543	2.126	3.464	5.315	5.512 (lbs)	103	210064	465010

NOTE: X_{1R} = rotated insert holder for reverse machining.

NOTE: 3E^{TECH+} module, charging unit, insert holders, and inserts sold separately.

3E^{TECH+} Digital Readout Module

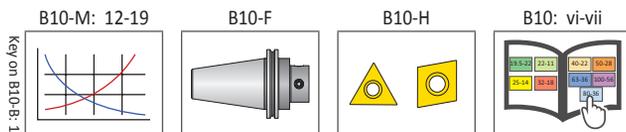
Part No.	Charging Unit*
536015	536016

NOTE: WEEE-Reg.-Nr. DE 15820388

*Charging unit sold separately.



NOTE: 3E^{TECH+} adjustment accuracy of 0.00005" or 0.001 mm on diameter.



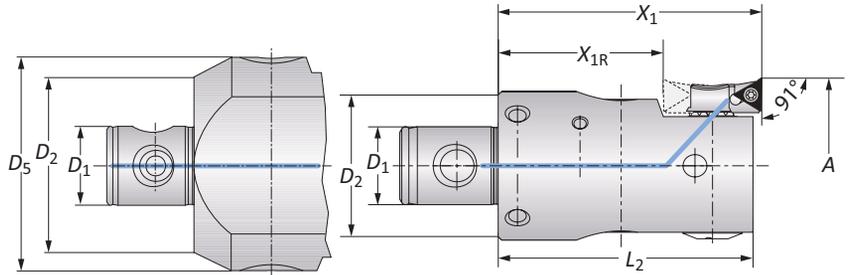
i = Imperial (in)
m = Metric (mm)

Inserts sold separately

IMPORTANT: Max spindle speed refers to maximum possible speed for an individual boring head and is not a recommended parameter. Refer to page B10-M: 12 for recommended application-specific parameters. Factory technical assistance is available for your specific applications through our Application Engineering department.
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464 Balance Digital 3E^{TECH+} Boring Heads

Metric | Alu-Line | Diameter Range: 65.00 mm - 205.00 mm



NOTE: Vernier adjustment accuracy of 0.0001" or 0.002 mm on diameter.

Form 101

Form 20

464 Balance Digital 3E^{TECH+} Alu-Line Boring Heads

MVS Connection	Boring Range	Boring Head					Weight	Insert Form	Part No.	
		D_2 D_1	A	X_1	X_{1R}	L_2			D_5	Insert Holder
m	50 - 28	65.00 - 83.00	75.00	39.00	73.00	-	0.60 (kg)	20	210020	464006
	50 - 28	65.00 - 83.00	75.00	39.00	73.00	-	0.60 (kg)	101	210063	464006
	50 - 28	65.00 - 83.00	75.00	39.00	73.00	-	0.60 (kg)	103	210064	464006
	63 - 36	82.00 - 103.00	90.00	54.00	88.00	-	1.00 (kg)	20	210020	464007
	63 - 36	82.00 - 103.00	90.00	54.00	88.00	-	1.00 (kg)	101	210063	464007
	63 - 36	82.00 - 103.00	90.00	54.00	88.00	-	1.00 (kg)	103	210064	464007
	80 - 36	100.00 - 130.00	90.00	54.00	88.00	-	1.50 (kg)	20	210020	464008
	80 - 36	100.00 - 130.00	90.00	54.00	88.00	-	1.50 (kg)	101	210063	464008
	80 - 36	100.00 - 130.00	90.00	54.00	88.00	-	1.50 (kg)	103	210064	464008
	80 - 36	125.00 - 167.50	90.00	54.00	88.00	100.00	1.90 (kg)	20	210020	464009
	80 - 36	125.00 - 167.50	90.00	54.00	88.00	100.00	1.90 (kg)	101	210063	464009
	80 - 36	125.00 - 167.50	90.00	54.00	88.00	100.00	1.90 (kg)	103	210064	464009
	80 - 36	162.50 - 205.00	90.00	54.00	88.00	135.00	2.50 (kg)	20	210020	464010
	80 - 36	162.50 - 205.00	90.00	54.00	88.00	135.00	2.50 (kg)	101	210063	464010
	80 - 36	162.50 - 205.00	90.00	54.00	88.00	135.00	2.50 (kg)	103	210064	464010

NOTE: X_{1R} = rotated insert holder for reverse machining.

NOTE: 3E^{TECH+} module, charging unit, insert holders, and inserts sold separately.

3E^{TECH+} Digital Readout Module

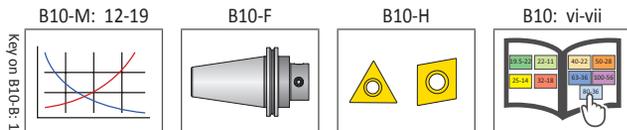
Part No.	Charging Unit*
536015	536016

NOTE: WEEE-Reg.-Nr. DE 15820388

*Charging unit sold separately.



NOTE: 3E^{TECH+} adjustment accuracy of 0.00005" or 0.001 mm on diameter.



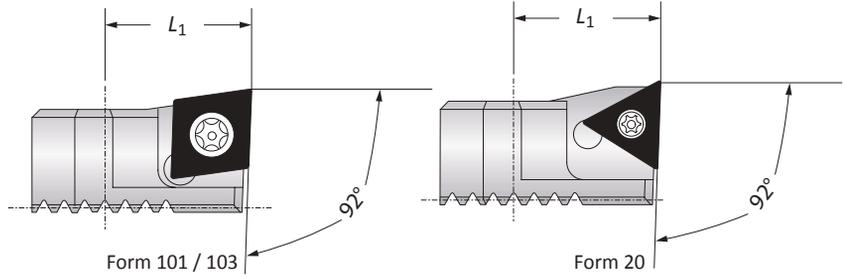
i = Imperial (in)
m = Metric (mm)

Inserts sold separately

IMPORTANT: Max spindle speed refers to maximum possible speed for an individual boring head and is not a recommended parameter. Refer to page B10-M: 12 for recommended application-specific parameters. Factory technical assistance is available for your specific applications through our Application Engineering department.
ext: 7611 | email: appeng@alliedmachine.com

Insert Holders for Abrasive Materials

Diameter Range: 2.559" - 8.071" (65.00 mm - 205.00 mm)

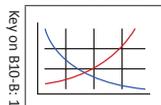


	Boring Range	Insert Holder L_1	Weight	Insert Form	Part No.
i	2.559 - 8.071	0.709	0.066 (lbs)	20	211061
	2.559 - 8.071	0.709	0.066 (lbs)	101	211063
	2.559 - 8.071	0.709	0.066 (lbs)	103	211065
m	65.00 - 205.00	18.00	0.03 (kg)	20	211061
	65.00 - 205.00	18.00	0.03 (kg)	101	211063
	65.00 - 205.00	18.00	0.03 (kg)	103	211065

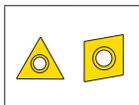
NOTE: Insert holders used for abrasive materials to protect boring head against chip wash.

NOTE: When machining grey cast iron, we recommend using insert holders for abrasive materials with CBN inserts for optimized chip removal.

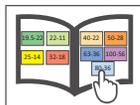
B10-M: 12-19



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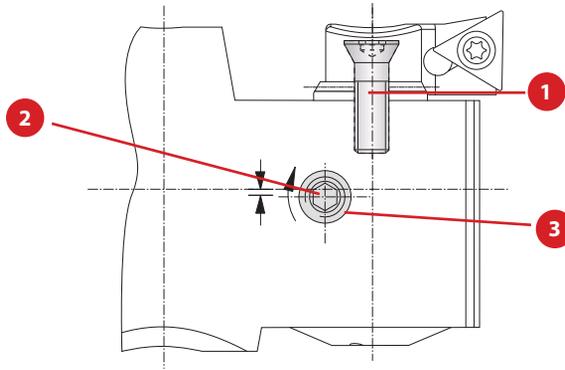
Key on B10-B: 1

i = Imperial (in)
m = Metric (mm)

Inserts sold separately

Accessories

Screws | 3E^{TECH+} Charging Unit



Screws

Boring Head	Part No.				
	1 Countersunk Screw	Countersunk Screw Service Key	2 Clamping Screw	Clamping Screw Service Key	3 Ball
420001 (410001)	215323	T15 / H	410151	S2 / A	364270
420002 (410002)	215338	T15 / H	410152	s2 / A	364270
465003 (464003)	215338	T15 / H	364138	s2.5 / A	364139
465004 (464004)	215338	T15 / H	115180	s2.5 / A	-
465005 (464005)	215338	T15 / H	115505	s3 / B	-
465006 (464006)	215462	T20 / H	315943	s4 / B	-
465007 (464007)	215462	T20 / H	515178	s4 / B	-
465008 (464008)	215462	T20 / H	515178	s4 / B	-
465009 (464009)	215462	T20 / H	515178	s4 / B	-
465010 (464010)	215462	T20 / H	515178	s4 / B	-

3E^{TECH+} Accessories

1 Charging Unit
Part No.
536016

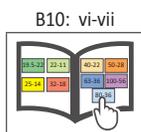
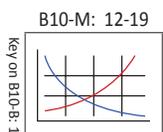
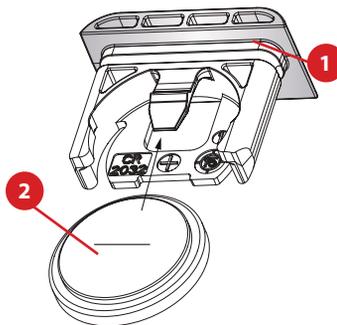
NOTE: Charging unit sold separately from 3E^{TECH+}.



3E^{TECH} (Old Display) Accessories

1 Sealing Ring	2 Battery CR2032
Part No.	Part No.
215483	515491

NOTE: Not required for 3E^{TECH+} (new display).



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365 (364) Balance and 465 (464) Balance Product Overview

Analog 365 (364) Balance and 465 (464) Balance **FINE BORING**

Analog fine boring tools for high-production jobs

Wohlhaupter® 365 (364) balance and 465 (464) balance analog boring heads offer precision boring with automatic balancing. Our boring heads are specifically engineered to minimize the residual imbalance produced by insert holder displacement. Wohlhaupter Alu-Line boring heads offer a lightweight aluminum design with a wear-resistant coating that reduces weight on the spindle up to 50% yet remains durable in challenging boring applications. The insert holder can also be rotated for reverse machining jobs.

- 365 (364) balance diameter range: 0.787" - 1.161" (20.00 mm - 29.50 mm).
- 465 (464) balance diameter range: 1.142" - 8.071" (29.00 mm - 205.00 mm).
- 465 (464) balance Alu-Line diameter range: 2.559" - 8.071" (65.00 mm - 205.00 mm).
 - Special coating on Alu-Line for wear-resistant surface.
 - Alu-Line body reduces tool weight by 50%, reducing stress on the spindle.
- Internal balancing improves tool life and surface finish.
- Coolant through.
- Vernier diameter adjustment of 0.0001" (0.002 mm).
- Insert holder can be rotated for back boring jobs.
- Max cutting speed: 3,281 SFM (1,000 m/min).



IMPORTANT: Max spindle speed refers to maximum possible speed for an individual boring head and is not a recommended parameter. Refer to page B10-M: 12 for recommended application-specific parameters. Factory technical assistance is available for your specific applications through our Application Engineering department.
ext: 7611 | email: appeng@alliedmachine.com

WOHLHAUPTER® ANALOG 465 (464) BALANCE **BORING HEADS**

ANALOG BORING HEAD PART NUMBER CONVERSION			
Diameter Range	Old Part No.	<i>UPDATED</i> Part No.	
i	0.787 - 0.965	365030	<i>No Change</i>
	0.965 - 1.161	365031	<i>No Change</i>
	1.142 - 1.516	365032	465033
	1.496 - 1.988	365033	465034
	1.969 - 2.579	365034	465035
	2.559 - 3.268	365045	465036
	3.228 - 4.055	365046	465037
	3.937 - 5.118	365047	465038
	4.921 - 6.594	365048	465039
6.398 - 8.071	365049	465040	
m	20.00 - 24.50	364030	<i>No Change</i>
	24.50 - 29.50	364031	<i>No Change</i>
	29.00 - 38.00	364032	464033
	38.00 - 50.00	364033	464034
	50.00 - 65.50	364034	464035
	65.00 - 83.00	364045	464036
	82.00 - 103.00	364046	464037
	100.00 - 130.00	364047	464038
	125.00 - 167.50	364048	464039
162.50 - 205.00	364049	464040	

✓ High-production fine boring

✓ Easy diameter adjustment

✓ Self-balancing

✓ Imperial and metric

FEATURES AN **ENHANCED** CLAMPING MECHANISM
FROM OUR TRUSTED LINE OF 565 (564) BALANCE
DIGITAL FINE BORING HEADS

Aluminum bodies with
wear-resistant coating from
2.559" - 8.071"
(65.00 mm - 205.00 mm)



Highly accurate
adjustments through
vernier scale



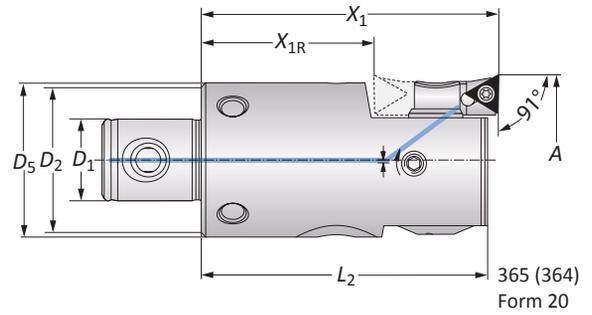
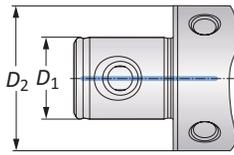
Equipped with
self-balancing mechanism

365 (364) Balance / 465 (464) Balance Analog Boring Heads

Diameter Range: 0.787" - 2.579" (20.00 mm - 65.50 mm)



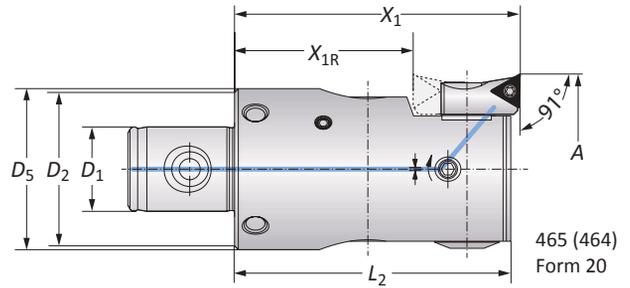
365 (364)
Form 101



365 (364)
Form 20



465 (464)
Form 101



465 (464)
Form 20

365/465 Balance Analog Boring Heads

MVS Connection	Boring Range	Boring Head					Weight	Insert Form	Part No.	
		$D_2 D_1$	A	X_1	X_{1R}	L_2			D_5	Insert Holder
	19 - 11	0.787 - 0.965	1.811	-	1.693	-	0.198 (lbs)	20*	364077	365030
	22 - 11	0.965 - 1.161	1.811	-	1.713	0.906	0.331 (lbs)	20	210059	365031
	22 - 11	0.965 - 1.161	1.811	-	1.713	0.906	0.331 (lbs)	101	210069	365031
	25 - 14	1.142 - 1.516	2.205	-	2.106	1.063	0.441 (lbs)	20	210059	465033
i	25 - 14	1.142 - 1.516	2.205	-	2.106	1.063	0.441 (lbs)	101	210069	465033
	32 - 18	1.496 - 1.988	2.598	1.496	2.450	1.339	0.882 (lbs)	20	264051	465034
	32 - 18	1.496 - 1.988	2.598	1.496	2.450	1.339	0.882 (lbs)	101	264077	465034
	40 - 22	1.969 - 2.579	2.953	1.850	2.854	1.654	1.764 (lbs)	20	210052	465035
	40 - 22	1.969 - 2.579	2.953	1.850	2.854	1.654	1.764 (lbs)	101	210062	465035

*Not suitable for indexable inserts with a radius of 0.031" (0.80 mm).

NOTE: X_{1R} = rotated insert holder for reverse machining.

NOTE: Insert holders and inserts sold separately.

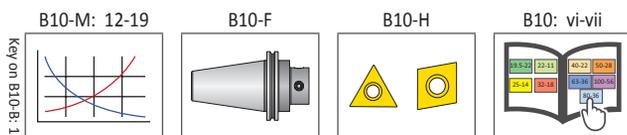
364/464 Balance Analog Boring Heads

MVS Connection	Boring Range	Boring Head					Weight	Insert Form	Part No.	
		$D_2 D_1$	A	X_1	X_{1R}	L_2			D_5	Insert Holder
	19 - 11	20.00 - 24.50	46.00	-	43.00	-	0.09 (kg)	20*	364077	364030
	22 - 11	24.50 - 29.50	46.00	-	43.50	23.00	0.15 (kg)	20	210059	364031
	22 - 11	24.50 - 29.50	46.00	-	43.50	23.00	0.15 (kg)	101	210069	364031
	25 - 14	29.00 - 38.00	56.00	-	53.50	27.00	0.20 (kg)	20	210059	464033
m	25 - 14	29.00 - 38.00	56.00	-	53.50	27.00	0.20 (kg)	101	210069	464033
	32 - 18	38.00 - 50.00	66.00	38.00	63.50	34.00	0.40 (kg)	20	264051	464034
	32 - 18	38.00 - 50.00	66.00	38.00	63.50	34.00	0.40 (kg)	101	264077	464034
	40 - 22	50.00 - 65.50	75.00	47.00	72.50	42.00	0.80 (kg)	20	210052	464035
	40 - 22	50.00 - 65.50	75.00	47.00	72.50	42.00	0.80 (kg)	101	210062	464035

*Not suitable for indexable inserts with a radius of 0.031" (0.80 mm).

NOTE: X_{1R} = rotated insert holder for reverse machining.

NOTE: Insert holders and inserts sold separately.



i = Imperial (in)

m = Metric (mm)

Inserts sold separately

IMPORTANT: Max spindle speed refers to maximum possible speed for an individual boring head and is not a recommended parameter. Refer to page B10-M: 12 for recommended application-specific parameters. Factory technical assistance is available for your specific applications through our Application Engineering department.

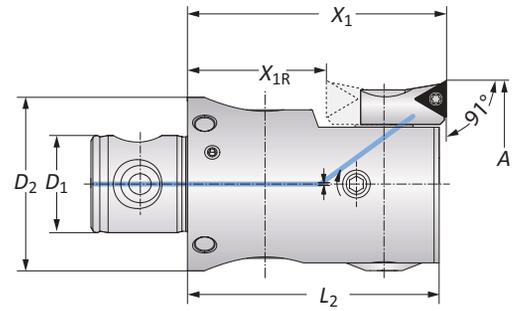
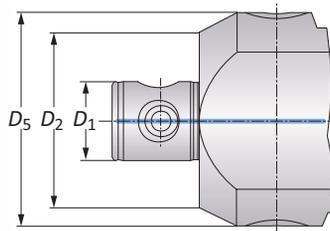
ext: 7611 | email: appeng@alliedmachine.com

465 (464) Balance Analog Boring Heads

Alu-Line | Diameter Range: 2.559" - 8.071" (65.00 mm - 205.00 mm)



Form 101



Form 20

465 Balance Analog Alu-Line Boring Heads

MVS Connection	Boring Range	Boring Head				Weight	Insert Form	Part No.			
		$D_2 D_1$	A	X_1	X_{1R}			L_2	D_5	Insert Holder	Boring Head
i	50 - 28	2.559 - 3.268	2.953	2.953	1.535	2.854	-	1.323 (lbs)	20	210020	465036
	50 - 28	2.559 - 3.268	2.953	2.953	1.535	2.854	-	1.323 (lbs)	101	210063	465036
	50 - 28	2.559 - 3.268	2.953	2.953	1.535	2.854	-	1.323 (lbs)	103	210064	465036
	63 - 36	3.228 - 4.055	3.543	3.543	2.126	3.445	-	2.205 (lbs)	20	210020	465037
	63 - 36	3.228 - 4.055	3.543	3.543	2.126	3.445	-	2.205 (lbs)	101	210063	465037
	63 - 36	3.228 - 4.055	3.543	3.543	2.126	3.445	-	2.205 (lbs)	103	210064	465037
	80 - 36	3.937 - 5.118	3.543	3.543	2.126	3.445	-	3.307 (lbs)	20	210020	465038
	80 - 36	3.937 - 5.118	3.543	3.543	2.126	3.445	-	3.307 (lbs)	101	210063	465038
	80 - 36	3.937 - 5.118	3.543	3.543	2.126	3.445	-	3.307 (lbs)	103	210064	465038
	80 - 36	4.921 - 6.594	3.543	3.543	2.126	3.445	3.937	4.189 (lbs)	20	210020	465039
	80 - 36	4.921 - 6.594	3.543	3.543	2.126	3.445	3.937	4.189 (lbs)	101	210063	465039
	80 - 36	4.921 - 6.594	3.543	3.543	2.126	3.445	3.937	4.189 (lbs)	103	210064	465039
	80 - 36	6.398 - 8.071	3.543	3.543	2.126	3.445	5.315	5.512 (lbs)	20	210020	465040
	80 - 36	6.398 - 8.071	3.543	3.543	2.126	3.445	5.315	5.512 (lbs)	101	210063	465040
	80 - 36	6.398 - 8.071	3.543	3.543	2.126	3.445	5.315	5.512 (lbs)	103	210064	465040

NOTE: X_{1R} = rotated insert holder for reverse machining.

NOTE: Insert holders and inserts sold separately.

464 Balance Analog Alu-Line Boring Heads

MVS Connection	Boring Range	Boring Head				Weight	Insert Form	Part No.			
		$D_2 D_1$	A	X_1	X_{1R}			L_2	D_5	Insert Holder	Boring Head
m	50 - 28	65.00 - 83.00	75.00	75.00	39.00	72.50	-	0.60 (kg)	20	210020	464036
	50 - 28	65.00 - 83.00	75.00	75.00	39.00	72.50	-	0.60 (kg)	101	210063	464036
	50 - 28	65.00 - 83.00	75.00	75.00	39.00	72.50	-	0.60 (kg)	103	210064	464036
	63 - 36	82.00 - 103.00	90.00	90.00	54.00	87.50	-	1.00 (kg)	20	210020	464037
	63 - 36	82.00 - 103.00	90.00	90.00	54.00	87.50	-	1.00 (kg)	101	210063	464037
	63 - 36	82.00 - 103.00	90.00	90.00	54.00	87.50	-	1.00 (kg)	103	210064	464037
	80 - 36	100.00 - 130.00	90.00	90.00	54.00	87.50	-	1.50 (kg)	20	210020	464038
	80 - 36	100.00 - 130.00	90.00	90.00	54.00	87.50	-	1.50 (kg)	101	210063	464038
	80 - 36	100.00 - 130.00	90.00	90.00	54.00	87.50	-	1.50 (kg)	103	210064	464038
	80 - 36	125.00 - 167.50	90.00	90.00	54.00	87.50	100.00	1.90 (kg)	20	210020	464039
	80 - 36	125.00 - 167.50	90.00	90.00	54.00	87.50	100.00	1.90 (kg)	101	210063	464039
	80 - 36	125.00 - 167.50	90.00	90.00	54.00	87.50	100.00	1.90 (kg)	103	210064	464039
	80 - 36	162.50 - 205.00	90.00	90.00	54.00	87.50	135.00	2.50 (kg)	20	210020	464040
	80 - 36	162.50 - 205.00	90.00	90.00	54.00	87.50	135.00	2.50 (kg)	101	210063	464040
	80 - 36	162.50 - 205.00	90.00	90.00	54.00	87.50	135.00	2.50 (kg)	103	210064	464040

NOTE: X_{1R} = rotated insert holder for reverse machining.

NOTE: Insert holders and inserts sold separately.

B10-M: 12-19

B10-F

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Key on B10-B: 1

i = Imperial (in)

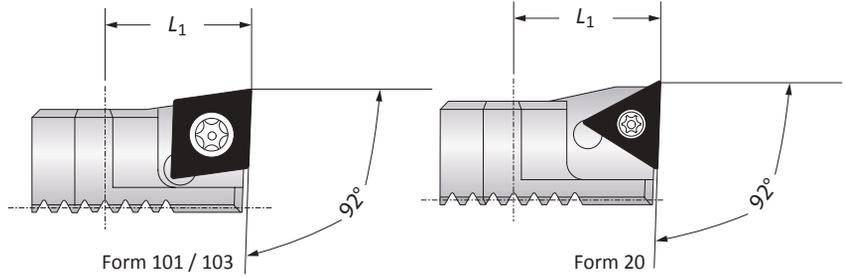
m = Metric (mm)

Inserts sold separately

IMPORTANT: Max spindle speed refers to maximum possible speed for an individual boring head and is not a recommended parameter. Refer to page B10-M: 12 for recommended application-specific parameters. Factory technical assistance is available for your specific applications through our Application Engineering department.
 ext: 7611 | email: appeng@alliedmachine.com

Insert Holders for Abrasive Materials

Diameter Range: 2.559" - 8.071" (65.00 mm - 205.00 mm)

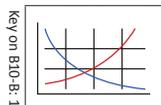


		Insert Holder			
Boring Range		L_1	Weight	Insert Form	Part No.
i	2.559 - 8.071	0.709	0.066 (lbs)	20	211061
	2.559 - 8.071	0.709	0.066 (lbs)	101	211063
	2.559 - 8.071	0.709	0.066 (lbs)	103	211065
m	65.00 - 205.00	18.00	0.03 (kg)	20	211061
	65.00 - 205.00	18.00	0.03 (kg)	101	211063
	65.00 - 205.00	18.00	0.03 (kg)	103	211065

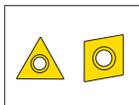
NOTE: Insert holders used for abrasive materials to protect boring head against chip wash.

NOTE: When machining grey cast iron, we recommend using insert holders for abrasive materials with CBN inserts for optimized chip removal.

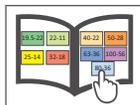
B10-M: 12-19



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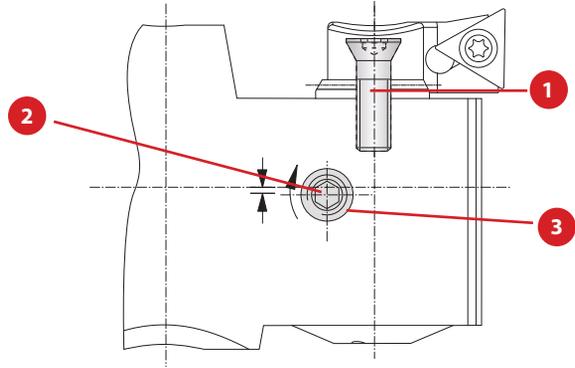


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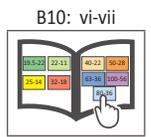
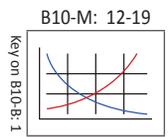
i = Imperial (in)
m = Metric (mm)
Inserts sold separately

Accessories

Screws



Boring Head	Part No.				
	1 Countersunk Screw	Countersunk Screw Service Key	2 Clamping Screw	Clamping Screw Service Key	3 Ball
365030 (364030)	215323	T15 / H	364260	s2 / A	364270
365031 (364031)	215338	T15 / H	364138	s2.5 / A	364139
465033 (464033)	215338	T15 / H	364138	s2.5 / A	364139
465034 (464034)	215338	T15 / H	115180	s2.5 / A	-
465035 (464035)	215338	T15 / H	115505	s3 / B	-
465036 (464036)	215462	T20 / H	315943	s4 / B	-
465037 (464037)	215462	T20 / H	515178	s4 / B	-
465038 (464038)	215462	T20 / H	515178	s4 / B	-
465039 (464039)	215462	T20 / H	515178	s4 / B	-
465040 (464040)	215462	T20 / H	515178	s4 / B	-



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565 (564) Balance Digital Product Overview



565 (564) Balance Digital FINE BORING

Adjustable diameter for precise machining.

Wohlhaupter® digital 565 (564) balance boring heads feature automatic balancing with an easy-to-read digital display. For diameter ranges above 2.559" (65.00 mm), 565 (564) boring heads are made of lightweight aluminum. 565 (564) boring heads are specifically engineered to minimize the residual imbalance produced by insert holder displacement. Reverse boring applications can be achieved by rotating the insert holders.

Test the **engineered lightweight** boring head today.

- Diameter range: 1.969" - 8.071" (50.00 mm - 205.00 mm).
- Alu-Line diameter range: 2.559" - 8.071" (65.00 mm - 205.00 mm).
 - Special coating on Alu-Line for wear-resistant surface.
 - Alu-Line body reduces tool weight by 50%, reducing stress on the spindle.
- Digital readout advantage for diameter adjustments of 0.0001" (0.002 mm).
- Coolant through.
- Internal balancing improves tool life and surface finish.
- Insert holder can be rotated for back boring jobs.
- Max cutting speed: 6,562 SFM (2,000 m/min).
- Max coolant pressure: 580 PSI (40 bar).



Aluminum Boring Head
2.559" - 8.071"
(65.00 mm - 205.00 mm)



Steel Boring Head
1.969" - 2.579"
(50.00 mm - 65.50 mm)

NOTE: Imperial items pictured.

NOTE: Digital adjustment accuracy of 0.0001" or 0.002 mm on diameter.

IMPORTANT: Max spindle speed refers to maximum possible speed for an individual boring head and is not a recommended parameter. Refer to page B10-M: 12 for recommended application-specific parameters. Factory technical assistance is available for your specific applications through our Application Engineering department.
ext: 7611 | email: appeng@alliedmachine.com

565 (564) DIGITAL BORING HEAD

Balance with NOVI^{TECH}[®]

Product:	Wohlhaupter 565 (564) balance digital boring head with NOVI ^{TECH}	Measure	565 (564) Balance Digital Boring Head with NOVI^{TECH}
Objectives:	0.0002" (0.005 mm) concentricity over the length of two bores spaced 14" (355.60 mm) apart	RPM	430 RPM
Material:	Cast iron	Speed	352 SFM (107.28 m/min)
Hole Ø:	3.125" (79.38 mm)	Feed Rate	0.003 IPR (0.08 mm/rev)
Depth:	18.5" (469.9 mm)	Penetration Rate	1.29 IPM (33 mm/min)
Stock Removal:	0.030" (0.80 mm) on diameter		

- ▶ Boring head
565 (564) series
Item No. 565045
- ▶ NOVI^{TECH} vibration dampening intermediate module
Item No. 519005
- ▶ Wohlhaupter boring insert:
Item No. 397239WHC79
(F103 04MN158 WHC79)

The balanced 565 (564) digital boring head with the NOVI^{TECH} vibration damper module provided:

✓ Precision concentricity over 7xD

✓ Eliminated vibration and chatter



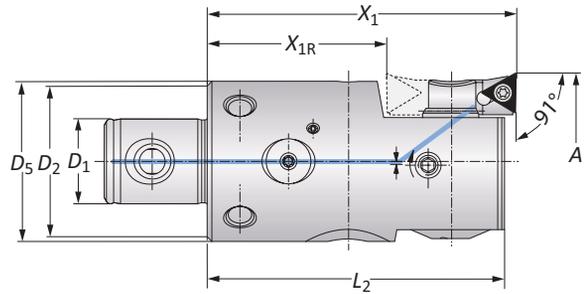
NOTE: Imperial item pictured.
NOTE: Digital adjustment accuracy of 0.0001" or 0.002 mm on diameter.

565 (564) Balance Digital Boring Heads

Diameter Range: 1.969" - 2.579" (50.00 mm - 65.50 mm)



NOTE: Imperial item pictured.
NOTE: Digital adjustment accuracy of 0.0001" or 0.002 mm on diameter.



565 Balance Digital Boring Heads

Form 101

Form 20

	MVS Connection	Boring Range	Boring Head				Weight	Insert Form	Part No.	
	$D_2 D_1$	A	X_1	X_{1R}	L_2	D_5			Insert Holder	Boring Head
i	40 - 22	1.969 - 2.579	2.953	1.850	2.854	1.654	1.764 (lbs)	20	210052	565034
	40 - 22	1.969 - 2.579	2.953	1.850	2.854	1.654	1.764 (lbs)	101	210062	565034

NOTE: X_{1R} = rotated insert holder for reverse machining.

NOTE: Insert holders and inserts sold separately.

564 Balance Digital Boring Heads

	MVS Connection	Boring Range	Boring Head				Weight	Insert Form	Part No.	
	$D_2 D_1$	A	X_1	X_{1R}	L_2	D_5			Insert Holder	Boring Head
m	40 - 22	50.00 - 65.50	75.00	47.00	72.50	42.00	0.80 (kg)	20	210052	564034
	40 - 22	50.00 - 65.50	75.00	47.00	72.50	42.00	0.80 (kg)	101	210062	564034

NOTE: X_{1R} = rotated insert holder for reverse machining.

NOTE: Insert holders and inserts sold separately.

B10-M: 12-19

B10-F

B10-H

B10: vi-vii

Key on B10-B: 1

i = Imperial (in)
m = Metric (mm)

Inserts sold separately

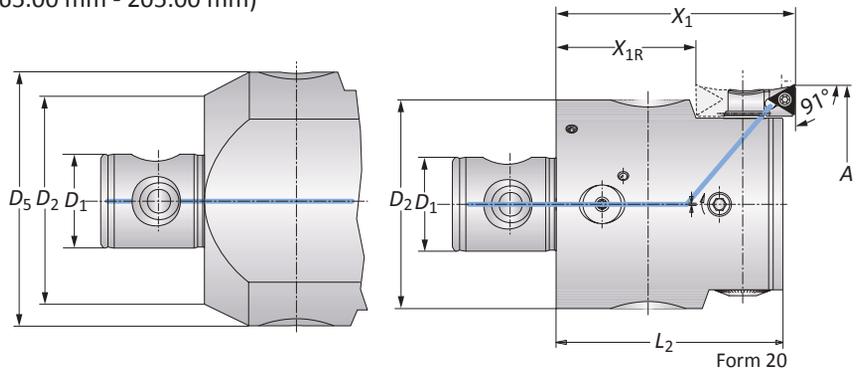
IMPORTANT: Max spindle speed refers to maximum possible speed for an individual boring head and is not a recommended parameter. Refer to page B10-M: 12 for recommended application-specific parameters. Factory technical assistance is available for your specific applications through our Application Engineering department.
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565 (564) Balance Digital Boring Heads

Alu-Line | Diameter Range: 2.559" - 8.070" (65.00 mm - 205.00 mm)



NOTE: Imperial item pictured.
NOTE: Digital adjustment accuracy of 0.0001" or 0.002 mm on diameter.



565 Balance Digital Alu-Line Boring Heads Form 301

MVS Connection	Boring Range	Boring Head				Weight	Insert Form	Part No.		
		$D_2 D_1$	A	X_1	X_{1R}			L_2	D_5	Insert Holder
i	50 - 28	2.559 - 3.268	2.953	1.535	2.874	-	1.323 (lbs)	20	210020	565045
	50 - 28	2.559 - 3.268	2.953	1.535	2.874	-	1.323 (lbs)	101	210063	565045
	50 - 28	2.559 - 3.268	2.953	1.535	2.874	-	1.323 (lbs)	103	210064	565045
	63 - 36	3.228 - 4.055	3.543	2.126	3.464	-	2.205 (lbs)	20	210020	565046
	63 - 36	3.228 - 4.055	3.543	2.126	3.464	-	2.205 (lbs)	101	210063	565046
	63 - 36	3.228 - 4.055	3.543	2.126	3.464	-	2.205 (lbs)	103	210064	565046
	80 - 36	3.937 - 5.118	3.543	2.126	3.464	-	3.307 (lbs)	20	210020	565047
	80 - 36	3.937 - 5.118	3.543	2.126	3.464	-	3.307 (lbs)	101	210063	565047
	80 - 36	3.937 - 5.118	3.543	2.126	3.464	-	3.307 (lbs)	103	210064	565047
	80 - 36	4.921 - 6.594	3.543	2.126	3.464	3.397	3.307 (lbs)	20	210020	565048
	80 - 36	4.921 - 6.594	3.543	2.126	3.464	3.937	4.189 (lbs)	101	210063	565048
	80 - 36	4.921 - 6.594	3.543	2.126	3.464	3.937	4.189 (lbs)	103	210064	565048
	80 - 36	6.398 - 8.071	3.543	2.126	3.464	5.315	4.189 (lbs)	20	210020	565049
	80 - 36	6.398 - 8.071	3.543	2.126	3.464	5.315	4.189 (lbs)	101	210063	565049
	80 - 36	6.398 - 8.071	3.543	2.126	3.464	5.315	5.512 (lbs)	103	210064	565049

NOTE: X_{1R} = rotated insert holder for reverse machining.
NOTE: Insert holders and inserts sold separately.

564 Balance Digital Alu-Line Boring Heads

MVS Connection	Boring Range	Boring Head				Weight	Insert Form	Part No.		
		$D_2 D_1$	A	X_1	X_{1R}			L_2	D_5	Insert Holder
ii	50 - 28	65.00 - 83.00	75.00	39.00	73.00	-	0.60 (kg)	20	210020	564045
	50 - 28	65.00 - 83.00	75.00	39.00	73.00	-	0.60 (kg)	101	210063	564045
	50 - 28	65.00 - 83.00	75.00	39.00	73.00	-	0.60 (kg)	103	210064	564045
	63 - 36	82.00 - 103.00	90.00	54.00	88.00	-	1.00 (kg)	20	210020	564046
	63 - 36	82.00 - 103.00	90.00	54.00	88.00	-	1.00 (kg)	101	210063	564046
	63 - 36	82.00 - 103.00	90.00	54.00	88.00	-	1.00 (kg)	103	210064	564046
	80 - 36	100.00 - 130.00	90.00	54.00	88.00	-	1.50 (kg)	20	210020	564047
	80 - 36	100.00 - 130.00	90.00	54.00	88.00	-	1.50 (kg)	101	210063	564047
	80 - 36	100.00 - 130.00	90.00	54.00	88.00	-	1.50 (kg)	103	210064	564047
	80 - 36	125.00 - 167.50	90.00	54.00	88.00	100.00	1.90 (kg)	20	210020	564048
	80 - 36	125.00 - 167.50	90.00	54.00	88.00	100.00	1.90 (kg)	101	210063	564048
	80 - 36	125.00 - 167.50	90.00	54.00	88.00	100.00	1.90 (kg)	103	210064	564048
	80 - 36	162.50 - 205.00	90.00	54.00	88.00	135.00	2.50 (kg)	20	210020	564049
	80 - 36	162.50 - 205.00	90.00	54.00	88.00	135.00	2.50 (kg)	101	210063	564049
	80 - 36	162.50 - 205.00	90.00	54.00	88.00	135.00	2.50 (kg)	103	210064	564049

NOTE: X_{1R} = rotated insert holder for reverse machining.
NOTE: Insert holders and inserts sold separately.

B10-M: 12-19

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B10-H

B10: vi-vii

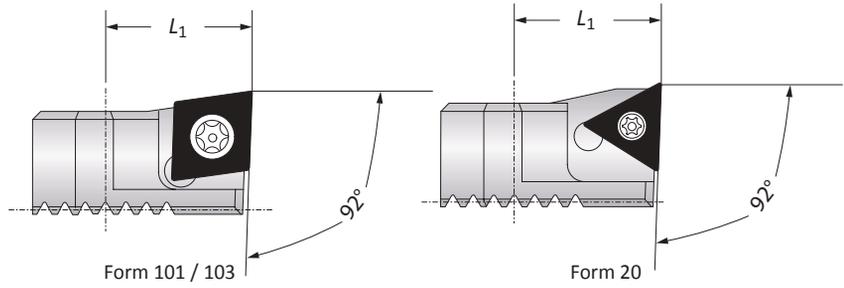
Key on B10-B: I

i = Imperial (in)
 ii = Metric (mm)
 Inserts sold separately

IMPORTANT: Max spindle speed refers to maximum possible speed for an individual boring head and is not a recommended parameter. Refer to page B10-M: 12 for recommended application-specific parameters. Factory technical assistance is available for your specific applications through our Application Engineering department.
 ext: 7611 | email: appeng@alliedmachine.com

Insert Holder for Abrasive Materials

Diameter Range: 2.559" - 8.071" (65.00 mm - 205.00 mm)

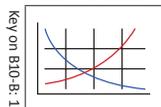


		Insert Holder			
		L_1	Weight	Insert Form	Part No.
i	Boring Range				
	2.559 - 8.071	0.709	0.066 (lbs)	20	211061
	2.559 - 8.071	0.709	0.066 (lbs)	101	211063
	2.559 - 8.071	0.709	0.066 (lbs)	103	211065
m	Boring Range				
	65.00 - 205.00	18.00	0.03 (kg)	20	211061
	65.00 - 205.00	18.00	0.03 (kg)	101	211063
	65.00 - 205.00	18.00	0.03 (kg)	103	211065

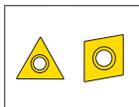
NOTE: Insert holders used for abrasive materials to protect boring head against chip wash.

NOTE: When machining grey cast iron, we recommend using insert holders for abrasive materials with CBN inserts for optimized chip removal.

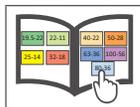
B10-M: 12-19



B10-H



B10: vi-vii

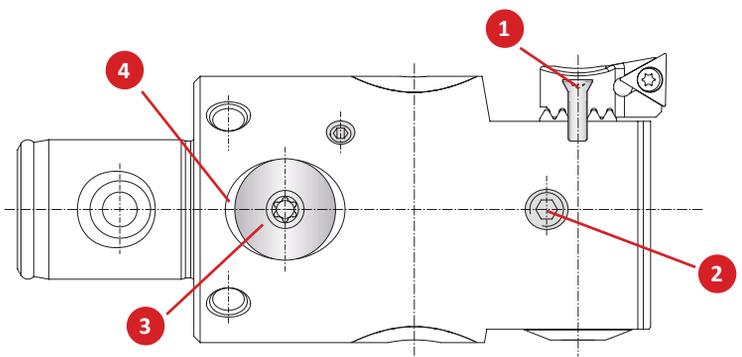


Key on B10-B: 1

i = Imperial (in)
m = Metric (mm)
Inserts sold separately

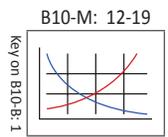
Accessories

Screws | Battery Cover | Batteries



Boring Head	Part No.							
	1 Countersunk Screw	Service Key	2 Clamping Screw	Service Key	3 Battery Cover	Service Key	4 Sealing Ring	Battery*
565034 (564034)	215338	T15 / H	115505	s3 / B	501016	T20 / H	415895	415896
565045 (564045)	215462	T20 / H	315943	s4 / B	501016	T20 / H	415895	415896
565046 (564046)	215462	T20 / H	515178	s4 / B	501016	T20 / H	415895	415896
565047 (564047)	215462	T20 / H	515178	s4 / B	501016	T20 / H	415895	415896
565048 (564048)	215462	T20 / H	515178	s4 / B	501016	T20 / H	415895	415896
565049 (564049)	215462	T20 / H	515178	s4 / B	501016	T20 / H	415895	415896

*Replace both batteries.



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320 (310) Product Overview

320 (310) Analog FINE BORING

Engineered with wear and tear in mind.

320 (310) Wohlhaupter boring heads are made from steel for \varnothing 0.787" - 4.055" (20.00 mm - 103.00 mm) and coated Alu-Line material for \varnothing 3.937" - 8.071" (100.00 mm - 205.00 mm) boring heads to protect against corrosion and wear. The insert holder can be rotated quickly for reverse machining.

- Diameter range: 0.787" - 8.071" (20.00 mm - 205.00 mm).
- Alu-Line diameter range: 3.937" - 8.071" (100.00 mm - 205.00 mm).
 - Special coating on Alu-Line provides hard, durable surface.
 - Alu-Line body reduces tool weight by 50%, reducing stress on the spindle.
- Coolant through.
- Vernier diameter adjustment of 0.0001" (0.002 mm).
- Max cutting speed: 3,281 SFM (1,000 m/min).



IMPORTANT: Max spindle speed refers to maximum possible speed for an individual boring head and is not a recommended parameter. Refer to page B10-M: 12 for recommended application-specific parameters. Factory technical assistance is available for your specific applications through our Application Engineering department.
ext: 7611 | email: appeng@alliedmachine.com

WOHLHAUPTER® 320 BORING HEAD with NOVI^{TECH}

Time is money, so make it count.

If you want to improve your machining processes, cycle time is a key factor to examine. After all, the longer it takes you to produce a part, the fewer parts you can produce in a given time. Our customer was experiencing lengthy cycle times while machining pumps from grey cast iron. The parts required three bored holes, each with a 12" (304.8 mm) depth and a 22" (558.8 mm) reach.

In order to free up machine time, the customer questioned if their process could be more efficient. The main objectives were to decrease the current cycle time and to maintain the required surface finish to perform the burnishing process that followed.

The previous tooling ran at a slow 0.47 IPM (11.938 mm/min) and a paint-drying 84-minute cycle time to bore the three holes on each part. With our **Wohlhaupter 320 boring head** utilizing the **NOVI^{TECH} vibration dampening module**, the customer increased to a more efficient 3.75 IPM (95.25 mm/min) and slashed the cycle time to 10.5 minutes (an 87% decrease). Along with the increased speed, the Wohlhaupter tooling also achieved a 155 Ra finish, accomplishing everything the customer needed.

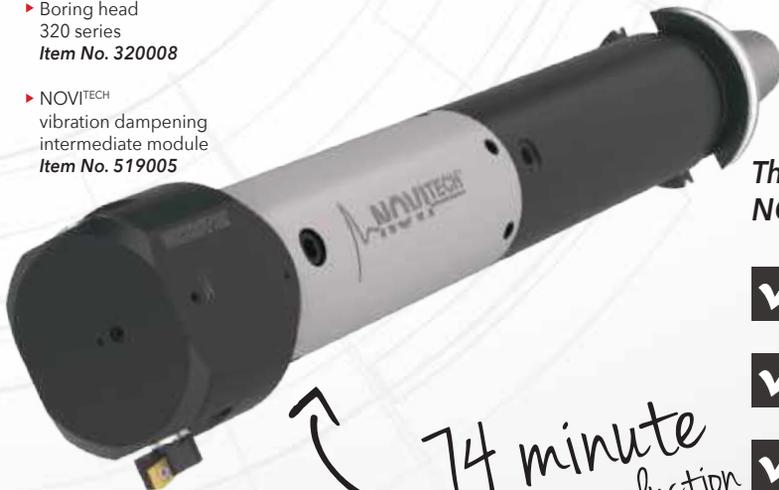
The Wohlhaupter solution reduced the process cycle time by 74 minutes. Improvements in speed and cycle time can free up machine hours, which means more throughput and higher profit for your company. **Are you losing money on applications with substantially long cycle times?**



Product:	Wohlhaupter 320 Boring Head with NOVI ^{TECH}	Measure	Competitor Boring Head	320 Boring Head w/ NOVI ^{TECH}
Objectives:	(1) Decrease cycle time (2) Maintain 160 Ra hole finish	RPM	39	469
Industry:	Oil and gas/petrochemical	Speed Rate	56 SFM (17.069 M/min)	675 SFM (205.74 M/min)
Part:	Pump	Feed Rate	0.012 IPR (0.305 mm/rev)	0.008 IPR (0.203 mm/rev)
Material:	Grey cast iron	Penetration Rate	0.47 IPM (11.938 mm/min)	3.75 IPM (95.25 mm/min)
Hole Ø:	5.500" (139.7 mm)	Cycle Time (per hole)	27 min 54 sec	3 min 32 sec
Hole Depth:	12.000" (304.8 mm)			

▶ Boring head
320 series
Item No. 320008

▶ NOVI^{TECH}
vibration dampening
intermediate module
Item No. 519005

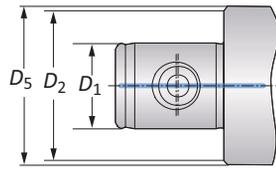


The Wohlhaupter 320 boring head with the NOVI^{TECH} vibration dampening module provided:

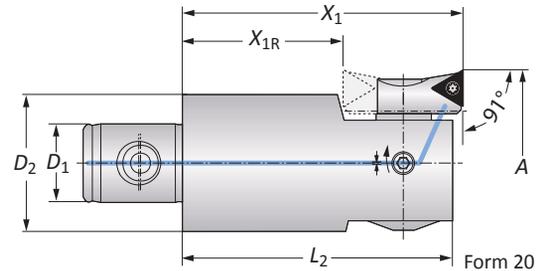
- ✓ Increased penetration rate
- ✓ Decreased cycle time
- ✓ Excellent finish in deep hole application

320 (310) Analog Boring Heads

Diameter Range: 0.787" - 4.055" (20.00 mm - 103.00 mm)



Form 101 / 103



Form 20

320 Analog Boring Heads

MVS Connection	Boring Range	Boring Head				Weight	Insert Form	Part No.	
		$D_2 D_1$	A	X_1	X_{1R}			L_2	D_5
19 - 11	0.787 - 0.965	1.810	-	1.693	-	0.221 (lbs)	20*	364077	320010
22 - 11	0.965 - 1.161	1.810	-	1.713	0.906	0.331 (lbs)	20	210059	320020
22 - 11	0.965 - 1.161	1.810	-	1.713	0.906	0.331 (lbs)	101	210069	320020
25 - 14	1.142 - 1.457	2.200	-	2.106	1.024	0.441 (lbs)	20	210059	320001
25 - 14	1.142 - 1.457	2.200	-	2.106	1.024	0.441 (lbs)	101	210069	320001
25 - 14	1.417 - 1.732	2.200	1.100	2.106	1.024	0.441 (lbs)	20	210052	320001
25 - 14	1.417 - 1.732	2.200	1.100	2.106	1.024	0.441 (lbs)	101	210062	320001
32 - 18	1.693 - 2.126	2.590	1.490	2.500	-	0.882 (lbs)	20	210052	320003
32 - 18	1.693 - 2.126	2.590	1.490	2.500	-	0.882 (lbs)	101	210062	320003
40 - 22	2.087 - 2.598	2.950	1.530	2.854	-	1.543 (lbs)	20	210020	320004
40 - 22	2.087 - 2.598	2.950	1.530	2.854	-	1.543 (lbs)	101	210063	320004
40 - 22	2.087 - 2.598	2.950	1.530	2.854	-	1.543 (lbs)	103	210064	320004
50 - 28	2.559 - 3.268	2.950	1.530	2.854	-	2.646 (lbs)	20	210020	320005
50 - 28	2.559 - 3.268	2.950	1.530	2.854	-	2.646 (lbs)	101	210063	320005
50 - 28	2.559 - 3.268	2.950	1.530	2.854	-	2.646 (lbs)	103	210064	320005
63 - 36	3.228 - 4.055	3.540	2.120	3.445	-	4.850 (lbs)	20	210020	320006
63 - 36	3.228 - 4.055	3.540	2.120	3.445	-	4.850 (lbs)	101	210063	320006
63 - 36	3.228 - 4.055	3.540	2.120	3.445	-	4.850 (lbs)	103	210064	320006

*Not suitable for indexable inserts with a radius of 0.031" (0.80 mm).

NOTE: X_{1R} = rotated insert holder for reverse machining.

NOTE: Insert holders and inserts sold separately.

310 Analog Boring Heads

MVS Connection	Boring Range	Boring Head				Weight	Insert Form	Part No.	
		$D_2 D_1$	A	X_1	X_{1R}			L_2	D_5
19 - 11	20.00 - 24.50	46.00	-	43.00	-	0.10 (kg)	20*	364077	310010
22 - 11	24.50 - 29.50	46.00	-	43.50	23.00	0.15 (kg)	20	210059	310020
22 - 11	24.50 - 29.50	46.00	-	43.50	23.00	0.15 (kg)	101	210069	310020
25 - 14	29.00 - 37.00	56.00	-	53.50	26.00	0.20 (kg)	20	210059	310001
25 - 14	29.00 - 37.00	56.00	-	53.50	26.00	0.20 (kg)	101	210069	310001
25 - 14	36.00 - 44.00	56.00	28.00	53.50	26.00	0.20 (kg)	20	210052	310001
25 - 14	36.00 - 44.00	56.00	28.00	53.50	26.00	0.20 (kg)	101	210062	310001
32 - 18	43.00 - 54.00	66.00	38.00	63.50	-	0.40 (kg)	20	210052	310003
32 - 18	43.00 - 54.00	66.00	38.00	63.50	-	0.40 (kg)	101	210062	310003
40 - 22	53.00 - 66.00	75.00	39.00	72.50	-	0.70 (kg)	20	210020	310004
40 - 22	53.00 - 66.00	75.00	39.00	72.50	-	0.70 (kg)	101	210063	310004
40 - 22	53.00 - 66.00	75.00	39.00	72.50	-	0.70 (kg)	103	210064	310004
50 - 28	65.00 - 83.00	75.00	39.00	72.50	-	1.20 (kg)	20	210020	310005
50 - 28	65.00 - 83.00	75.00	39.00	72.50	-	1.20 (kg)	101	210063	310005
50 - 28	65.00 - 83.00	75.00	39.00	72.50	-	1.20 (kg)	103	210064	310005
63 - 36	82.00 - 103.00	90.00	54.00	87.50	-	2.20 (kg)	20	210020	310006
63 - 36	82.00 - 103.00	90.00	54.00	87.50	-	2.20 (kg)	101	210063	310006
63 - 36	82.00 - 103.00	90.00	54.00	87.50	-	2.20 (kg)	103	210064	310006

*Not suitable for indexable inserts with a radius of 0.031" (0.80 mm).

NOTE: X_{1R} = rotated insert holder for reverse machining.

NOTE: Insert holders and inserts sold separately.

i = Imperial (in)

m = Metric (mm)

Inserts sold separately

IMPORTANT: Max spindle speed refers to maximum possible speed for an individual boring head and is not a recommended parameter. Refer to page B10-M: 12 for recommended application-specific parameters. Factory technical assistance is available for your specific applications through our Application Engineering department.

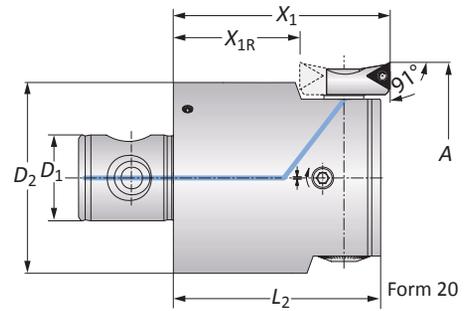
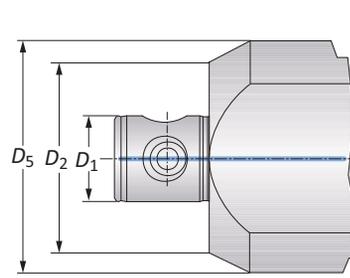
ext: 7611 | email: appeng@alliedmachine.com

320 (310) Boring Heads

Alu-Line | Diameter Range: 3.937" - 8.071" (100.00 mm - 205.00 mm)



Form 101 / 103



Form 20

320 Analog Alu-Line Boring Heads

	MVS Connection	Boring Range	Boring Head				Weight	Insert Form	Part No.	
	D ₂ D ₁	A	X ₁	X _{1R}	L ₂	D ₅			Insert Holder	Boring Head
i	80 - 36	3.937 - 5.118	3.543	2.126	3.445	-	3.086 (lbs)	20	210020	320007
	80 - 36	3.937 - 5.118	3.543	2.126	3.445	-	3.086 (lbs)	101	210063	320007
	80 - 36	3.937 - 5.118	3.543	2.126	3.445	-	3.086 (lbs)	103	210064	320007
	80 - 36	4.921 - 6.594	3.543	2.126	3.445	3.937	3.968 (lbs)	20	210020	320008
	80 - 36	4.921 - 6.594	3.543	2.126	3.445	3.937	3.968 (lbs)	101	210063	320008
	80 - 36	4.921 - 6.594	3.543	2.126	3.445	3.937	3.968 (lbs)	103	210064	320008
	80 - 36	6.397 - 8.071	3.543	2.126	3.445	5.315	5.291 (lbs)	20	210020	320009
	80 - 36	6.397 - 8.071	3.543	2.126	3.445	5.315	5.291 (lbs)	101	210063	320009
	80 - 36	6.397 - 8.071	3.543	2.126	3.445	5.315	5.291 (lbs)	103	210064	320009

NOTE: X_{1R} = rotated insert holder for reverse machining.

NOTE: Insert holders and inserts sold separately.

310 Analog Alu-Line Boring Heads

	MVS Connection	Boring Range	Boring Head				Weight	Insert Form	Part No.	
	D ₂ D ₁	A	X ₁	X _{1R}	L ₂	D ₅			Insert Holder	Boring Head
m	80 - 36	100.00 - 130.00	90.00	54.00	87.50	-	1.40 (kg)	20	210020	310007
	80 - 36	100.00 - 130.00	90.00	54.00	87.50	-	1.40 (kg)	101	210063	310007
	80 - 36	100.00 - 130.00	90.00	54.00	87.50	-	1.40 (kg)	103	210064	310007
	80 - 36	125.00 - 167.50	90.00	54.00	87.50	100.00	1.80 (kg)	20	210020	310008
	80 - 36	125.00 - 167.50	90.00	54.00	87.50	100.00	1.80 (kg)	101	210063	310008
	80 - 36	125.00 - 167.50	90.00	54.00	87.50	100.00	1.80 (kg)	103	210064	310008
	80 - 36	162.50 - 205.00	90.00	54.00	87.50	135.00	2.40 (kg)	20	210020	310009
	80 - 36	162.50 - 205.00	90.00	54.00	87.50	135.00	2.40 (kg)	101	210063	310009
	80 - 36	162.50 - 205.00	90.00	54.00	87.50	135.00	2.40 (kg)	103	210064	310009

NOTE: X_{1R} = rotated insert holder for reverse machining.

NOTE: Insert holders and inserts sold separately.

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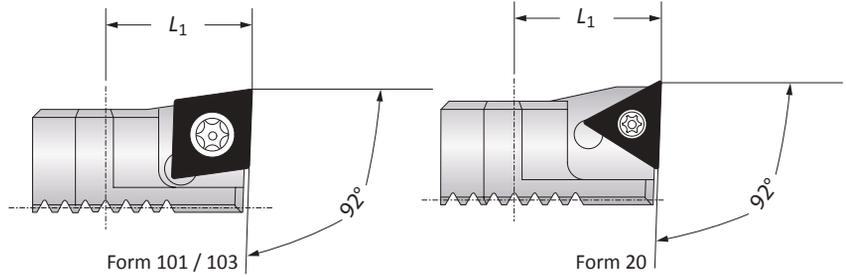
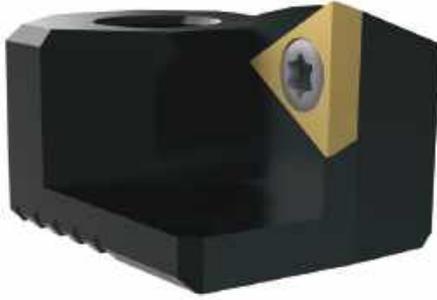
i = Imperial (in)
m = Metric (mm)

Inserts sold separately

IMPORTANT: Max spindle speed refers to maximum possible speed for an individual boring head and is not a recommended parameter. Refer to page B10-M: 12 for recommended application-specific parameters. Factory technical assistance is available for your specific applications through our Application Engineering department.
ext: 7611 | email: appeng@alliedmachine.com

Insert Holders for Abrasive Materials | Serrated Shims

Diameter Range: 2.087" - 8.071" (53.00 mm - 205.00 mm)

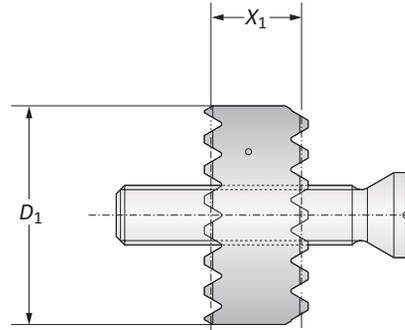


Insert Holders

Boring Range		Insert Holder	Weight	Insert Form	Part No.
		L_1			
i	2.087 - 8.071	0.709	0.066 (lbs)	20	211061
	2.087 - 8.071	0.709	0.066 (lbs)	101	211063
	2.087 - 8.071	0.709	0.066 (lbs)	103	211065
m	53.00 - 205.00	18.00	0.03 (kg)	20	211061
	53.00 - 205.00	18.00	0.03 (kg)	101	211063
	53.00 - 205.00	18.00	0.03 (kg)	103	211065

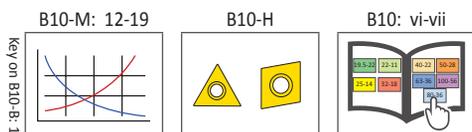
NOTE: Insert holders used for abrasive materials to protect boring head against chip wash.

NOTE: When machining grey cast iron, we recommend using insert holders for abrasive materials with CBN inserts for optimized chip removal.



Serrated Shims

	Boring Range	Additional Boring Range	Serrated Shim		Weight	Part No.	
			X_1	D_1		Serrated Shim and Screw	Replacement Screw
i	1.141 - 2.126	0.315	0.157	0.472	0.022 (lbs)	310070	415360
	1.141 - 2.126	0.472	0.236	0.472	0.022 (lbs)	310071	415342
	2.087 - 8.071	0.394	0.196	0.708	0.022 (lbs)	310074	515595
	2.087 - 8.071	0.590	0.295	0.708	0.022 (lbs)	310075	515596
m	29.00 - 54.00	8.00	4.00	12.00	0.01 (kg)	310070	415360
	29.00 - 54.00	12.00	6.00	12.00	0.01 (kg)	310071	415342
	53.00 - 205.00	10.00	5.00	18.00	0.01 (kg)	310074	515595
	53.00 - 205.00	15.00	7.50	18.00	0.01 (kg)	310075	515596

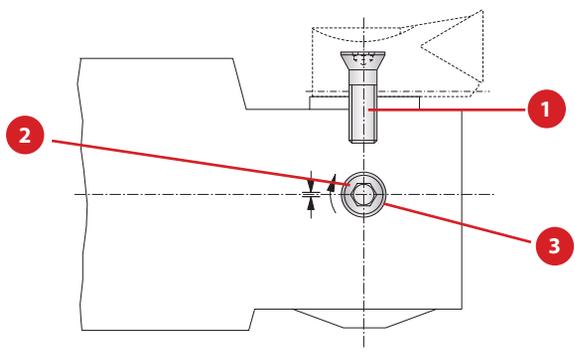


Key on B10-B: 1

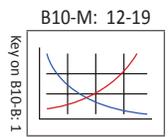
i = Imperial (in)
m = Metric (mm)
Inserts sold separately

Accessories

Screws



Boring Head	1 Countersunk Screw		2 Clamping Screw		3 Ball
	Part No.	Service Key	Part No.	Service Key	Part No.
320010 (310010)	215323	T15 / H	364260	s2.0 / A	364270
320020 (310020)	215338	T15 / H	364138	s2.5 / A	364139
320001 (310001)	215338	T15 / H	115136	s2.5 / A	-
320003 (310003)	215338	T15 / H	115180	s2.5 / A	-
320004 (310004)	215462	T20 / H	115249	s4 / B	-
320005 (310005)	215462	T20 / H	115185	s4 / B	-
320006 (310006)	215462	T20 / H	315279	s4 / B	-
320007 (310007)	215462	T20 / H	115186	s4 / B	-
320008 (310008)	215462	T20 / H	115186	s4 / B	-
320009 (310009)	215462	T20 / H	115186	s4 / B	-



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538 (537) Product Overview



538 (537) Cassettes FINE BORING

Engineered for easy precision.

538 (537) fine boring cassettes offer high accuracy and are available in an easy-to-use digital or analog version. The digital version features a docking port to attach the 3E^{TECH+} digital readout module for μ -accurate diameter adjustments while the analog cassettes provide highly accurate adjustments through the vernier scale. 538 (537) cassettes are made of hardened steel and can be used on serrated tool bodies and slides from 3.937" - 128.150" (100.00 mm - 3255.00 mm). The insert holder can be rotated easily for reverse machining applications.

Experience **digital precision boring** for yourself.

- Diameter range: 3.937" - 8.071" (100.00 mm - 205.00 mm).
- Cassette can be used on large diameter serrated slides (pg. B10-G: 10 - 11): 7.874" - 128.150" (200.00 mm - 3255.00 mm).
- Coolant through.
- 3E^{TECH+} module provides a simple digital readout.
- Analog version with a vernier scale.
- Max cutting speed: 2,953 SFM (900 m/min).



NOTE: 3E^{TECH+} adjustment accuracy of 0.00005" or 0.001 mm on diameter.

NOTE: Vernier adjustment accuracy of 0.0001" or 0.002 mm on diameter.

IMPORTANT: Max spindle speed refers to maximum possible speed for an individual boring head and is not a recommended parameter. Refer to page B10-M: 12 for recommended application-specific parameters. Factory technical assistance is available for your specific applications through our Application Engineering department.
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538 (537) BORING CASSETTES



Vernier scale
on both analog
and digital cassettes

Digital 538 (537)
cassettes with 3E^{TECH+}
docking port

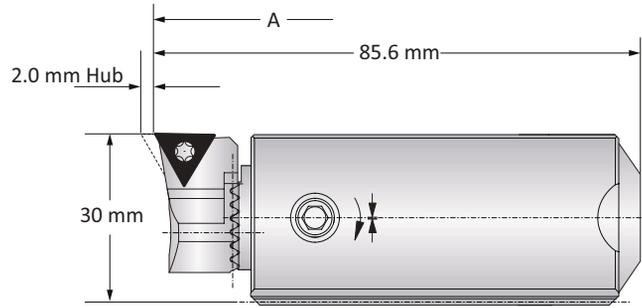
- ✓ Convenient tool handling
- ✓ Large range of applications
- ✓ Hardened steel bodies

538 (537) Analog Cassettes

Diameter Range: 3.937" - 8.071" (100.00 mm - 205.00 mm)



Form 101 / 103 **NOTE:** Vernier adjustment accuracy of 0.0001" or 0.002 mm on diameter.



Form 20

Analog 538 (537) Cassettes

	Boring Range	Weight	Insert Form	Part No.		
				Insert Holder	Clamping Piece	Cassette*
i	3.937 - 8.071	1.323 (lbs)	20	210020	137026	538051
	3.937 - 8.071	1.323 (lbs)	101	210063	137026	538051
	3.937 - 8.071	1.323 (lbs)	103	210064	137026	538051
m	100.00 - 205.00	0.60 (kg)	20	210020	137026	537051
	100.00 - 205.00	0.60 (kg)	101	210063	137026	537051
	100.00 - 205.00	0.60 (kg)	103	210064	137026	537051

*Required serrated tool body sold separately.

NOTE: Cassette and insert holder can be used on large diameter serrated slides (B10-G: 10 - 11).

NOTE: Insert holders, inserts, and clamping pieces *sold separately*.

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B10-F

B10-H

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i = Imperial (in)
m = Metric (mm)

Inserts sold separately

IMPORTANT: Max spindle speed refers to maximum possible speed for an individual boring head and is not a recommended parameter. Refer to page B10-M: 12 for recommended application-specific parameters. Factory technical assistance is available for your specific applications through our Application Engineering department.
ext: 7611 | email: appeng@alliedmachine.com

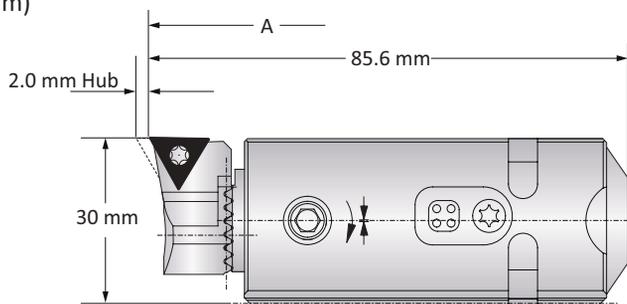
538 (537) Digital Cassettes with 3E^{TECH+}

Diameter Range: 3.937" - 8.071" (100.00 mm - 205.00 mm)



Form 101 / 103

NOTE: Vernier adjustment accuracy of 0.0001" or 0.002 mm on diameter.



Form 20

Digital 538 (537) Cassettes

	Boring Range	Weight	Insert Form	Part No.		
				Insert Holder	Clamping Piece	Cassette*
i	3.937 - 8.071	1.323 (lbs)	20	210020	137026	538052
	3.937 - 8.071	1.323 (lbs)	101	210063	137026	538052
	3.937 - 8.071	1.323 (lbs)	103	210064	137026	538052
m	100.00 - 205.00	0.60 (kg)	20	210020	137026	537052
	100.00 - 205.00	0.60 (kg)	101	210063	137026	537052
	100.00 - 205.00	0.60 (kg)	103	210064	137026	537052

*Required serrated tool body sold separately.

NOTE: Cassette and insert holder can be used on large diameter serrated slides (B10-G: 10 - 11).

NOTE: 3E^{TECH+} digital readout module, charging unit, insert holders, inserts, and clamping pieces **sold separately**.

3E^{TECH+} Digital Readout Module

Part No.	Charging Unit*
536015	536016

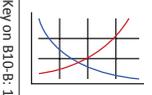
NOTE: WEEE-Reg.-Nr. DE 15820388

*Charging unit sold separately.

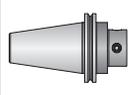


NOTE: 3E^{TECH+} adjustment accuracy of 0.00005" or 0.001 mm on diameter.

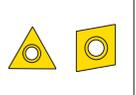
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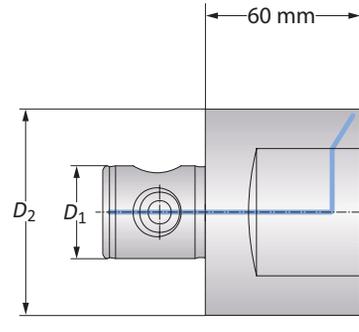
i = Imperial (in)
m = Metric (mm)

Inserts sold separately

IMPORTANT: Max spindle speed refers to maximum possible speed for an individual boring head and is not a recommended parameter. Refer to page B10-M: 12 for recommended application-specific parameters. Factory technical assistance is available for your specific applications through our Application Engineering department.
ext: 7611 | email: appeng@alliedmachine.com

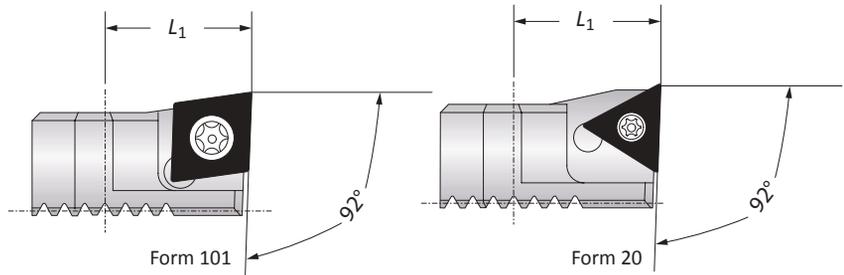
Serrated Tool Bodies | Insert Holders for Abrasive Materials

Diameter Range: 3.937" - 8.071" (100.00 mm - 205.00 mm)



Serrated Tool Bodies

MVS Connection		Serrated Tool Body	
	$D_2 D_1$	Boring Range	Part No.
i	80 - 36	3.937 - 6.102	148007
	80 - 36	5.906 - 8.071	148009
m	80 - 36	100.00 - 155.00	148007
	80 - 36	150.00 - 205.00	148009



Insert Holders for Abrasive Materials

Boring Range		Insert Holder	Weight	Insert Form	Part No.
		L_1			
i	3.937 - 8.071	0.709	0.066 (lbs)	20	211061
	3.937 - 8.071	0.709	0.066 (lbs)	101	211063
	3.937 - 8.071	0.709	0.066 (lbs)	103	211065
m	100.00 - 205.00	18.00	0.03 (kg)	20	211061
	100.00 - 205.00	18.00	0.03 (kg)	101	211063
	100.00 - 205.00	18.00	0.03 (kg)	103	211065

NOTE: Insert holders used for abrasive materials to protect boring head against chip wash.

NOTE: When machining grey cast iron, we recommend using insert holders for abrasive materials with CBN inserts for optimized chip removal.

B10-M: 12-19

B10-H

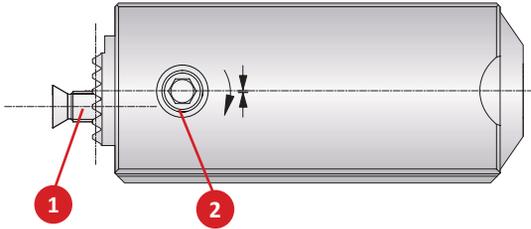
B10: vi-vii

Key on B10-B: 1

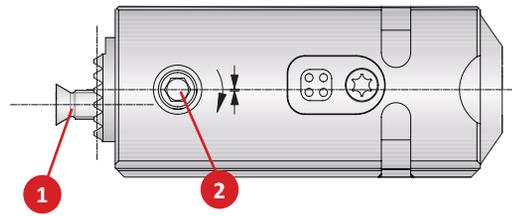
i = Imperial (in)
m = Metric (mm)
Inserts sold separately

Accessories

538 (537) Screws | 3E^{TECH+} Charging Unit | 538 (537) Clamping Pieces



538 (537) Analog Cassette



538 (537) 3E^{TECH+} Cassette

538 (537) Screws

Cassette Part No.	1 Countersunk Screw		2 Clamping Screw	
	Part No.	Service Key	Part No.	Service Key
i 538051	215462	T20 / H	115249	s4 / F
	215462	T20 / H	315789	s4 / F
m 537051	215462	T20 / H	115249	s4 / F
	215462	T20 / H	315789	s4 / F

3E^{TECH+} Accessories

1 Charging Unit
Part No.
536016

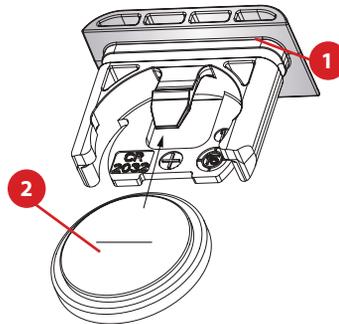


NOTE: Charging unit sold separately from 3E^{TECH+}.

NOTE: 3E^{TECH+} adjustment accuracy of 0.00005" or 0.001 mm on diameter.

3E^{TECH} (Old Display) Accessories

1 Sealing Ring	2 Battery CR2032
Part No.	Part No.
215483	515491

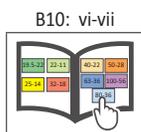
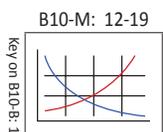
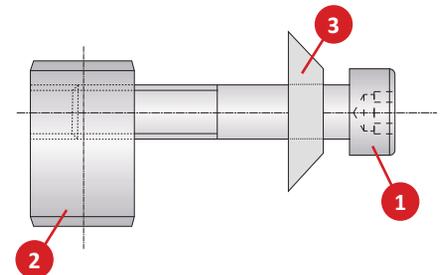


NOTE: Not required for 3E^{TECH+} (new display).

538 (537) Clamping Pieces

Slide Type	Complete Part No.	Service Key	Replacement Components		
			1 Cap Screw	2 Clamping Nut	3 Disk Spring
Serrated Tool Bodies	137026	115578 s6 / B	215101	140118	337105
Basic and Eco Slides	137027		215102	215105	337105
Flex Slides	137019		415900	215105	337105

NOTE: Clamping pieces sold separately.



i = Imperial (in)
m = Metric (mm)

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SECTION

B10-C

Combi-Line Rough and Finish Boring

Wohlhaupter® Rough and Finish Boring

Combi-Line

▶ Diameter Range: 0.965" - 7.913" (24.50 mm - 201.00 mm)



One tool. Two operations.

The Wohlhaupter Combi-Line combines both rough and finish boring into one operation. The front insert holder is the roughing cutting edge while the shorter holder finishes the hole, saving you time and money.

Your safety and the safety of others is very important. This catalog contains important safety messages. Always read and follow all safety precautions.



This triangle is a safety hazard symbol. It alerts you to potential safety hazards that can cause tool failure and serious injury.

When you see this symbol in the catalog, look for a related safety message that may be near this triangle or referred to in the nearby text.

There are safety signal words also used in the catalog. Safety messages follow these words.

WARNING

WARNING (shown above) means that failure to follow the precautions in this message could result in tool failure and serious injury.

NOTICE means that failure to follow the precautions in this message could result in damage to the tool or machine but not result in personal injury.

NOTE and **IMPORTANT** are also used. These are important that you read and follow but are not safety-related.

Visit www.alliedmachine.com for the most up-to-date information and procedures.

Applicable Industries



Aerospace



Agriculture



Automotive



Firearms



General
Machining



Oil & Gas

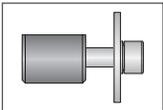


Renewable
Energy

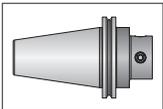
Combined Rough and Finish Boring Table of Contents

Reference Icons

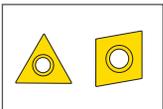
The following icons will appear throughout the catalog to help you navigate between products.



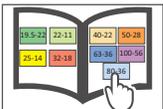
Clamping Elements
For use with insert holders and boring heads



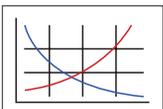
Shanks
A variety of shanks for different machines



Inserts
For use with insert holder boring heads and boring bars using indexable inserts



MVS Connection Color Guide
Detailed instructions and information regarding the MVS connection(s)



Recommended Cutting Data
Speed and feed recommendations for optimum and safe boring



Coolant-Through Option
Indicates that the product is coolant through

Combi-Line Introduction

Product Overview 2 - 3

Material Removal Percentages | Tool Usage. 4

Boring Head and Insert Holder. 5

Accessories. 6

Series	Diameter Range	
	Imperial (inch)	Metric (mm)
Combi-Line 404 (401)	0.965 - 7.913	24.50 - 201.00

Combi-Line Product Overview

Combi-Line ROUGH & FINISH BORING

Two operations. One Tool.

Decrease cycle time and tool changes with the Wohlhaupter Combi-Line. The Combi-Line combines rough and finish boring into one tool with height displaced insert holders.

Reduce your *cycle time* with the Combi-Line.

- Diameter range: 0.965" - 7.913" (24.50 mm - 201.00 mm).
- Reduce cycle and tool changing time.
- Available in semi-standard same level or height displaced insert holders.
- Coolant through.
- 0.0001" (0.002 mm) vernier adjustment on finishing insert holder.
- Max spindle speed: 5,000 SFM.



IMPORTANT: Max spindle speed refers to maximum possible speed for an individual boring head and is not a recommended parameter. Refer to page B10-M: 12 for recommended application-specific parameters. Factory technical assistance is available for your specific applications through our Application Engineering department.
ext: 7611 | email: appeng@alliedmachine.com

Cycle time is crucial. Why not choose the best process?

Application: Ductile Cast Iron

Finish Diameter: 1.968" (50 mm) (+/- 0.0005" [0.013 mm])

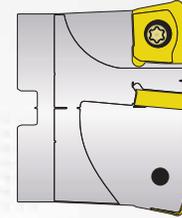
Pre-Hole Diameter: 1.771" (45 mm)

Boring Depth: 8.228" (209 mm)

Hole Finish: 32 Ra (0.8 Ra μm)



Measure	1st Process Option	
	Step 1 Rough 49 mm Competitor 1.5" High Feed Milling Tool	Step 2 Finish 50 mm Wohlhaupter 320 Boring Head
Speed	1000 SFM (2500 RPM)	600 SFM (1165 PRM)
Feed Rate	0.020 IPT (153 IPM)	0.004 IPR (0.466 IPM)
Total Passes	77	1
Cycle Time (per hole)	1.93 min	1.77 min
Tool Change Time	15 sec	
Cycle Time (per part)	3 min 54 sec	



1.5" High Feed Milling Tool



Wohlhaupter 320 Boring Head

Measure	2nd Process Option	
	Step 1 Rough 49 mm Wohlhaupter Twin Cutter at 49 mm \varnothing	Step 2 Finish 50 mm Wohlhaupter 320 Boring Head
Speed	500 SFM (990 RPM)	600 SFM (1165 PRM)
Feed Rate	0.012 IPR (11.88 IPM)	0.004 IPR (0.466 IPM)
Total Passes	1	1
Cycle Time (per hole)	.69 min	1.77 min
Tool Change Time	15 sec	
Cycle Time (per part)	2 min 46 sec	



Wohlhaupter Twin Cutter



Wohlhaupter 320 Boring Head

OUR **SOLUTION**

Combi-Line Rough and Finish Boring

Measure	3rd Process Option Finish 50 mm Wohlhaupter Combi-Line
Speed	600 SFM (1165 RPM)
Feed Rate	0.004 IPR (0.466 IPM)
Total Passes	1
Cycle Time (per hole)	1.77 min
Tool Change Time	0
Cycle Time (per part)	1 min 46 sec

- ▶ Combi-Line assembly:
 - (1) Insert holders (x2): 402021
 - (2) Serrated tool body: 404006
 - (3) Shank: 353014

- Boring inserts
- ▶ Item No. 297653WHC19



*60 seconds of
total cycle time saved*

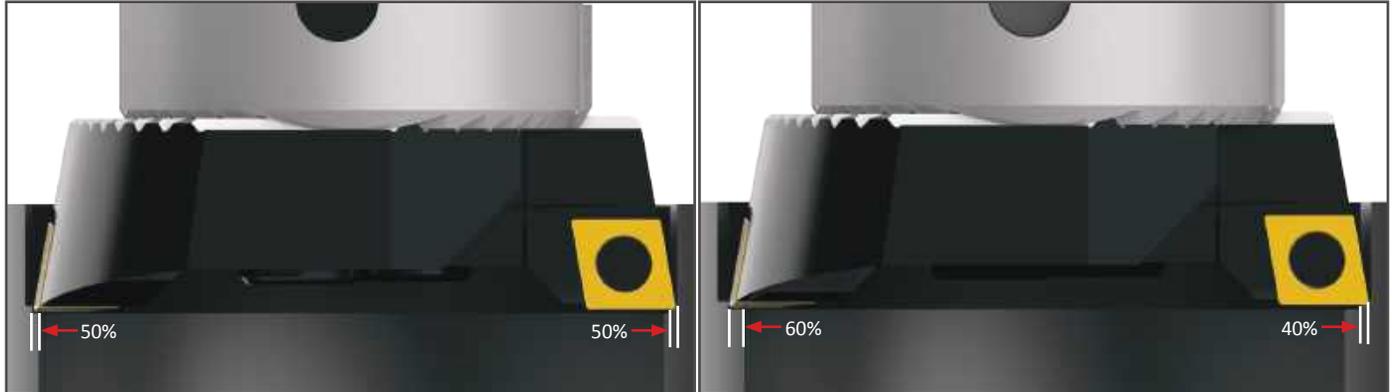


1 tool vs. 2 tools saves you time and money



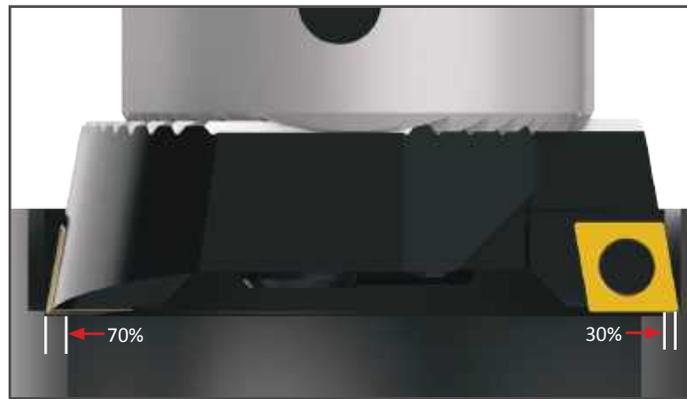
Material Removal Percentages | Tool Usage

Material Removal Percentages



Material removal up to 0.157" (4.00 mm) on diameter: **50% roughing 50% finishing**

Material removal up to 0.157" - 0.276" (4.00 mm - 7.00 mm) on diameter: **60% roughing 40% finishing**



Material removal up to 0.276" - 0.394" (7.00 mm - 10.00 mm) on diameter: **70% roughing 30% finishing**

- For tools with a length-to-diameter ratio greater than 4:1, the existing hole diameter should be no more than 0.157" (4.00 mm) smaller than the finish diameter. The 50% roughing and 50% finishing rule should be applied.
- When boring with severe interruptions, the existing hole diameter should be no more than 0.157" (4.00 mm) smaller than the finish diameter. The 50% roughing and 50% finishing rule should be applied.

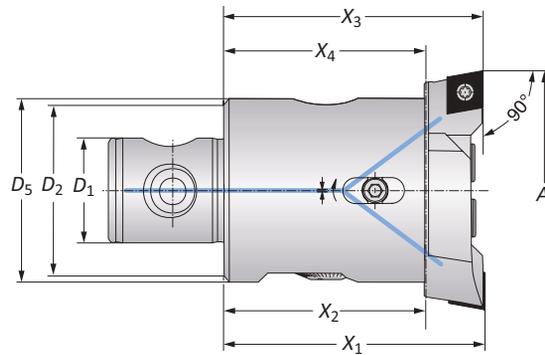
IMPORTANT: Consult application engineering for technical support when using Combi-Line tools in holes with interruptions.
 ext: 7611 | email: appeng@alliedmachine.com

Tool Usage

- For most applications, the same inserts should be used in both the roughing and finishing insert holders.
- To insure proper chip breaking, the finishing insert holder DOC must be at least 0.020" (0.50 mm).
- Up to a 4:1 length-to-diameter ratio, standard insert holders with a height displacement of up to 0.012" (0.30 mm) can be used.
- Inserts with wiper geometry are recommended only for special Combi-Line applications.

Boring Heads and Insert Holders

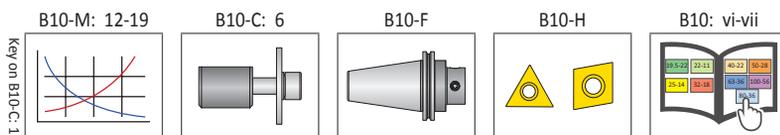
Diameter Range: 0.965" - 7.913" (24.50 mm - 201.00 mm)



COMBI LINE

Connection	Boring Range	Boring Head					Weight	Insert Form	Part No.		
		D_2 D_1	A	X_1	X_3	X_2			X_4	D_5	(x2)* Insert Holder**
i	22 - 11	0.965 - 1.161	1.811	1.801	1.339	1.329	-	0.220 (lbs)	101	402029	404003
	25 - 14	1.142 - 1.457	2.205	2.195	1.614	1.604	1.024	0.440 (lbs)	101	402009	404004
	25 - 14	1.142 - 1.457	2.205	2.195	1.614	1.604	1.024	0.440 (lbs)	103	402011	404004
	25 - 14	1.417 - 1.732	2.205	2.195	1.614	1.604	1.181	0.661 (lbs)	101	402017	404005
	25 - 14	1.417 - 1.732	2.205	2.195	1.614	1.604	1.181	0.661 (lbs)	103	402019	404005
	32 - 18	1.693 - 2.126	2.598	2.587	1.890	1.878	1.339	0.881 (lbs)	103	402021	404006
	40 - 22	2.087 - 2.598	2.953	2.941	2.165	2.154	-	1.543 (lbs)	103	402005	404007
	50 - 28	2.559 - 3.268	2.953	2.941	2.165	2.154	-	2.425 (lbs)	103	402013	404008
	63 - 36	3.228 - 4.055	3.543	3.531	2.756	2.744	-	4.850 (lbs)	103	402001	404009
	80 - 36	4.016 - 5.000	3.543	3.531	2.598	2.587	3.346	6.613 (lbs)	103	402025	404010
	80 - 36	5.000 - 5.984	3.543	3.531	2.598	2.587	3.346	6.834 (lbs)	103	402026	404010
	80 - 36	5.945 - 6.929	3.543	3.531	2.598	2.587	5.276	8.377 (lbs)	103	402025	404011
80 - 36	6.929 - 7.913	3.543	3.531	2.598	2.587	5.276	8.598 (lbs)	103	402026	404011	
m	22 - 11	24.50 - 29.50	46.00	45.75	34.00	33.75	-	0.10 (kg)	101	402029	401003
	25 - 14	29.00 - 37.00	56.00	55.75	41.00	40.75	26.00	0.20 (kg)	101	402009	401004
	25 - 14	29.00 - 37.00	56.00	55.75	41.00	40.75	26.00	0.20 (kg)	103	402011	401004
	25 - 14	36.00 - 44.00	56.00	55.75	41.00	40.75	30.00	0.30 (kg)	101	402017	401005
	25 - 14	36.00 - 44.00	56.00	55.75	41.00	40.75	30.00	0.30 (kg)	103	402019	401005
	32 - 18	43.00 - 54.00	66.00	65.70	48.00	47.70	34.00	0.40 (kg)	103	402021	401006
	40 - 22	53.00 - 66.00	75.00	74.70	55.00	54.70	-	0.70 (kg)	103	402005	401007
	50 - 28	65.00 - 83.00	75.00	74.70	55.00	54.70	-	1.10 (kg)	103	402013	401008
	63 - 36	82.00 - 103.00	90.00	89.70	70.00	69.70	-	2.20 (kg)	103	402001	401009
	80 - 36	102.00 - 127.00	90.00	89.70	66.00	65.70	85.00	3.00 (kg)	103	402025	401010
	80 - 36	127.00 - 152.00	90.00	89.70	66.00	65.70	85.00	3.10 (kg)	103	402026	401010
	80 - 36	151.00 - 176.00	90.00	89.70	66.00	65.70	134.00	3.80 (kg)	103	402025	401011
80 - 36	176.00 - 201.00	90.00	89.70	66.00	65.70	134.00	3.90 (kg)	103	402026	401011	

*(2) insert holders are required.
**Insert holders sold individually.



i = Imperial (in)
m = Metric (mm)

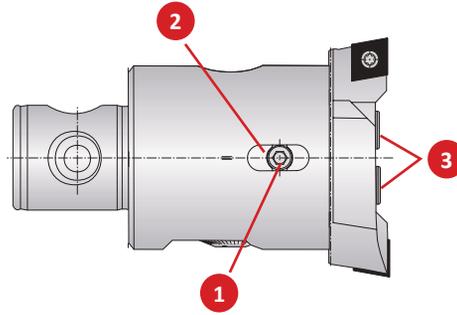
Inserts sold separately

IMPORTANT: Max spindle speed refers to maximum possible speed for an individual boring head and is not a recommended parameter. Refer to page B10-M: 12 for recommended application-specific parameters. Factory technical assistance is available for your specific applications through our Application Engineering department.
ext: 7611 | email: appeng@alliedmachine.com



Accessories

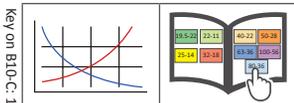
Screws | Clamping Elements



Boring Head Part No.	1. Clamp Screw		2. Clamping Piece	3. Cap Screw	
	Part No.	Service Key	Part No.	Part No.	Service Key
404003 (401003)	401223	s2.5 / A	–	401323	s3 / B
404004 (401004)	401224	s2.5 / B	401204	401324	s4 / B
404005 (401005)	401225	s2.5 / B	401205	401324	s4 / B
404006 (401006)	401226	s3 / B	401206	401324	s4 / B
404007 (401007)	401227	s3 / B	401207	401327	s5 / B
404008 (401008)	115288	s4 / B	401208	401329	s6 / B
404009 (401009)	215501	s4 / B	401209	401329	s6 / B
404010 (401010)	401230	s4 / B	401210	019183	s8 / C
404011 (401011)	401230	s4 / B	401210	019183	s8 / C

B10-M: 12-19

B10: vi-vii



i = Imperial (in)
m = Metric (mm)

SECTION

B10-D

Rough Machining

Wohlhaupter® Rough Machining

Twin Cutters | Chamfering Tools | Grooving Tools | Axial Grooving | Reverse Machining | VolCut

▶ Diameter Range: 0.768" - 9.645" (19.50 mm - 245.00 mm)



Variety of tooling. Versatile operations.

A versatile range of tools for rough machining includes rough boring, chamfering, reverse machining, circular milling, and axial grooving. The insert holders with various insert pockets as well as height displaced insert holders are able to be easily adjusted for a quick setup process.

Your safety and the safety of others is very important. This catalog contains important safety messages. Always read and follow all safety precautions.



This triangle is a safety hazard symbol. It alerts you to potential safety hazards that can cause tool failure and serious injury.

When you see this symbol in the catalog, look for a related safety message that may be near this triangle or referred to in the nearby text.

There are safety signal words also used in the catalog. Safety messages follow these words.

WARNING

WARNING (shown above) means that failure to follow the precautions in this message could result in tool failure and serious injury.

NOTICE means that failure to follow the precautions in this message could result in damage to the tool or machine but not result in personal injury.

NOTE and **IMPORTANT** are also used. These are important that you read and follow but are not safety-related.

Visit www.alliedmachine.com for the most up-to-date information and procedures.

Applicable Industries



Aerospace



Agriculture



Automotive



Firearms



General
Machining



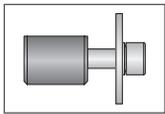
Oil & Gas



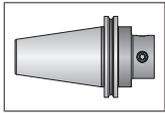
Renewable
Energy

Reference Icons

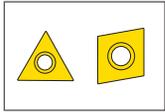
The following icons will appear throughout the catalog to help you navigate between products.



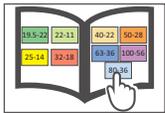
Clamping Elements
For use with insert holders and boring heads



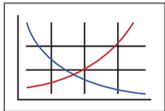
Shanks
A variety of shanks for different machines



Inserts
For use with insert holder boring heads and boring bars using indexable inserts



MVS Connection Color Guide
Detailed instructions and information regarding the MVS connection(s)



Recommended Cutting Data
Speed and feed recommendations for optimum and safe boring



Coolant-Through Option
Indicates that the product is coolant through

Rough Machining Table of Contents

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Series	Diameter Range	
	Imperial (inch)	Metric (mm)
Twin Cutters	0.768 - 8.071	19.50 - 205.00
Chamfering	0.748 - 8.504	19.00 - 216.00
Radial Grooving	0.787 - 3.110	20.00 - 79.00
Axial Grooving	0.787 - 8.071	20.00 - 205.00
Reverse Machining	1.142 - 9.646	29.00 - 245.00

Rough Machining Product Preview

Roughing Tools ROUGH MACHINING

Versatile tools for a variety of applications.

- Diameter range: 0.768" - 9.646" (19.50 mm - 245.00 mm).
- Tangential inserts and insert holders also available.
- Serrated tool bodies can be used for multiple applications including rough boring, chamfering, back boring, and axial grooving.
- Insert holders can be used on large diameter Alu-Line serrated tool bodies and slides located in section G: 3.937" - 128.15" (100.00 mm - 3255.00 mm).

Roughing Applications



- **Twin Cutter Assembly:**
- (1) Reducer: 219087
 - (2) Serrated tool body: 148004
 - (3) Insert holders: 151004
 - (4) Inserts: 10408M158HC79



- **Tangential Cutter Assembly:**
- (1) Shank: 353007
 - (2) Serrated tool body: 148005
 - (3) Insert holders: 151043
 - (4) Inserts: 00508M880HC198

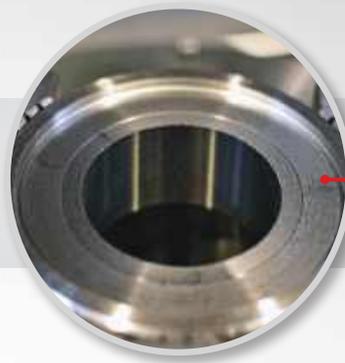


First Tangential Cut



▶ **Tangential Cutter Assembly:**

- (1) Shank: 353008
- (2) Serrated tool body: 148006
- (3) Insert holders: 151035
- (4) Inserts: 397594WHC198

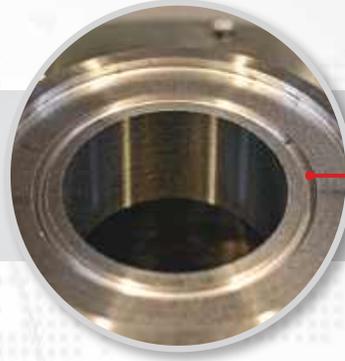


Second Tangential Cut



▶ **Axial Grooving Assembly:**

- (1) Shank: 353009
- (2) Serrated tool body: 148007
- (3) Support block: 226011
- (4) Insert holder: 226010
- (5) Insert: 297978WCH136

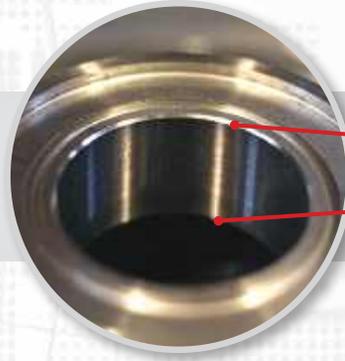


Axial Groove Cut



▶ **Chamfer Assembly:**

- (1) Shank: 353003
- (2) Serrated tool body: 148004
- (3) Insert holder: 201009
- (4) Inserts: 297497WHC79



Top Chamfer

Bottom Chamfer



▶ **Radial Grooving Assembly:**

- (1) Shank: 353007
- (2) Grooving tool: 143055
- (3) Inserts: 097254WCH136



Grooves



▶ **Finished Application**

Case Study

Cycle time is crucial. Why not choose the best process?

Application: Ductile Cast Iron

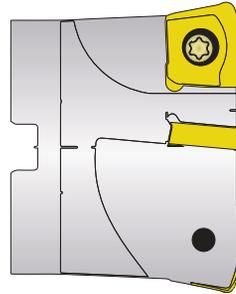
Finish Diameter: 1.930" (49 mm)

Pre-Hole Diameter: 1.77" (45 mm)

Boring Depth: 8.23" (209 mm)



Measure	Rough 49 mm Competitor 1.5" High Feed Milling Tool
Speed	1000 SFM (2500 RPM)
Feed Rate	0.020 IPT (153 IPM)
Total Passes	77
Cycle Time (per part)	1.93 min



1.5" High Feed Milling Tool

► **OUR SOLUTION**
Wohlhaupter® Twin Cutter

Measure	Rough 49 mm Wohlhaupter Twin Cutter
Speed	500 SFM (900 RPM)
Feed Rate	0.012 IPR (11.88 IPM)
Total Passes	1
Cycle Time (per part)	0.69 min

- Twin Cutter assembly:
 - (1) Insert Holders (x2): 151023
 - (2) Serrated tool body: 148018
 - (3) Shank: 353015

- Boring inserts
- Item No.: 297239WHC79

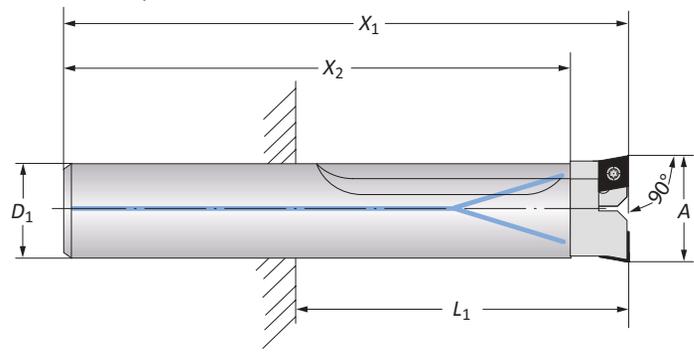


Wohlhaupter Twin Cutter

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Twin Cutters Same Level

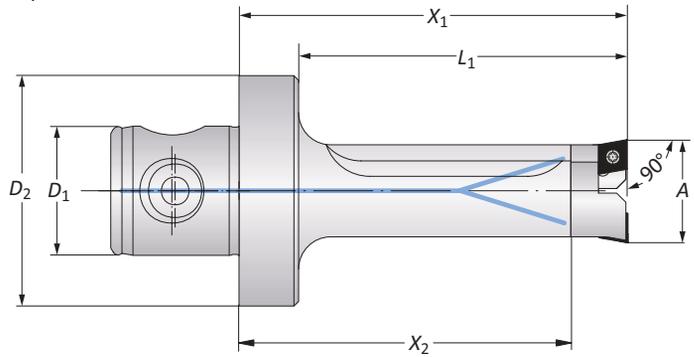
90° | Diameter Range: 0.768" - 1.181" (19.50 mm - 30.00 mm)



Twin Cutters Same Level

Connection	Boring Range		Twin Cutter			Weight	Insert Form	Part No.	
	D ₁	A	X ₁	X ₂	L ₁			Insert Holder	Serrated Body
i	18	0.768 - 0.906	5.910	5.433	3.149	0.661 (lbs)	101	235031	235021
	20	0.886 - 1.024	5.910	5.433	3.543	0.661 (lbs)	101	235032	235022
	23	1.004 - 1.181	6.299	5.826	3.937	0.661 (lbs)	101	235033	235023
m	18	19.50 - 23.00	150.00	138.00	80.00	0.30 (kg)	101	235031	235021
	20	22.50 - 26.00	150.00	138.00	90.00	0.30 (kg)	101	235032	235022
	23	25.50 - 30.00	160.00	148.00	100.00	0.30 (kg)	101	235033	235023

NOTE: Insert holders sold in quantities of 1, and inserts sold separately.



Twin Cutters Same Level

Connection	Boring Range		Twin Cutter			Weight	Insert Form	Part No.	
	D ₂ D ₁	A	X ₁	X ₂	L ₁			Insert Holder	Serrated Body
i	50 - 28	0.768 - 0.906	3.346	2.874	2.834	0.881 (lbs)	101	235031	235001
	50 - 28	0.886 - 1.024	3.543	3.070	3.031	1.102 (lbs)	101	235032	235002
	50 - 28	1.004 - 1.181	3.740	3.268	3.228	1.102 (lbs)	101	235033	235003
	63 - 36	0.768 - 0.906	3.346	2.874	2.834	1.543 (lbs)	101	235031	235011
	63 - 36	0.886 - 1.024	3.543	3.070	3.031	1.543 (lbs)	101	235032	235012
	63 - 36	1.004 - 1.181	3.740	3.268	3.228	1.843 (lbs)	101	235033	235013
m	50 - 28	19.50 - 23.00	85.00	73.00	72.00	0.40 (kg)	101	235031	235001
	50 - 28	22.50 - 26.00	90.00	78.00	77.00	0.50 (kg)	101	235032	235002
	50 - 28	25.50 - 30.00	95.00	83.00	82.00	0.50 (kg)	101	235033	235003
	63 - 36	19.50 - 23.00	85.00	73.00	72.00	0.70 (kg)	101	235031	235011
	63 - 36	22.50 - 26.00	90.00	78.00	77.00	0.70 (kg)	101	235032	235012
	63 - 36	25.50 - 30.00	95.00	83.00	82.00	0.83 (kg)	101	235033	235013

NOTE: Insert holders sold in quantities of 1, and inserts sold separately.

B10-M: 12-19

B10-D: 24

B10-F

B10-H

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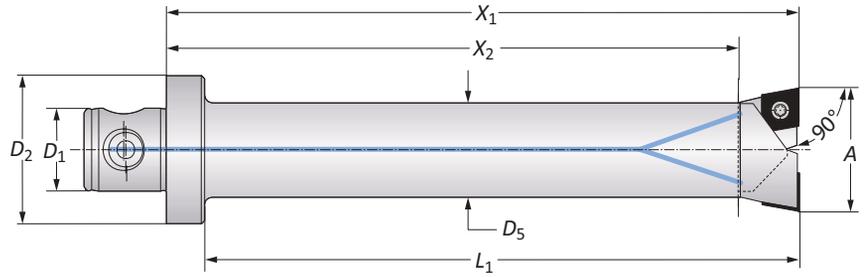
i = Imperial (in)
m = Metric (mm)

Inserts sold separately

IMPORTANT: Max spindle speed refers to maximum possible speed for an individual boring head and is not a recommended parameter. Refer to page B10-M: 12 for recommended application-specific parameters. Factory technical assistance is available for your specific applications through our Application Engineering department.
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Twin Cutters Same Level

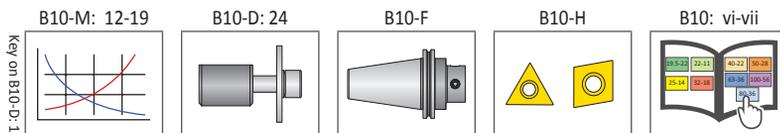
90° | 5xD | Diameter Range: 1.142" - 2.598" (29.00 mm - 66.00 mm)



Connection	Boring Range	Twin Cutter					Weight	Insert Form	Part No.	
		$D_2 D_1$	A	X_1	X_2	L_1			D_5	Insert Holder
i	50 - 28	1.142 - 1.457	6.102	5.551	5.590	1.023	1.984 (lbs)	103	151001	148021
	50 - 28	1.417 - 1.732	6.889	6.338	6.377	1.259	2.866 (lbs)	103	151002	148022
	50 - 28	1.693 - 2.126	8.465	7.677	7.952	1.456	4.188 (lbs)	103	151023	148023
	50 - 28	1.693 - 2.126	8.465	7.677	7.952	1.456	4.188 (lbs)	104	151003	148023
	50 - 28	2.087 - 2.598	8.465	7.677	7.952	1.732	5.511 (lbs)	103	151024	148024
50 - 28	2.087 - 2.598	8.465	7.677	7.952	1.732	5.511 (lbs)	104	151004	148024	
m	50 - 28	29.00 - 37.00	155.00	141.00	142.00	26.00	0.90 (kg)	103	151001	148021
	50 - 28	36.00 - 44.00	175.00	161.00	162.00	32.00	1.30 (kg)	103	151002	148022
	50 - 28	43.00 - 54.00	215.00	195.00	202.00	37.00	1.90 (kg)	103	151023	148023
	50 - 28	43.00 - 54.00	215.00	195.00	202.00	37.00	1.90 (kg)	104	151003	148023
	50 - 28	53.00 - 66.00	215.00	195.00	202.00	44.00	2.50 (kg)	103	151024	148024
	50 - 28	53.00 - 66.00	215.00	195.00	202.00	44.00	2.50 (kg)	104	151004	148024

NOTE: Different lengths available upon request.

NOTE: Insert holders sold in quantities of 1, and inserts sold separately.



i = Imperial (in)
m = Metric (mm)

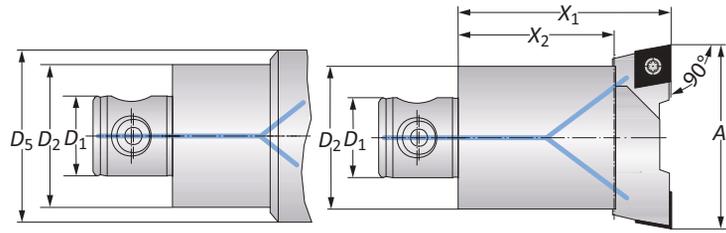
Inserts sold separately

IMPORTANT: Max spindle speed refers to maximum possible speed for an individual boring head and is not a recommended parameter. Refer to page B10-M: 12 for recommended application-specific parameters. Factory technical assistance is available for your specific applications through our Application Engineering department.

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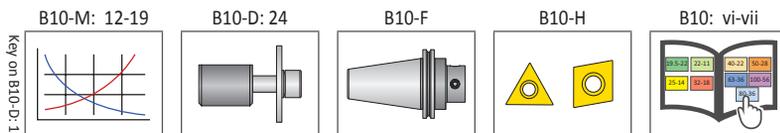
Twin Cutters Same Level

90° | Diameter Range: 1.142" - 4.055" (29.00 mm - 103.00 mm)



Connection	Boring Range	Twin Cutter				Weight	Insert Form	Part No.	
		D ₂ D ₁	A	X ₁	X ₂			D ₅	Insert Holder
i	25 - 14	1.142 - 1.457	2.205	1.653	-	0.441 (lbs)	103	151001	148001
	25 - 14	1.417 - 1.732	2.205	1.653	1.811	0.441 (lbs)	103	151002	148002
	32 - 18	1.417 - 1.732	2.205	1.653	1.811	0.881 (lbs)	103	151002	148017
	32 - 18	1.693 - 2.126	2.598	1.811	1.417	0.881 (lbs)	103	151023	148003
	32 - 18	1.693 - 2.126	2.598	1.811	1.417	0.881 (lbs)	104	151003	148003
	40 - 22	1.693 - 2.126	2.598	1.811	1.417	1.543 (lbs)	103	151023	148018
	40 - 22	1.693 - 2.126	2.598	1.811	1.417	1.543 (lbs)	104	151003	148018
	40 - 22	2.087 - 2.598	2.953	2.165	-	1.543 (lbs)	103	151024	148004
	40 - 22	2.087 - 2.598	2.953	2.165	-	1.543 (lbs)	104	151004	148004
	50 - 28	2.559 - 3.268	2.953	2.165	-	2.425 (lbs)	103	151025	148005
	50 - 28	2.559 - 3.268	2.953	2.165	-	2.425 (lbs)	104	151005	148005
	63 - 36	3.228 - 4.055	3.543	2.362	-	4.188 (lbs)	103	151026	148006
	63 - 36	3.228 - 4.055	3.543	2.362	-	4.188 (lbs)	104	151086	148006
	63 - 36	3.228 - 4.055	3.543	2.362	-	4.188 (lbs)	105	151006	148006
	m	25 - 14	29.00 - 37.00	56.00	42.00	-	0.20 (kg)	103	151001
25 - 14		36.00 - 44.00	56.00	42.00	30.00	0.20 (kg)	103	151002	148002
32 - 18		36.00 - 44.00	56.00	42.00	30.00	0.40 (kg)	103	151002	148017
32 - 18		43.00 - 54.00	66.00	46.00	36.00	0.40 (kg)	103	151023	148003
32 - 18		43.00 - 54.00	66.00	46.00	36.00	0.40 (kg)	104	151003	148003
40 - 22		43.00 - 54.00	66.00	46.00	36.00	0.70 (kg)	103	151023	148018
40 - 22		43.00 - 54.00	66.00	46.00	36.00	0.70 (kg)	104	151003	148018
40 - 22		53.00 - 66.00	75.00	55.00	-	0.70 (kg)	103	151024	148004
40 - 22		53.00 - 66.00	75.00	55.00	-	0.70 (kg)	104	151004	148004
50 - 28		65.00 - 83.00	75.00	55.00	-	1.10 (kg)	103	151025	148005
50 - 28		65.00 - 83.00	75.00	55.00	-	1.10 (kg)	104	151005	148005
63 - 36		82.00 - 103.00	90.00	60.00	-	1.90 (kg)	103	151026	148006
63 - 36		82.00 - 103.00	90.00	60.00	-	1.90 (kg)	104	151086	148006
63 - 36		82.00 - 103.00	90.00	60.00	-	1.90 (kg)	105	151006	148006

NOTE: Insert holders sold in quantities of 1, and inserts sold separately.



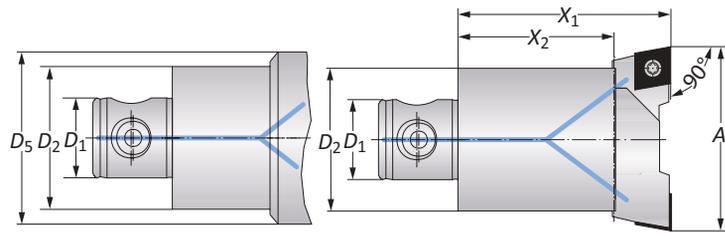
i = Imperial (in)
m = Metric (mm)

Inserts sold separately

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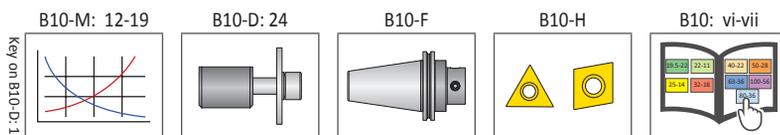
Twin Cutters Same Level

90° | Diameter Range: 3.937" - 8.071" (100.00 mm - 205.00 mm)



	Connection	Boring Range	Twin Cutter			Weight	Insert Form	Part No.	
	D_2 D_1	A	X_1	X_2	D_5			Insert Holder	Serrated Body
i	80 - 36	3.937 - 5.118	3.543	2.362	-	6.613 (lbs)	103	151027	148007
	80 - 36	3.937 - 5.118	3.543	2.362	-	6.613 (lbs)	104	151087	148007
	80 - 36	3.937 - 5.118	3.543	2.362	-	6.613 (lbs)	105	151007	148007
	80 - 36	4.921 - 6.102	3.543	2.362	-	7.054 (lbs)	103	151028	148007
	80 - 36	4.921 - 6.102	3.543	2.362	-	7.054 (lbs)	104	151088	148007
	80 - 36	4.921 - 6.102	3.543	2.362	-	7.054 (lbs)	105	151008	148007
	80 - 36	5.906 - 8.071	3.543	2.362	4.921	8.818 (lbs)	103	151028	148009
	80 - 36	5.906 - 8.071	3.543	2.362	4.921	8.818 (lbs)	104	151088	148009
	80 - 36	5.906 - 8.071	3.543	2.362	4.921	8.818 (lbs)	105	151008	148009
m	80 - 36	100.00 - 130.00	90.00	60.00	-	3.00 (kg)	103	151027	148007
	80 - 36	100.00 - 130.00	90.00	60.00	-	3.00 (kg)	104	151087	148007
	80 - 36	100.00 - 130.00	90.00	60.00	-	3.00 (kg)	105	151007	148007
	80 - 36	125.00 - 155.00	90.00	60.00	-	3.20 (kg)	103	151028	148007
	80 - 36	125.00 - 155.00	90.00	60.00	-	3.20 (kg)	104	151088	148007
	80 - 36	125.00 - 155.00	90.00	60.00	-	3.20 (kg)	105	151008	148007
	80 - 36	150.00 - 205.00	90.00	60.00	125.00	4.00 (kg)	103	151028	148009
	80 - 36	150.00 - 205.00	90.00	60.00	125.00	4.00 (kg)	104	151088	148009
	80 - 36	150.00 - 205.00	90.00	60.00	125.00	4.00 (kg)	105	151008	148009

NOTE: Insert holders sold in quantities of 1, and inserts sold separately.



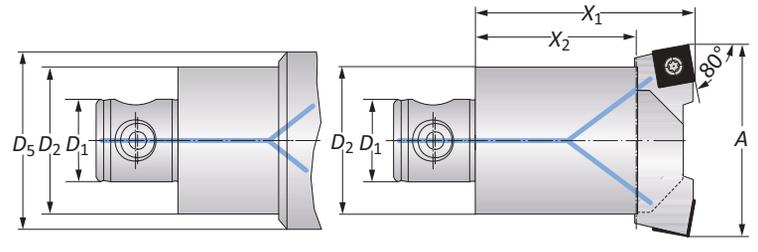
i = Imperial (in)
m = Metric (mm)

Inserts sold separately

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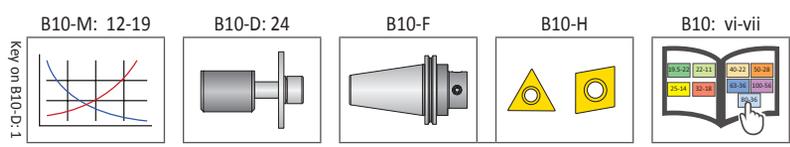
Twin Cutters Same Level

80° | Diameter Range: 1.142" - 8.071" (29.00 mm - 205.00 mm)



Connection	Boring Range	Twin Cutter				Weight	Insert Form	Part No.	
		D ₂ D ₁	A	X ₁	X ₂			D ₅	Insert Holder
i	25 - 14	1.142 - 1.457	2.205	1.653	-	0.440 (lbs)	112	151011	148001
	25 - 14	1.417 - 1.732	2.205	1.653	1.181	0.440 (lbs)	112	151012	148002
	32 - 18	1.417 - 1.732	2.441	1.653	1.181	0.881 (lbs)	112	151012	148017
	32 - 18	1.693 - 2.126	2.598	1.811	1.417	0.440 (lbs)	113	151013	148003
	40 - 22	1.693 - 2.126	2.598	1.811	1.417	1.543 (lbs)	113	151013	148018
	40 - 22	2.087 - 2.598	2.952	2.165	-	1.543 (lbs)	113	151014	148004
	50 - 28	2.559 - 3.268	2.952	2.165	-	2.425 (lbs)	113	151015	148005
	63 - 36	3.228 - 4.055	3.543	2.362	-	5.070 (lbs)	113	151036	148006
	80 - 36	3.937 - 5.118	3.543	2.362	-	6.613 (lbs)	113	151037	148007
	80 - 36	4.921 - 6.102	3.543	2.362	-	7.054 (lbs)	113	151038	148007
80 - 36	5.906 - 8.071	3.543	2.362	4.921	8.818 (lbs)	113	151038	148009	
m	25 - 14	29.00 - 37.00	56.00	42.00	-	0.20 (kg)	112	151011	148001
	25 - 14	36.00 - 44.00	56.00	42.00	30.00	0.20 (kg)	112	151012	148002
	32 - 18	36.00 - 44.00	62.00	42.00	30.00	0.40 (kg)	112	151012	148017
	32 - 18	43.00 - 54.00	66.00	46.00	36.00	0.40 (kg)	113	151013	148003
	40 - 22	43.00 - 54.00	66.00	46.00	36.00	0.70 (kg)	113	151013	148018
	40 - 22	53.00 - 66.00	75.00	55.00	-	0.70 (kg)	113	151014	148004
	50 - 28	65.00 - 83.00	75.00	55.00	-	1.10 (kg)	113	151015	148005
	63 - 36	82.00 - 103.00	90.00	60.00	-	2.30 (kg)	113	151036	148006
	80 - 36	100.00 - 130.00	90.00	60.00	-	3.00 (kg)	113	151037	148007
	80 - 36	125.00 - 155.00	90.00	60.00	-	3.20 (kg)	113	151038	148007
80 - 36	150.00 - 205.00	90.00	60.00	125.00	4.00 (kg)	113	151038	148009	

NOTE: Insert holders sold in quantities of 1, and inserts sold separately.

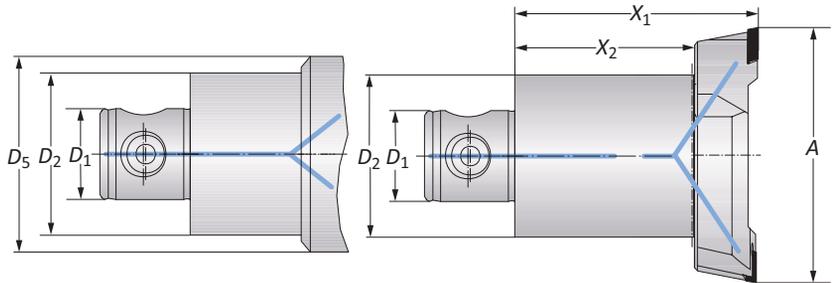


i = Imperial (in)
m = Metric (mm)
Inserts sold separately

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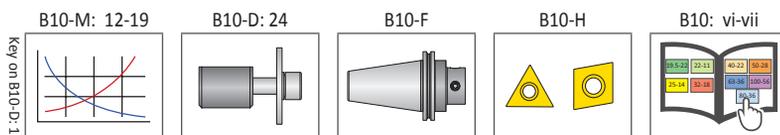
Twin Cutters Same Level Tangential Inserts

Diameter Range: 2.087" - 8.071" (53.00 mm - 205.00 mm)



Connection	Boring Range	Twin Cutter			Weight	Insert Form	Part No.		
		$D_2 D_1$	A	X_1			X_2	D_5	Insert Holder
i	40 - 22	2.087 - 2.598	2.953	2.165	–	1.543 (lbs)	04	151022	148004
	50 - 28	2.559 - 3.268	2.953	2.165	–	2.204 (lbs)	04	151032	148005
	50 - 28	2.559 - 3.268	2.953	2.165	–	2.204 (lbs)	05	151043	148005
	63 - 36	3.228 - 4.055	3.543	2.362	–	4.850 (lbs)	05	151035	148006
	80 - 36	3.937 - 5.118	3.543	2.362	–	6.613 (lbs)	05	151009	148007
	80 - 36	4.921 - 6.102	3.543	2.362	–	6.843 (lbs)	05	151010	148007
	80 - 36	5.906 - 8.071	3.543	2.362	4.921	8.818 (lbs)	05	151010	148009
	m	40 - 22	53.00 - 66.00	75.00	55.00	–	0.70 (kg)	04	151022
50 - 28		65.00 - 83.00	75.00	55.00	–	1.00 (kg)	04	151032	148005
50 - 28		65.00 - 83.00	75.00	55.00	–	1.00 (kg)	05	151043	148005
63 - 36		82.00 - 103.00	90.00	60.00	–	2.20 (kg)	05	151035	148006
80 - 36		100.00 - 130.00	90.00	60.00	–	3.00 (kg)	05	151009	148007
80 - 36		125.00 - 155.00	90.00	60.00	–	3.10 (kg)	05	151010	148007
80 - 36		150.00 - 205.00	90.00	60.00	125.00	4.00 (kg)	05	151010	148009

NOTE: Insert holders sold in quantities of 1, and inserts sold separately.



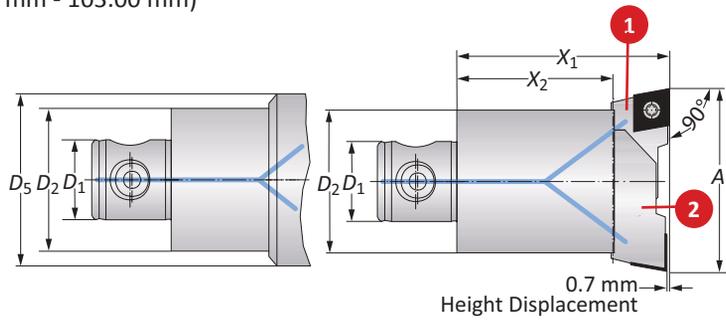
i = Imperial (in)
m = Metric (mm)

Inserts sold separately

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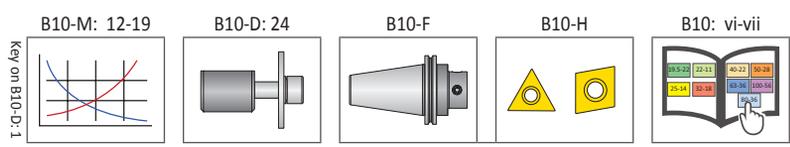
Twin Cutters Height Displaced

90° | Diameter Range: 1.142" - 4.055" (29.00 mm - 103.00 mm)



Connection	Boring Range	Twin Cutter				Weight	Insert Form	Part No.		
		D ₂ D ₁	A	X ₁	X ₂			D ₅	1 Insert Holder	2. Insert Holder (-0.7 mm)
i	25 - 14	1.142 - 1.457	2.205	1.653	-	0.440 (lbs)	103	151001	151061	148001
	25 - 14	1.417 - 1.732	2.205	1.653	1.181	0.440 (lbs)	103	151002	151062	148002
	32 - 18	1.417 - 1.732	2.205	1.653	1.181	0.881 (lbs)	103	151002	151062	148017
	32 - 18	1.693 - 2.126	2.598	1.811	1.417	0.881 (lbs)	104	151003	151093	148003
	40 - 22	1.693 - 2.126	2.598	1.811	1.417	1.543 (lbs)	104	151003	151093	148018
	40 - 22	2.087 - 2.598	2.953	2.165	-	1.543 (lbs)	104	151004	151094	148004
	50 - 28	2.559 - 3.268	2.953	2.165	-	2.425 (lbs)	104	151005	151095	148005
	63 - 36	3.228 - 4.055	3.543	2.362	-	5.291 (lbs)	104	151086	151090	148006
	63 - 36	3.228 - 4.055	3.543	2.362	-	5.291 (lbs)	105	151006	151096	148006
m	25 - 14	29.00 - 37.00	56.00	42.00	-	0.20 (kg)	103	151001	151061	148001
	25 - 14	36.00 - 44.00	56.00	42.00	30.00	0.20 (kg)	103	151002	151062	148002
	32 - 18	36.00 - 44.00	56.00	42.00	30.00	0.40 (kg)	103	151002	151062	148017
	32 - 18	43.00 - 54.00	66.00	46.00	36.00	0.40 (kg)	104	151003	151093	148003
	40 - 22	43.00 - 54.00	66.00	46.00	36.00	0.70 (kg)	104	151003	151093	148018
	40 - 22	53.00 - 66.00	75.00	55.00	-	0.70 (kg)	104	151004	151094	148004
	50 - 28	65.00 - 83.00	75.00	55.00	-	1.10 (kg)	104	151005	151095	148005
	63 - 36	82.00 - 103.00	90.00	60.00	-	2.40 (kg)	104	151086	151090	148006
	63 - 36	82.00 - 103.00	90.00	60.00	-	2.40 (kg)	105	151006	151096	148006

NOTE: Insert holders sold in quantities of 1, and inserts sold separately.

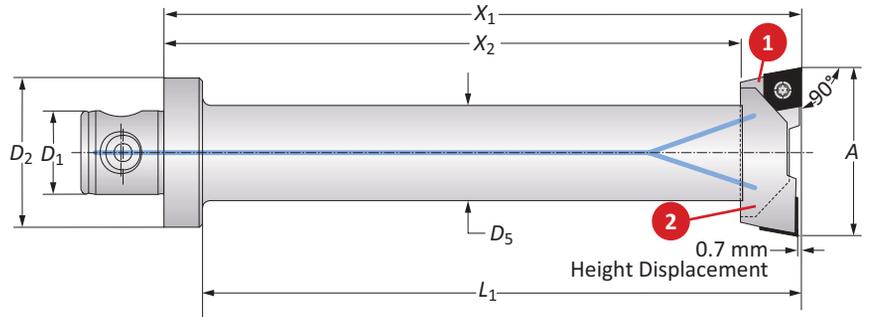


i = Imperial (in)
m = Metric (mm)
Inserts sold separately

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Twin Cutters Height Displaced

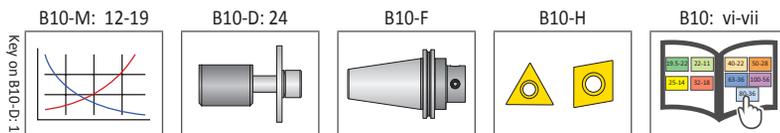
90° | 5xD | Diameter Range: 1.142" - 2.598" (29.00 mm - 66.00 mm)



	Connection	Boring Range	Twin Cutter				Weight	Insert Form	Part No.		
			D_2 D_1	A	X_1	X_2			L_1	D_5	1. Insert Holder
i	50 - 28	1.142 - 1.457	6.102	5.551	5.590	1.023	1.984 (lbs)	103	151001	151061	148021
	50 - 28	1.417 - 1.732	6.889	6.338	6.377	1.259	2.866 (lbs)	103	151002	151062	148022
	50 - 28	1.693 - 2.126	8.465	7.677	7.952	1.456	4.188 (lbs)	104	151003	151093	148023
	50 - 28	2.087 - 2.598	8.465	7.677	7.951	1.732	5.511 (lbs)	104	151004	151094	148024
m	50 - 28	29.00 - 37.00	155.00	141.00	142.00	26.00	0.90 (kg)	103	151001	151061	148021
	50 - 28	36.00 - 44.00	175.00	161.00	162.00	32.00	1.30 (kg)	103	151002	151062	148022
	50 - 28	43.00 - 54.00	215.00	195.00	202.00	37.00	1.90 (kg)	104	151003	151093	148023
	50 - 28	53.00 - 66.00	215.00	195.00	202.00	44.00	2.50 (kg)	104	151004	151094	148024

NOTE: Different lengths available upon request.

NOTE: Insert holders sold in quantities of 1, and inserts sold separately.



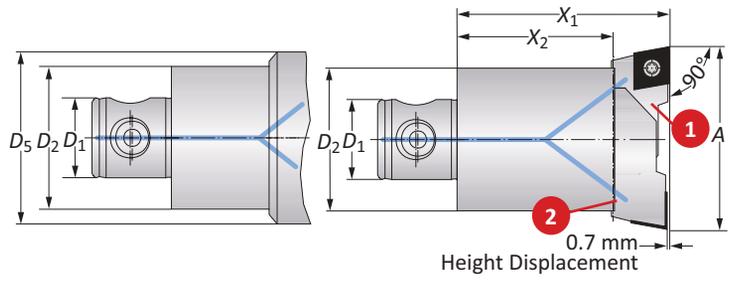
IMPORTANT: Max spindle speed refers to maximum possible speed for an individual boring head and is not a recommended parameter. Refer to page B10-M: 12 for recommended application-specific parameters. Factory technical assistance is available for your specific applications through our Application Engineering department.
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i = Imperial (in)
 m = Metric (mm)

Inserts sold separately

Twin Cutters Height Displaced

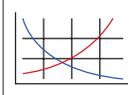
90° | Diameter Range: 3.937" - 8.071" (100.00 mm - 205.00 mm)



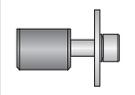
	Connection	Boring Range		Twin Cutter			Weight	Insert Form	Part No.		
		D ₂ D ₁	A	X ₁	X ₂	D ₅			1. Insert Holder	2. Insert Holder (-0.7 mm)	Serrated Body
i	80 - 36	3.937 - 5.118		3.543	2.362	-	6.613 (lbs)	104	151087	151091	148007
	80 - 36	3.937 - 5.118		3.543	2.362	-	6.613 (lbs)	105	151007	151097	148007
	80 - 36	4.921 - 6.102		3.543	2.362	-	7.054 (lbs)	104	151088	151092	148007
	80 - 36	4.921 - 6.102		3.543	2.362	-	7.054 (lbs)	105	151008	151098	148007
	80 - 36	5.906 - 8.071		3.543	2.362	4.921	8.818 (lbs)	104	151088	151092	148009
	80 - 36	5.906 - 8.071		3.543	2.362	4.921	8.818 (lbs)	105	151008	151098	148009
m	80 - 36	100.00 - 130.00		90.00	60.00	-	3.00 (kg)	104	151087	151091	148007
	80 - 36	100.00 - 130.00		90.00	60.00	-	3.00 (kg)	105	151007	151097	148007
	80 - 36	125.00 - 155.00		90.00	60.00	-	3.20 (kg)	104	151088	151092	148007
	80 - 36	125.00 - 155.00		90.00	60.00	-	3.20 (kg)	105	151008	151098	148007
	80 - 36	150.00 - 205.00		90.00	60.00	125.00	4.00 (kg)	104	151088	151092	148009
	80 - 36	150.00 - 205.00		90.00	60.00	125.00	4.00 (kg)	105	151008	151098	148009

NOTE: Insert holders sold in quantities of 1, and inserts sold separately.

B10-M: 12-19



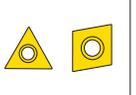
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B10-F



B10-H



B10: vi-vii



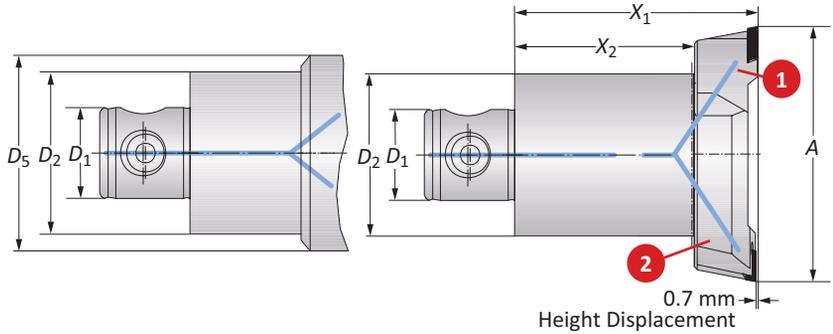
i = Imperial (in)
m = Metric (mm)
 Inserts sold separately

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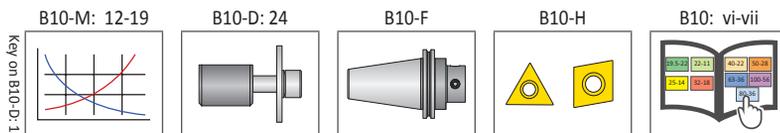
Twin Cutters Height Displaced Tangential Inserts

Diameter Range: 2.087" - 8.071" (53.00 mm - 205.00 mm)



	Connection	Boring Range	Twin Cutter				Insert Form	Part No.		
	$D_2 D_1$	A	X_1	X_2	D_5	Weight		1. Insert Holder	2. Insert Holder (-0.7 mm)	Serrated Body
i	40 - 22	2.087 - 2.598	2.953	2.165	-	1.543 (lbs)	04	151022	268009	148004
	50 - 28	2.559 - 3.268	2.953	2.165	-	2.204 (lbs)	04	151032	268010	148005
	50 - 28	2.559 - 3.268	2.953	2.165	-	2.204 (lbs)	05	151043	268019	148005
	63 - 36	3.229 - 4.055	3.543	2.362	-	5.291 (lbs)	04	151034	268020	148006
	63 - 36	3.229 - 4.055	3.543	2.362	-	5.291 (lbs)	05	151035	268021	148006
	80 - 36	3.937 - 5.118	3.543	2.362	-	6.613 (lbs)	05	151009	268022	148007
	80 - 36	4.921 - 6.102	3.543	2.362	-	6.834 (lbs)	05	151010	268023	148007
	80 - 36	5.906 - 8.071	3.543	2.362	4.921	8.818 (lbs)	05	151010	268023	148009
m	40 - 22	53.00 - 66.00	75.00	55.00	-	0.70 (kg)	04	151022	268009	148004
	50 - 28	65.00 - 83.00	75.00	55.00	-	1.00 (kg)	04	151032	268010	148005
	50 - 28	65.00 - 83.00	75.00	55.00	-	1.00 (kg)	05	151043	268019	148005
	63 - 36	82.00 - 103.00	90.00	60.00	-	2.20 (kg)	04	151034	268020	148006
	63 - 36	82.00 - 103.00	90.00	60.00	-	2.20 (kg)	05	151035	268021	148006
	80 - 36	100.00 - 130.00	90.00	60.00	-	3.00 (kg)	05	151009	268022	148007
	80 - 36	125.00 - 155.00	90.00	60.00	-	3.10 (kg)	05	151010	268023	148007
	80 - 36	150.00 - 205.00	90.00	60.00	125.00	4.00 (kg)	05	151010	268023	148009

NOTE: Insert holders sold in quantities of 1, and inserts sold separately.



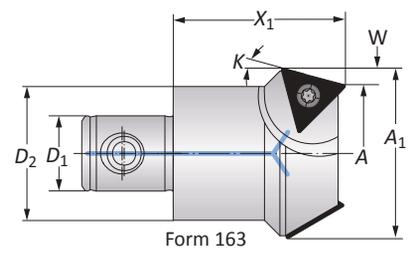
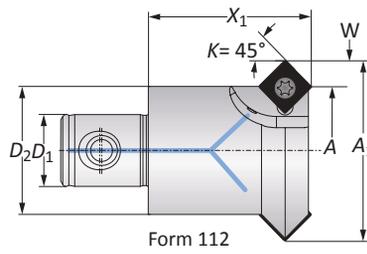
i = Imperial (in)
m = Metric (mm)

Inserts sold separately

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Chamfering Tools

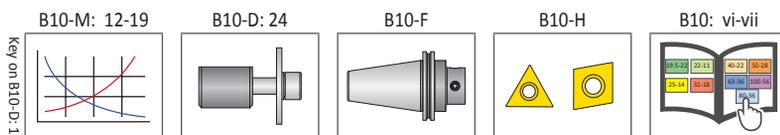
Diameter Range: 0.787" - 1.260" (20.00 mm - 32.00 mm)



Connection	Approach Angle	Boring Range	Cutter Diameter	Chamfering Tool		Weight	Insert Form	Number of Inserts	Part No.	
				A_1	X_1					W
i	25 - 14	15°	0.984	1.299	1.220	0.157	0.330 (lbs)	163	2	201087
	25 - 14	45°	0.787	1.299	1.220	0.255	0.330 (lbs)	112	2	201082
	32 - 18	15°	1.260	1.574	1.614	0.157	0.440 (lbs)	163	2	201088
	32 - 18	30°	0.984	1.614	1.614	0.314	0.440 (lbs)	163	2	201089
	32 - 18	45°	1.260	1.771	1.614	0.255	0.440 (lbs)	112	3	201083
m	25 - 14	15°	25.00	33.00	31.00	4.00	0.15 (kg)	163	2	201087
	25 - 14	45°	20.00	33.00	31.00	6.50	0.15 (kg)	112	2	201082
	32 - 18	15°	32.00	40.00	41.00	4.00	0.20 (kg)	163	2	201088
	32 - 18	30°	25.00	41.00	41.00	8.00	0.20 (kg)	163	2	201089
	32 - 18	45°	32.00	45.00	41.00	6.50	0.20 (kg)	112	3	201083

NOTE: K 45° for front and reverse side chamfering.

NOTE: Inserts sold separately.



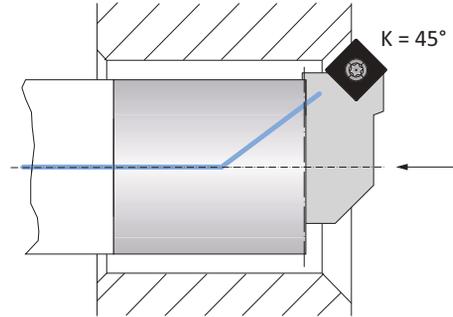
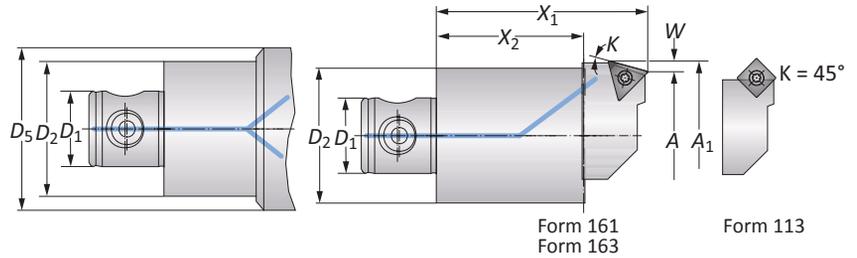
i = Imperial (in)
m = Metric (mm)
Inserts sold separately

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Chamfering Tools

Imperial | Diameter Range: 0.748" - 2.795"

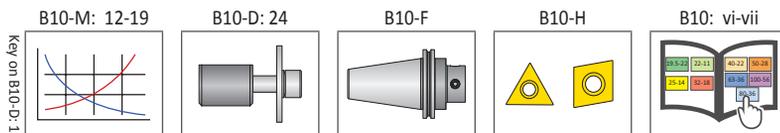


Connection $D_2 D_1$	Approach Angle K	Boring Range A	Chamfering Range A_1	Chamfering Tool				Weight	Insert Form	Part No.	
				X_1	X_2	D_5	W			Insert Holder	Serrated Body
25 - 14	15°	0.945 - 1.260	1.141 - 1.457	2.362	1.653	-	0.098	0.440 (lbs)	161	201057	148001
25 - 14	15°	1.220 - 1.535	1.417 - 1.732	2.362	1.653	1.181	0.098	0.440 (lbs)	161	201058	148002
25 - 14	20°	0.866 - 1.181	1.141 - 1.456	2.362	1.653	-	0.138	0.440 (lbs)	161	201017	148001
25 - 14	20°	1.142 - 1.457	1.417 - 1.732	2.362	1.653	1.181	0.138	0.440 (lbs)	161	201018	148002
25 - 14	30°	0.787 - 1.102	1.141 - 1.456	2.362	1.653	-	0.177	0.440 (lbs)	161	201067	148001
25 - 14	30°	1.063 - 1.378	1.417 - 1.732	2.362	1.653	1.181	0.177	0.440 (lbs)	161	201068	148002
25 - 14	45°	0.748 - 1.063	1.299 - 1.614	2.283	1.653	-	0.197	0.440 (lbs)	161	201003*	148001
25 - 14	45°	1.024 - 1.339	1.496 - 1.811	2.283	1.653	-	0.197	0.440 (lbs)	112	201004	148001
25 - 14	45°	1.220 - 1.535	1.692 - 2.007	2.362	1.653	1.181	0.236	0.440 (lbs)	112	201007	148002
32 - 18	15°	1.220 - 1.535	1.417 - 1.732	2.362	1.653	1.181	0.098	0.440 (lbs)	161	201058	148017
32 - 18	20°	1.142 - 1.457	1.417 - 1.732	2.362	1.653	1.181	0.138	0.440 (lbs)	161	201018	148017
32 - 18	30°	1.063 - 1.378	1.417 - 1.732	2.362	1.653	1.181	0.177	0.440 (lbs)	161	201068	148017
32 - 18	45°	1.220 - 1.535	1.692 - 2.007	2.362	1.653	1.181	0.236	0.440 (lbs)	112	201007	148017
32 - 18	15°	1.378 - 1.811	1.692 - 2.125	2.795	1.811	1.417	0.157	0.881 (lbs)	163	201059	148003
32 - 18	20°	1.299 - 1.732	1.692 - 2.125	2.795	1.811	1.417	0.197	0.881 (lbs)	163	201019	148003
32 - 18	30°	1.102 - 1.535	1.692 - 2.125	2.795	1.811	1.417	0.297	0.881 (lbs)	163	201069	148003
32 - 18	45°	1.378 - 1.811	1.968 - 2.401	2.598	1.811	1.417	0.295	0.881 (lbs)	113	201008	148003
40 - 22	15°	1.378 - 1.811	1.692 - 2.125	2.795	1.811	1.417	0.157	0.881 (lbs)	163	201059	148018
40 - 22	20°	1.299 - 1.732	1.692 - 2.125	2.795	1.811	1.417	0.197	0.881 (lbs)	163	201019	148018
40 - 22	30°	1.102 - 1.535	1.692 - 2.125	2.795	1.811	1.417	0.295	0.881 (lbs)	163	201069	148018
40 - 22	45°	1.378 - 1.811	1.968 - 2.401	2.598	1.811	1.417	0.295	0.881 (lbs)	113	201008	148018
40 - 22	15°	1.457 - 1.969	1.771 - 2.283	3.150	2.165	-	0.157	1.543 (lbs)	163	201060	148004
40 - 22	20°	1.457 - 1.969	1.850 - 2.362	3.150	2.165	-	0.197	1.543 (lbs)	163	201020	148004
40 - 22	30°	1.457 - 1.969	2.047 - 2.559	3.150	2.165	-	0.295	1.543 (lbs)	163	201070	148004
40 - 22	45°	1.963 - 2.205	2.283 - 2.795	3.150	2.165	-	0.295	1.543 (lbs)	113	201009	148004

*Insert holder cannot be used for reverse machining.

NOTE: K 45° for front and reverse side chamfering above \varnothing 1.220".

NOTE: Insert holders and inserts sold separately.



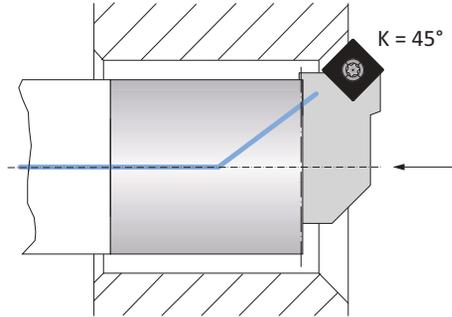
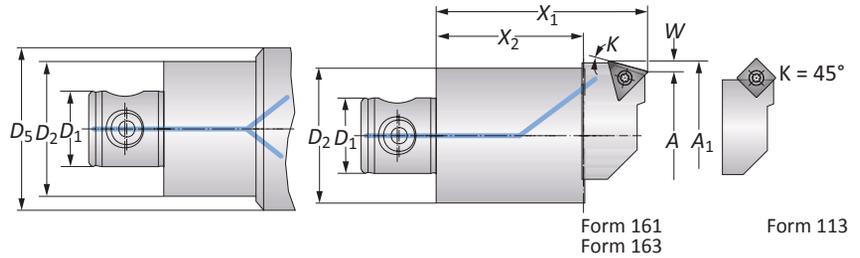
i = Imperial (in)
m = Metric (mm)

Inserts sold separately

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Chamfering Tools

Metric | Diameter Range: (19.00 mm - 71.00 mm)

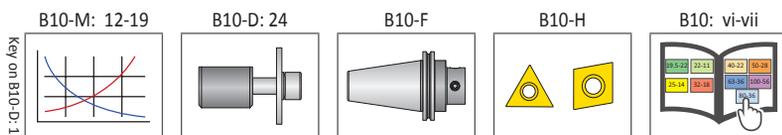


Connection	Approach Angle	Boring Range	Chamfering Range	Chamfering Tool				Weight	Insert Form	Part No.		
				$D_2 D_1$	K	A	A_1			X_1	X_2	D_5
M	25 - 14	15°	24.00 - 32.00	29.00 - 37.00	60.00	42.00	-	2.50	0.20 (kg)	161	201057	148001
	25 - 14	15°	31.00 - 39.00	36.00 - 44.00	60.00	42.00	30.00	2.50	0.20 (kg)	161	201058	148002
	25 - 14	20°	22.00 - 30.00	29.00 - 37.00	60.00	42.00	-	3.50	0.20 (kg)	161	201017	148001
	25 - 14	20°	29.00 - 37.00	36.00 - 44.00	60.00	42.00	30.00	3.50	0.20 (kg)	161	201018	148002
	25 - 14	30°	20.00 - 28.00	29.00 - 37.00	60.00	42.00	-	4.50	0.20 (kg)	161	201067	148001
	25 - 14	30°	27.00 - 35.00	36.00 - 44.00	60.00	42.00	30.00	4.50	0.20 (kg)	161	201068	148002
	25 - 14	45°	19.00 - 27.00	33.00 - 41.00	58.00	42.00	-	5.00	0.20 (kg)	161	201003*	148001
	25 - 14	45°	26.00 - 34.00	38.00 - 46.00	58.00	42.00	-	5.00	0.20 (kg)	112	201004	148001
	25 - 14	45°	31.00 - 39.00	43.00 - 51.00	60.00	42.00	30.00	6.00	0.20 (kg)	112	201007	148002
	32 - 18	15°	31.00 - 39.00	36.00 - 44.00	60.00	42.00	30.00	2.50	0.20 (kg)	161	201058	148017
	32 - 18	20°	29.00 - 37.00	36.00 - 44.00	60.00	42.00	30.00	3.50	0.20 (kg)	161	201018	148017
	32 - 18	30°	27.00 - 35.00	36.00 - 44.00	60.00	42.00	30.00	4.50	0.20 (kg)	161	201068	148017
	32 - 18	45°	31.00 - 39.00	43.00 - 51.00	60.00	42.00	30.00	6.00	0.20 (kg)	112	201007	148017
	32 - 18	15°	35.00 - 46.00	43.00 - 54.00	71.00	46.00	36.00	4.00	0.40 (kg)	163	201059	148003
	32 - 18	20°	33.00 - 44.00	43.00 - 54.00	71.00	46.00	36.00	5.00	0.40 (kg)	163	201019	148003
	32 - 18	30°	28.00 - 39.00	43.00 - 54.00	71.00	46.00	36.00	7.50	0.40 (kg)	163	201069	148003
	32 - 18	45°	35.00 - 46.00	50.00 - 61.00	66.00	46.00	36.00	7.50	0.40 (kg)	113	201008	148003
	40 - 22	15°	35.00 - 46.00	43.00 - 54.00	71.00	46.00	36.00	4.00	0.40 (kg)	163	201059	148018
	40 - 22	20°	33.00 - 44.00	43.00 - 54.00	71.00	46.00	36.00	5.00	0.40 (kg)	163	201019	148018
	40 - 22	30°	28.00 - 39.00	43.00 - 54.00	71.00	46.00	36.00	7.50	0.40 (kg)	163	201069	148018
40 - 22	45°	35.00 - 46.00	50.00 - 61.00	66.00	46.00	36.00	7.50	0.40 (kg)	113	201008	148018	
40 - 22	15°	37.00 - 50.00	45.00 - 58.00	80.00	55.00	-	4.00	0.70 (kg)	163	201060	148004	
40 - 22	20°	37.00 - 50.00	47.00 - 60.00	80.00	55.00	-	5.00	0.70 (kg)	163	201020	148004	
40 - 22	30°	37.00 - 50.00	52.00 - 65.00	80.00	55.00	-	7.50	0.70 (kg)	163	201070	148004	
40 - 22	45°	43.00 - 56.00	58.00 - 71.00	80.00	55.00	-	7.50	0.70 (kg)	113	201009	148004	

*Insert holder cannot be used for reverse machining.

NOTE: K 45° for front and reverse side chamfering above \varnothing 31.00 mm.

NOTE: Insert holders and inserts sold separately.



I = Imperial (in)

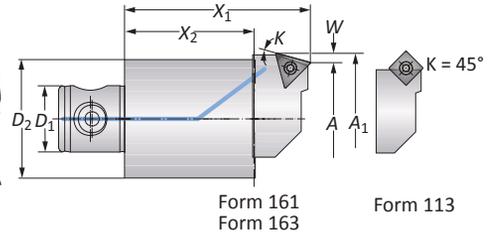
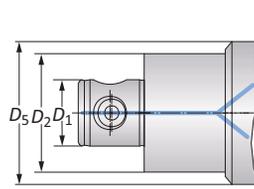
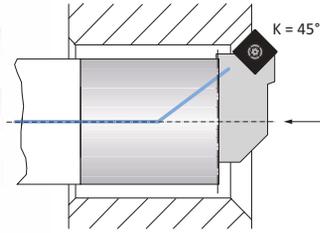
M = Metric (mm)

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Chamfering Tools

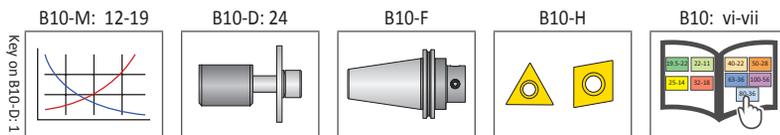
Diameter Range: 1.969" - 8.504" (50.00 mm - 216.00 mm)



Connection	Approach Angle	Boring Range	Chamfering Range	Chamfering Tool				Weight	Insert Form	Part No.	
				A	A_1	X_1	X_2			D_5	W
50 - 28	15°	1.969 - 2.677	2.283 - 2.992	3.150	2.165	-	0.157	2.204 (lbs)	163	201061	148005
50 - 28	20°	1.969 - 2.677	2.362 - 3.070	3.150	2.165	-	0.197	2.204 (lbs)	163	201021	148005
50 - 28	30°	1.969 - 2.677	2.559 - 3.267	3.150	2.165	-	0.197	2.204 (lbs)	163	201071	148005
50 - 28	45°	2.165 - 2.874	2.755 - 3.464	3.150	2.165	-	0.295	2.204 (lbs)	113	201010	148005
63 - 36	15°	2.677 - 3.504	2.992 - 3.818	3.543	2.362	-	0.157	4.188 (lbs)	163	201062	148006
63 - 36	20°	2.677 - 3.504	3.070 - 3.897	3.543	2.362	-	0.197	4.188 (lbs)	163	201022	148006
63 - 36	30°	2.677 - 3.504	3.268 - 4.094	3.543	2.362	-	0.295	4.188 (lbs)	163	201072	148006
63 - 36	45°	2.835 - 3.661	3.425 - 4.251	3.543	2.362	-	0.295	4.188 (lbs)	113	201011	148006
80 - 36	15°	3.504 - 4.685	3.818 - 5.000	3.543	2.362	-	0.157	5.732 (lbs)	163	201063	148007
80 - 36	15°	4.685 - 5.866	5.000 - 6.259	3.543	2.362	-	0.157	5.952 (lbs)	163	201064	148007
80 - 36	15°	5.669 - 7.835	5.984 - 8.149	3.543	2.362	4.921	0.157	7.936 (lbs)	163	201064	148009
80 - 36	20°	3.504 - 4.685	3.989 - 5.078	3.543	2.362	-	0.197	5.732 (lbs)	163	201023	148007
80 - 36	20°	4.685 - 5.866	5.078 - 6.259	3.543	2.362	-	0.197	5.952 (lbs)	163	201024	148007
80 - 36	20°	5.669 - 7.835	6.062 - 8.228	3.543	2.362	4.921	0.197	7.936 (lbs)	163	201024	148009
80 - 36	30°	3.504 - 4.685	4.094 - 5.275	3.543	2.362	-	0.295	5.732 (lbs)	163	201073	148007
80 - 36	30°	4.685 - 5.866	5.275 - 6.456	3.543	2.362	-	0.295	5.952 (lbs)	163	201074	148007
80 - 36	30°	5.669 - 7.835	6.259 - 8.425	3.543	2.362	4.921	0.295	7.936 (lbs)	163	201074	148009
80 - 36	45°	3.622 - 4.803	4.212 - 5.393	3.543	2.362	-	0.295	5.732 (lbs)	113	201012	148007
80 - 36	45°	4.764 - 5.945	5.354 - 6.535	3.543	2.362	-	0.295	5.952 (lbs)	113	201013	148007
80 - 36	45°	5.748 - 7.913	6.338 - 8.504	3.543	2.362	4.921	0.295	7.936 (lbs)	113	201013	148009
50 - 28	15°	50.00 - 68.00	58.00 - 76.00	80.00	55.00	-	4.00	1.00 (kg)	163	201061	148005
50 - 28	20°	50.00 - 68.00	60.00 - 78.00	80.00	55.00	-	5.00	1.00 (kg)	163	201021	148005
50 - 28	30°	50.00 - 68.00	65.00 - 83.00	80.00	55.00	-	7.50	1.00 (kg)	163	201071	148005
50 - 28	45°	55.00 - 73.00	70.00 - 88.00	80.00	55.00	-	7.50	1.00 (kg)	113	201010	148005
63 - 36	15°	68.00 - 89.00	76.00 - 97.00	90.00	60.00	-	4.00	1.90 (kg)	163	201062	148006
63 - 36	20°	68.00 - 89.00	78.00 - 99.00	90.00	60.00	-	5.00	1.90 (kg)	163	201022	148006
63 - 36	30°	68.00 - 89.00	83.00 - 104.00	90.00	60.00	-	7.50	1.90 (kg)	163	201072	148006
63 - 36	45°	72.00 - 93.00	87.00 - 108.00	90.00	60.00	-	7.50	1.90 (kg)	113	201011	148006
80 - 36	15°	89.00 - 119.00	97.00 - 127.00	90.00	60.00	-	4.00	2.60 (kg)	163	201063	148007
80 - 36	15°	119.00 - 149.00	127.00 - 159.00	90.00	60.00	-	4.00	2.70 (kg)	163	201064	148007
80 - 36	15°	144.00 - 199.00	152.00 - 207.00	90.00	60.00	125.00	4.00	3.60 (kg)	163	201064	148009
80 - 36	20°	89.00 - 119.00	99.00 - 129.00	90.00	60.00	-	5.00	2.60 (kg)	163	201023	148007
80 - 36	20°	119.00 - 149.00	129.00 - 159.00	90.00	60.00	-	5.00	2.70 (kg)	163	201024	148007
80 - 36	20°	144.00 - 199.00	154.00 - 209.00	90.00	60.00	125.00	5.00	3.60 (kg)	163	201024	148009
80 - 36	30°	89.00 - 119.00	104.00 - 134.00	90.00	60.00	-	7.50	2.60 (kg)	163	201073	148007
80 - 36	30°	119.00 - 149.00	134.00 - 164.00	90.00	60.00	-	7.50	2.70 (kg)	163	201074	148007
80 - 36	30°	144.00 - 199.00	159.00 - 214.00	90.00	60.00	125.00	7.50	3.60 (kg)	163	201074	148009
80 - 36	45°	92.00 - 122.00	107.00 - 137.00	90.00	60.00	-	7.50	2.60 (kg)	113	201012	148007
80 - 36	45°	121.00 - 151.00	136.00 - 166.00	90.00	60.00	-	7.50	2.70 (kg)	113	201013	148007
80 - 36	45°	146.00 - 201.00	161.00 - 216.00	90.00	60.00	125.00	7.50	3.60 (kg)	113	201013	148009

NOTE: K 45° = front and reverse side chamfering.

NOTE: Insert holders and inserts sold separately.



ⓘ = Imperial (in)
Ⓜ = Metric (mm)

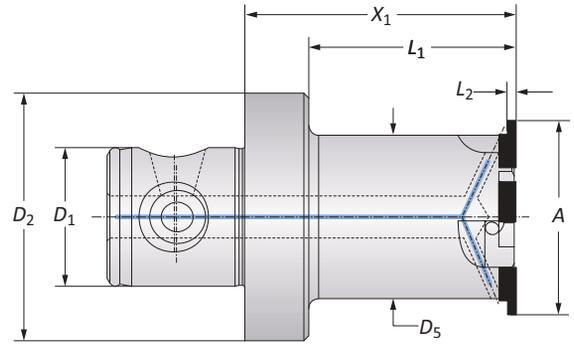
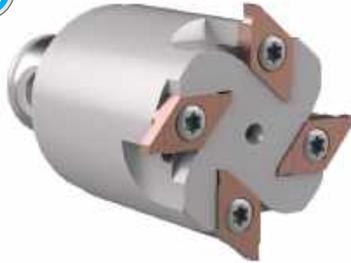
Inserts sold separately

IMPORTANT: Max spindle speed refers to maximum possible speed for an individual boring head and is not a recommended parameter. Refer to page B10-M: 12 for recommended application-specific parameters. Factory technical assistance is available for your specific applications through our Application Engineering department.

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Grooving Tools for Circular Milling

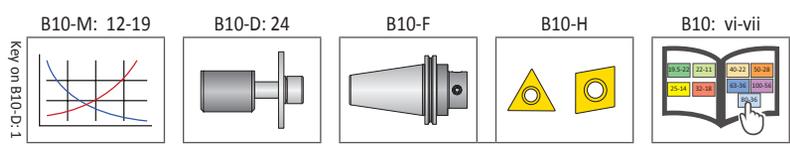
Diameter Range: $\varnothing > 0.787''$ (20.00 mm)



	Connection	Cutter Diameter	Grooving Tool			Groove Width	Groove Depth	Number of Inserts	Weight	Insert Form	Part No.
			$D_2 D_1$	A	X_1						
i	50 - 28	0.787	2.165	1.575	0.669	max 0.093	max 0.059	2	0.881 (lbs)	89	143051
	50 - 28	0.787	3.740	3.228	0.669	max 0.093	max 0.059	2	0.881 (lbs)	89	143052
	50 - 28	1.535	2.165	1.654	1.299	max 0.133	max 0.098	4	1.322 (lbs)	90	143053
	32 - 18	1.535	1.575	1.575	1.299	max 0.133	max 0.098	4	0.661 (lbs)	90	143054
	50 - 28	1.929	2.165	1.575	1.692	max 0.133	max 0.098	5	1.543 (lbs)	90	143055
	40 - 22	1.929	1.575	1.575	1.692	max 0.133	max 0.098	5	1.102 (lbs)	90	143056
	50 - 28	2.480	1.575	1.575	2.086	max 0.231	max 0.185	6	1.543 (lbs)	91	143057
	63 - 36	3.110	1.575	1.575	2.716	max 0.231	max 0.185	8	2.645 (lbs)	91	143058
ii	50 - 28	20.00	55.00	40.00	17.00	max 2.37	max 1.50	2	0.40 (kg)	89	143051
	50 - 28	20.00	95.00	82.00	17.00	max 2.37	max 1.50	2	0.40 (kg)	89	143052
	50 - 28	39.00	55.00	42.00	33.00	max 3.37	max 2.50	4	0.60 (kg)	90	143053
	32 - 18	39.00	40.00	40.00	33.00	max 3.37	max 2.50	4	0.30 (kg)	90	143054
	50 - 28	49.00	55.00	40.00	43.00	max 3.37	max 2.50	5	0.70 (kg)	90	143055
	40 - 22	49.00	40.00	40.00	43.00	max 3.37	max 2.50	5	0.50 (kg)	90	143056
	50 - 28	63.00	40.00	40.00	53.00	max 5.87	max 4.70	6	0.70 (kg)	91	143057
	63 - 36	79.00	40.00	40.00	69.00	max 5.87	max 4.70	8	1.20 (kg)	91	143058

NOTE: Different lengths available upon request.

NOTE: Inserts sold separately.



i = Imperial (in)
ii = Metric (mm)

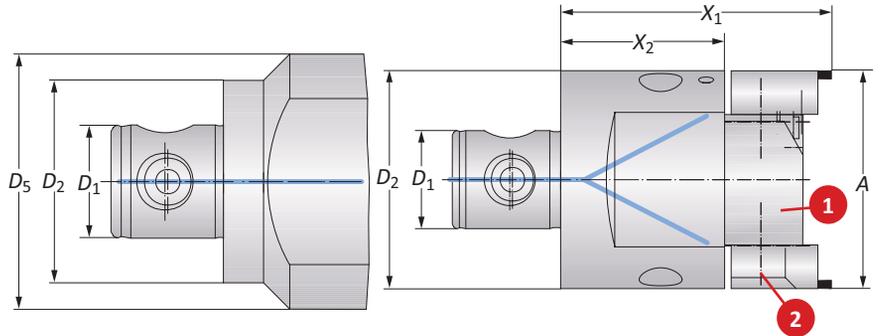
Inserts sold separately

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Axial Grooving Tools

Diameter Range: 0.787" - 8.071" (20.00 mm - 205.00 mm)



	Connection	Boring Range	Grooving Tool			Weight	Part No.			
	D ₂ D ₁	A	X ₁	X ₂	D ₅		1. Support Block	Insert Form	2. Insert Holder	Serrated Tool Body
i	50 - 28	0.787 - 2.283	3.268	2.165	2.480	2.866 (lbs)	–	304	226030	148010
	80 - 36	2.244 - 3.307	3.937	2.362	–	5.732 (lbs)	226011	304	226031	148007
	80 - 36	3.228 - 6.102	3.937	2.362	4.921	8.157 (lbs)	226012	304	226031	148009
	80 - 36	6.024 - 8.071	3.937	2.362	4.921	8.157 (lbs)	226013	304	226031	148009
m	50 - 28	20.00 - 58.00	83.00	55.00	63.00	1.30 (kg)	–	304	226030	148010
	80 - 36	57.00 - 84.00	100.00	60.00	–	2.60 (kg)	226011	304	226031	148007
	80 - 36	82.00 - 155.00	100.00	60.00	125.00	3.70 (kg)	226012	304	226031	148009
	80 - 36	153.00 - 205.00	100.00	60.00	125.00	3.70 (kg)	226013	304	226031	148009

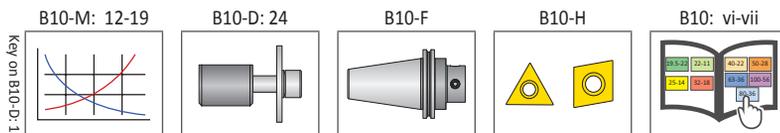
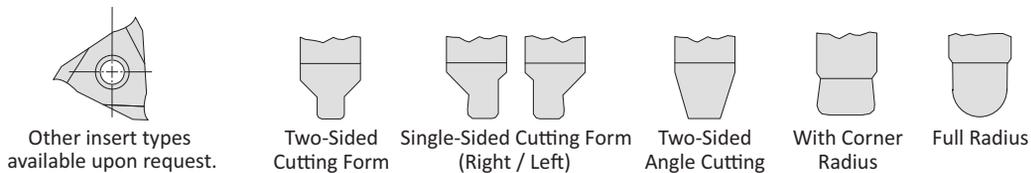
NOTE: Groove width is 0.039" - 0.276" (1.00 mm - 7.00 mm). (With Twin Cutter and diameter offset up to 12.00 mm is possible.)

Groove depth is 0.039" - 0.236" (1.00 mm - 6.00 mm).

NOTE: Support block with machining diameters smaller than 4.842" (123.00 mm) can only be secured with one screw.

NOTE: Insert holders, support blocks, and inserts sold separately.

Examples of recessing replaceable inserts:



i = Imperial (in)
m = Metric (mm)

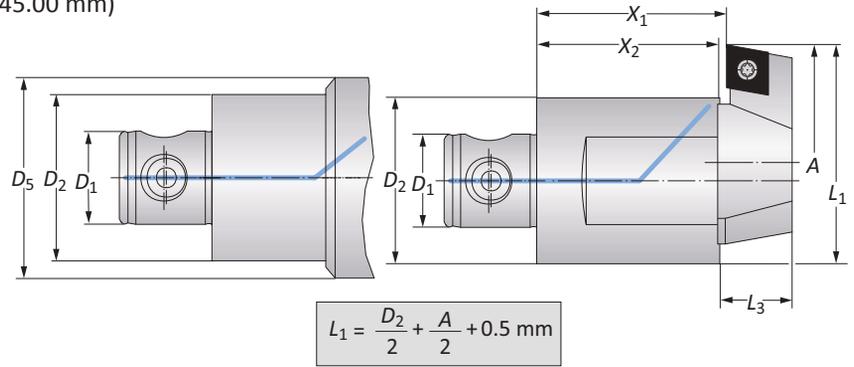
Inserts sold separately

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Reverse Machining Tools

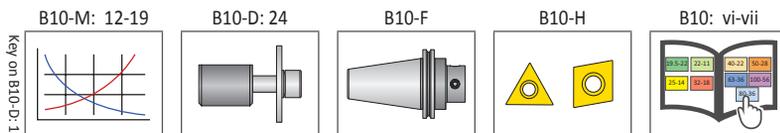
Diameter Range: 1.142" - 9.646" (29.00 mm - 245.00 mm)



Connection	Boring Range	Reverse Machining					Weight	Insert Form	Insert Holder	Part No.	
		D ₂ D ₁	A	X ₁	X ₂	L ₃				D ₅	Serrated Tool Body
i	25 - 14	1.142 - 1.457	1.575	1.535	0.551	-	0.440 (lbs)	103	251001	148011	
	25 - 14	1.339 - 1.654	1.575	1.535	0.551	-	0.440 (lbs)	103	251002	148011	
	25 - 14	1.417 - 1.732	1.575	1.535	0.551	-	0.440 (lbs)	103	251002	148012	
	25 - 14	1.732 - 2.047	1.575	1.535	0.708	-	0.440 (lbs)	104	251003	148012	
	32 - 18	1.693 - 2.126	1.575	1.535	0.708	-	0.661 (lbs)	104	251003	148013	
	32 - 18	2.165 - 2.598	1.575	1.535	0.708	-	0.881 (lbs)	104	251004	148013	
	40 - 22	2.087 - 2.835	1.575	1.535	0.708	-	1.102 (lbs)	104	251004	148014	
	40 - 22	2.598 - 3.346	1.575	1.535	0.708	-	1.102 (lbs)	104	251005	148014	
	50 - 28	2.756 - 3.740	2.205	2.165	0.866	-	2.425 (lbs)	104	251006	148015	
	50 - 28	3.622 - 4.606	2.205	2.165	0.866	-	2.866 (lbs)	104	251007	148015	
	63 - 36	3.622 - 4.803	2.205	2.165	0.866	-	3.747 (lbs)	104	251007	148016	
	80 - 36	4.724 - 5.906	2.441	2.362	1.023	-	5.952 (lbs)	104	251008	148007	
80 - 36	6.535 - 7.717	2.441	2.362	1.023	-	6.393 (lbs)	104	251009	148007		
80 - 36	5.709 - 7.874	2.441	2.362	1.023	4.921	7.936 (lbs)	104	251008	148009		
80 - 36	7.480 - 9.646	2.441	2.362	1.023	4.921	8.157 (lbs)	104	251009	148009		
m	25 - 14	29.00 - 37.00	40.00	39.00	14.00	-	0.20 (kg)	103	251001	148011	
	25 - 14	34.00 - 42.00	40.00	39.00	14.00	-	0.20 (kg)	103	251002	148011	
	25 - 14	36.00 - 44.00	40.00	39.00	14.00	-	0.20 (kg)	103	251002	148012	
	25 - 14	44.00 - 52.00	40.00	39.00	18.00	-	0.20 (kg)	104	251003	148012	
	32 - 18	43.00 - 54.00	40.00	39.00	18.00	-	0.30 (kg)	104	251003	148013	
	32 - 18	55.00 - 66.00	40.00	39.00	18.00	-	0.40 (kg)	104	251004	148013	
	40 - 22	53.00 - 72.00	40.00	39.00	18.00	-	0.50 (kg)	104	251004	148014	
	40 - 22	66.00 - 85.00	40.00	39.00	18.00	-	0.50 (kg)	104	251005	148014	
	50 - 28	70.00 - 95.00	56.00	55.00	22.00	-	1.10 (kg)	104	251006	148015	
	50 - 28	92.00 - 117.00	56.00	55.00	22.00	-	1.30 (kg)	104	251007	148015	
	63 - 36	92.00 - 122.00	56.00	55.00	22.00	-	1.70 (kg)	104	251007	148016	
	80 - 36	120.00 - 150.00	62.00	60.00	26.00	-	2.70 (kg)	104	251008	148007	
80 - 36	166.00 - 196.00	62.00	60.00	26.00	-	2.90 (kg)	104	251009	148007		
80 - 36	145.00 - 200.00	62.00	60.00	26.00	125.00	3.60 (kg)	104	251008	148009		
80 - 36	190.00 - 245.00	62.00	60.00	26.00	125.00	3.70 (kg)	104	251009	148009		

NOTE: Only use inserts with chip grooves all around.

NOTE: Insert holders and inserts sold separately.



i = Imperial (in)

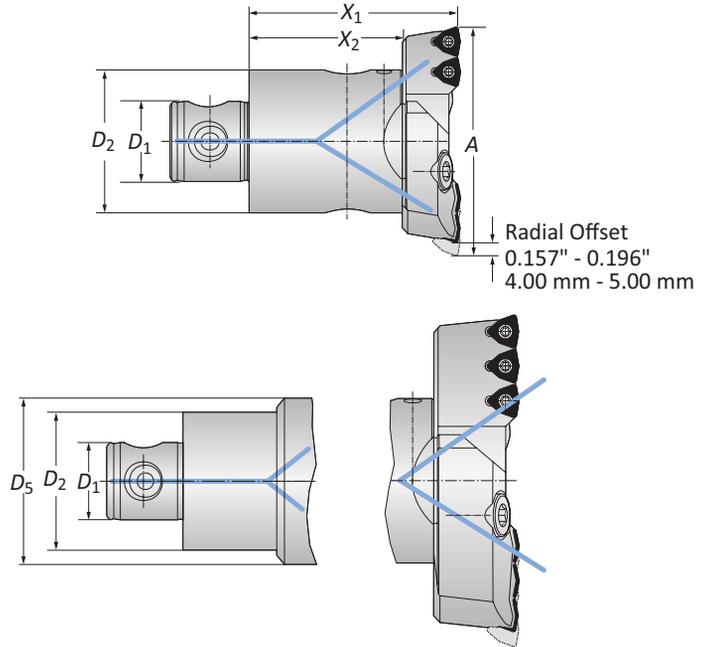
m = Metric (mm)

Inserts sold separately

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VolCut Insert Holders

Diameter Range: 2.559" - 128.150" (65.00 mm - 3255.00 mm)



Serrated Bodies with VolCut Insert Holders

Connection	Boring Range		Serrated Body			Weight	Number of Inserts	Insert Form	Part No.		
	D ₂ D ₁	A	A _{min} **	X ₁	X ₂				D ₅	VolCut Insert Holder	Serrated Body
i	50 - 28	2.559 - 3.268	2.559 - 2.756	2.913	2.165	-	2.425 (lbs)	2	464	151019	148005
	63 - 36	3.228 - 4.055	3.228 - 3.425	3.504	2.362	-	4.850 (lbs)	3	464	151039	148006
	80 - 36	3.937 - 5.118	3.937 - 4.134	3.504	2.362	-	6.613 (lbs)	3	464	151059	148007
	80 - 36	4.921 - 6.102	4.921 - 5.118	3.504	2.362	-	7.054 (lbs)	3	464	151069	148007
	80 - 36	5.906 - 8.071	5.906 - 6.102	3.504	2.362	4.921	11.243 (lbs)	3	464	151069	148009
⚠ D60	7.874 - 128.150	-	-	-	-	-	-	3	464	149030	*
m	50 - 28	65.00 - 83.00	65.00 - 70.00	74.00	55.00	-	1.10 (kg)	2	464	151019	148005
	63 - 36	82.00 - 103.00	82.00 - 87.00	89.00	60.00	-	2.20 (kg)	3	464	151039	148006
	80 - 36	100.00 - 130.00	100.00 - 105.00	89.00	60.00	-	3.00 (kg)	3	464	151059	148007
	80 - 36	125.00 - 155.00	125.00 - 130.00	89.00	60.00	-	3.20 (kg)	3	464	151069	148007
	80 - 36	150.00 - 205.00	150.00 - 155.00	89.00	60.00	125.00	5.10 (kg)	3	464	151069	148009
⚠ D60	200.00 - 3255.00	-	-	-	-	-	-	3	464	149030	*

NOTE: Inserts, insert holders, and serrated body are sold separately.

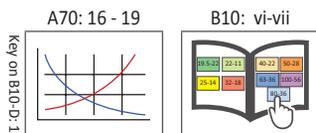
*For large diameter serrated slides, please contact Application Eng. (330.343.4283 ext: 7611) and see section B10-G in the Wohlhaupter® Product Catalog.

**For smaller diameters, both cartridges must be set to the same diameter. Only the outside insert on each cartridge can be engaged in the material.

IC Inserts

Carbide Grade	Geometry	Part No.	WSP-Screw
P35 (C5)	Standard	AM300® OP-05T308-P	IS-10-1
K35 (C1)	Standard	OP-05T308-1P	IS-10-1
K20 (C2)	Standard	OP-05T308-2P	IS-10-1
P35 (C5)	High Rake	OP-05T308-PHR	IS-10-1

NOTE: See section A70 in the Allied Master Product Catalog for recommended cutting data, cutting materials, and geometries.



i = Imperial (in)
m = Metric (mm)

Inserts sold separately

WARNING For large diameter boring with VolCut insert holders please:

- Contact our Application Engineering department before purchasing (330.343.4283 ext: 7611 | email: appeng@alliedmachine.com)
- Refer to section B10-G in the Wohlhaupter® MultiBore® System Tools Catalog.

VolCut Technical Information

Setup Instructions | Minimum Pilot Calculation



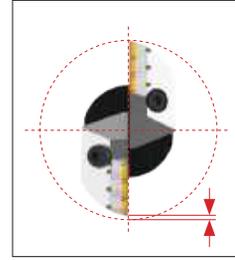
Step 1:
Loosen the mounting screws on both cartridges.



Step 2:
Set one cartridge to the finish diameter by tightening the adjustment screw against the adjustment pin.



Step 3:
Tighten the mounting screws on the cartridge to 15-19 Nm (11-14 ft-lbf).



Step 4:
Set the opposing cartridge with 0.157" - 0.196" (4 mm - 5 mm) radial offset inward by tightening the adjustment screw against the adjustment pin (optimum situation for each insert to remove equal material).



Step 5:
Tighten the mounting screws on the cartridge to 15-19 Nm (11-14 ft-lbf).

Note: Drilling systems with OP inserts are used as single cutters. The replaceable inserts are mounted offset in diameter. Please review the assembly instructions.

Minimum Pilot Calculation

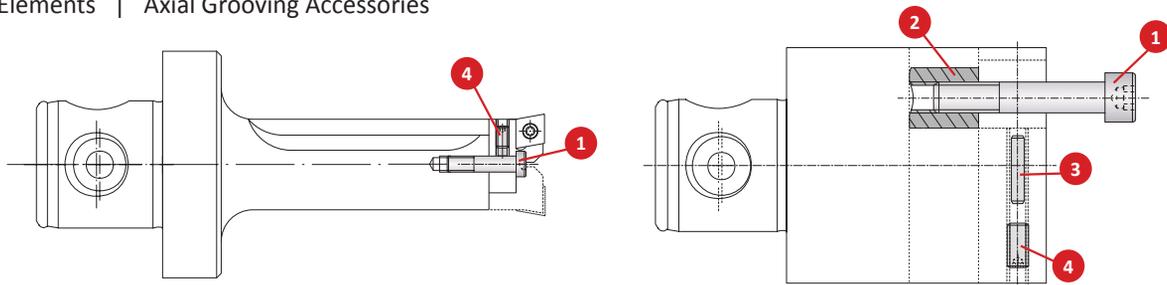
Calculation: Finish Diameter - Opening Range = Minimum Pilot Hole Diameter

Insert Holder	Diameter Range	Opening Range
151019	2.559" - 2.756" (65.00 mm - 70.00 mm)	0.600" (15.24 mm)
	2.756" - 3.268" (70.00 mm - 83.00 mm)	1.880" (47.75 mm)
151039	3.228" - 3.425" (82.00 mm - 87.00 mm)	0.600" (15.24 mm)
	3.425" - 4.055" (87.00 mm - 103.00 mm)	2.680" (68.07 mm)
151059	3.937" - 4.134" (100.00 mm - 105.00 mm)	0.600" (15.24 mm)
	4.134" - 5.118" (105.00 mm - 130.00 mm)	2.680" (68.07 mm)
151069	4.921" - 5.118" (125.00 mm - 130.00 mm)	0.600" (15.24 mm)
	5.118" - 8.071" (130.00 mm - 205.00 mm)	2.680" (68.07 mm)
149030	7.874" - 128.150" (200.00 mm - 3255.00 mm)	2.680" (68.07 mm)

Example: To open an existing hole to 4.500" diameter, a 151059 insert holder would be used with a 148007 serrated tool body, and the minimum pilot diameter would be 4.500" - 2.680" = 1.820" (114.30 mm - 68.07 mm = 46.23 mm).

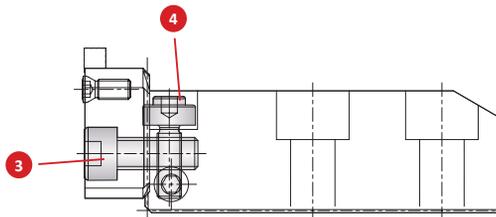
Accessories

Clamping Elements | Axial Grooving Accessories



Clamping Elements

Connection	Serrated Tool Body	Part No.					
		1. Cap Screw	Service Key	2. Clamping Nut	3. Adjustment Pin	4. Thread Pin	Service Key
25 - 14	148001	140108	s4 / B	140114	-	115280	s2.5 / A
25 - 14	148002	148110	s5 / B	115667	-	126157	s2.5 / A
25 - 14	148011	148110	s5 / B	148113	-	117148	s2.5 / A
25 - 14	148012	148110	s5 / B	115666	-	117148	s2.5 / A
32 - 18	148003	140110	s5 / B	115667	-	126157	s2.5 / A
32 - 18	148013	148110	s5 / B	148114	-	115192	s2.5 / A
32 - 18	148017	148110	s5 / B	115667	-	126157	s2.5 / A
40 - 22	148004	140110	s5 / B	140116	-	115407	s2.5 / A
40 - 22	148014	148110	s5 / B	148114	-	126157	s2.5 / A
40 - 22	148018	140110	s5 / B	115667	-	126157	s2.5 / A
50 - 28	148005	140111	s6 / B	140117	-	140121	s2.5 / A
50 - 28	148010	140111	s6 / B	140117	-	140121	s2.5 / A
50 - 28	148015	140112	s6 / B	140117	-	215111	s2.5 / A
50 - 28	235001	415111	T25 / B	-	-	215346	s1.5 / A
50 - 28	235002	415112	T25 / B	-	-	215346	s1.5 / A
50 - 28	235003	415113	T25 / B	-	-	215346	s1.5 / A
50 - 28	148021	140108	s4 / B	140114	-	115280	s2.5 / A
50 - 28	148022	140110	s5 / B	115667	-	126157	s2.5 / A
50 - 28	148023	140110	s5 / B	115667	-	126157	s2.5 / A
50 - 28	148024	140110	s5 / B	140116	-	115407	s2.5 / A
63 - 36	148006	140112	s6 / B	140118	-	140121	s2.5 / A
63 - 36	148016	140112	s6 / B	140117	-	116550	s2.5 / A
63 - 36	235011	415111	T25 / B	-	-	215346	s1.5 / A
63 - 36	235012	415112	T25 / B	-	-	215346	s1.5 / A
63 - 36	235013	415113	T25 / B	-	-	215346	s1.5 / A
80 - 36	148007	115730	s6 / B	140119	-	116550	s2.5 / A
80 - 36	148009	115730	s6 / B	140119	140120	115519	s2.5 / A
∅ 18	235021	415111	T25 / B	-	-	215346	s1.5 / A
∅ 20	235022	415112	T25 / B	-	-	215346	s1.5 / A
∅ 23	235023	415113	T25 / B	-	-	215346	s1.5 / A

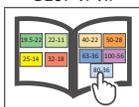
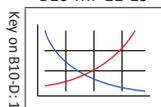


Axial Grooving Accessories

Support Base	3. Cap Screw		4. Axial Adjustment Screw	
	Part No.	Service Key	Part No.	Service Key
226011	023182	s6 / B	215374	s4 / B
226012	023182	s6 / B	215374	s4 / B
226013	023182	s6 / B	215374	s4 / B

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i = Imperial (in)
m = Metric (mm)

SECTION

B10-E

Intermediate Modules

Wohlhaupter® Intermediate Modules

NOVI^{TECH}® | Reducers | Extensions



Increase Tool Stability with Intermediate Modules

- Allow for expanded use of existing components.
- Add flexibility to setups.
- Reduce need for specials and their associated cost and lead time.
- Each component individually balanced.

Applicable Industries



Aerospace



Agriculture



Automotive



Firearms



General
Machining



Oil & Gas



Renewable
Energy

Your safety and the safety of others is very important. This catalog contains important safety messages. Always read and follow all safety precautions.



This triangle is a safety hazard symbol. It alerts you to potential safety hazards that can cause tool failure and serious injury.

When you see this symbol in the catalog, look for a related safety message that may be near this triangle or referred to in the nearby text.

There are safety signal words also used in the catalog. Safety messages follow these words.

WARNING

WARNING (shown above) means that failure to follow the precautions in this message could result in tool failure and serious injury.

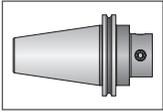
NOTICE means that failure to follow the precautions in this message could result in damage to the tool or machine but not result in personal injury.

NOTE and **IMPORTANT** are also used. These are important that you read and follow but are not safety-related.

Visit www.alliedmachine.com for the most up-to-date information and procedures.

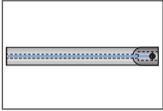
Reference Icons

The following icons will appear throughout the catalog to help you navigate between products.



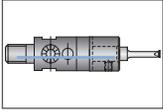
Shanks

A variety of shanks for different machines



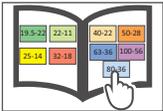
249 (248) Shanks

A variety of shanks for different machines



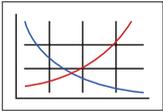
249 (248) Boring Head

249 (248) boring head that connects into the adapter shanks



MVS Connection Color Guide

Detailed instructions and information regarding the MVS connection(s)



Recommended Cutting Data

Speed and feed recommendations for optimum and safe boring



Coolant-Through Option

Indicates that the product is coolant through

Intermediate Modules Table of Contents

Introduction

Product Overview 2 - 3

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249 (248) Adapters 6 - 7

Reducers 8 - 13

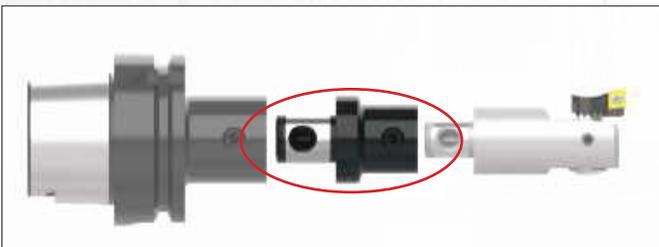
Extensions 14 - 16

Intermediate Modules Product Overview



Intermediate MODULES

Reducers



Features:

- ▶ Improves rigidity by stepping down to smaller MVS connection sizes.
- ▶ Connects quickly and easily with the MVS connection.
- ▶ Accommodates smaller diameter applications.

Extensions



Features:

- ▶ Used to increase bore depth.
- ▶ Connects quickly and easily with the MVS connection.
- ▶ Aluminum components available to reduce stress on the spindle.

WOHLHAUPTER® FINE BORING HEAD with NOVI^{TECH}®

Are you looking for more from your tooling?

After facing problems with chatter and chipping inserts, our customer, who machines fueling machine head rotors from ASTM A276 - 304L in the nuclear power industry, sought a better solution to their machining process.

The customer turned to Allied for help finding a new solution. Once the causes of insert failure and chatter were identified, our experienced team was able to create the best assembly suitable for the application. Using **Wohlhaupter's analog balanced fine boring head** paired with the **NOVI^{TECH} vibration damper module**, they were able to eliminate the issues our customers were facing.

With the previous tooling, the customer achieved only 12 minutes of tool life, but with Allied's Wohlhaupter assembly, they achieved more than four times the life for 65 minutes!

Allied's Wohlhaupter assembly improved the machining process by making it more consistent and saved the customer money by reducing cost per hole. If you are looking to save time and money, **give us a call, and we will help you find the right solution.**



		Measure	Competitor Boring Head	Wohlhaupter Fine Boring Head with NOVI ^{TECH}
Product:	Wohlhaupter analog balanced fine boring head with NOVI ^{TECH}	RPM	106	372
Objectives:	(1) Decrease cycle time (2) Improve process	Speed Rate	131.234 SFM (40 M/min)	459.318 SFM (140 M/min)
Industry:	Renewable energy/energy	Feed Rate	0.003 IPR (0.076 mm/rev)	0.006 IPR (0.16 mm/rev)
Part:	Nuclear fueling machine head rotor	Penetration Rate	0.315 IPM (8 mm/min)	2.362 IPM (60 mm/min)
Material:	ASTM A276-304L	Cycle Time	2 hr 10 min	17 min
Hole Ø:	4.7244" (120 mm)	Tool Life	12 min	65 min
Hole Depth:	40.9449" (1040 mm)	Wohlhaupter offered 93.32% cost per hole savings over the competitor tooling.		

- ▶ Analog balanced fine boring head
Item No. 464038*
*replacement for 364047
- ▶ Boring insert
Item No. 297994WHC111
- ▶ NOVI^{TECH} vibration damper intermediate module
Item No. 519004



*86.92%
cycle time reduction*

The Wohlhaupter boring head with the NOVI^{TECH} vibration damper module provided:

- ✓ Increased penetration rate
- ✓ Decreased cycle time
- ✓ Increased tool life
- ✓ Decreased cost per hole

NOVITECH® Vibration Damping Intermediate Modules Overview



THE DEEP HOLE 10xD BORING SOLUTION YOU'VE BEEN LOOKING FOR



OUR SOLUTION

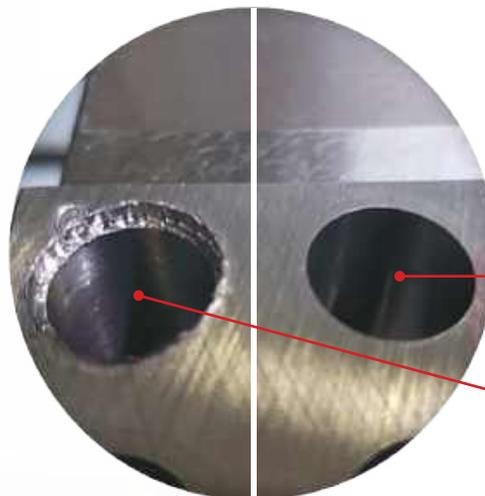
- ▶ Machine up to **10xD**.
- ▶ Connect quickly and easily with the **MVS connection**.
- ▶ Utilize existing **Wohlhaupter® components**.
- ▶ **Increase** your productivity, surface quality, and process reliability.
- ▶ **Increase** your tool and spindle life.

YOUR ADVANTAGE

Damper module with viscoelastic bearing

Absorber mass

THE SURFACE QUALITY TELLS IT ALL



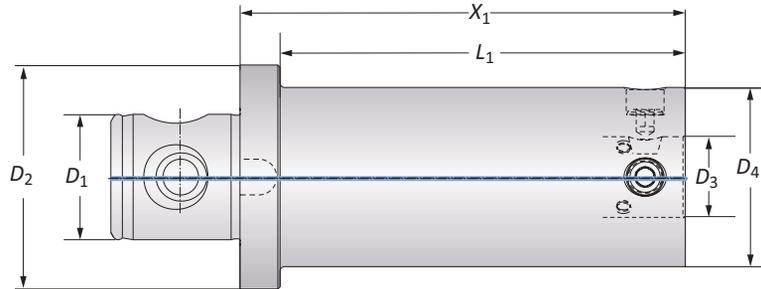
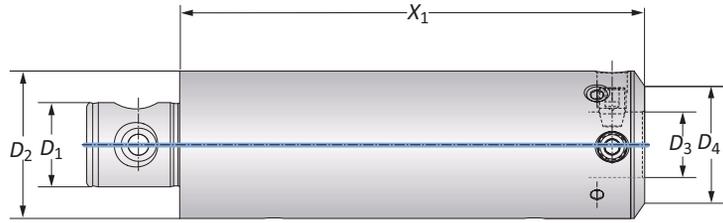
When our customer was machining alloy steel to 9xD, the NOVITECH provided reliable machining, which achieved high surface quality (Ra = 32).

Wohlhaupter NOVITECH with VarioBore precision boring head

Standard tool construction with steel extension

NOVI^{TECH}® Vibration Damping Intermediate Modules

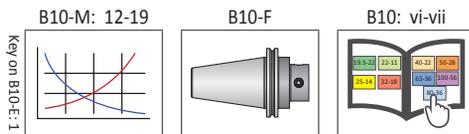
Machining Diameter: 1.969" - 8.071" (50.00 mm - 205.00 mm)



MVS Connection		NOVI ^{TECH}		Weight	Part No.
D_2 D_1	D_4 D_3	X_1	L_1		
50 - 28*	40 - 22	7.874	-	6.172 (lbs)	519002
63 - 36	50 - 28	7.874	-	12.560 (lbs)	519003
80 - 36	63 - 36	7.874	-	16.530 (lbs)	519004
80 - 36	80 - 36	7.874	-	16.530 (lbs)	519005
100 - 56	80 - 36	7.874	7.165	21.825 (lbs)	519006
<hr/>					
50 - 28*	40 - 22	200.00	-	2.80 (kg)	519002
63 - 36	50 - 28	200.00	-	5.70 (kg)	519003
80 - 36	63 - 36	200.00	-	7.50 (kg)	519004
80 - 36	80 - 36	200.00	-	7.50 (kg)	519005
100 - 56	80 - 36	200.00	182.00	9.90 (kg)	519006

* D_2 = 49.50 mm

NOTE: The NOVITECH[®] intermediate module should always be assembled as close as possible to the cutting edge (i.e. the next component behind the boring head).



I = Imperial (in)
M = Metric (mm)

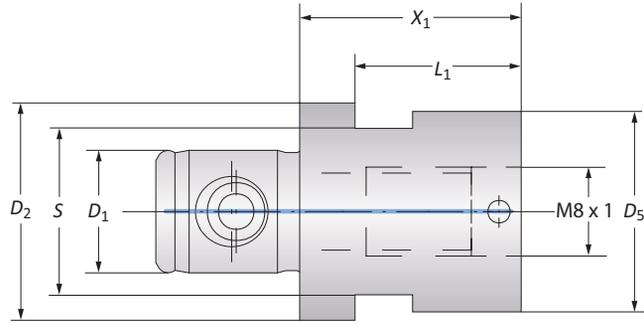
IMPORTANT: Max spindle speed refers to maximum possible speed for an individual boring head and is not a recommended parameter. Refer to page B10-M: 12 for recommended application-specific parameters. Factory technical assistance is available for your specific applications through our Application Engineering department. ext: 7611 | email: appeng@alliedmachine.com

WARNING Exceeding weight capacity for machine tool spindle and tool changer can cause machine damage and/or serious injury. To prevent:
-Consult machine tool builder for machine's weight limitations.
-Refer to example on page B10-M: 11 for calculating tool assembly weight.
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-When using heavy metal components, do not exceed recommended 8xD length-to-diameter ratio.
-When using a carbide shank, do not exceed recommended 9xD length-to-diameter ratio.
-When using a NOVITECH[®] module, do not exceed recommended 10xD length-to-diameter ratio.
-Refer to examples on pages B10-M: 8-10 for calculating length-to-diameter ratio.
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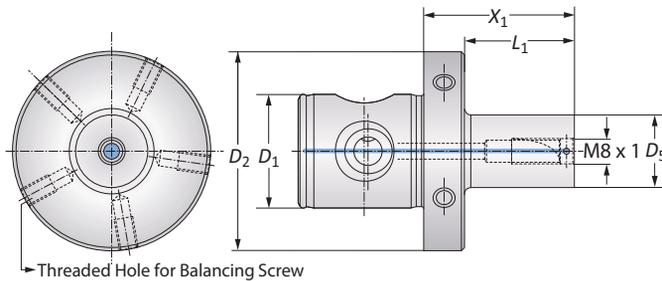
249 (248) Adapters

Adapters | Balanced Adapters



Adapters

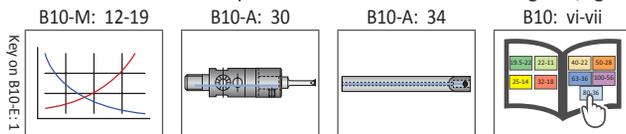
	MVS Connection		Adapter				Weight	Service Key	Part No.
	$D_2 D_1$	Boring Connection	X_1	L_1	S	D_5			
i	19.5 - 11	M8 x 1	0.787	0.590	15/P	0.708	0.110 (lbs)	15 S / P	219168
	23 - 11	M8 x 1	0.787	-	19/P	0.905	0.154 (lbs)	19 S / P	219169
m	19.5 - 11	M8 x 1	20.00	15.00	15/P	18.00	0.05 (kg)	15 S / P	219168
	23 - 11	M8 x 1	20.00	-	19/P	23.00	0.07 (kg)	19 S / P	219169



Balanced Adapters

	MVS Connection		Adapter			Weight	Balancing Screw	Part No.
	$D_2 D_1$	Boring Connection	X_1	L_1	D_5			
i	50 - 28	M8 x 1	1.259	0.748	0.590	0.771 (lbs)	M6 x 1 x 10	219185
	50 - 28	M8 x 1	1.890	1.377	0.708	0.881 (lbs)	M6 x 1 x 10	219176
	50 - 28	M8 x 1	1.890	1.377	0.905	0.992 (lbs)	M6 x 1 x 10	219177
m	50 - 28	M8 x 1	32.00	19.00	15.00	0.35 (kg)	M6 x 1 x 10	219185
	50 - 28	M8 x 1	48.00	35.00	18.00	0.40 (kg)	M6 x 1 x 10	219176
	50 - 28	M8 x 1	48.00	35.00	23.00	0.45 (kg)	M6 x 1 x 10	219177

NOTE: Balance refers to a specific residual imbalance of ≤ 10 g mm/kg.



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ext: 7611 | email: appeng@alliedmachine.com

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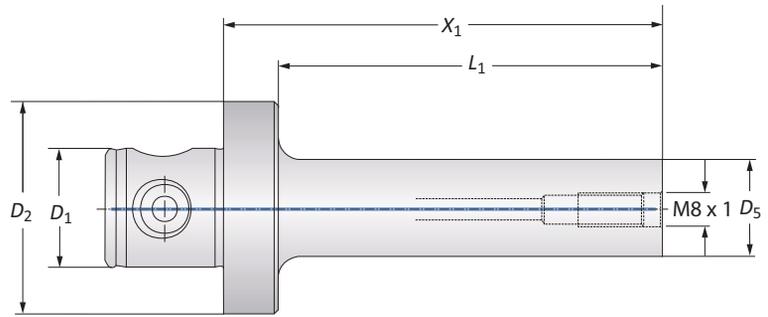
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- When using heavy metal components, do not exceed recommended 8xD length-to-diameter ratio.
- When using a carbide shank, do not exceed recommended 9xD length-to-diameter ratio.
- When using a NOVI^{TECH} module, do not exceed recommended 10xD length-to-diameter ratio.
- Refer to examples on pages B10-M: 8-10 for calculating length-to-diameter ratio.

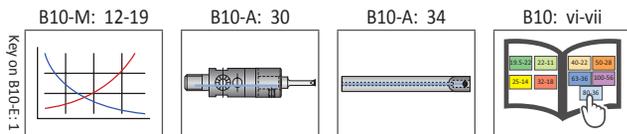
Factory technical assistance is available for your specific applications through our Application Engineering department. ext: 7611 | email: appeng@alliedmachine.com

249 (248) Adapters

Vibration Reducing Heavy Metal Adapters



	MVS Connection		Adapter			Weight	Part No.
	D_2 D_1	Boring Connection	X_1	L_1	D_5		
i	50 - 28	M8 x 1	2.677	2.165	0.590	1.763 (lbs)	248147
	50 - 28	M8 x 1	3.307	2.795	0.748	2.204 (lbs)	248148
	50 - 28	M8 x 1	4.094	3.582	0.905	2.866 (lbs)	248149
m	50 - 28	M8 x 1	68.00	55.00	15.00	0.80 (kg)	248147
	50 - 28	M8 x 1	84.00	71.00	19.00	1.00 (kg)	248148
	50 - 28	M8 x 1	104.00	91.00	23.00	1.30 (kg)	248149



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m = Metric (mm)

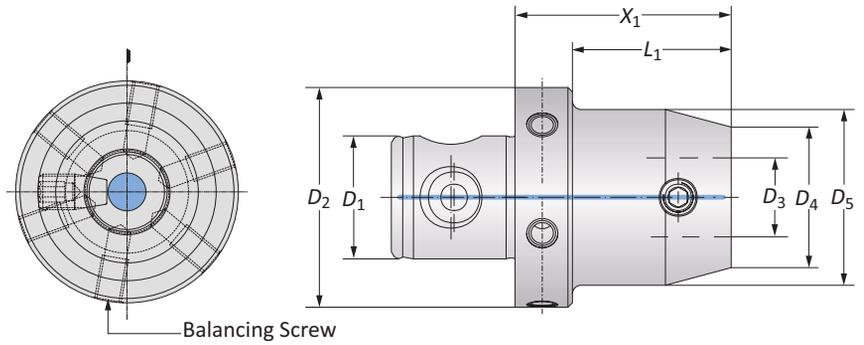
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WARNING Exceeding weight capacity for machine tool spindle and tool changer can cause machine damage and/or serious injury. To prevent:
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-Refer to example on page B10-M: 11 for calculating tool assembly weight.
Factory technical assistance is also available for specific applications through our Application Engineering department. ext: 7611 | email: appeng@alliedmachine.com

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-When using a carbide shank, do not exceed recommended 9xD length-to-diameter ratio.
-When using a NOVI^{TECH} module, do not exceed recommended 10xD length-to-diameter ratio.
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Reducers

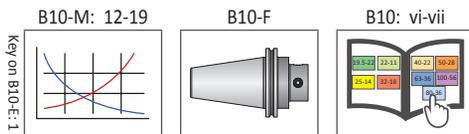
Imperial | Balanced



MVS Connection		Reducer			Weight	Balancing Screw	Part No.
$D_2 D_1$	$D_4 D_3$	X_1	L_1	D_5			
25 - 14	19.5 - 11	1.181	0.827	-	0.220 (lbs)	-	219034
25 - 14	22 - 11	1.181	0.827	-	0.440 (lbs)	-	219035
32 - 18	22 - 11	0.472	0.020	-	0.220 (lbs)	-	219036
32 - 18	25 - 14	1.181	0.827	-	0.220 (lbs)	-	219037
40 - 22	22 - 11	0.472	0.020	-	0.440 (lbs)	-	219038
40 - 22	25 - 14	1.181	0.827	-	0.440 (lbs)	-	219039
40 - 22	32 - 18	1.181	-	1.575	1.102 (lbs)	-	219040
50 - 28	19.5 - 11	2.126	1.614	-	0.881 (lbs)	M6 x 1 x 10	219051
50 - 28	22 - 11	0.551	0.020	-	0.661 (lbs)	M6 x 1 x 10	219041
50 - 28	22 - 11	2.126	1.614	-	0.881 (lbs)	M6 x 1 x 10	219052
50 - 28	25 - 14	0.551	0.020	-	0.661 (lbs)	M6 x 1 x 7	119094
50 - 28	25 - 14	2.323	1.811	-	0.881 (lbs)	M6 x 1 x 10	119054
50 - 28	25 - 14	2.323	1.811	1.260	1.102 (lbs)	M6 x 1 x 10	119055
50 - 28	25 - 14	4.685	4.173	1.260	1.984 (lbs)	M6 x 1 x 10	119010
50 - 28	25 - 14	4.685	4.173	1.417	2.204 (lbs)	M6 x 1 x 10	219030*
50 - 28	32 - 18	1.929	1.417	1.378	1.984 (lbs)	M6 x 1 x 10	219085
50 - 28	32 - 18	4.291	3.780	1.378	2.204 (lbs)	M6 x 1 x 10	219086
50 - 28	32 - 18	4.291	3.780	1.575	2.425 (lbs)	M6 x 1 x 10	119012
50 - 28	32 - 18	4.291	3.780	1.811	2.866 (lbs)	M6 x 1 x 10	219032*
50 - 28	40 - 22	1.575	1.063	-	1.102 (lbs)	M6 x 1 x 10	219087
50 - 28	40 - 22	3.937	3.425	1.850	2.866 (lbs)	M6 x 1 x 10	219088
50 - 28	63 - 36	1.969	-	-	2.204 (lbs)	M6 x 1 x 10	119059

*Reinforced reducer.

NOTE: Balance refers to a specific residual imbalance of ≤ 10 g mm/kg.



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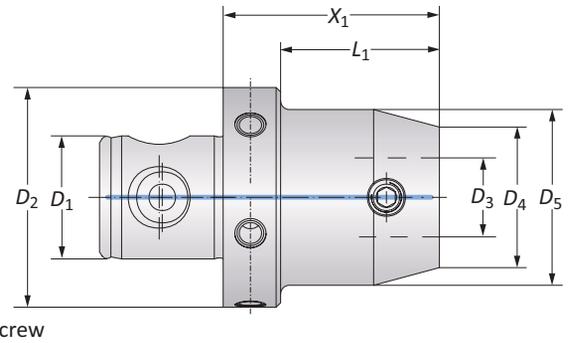
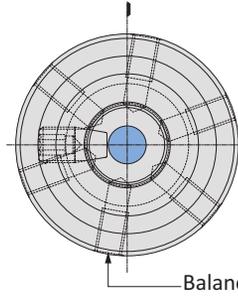
- Consult machine tool builder for machine's weight limitations.
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 - When using heavy metal components, do not exceed recommended 8xD length-to-diameter ratio.
 - When using a carbide shank, do not exceed recommended 9xD length-to-diameter ratio.
 - When using a NOVI^{TECH} module, do not exceed recommended 10xD length-to-diameter ratio.
 - Refer to examples on pages B10-M: 8-10 for calculating length-to-diameter ratio.
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Reducers

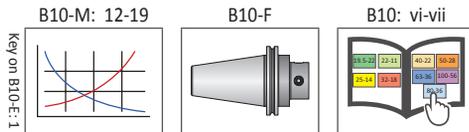
Metric | Balanced



MVS Connection		Reducer			Weight	Balancing Screw	Part No.
$D_2 D_1$	$D_4 D_3$	X_1	L_1	D_5			
25 - 14	19.5 - 11	30.00	21.00	-	0.10 (kg)	-	219034
25 - 14	22 - 11	30.00	21.00	-	0.20 (kg)	-	219035
32 - 18	22 - 11	12.00	0.50	-	0.10 (kg)	-	219036
32 - 18	25 - 14	30.00	21.00	-	0.10 (kg)	-	219037
40 - 22	22 - 11	12.00	0.50	-	0.20 (kg)	-	219038
40 - 22	25 - 14	30.00	21.00	-	0.20 (kg)	-	219039
40 - 22	32 - 18	30.00	-	40.00	0.50 (kg)	-	219040
50 - 28	19.5 - 11	54.00	41.00	-	0.40 (kg)	M6 x 1 x 10	219051
50 - 28	22 - 11	14.00	0.50	-	0.30 (kg)	M6 x 1 x 10	219041
50 - 28	22 - 11	54.00	41.00	-	0.40 (kg)	M6 x 1 x 10	219052
50 - 28	25 - 14	14.00	0.50	-	0.30 (kg)	M6 x 1 x 7	119094
50 - 28	25 - 14	59.00	46.00	-	0.40 (kg)	M6 x 1 x 10	119054
50 - 28	25 - 14	59.00	46.00	32.00	0.50 (kg)	M6 x 1 x 10	119055
50 - 28	25 - 14	119.00	106.00	32.00	0.90 (kg)	M6 x 1 x 10	119010
50 - 28	25 - 14	119.00	106.00	36.00	1.00 (kg)	M6 x 1 x 10	219030*
50 - 28	32 - 18	49.00	36.00	35.00	0.90 (kg)	M6 x 1 x 10	219085
50 - 28	32 - 18	109.00	96.00	35.00	1.00 (kg)	M6 x 1 x 10	219086
50 - 28	32 - 18	109.00	96.00	40.00	1.10 (kg)	M6 x 1 x 10	119012
50 - 28	32 - 18	109.00	96.00	46.00	1.30 (kg)	M6 x 1 x 10	219032*
50 - 28	40 - 22	40.00	27.00	-	0.50 (kg)	M6 x 1 x 10	219087
50 - 28	40 - 22	100.00	87.00	47.00	1.30 (kg)	M6 x 1 x 10	219088
50 - 28	63 - 36	50.00	-	-	1.00 (kg)	M6 x 1 x 10	119059

*Reinforced reducer.

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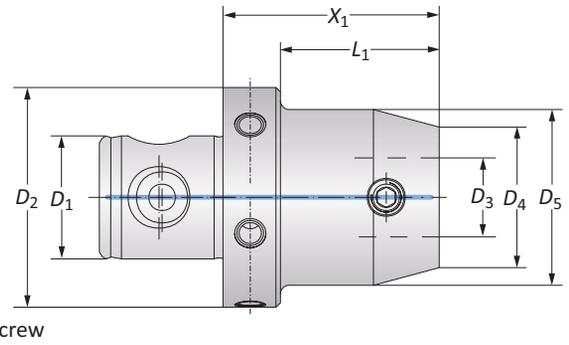
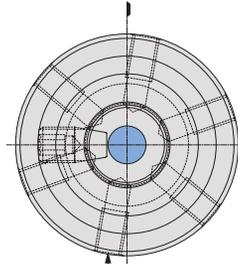
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-Do not exceed recommended 10xD length-to-diameter ratio or exceed 4 total components (including shank).
-When using Alu-Line components, do not exceed recommended 5xD length-to-diameter ratio.
-When using tool steel components, do not exceed recommended 6xD length-to-diameter ratio.
-When using heavy metal components, do not exceed recommended 8xD length-to-diameter ratio.
-When using a carbide shank, do not exceed recommended 9xD length-to-diameter ratio.
-When using a NOVI^{TECH} module, do not exceed recommended 10xD length-to-diameter ratio.
-Refer to examples on pages B10-M: 8-10 for calculating length-to-diameter ratio.
Factory technical assistance is available for your specific applications through our Application Engineering department. ext: 7611 | email: appeng@alliedmachine.com

Reducers

Imperial | Balanced

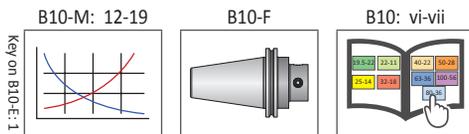


MVS Connection		Reducer			Weight	Balancing Screw	Part No.
$D_2 D_1$	$D_4 D_3$	X_1	L_1	D_5			
63 - 36	19.5 - 11	2.126	1.614	-	1.322 (lbs)	M6 x 1 x 10	219053
63 - 36	22 - 11	0.551	0.020	-	1.322 (lbs)	M6 x 1 x 10	219042
63 - 36	22 - 11	2.126	1.614	-	1.543 (lbs)	M6 x 1 x 10	219054
63 - 36	25 - 14	0.551	0.020	-	1.322 (lbs)	M6 x 1 x 10	119095
63 - 36	25 - 14	2.323	1.811	-	1.543 (lbs)	M6 x 1 x 10	119060
63 - 36	25 - 14	2.323	1.811	1.260	1.763 (lbs)	M6 x 1 x 10	119061
63 - 36	25 - 14	4.685	4.173	1.260	2.425 (lbs)	M6 x 1 x 15	119019
63 - 36	25 - 14	4.685	4.173	1.417	2.866 (lbs)	M6 x 1 x 10	219031*
63 - 36	32 - 18	1.929	1.417	1.378	1.543 (lbs)	M6 x 1 x 10	219089
63 - 36	32 - 18	4.291	3.780	1.378	2.645 (lbs)	M6 x 1 x 10	219090
63 - 36	32 - 18	4.291	3.780	1.575	3.086 (lbs)	M6 x 1 x 10	119021
63 - 36	32 - 18	4.291	3.780	1.811	3.527 (lbs)	M6 x 1 x 10	219033*
63 - 36	40 - 22	1.575	1.063	-	1.763 (lbs)	M6 x 1 x 10	219091
63 - 36	40 - 22	3.937	3.425	1.850	3.527 (lbs)	M6 x 1 x 15	219092
63 - 36	40 - 22	5.906	5.394	1.969	5.291 (lbs)	M6 x 1 x 15	119067
63 - 36	50 - 28	1.575	-	2.480	2.204 (lbs)	M6 x 1 x 10	119064
63 - 36	50 - 28	1.575	1.063	-	1.763 (lbs)	M6 x 1 x 10	119096**
63 - 36	50 - 28	3.937	-	2.480	5.291 (lbs)	M6 x 1 x 15	119025
63 - 36	50 - 28	3.937	3.425	-	3.747 (lbs)	M6 x 1 x 10	119097**
80 - 36	63 - 36	1.969	-	3.150	3.527 (lbs)	M6 x 1 x 15	119098
100 - 56	80 - 36	2.756	2.047	-	7.936 (lbs)	M8 x 1.25 x 20	219066

* Reinforced reducer.

**For milling applications.

NOTE: Balance refers to a specific residual imbalance of ≤ 10 g mm/kg.



i = Imperial (in)
m = Metric (mm)

IMPORTANT: Max spindle speed refers to maximum possible speed for an individual boring head and is not a recommended parameter. Refer to page B10-M: 12 for recommended application-specific parameters. Factory technical assistance is available for your specific applications through our Application Engineering department. ext: 7611 | email: appeng@alliedmachine.com

WARNING Exceeding weight capacity for machine tool spindle and tool changer can cause machine damage and/or serious injury. To prevent:

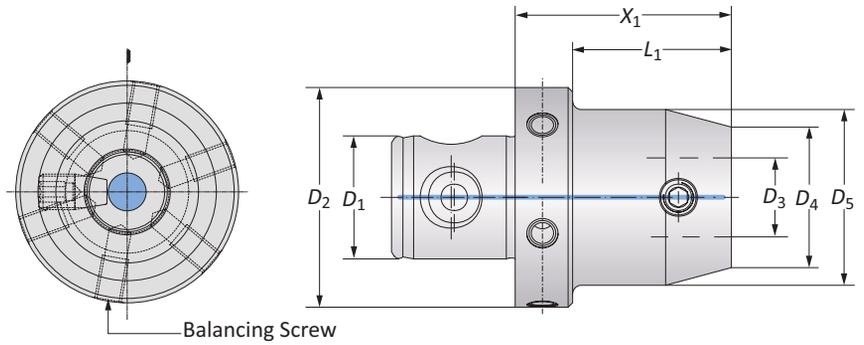
- Consult machine tool builder for machine's weight limitations.
 - Refer to example on page B10-M: 11 for calculating tool assembly weight.
- Factory technical assistance is also available for specific applications through our Application Engineering department. ext: 7611 | email: appeng@alliedmachine.com

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 - When using tool steel components, do not exceed recommended 6xD length-to-diameter ratio.
 - When using heavy metal components, do not exceed recommended 8xD length-to-diameter ratio.
 - When using a carbide shank, do not exceed recommended 9xD length-to-diameter ratio.
 - When using a NOVI^{TECH} module, do not exceed recommended 10xD length-to-diameter ratio.
 - Refer to examples on pages B10-M: 8-10 for calculating length-to-diameter ratio.
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Reducers

Metric | Balanced

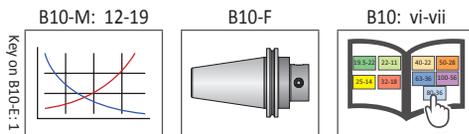


MVS Connection	Reducer		Weight	Balancing Screw	Part No.		
	$D_2 D_1$	$D_4 D_3$				X_1	L_1
63 - 36	19.5 - 11	54.00	41.00	-	0.60 (kg)	M6 x 1 x 10	219053
63 - 36	22 - 11	14.00	0.50	-	0.60 (kg)	M6 x 1 x 10	219042
63 - 36	22 - 11	54.00	41.00	-	0.70 (kg)	M6 x 1 x 10	219054
63 - 36	25 - 14	14.00	0.50	-	0.60 (kg)	M6 x 1 x 10	119095
63 - 36	25 - 14	59.00	46.00	-	0.70 (kg)	M6 x 1 x 10	119060
63 - 36	25 - 14	59.00	46.00	32.00	0.80 (kg)	M6 x 1 x 10	119061
63 - 36	25 - 14	119.00	106.00	32.00	1.10 (kg)	M6 x 1 x 15	119019
63 - 36	25 - 14	119.00	106.00	36.00	1.30 (kg)	M6 x 1 x 10	219031*
63 - 36	32 - 18	49.00	36.00	35.00	0.70 (kg)	M6 x 1 x 10	219089
63 - 36	32 - 18	109.00	96.00	35.00	1.20 (kg)	M6 x 1 x 10	219090
63 - 36	32 - 18	109.00	96.00	40.00	1.40 (kg)	M6 x 1 x 10	119021
63 - 36	32 - 18	109.00	96.00	46.00	1.60 (kg)	M6 x 1 x 10	219033*
63 - 36	40 - 22	40.00	27.00	-	0.80 (kg)	M6 x 1 x 10	219091
63 - 36	40 - 22	100.00	87.00	47.00	1.60 (kg)	M6 x 1 x 15	219092
63 - 36	40 - 22	150.00	137.00	50.00	2.40 (kg)	M6 x 1 x 15	119067
63 - 36	50 - 28	40.00	-	63.00	1.00 (kg)	M6 x 1 x 10	119064
63 - 36	50 - 28	40.00	27.00	-	0.80 (kg)	M6 x 1 x 10	119096**
63 - 36	50 - 28	100.00	-	63.00	2.40 (kg)	M6 x 1 x 15	119025
63 - 36	50 - 28	100.00	87.00	-	1.70 (kg)	M6 x 1 x 10	119097**
80 - 36	63 - 36	50.00	-	80.00	1.60 (kg)	M6 x 1 x 15	119098
100 - 56	80 - 36	70.00	52.00	-	3.60 (kg)	M8 x 1.25 x 20	219066

* Reinforced reducer.

**For milling applications.

NOTE: Balance refers to a specific residual imbalance of ≤ 10 g mm/kg.



I = Imperial (in)
M = Metric (mm)

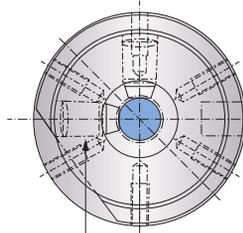
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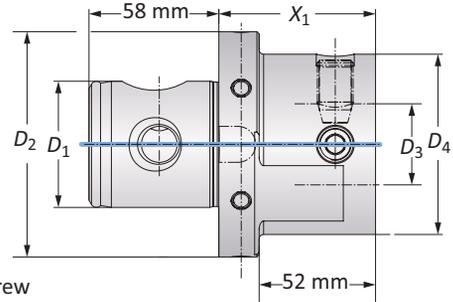
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-When using tool steel components, do not exceed recommended 6xD length-to-diameter ratio.
-When using heavy metal components, do not exceed recommended 8xD length-to-diameter ratio.
-When using a carbide shank, do not exceed recommended 9xD length-to-diameter ratio.
-When using a NOVI^{TECH} module, do not exceed recommended 10xD length-to-diameter ratio.
-Refer to examples on pages B10-M: 8-10 for calculating length-to-diameter ratio.
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Reducer

Balanced Alu-Line

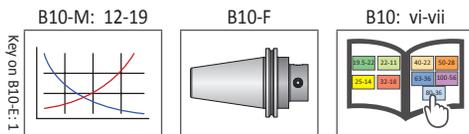


Balancing Screw



	MVS Connection		Reducer		Weight	Balancing Screw	Part No.
	$D_2 D_1$	$D_4 D_3$	X_1	L_1			
i	100 - 56	80 - 36	2.756	2.047	2.866 (lbs)	M8 x 1.25 x 20	319013
m	100 - 56	80 - 36	70.00	52.00	1.30 (kg)	M8 x 1.25 x 20	319013

NOTE: Balance refers to a specific residual imbalance of ≤ 10 g mm/kg.



Key on B10-E: 1

i = Imperial (in)
m = Metric (mm)

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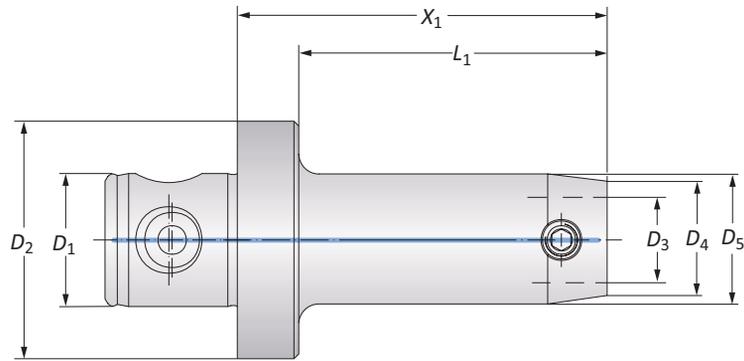
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- When using heavy metal components, do not exceed recommended 8xD length-to-diameter ratio.
- When using a carbide shank, do not exceed recommended 9xD length-to-diameter ratio.
- When using a NOVI^{TECH} module, do not exceed recommended 10xD length-to-diameter ratio.
- Refer to examples on pages B10-M: 8-10 for calculating length-to-diameter ratio.

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Heavy Metal Reducers

Vibration Reduction



MVS Connection		Heavy Metal Reducer			Weight	Part No.
$D_2 D_1$	$D_4 D_3$	X_1	L_1	D_5		
50 - 28	19.5 - 11	3.543	3.031	-	2.204 (lbs)	219055
50 - 28	22 - 11	4.331	3.819	0.906	2.866 (lbs)	219056
50 - 28	25 - 14	4.882	4.370	1.102	3.747 (lbs)	219057
50 - 28	25 - 14	5.669	5.157	1.260	5.070 (lbs)	219058
50 - 28	25 - 14	6.457	5.945	1.378	6.393 (lbs)	219059
50 - 28	32 - 18	6.063	5.551	1.457	6.393 (lbs)	219093
50 - 28	32 - 18	6.063	5.551	1.654	8.157 (lbs)	219060
<hr/>						
50 - 28	19.5 - 11	90.00	77.00	-	1.00 (kg)	219055
50 - 28	22 - 11	110.00	97.00	23.00	1.30 (kg)	219056
50 - 28	25 - 14	124.00	111.00	28.00	1.70 (kg)	219057
50 - 28	25 - 14	144.00	131.00	32.00	2.30 (kg)	219058
50 - 28	25 - 14	164.00	151.00	35.00	2.90 (kg)	219059
50 - 28	32 - 18	154.00	141.00	37.00	2.90 (kg)	219093
50 - 28	32 - 18	154.00	141.00	42.00	3.70 (kg)	219060

NOTE: Heavy metal reducers are used to reduce vibration when machining deep boring applications. When using heavy metal reducers, the maximum cutting speed (V_c) is 200 m/min. If steel extensions are also used, reduce the cutting speed by 50% and use replaceable inserts where $r = 0.10$ mm.

B10-M: 12-19

Key on B10-E: 1

B10-F

B10: vi-vii

i = Imperial (in)
m = Metric (mm)

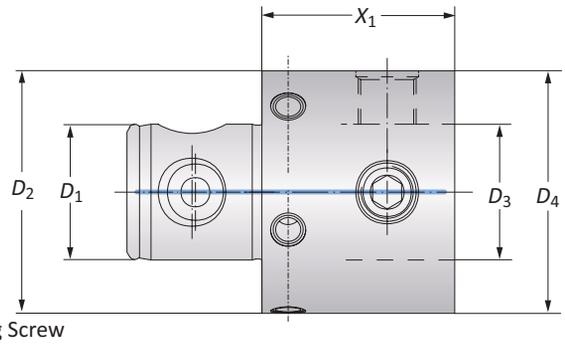
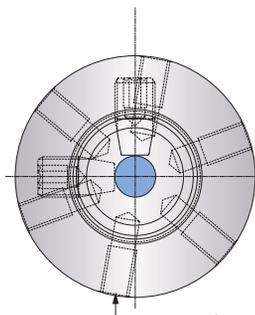
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WARNING Exceeding weight capacity for machine tool spindle and tool changer can cause machine damage and/or serious injury. To prevent:
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 -When using heavy metal components, do not exceed recommended 8xD length-to-diameter ratio.
 -When using a carbide shank, do not exceed recommended 9xD length-to-diameter ratio.
 -When using a NOVI^{TECH} module, do not exceed recommended 10xD length-to-diameter ratio.
 -Refer to examples on pages B10-M: 8-10 for calculating length-to-diameter ratio.
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Extensions

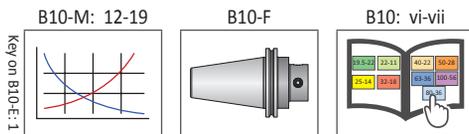
Imperial | Balanced



MVS Connection		Extension		Weight	Balancing Screw	Part No.
$D_2 D_1$	$D_4 D_3$	X_1				
19.5 - 11	19.5 - 11	1.575	0.220 (lbs)	-	219043	
22 - 11	22 - 11	1.575	0.220 (lbs)	-	219044	
25 - 14	25 - 14	0.984	0.220 (lbs)	-	219068	
25 - 14	25 - 14	1.575	0.220 (lbs)	-	119001	
32 - 18	32 - 18	1.575	0.440 (lbs)	-	119002	
40 - 22	40 - 22	1.575	0.881 (lbs)	-	119003	
50 - 28	50 - 28	1.575	1.322 (lbs)	M6 x 1 x 10	119004	
50 - 28*	50 - 28*	2.953	2.425 (lbs)	M6 x 1 x 10	219097	
50 - 28	50 - 28	2.953	2.425 (lbs)	M6 x 1 x 10	219082	
50 - 28	50 - 28	3.937	3.306 (lbs)	M6 x 1 x 10	119058	
63 - 36	63 - 36	1.969	2.425 (lbs)	M6 x 1 x 10	119005	
63 - 36	63 - 36	2.953	3.747 (lbs)	M6 x 1 x 15	219083	
63 - 36	63 - 36	4.921	6.393 (lbs)	M6 x 1 x 15	119065	
80 - 36	80 - 36	1.969	4.188 (lbs)	M6 x 1 x 15	119006	
80 - 36	80 - 36	2.953	6.172 (lbs)	M6 x 1 x 15	219084	
80 - 36	80 - 36	4.921	10.580 (lbs)	M6 x 1 x 15	119066	
80 - 36	80 - 36	7.874	16.310 (lbs)	M8 x 1.25 x 21	219094	
80 - 36	80 - 36	10.827	22.260 (lbs)	M8 x 1.25 x 21	119069	
100 - 56	100 - 56	2.953	9.479 (lbs)	M8 x 1.25 x 20	219095	
100 - 56	100 - 56	3.937	12.340 (lbs)	M8 x 1.25 x 20	219061	
100 - 56	100 - 56	5.906	17.850 (lbs)	M8 x 1.25 x 20	219096	
100 - 56	100 - 56	7.874	22.480 (lbs)	M8 x 1.25 x 20	219062	
100 - 56	100 - 56	11.811	32.180 (lbs)	M8 x 1.25 x 20	219063	

* $D_2 / D_4 = 1.949''$ (49.50 mm) for boring 1.969'' (50.00 mm) diameter applications.

NOTE: Balance refers to a specific residual imbalance of ≤ 10 g mm/kg.



i = Imperial (in)
m = Metric (mm)

IMPORTANT: Max spindle speed refers to maximum possible speed for an individual boring head and is not a recommended parameter. Refer to page B10-M: 12 for recommended application-specific parameters. Factory technical assistance is available for your specific applications through our Application Engineering department. ext: 7611 | email: appeng@alliedmachine.com

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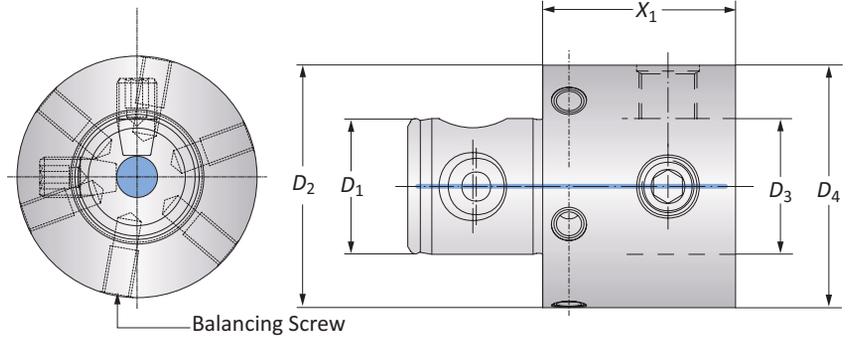
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 - When using tool steel components, do not exceed recommended 6xD length-to-diameter ratio.
 - When using heavy metal components, do not exceed recommended 8xD length-to-diameter ratio.
 - When using a carbide shank, do not exceed recommended 9xD length-to-diameter ratio.
 - When using a NOVI^{TECH} module, do not exceed recommended 10xD length-to-diameter ratio.
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Extensions

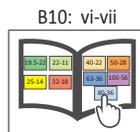
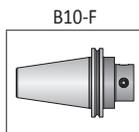
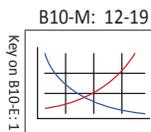
Metric | Balanced



MVS Connection		Extension		Weight	Balancing Screw	Part No.
D_2 D_1	D_4 D_3	X_1				
19.5 - 11	19.5 - 11	40.00	0.10 (kg)	-	219043	
22 - 11	22 - 11	40.00	0.10 (kg)	-	219044	
25 - 14	25 - 14	25.00	0.10 (kg)	-	219068	
25 - 14	25 - 14	40.00	0.10 (kg)	-	119001	
32 - 18	32 - 18	40.00	0.20 (kg)	-	119002	
40 - 22	40 - 22	40.00	0.40 (kg)	-	119003	
50 - 28	50 - 28	40.00	0.60 (kg)	M6 x 1 x 10	119004	
50 - 28*	50 - 28*	75.00	1.10 (kg)	M6 x 1 x 10	219097	
50 - 28	50 - 28	75.00	1.10 (kg)	M6 x 1 x 10	219082	
50 - 28	50 - 28	100.00	1.50 (kg)	M6 x 1 x 10	119058	
63 - 36	63 - 36	50.00	1.10 (kg)	M6 x 1 x 10	119005	
63 - 36	63 - 36	75.00	1.70 (kg)	M6 x 1 x 15	219083	
63 - 36	63 - 36	125.00	2.90 (kg)	M6 x 1 x 15	119065	
80 - 36	80 - 36	50.00	1.90 (kg)	M6 x 1 x 15	119006	
80 - 36	80 - 36	75.00	2.80 (kg)	M6 x 1 x 15	219084	
80 - 36	80 - 36	125.00	4.80 (kg)	M6 x 1 x 15	119066	
80 - 36	80 - 36	200.00	7.40 (kg)	M8 x 1.25 x 21	219094	
80 - 36	80 - 36	275.00	10.10 (kg)	M8 x 1.25 x 21	119069	
100 - 56	100 - 56	75.00	4.30 (kg)	M8 x 1.25 x 20	219095	
100 - 56	100 - 56	100.00	5.60 (kg)	M8 x 1.25 x 20	219061	
100 - 56	100 - 56	150.00	8.10 (kg)	M8 x 1.25 x 20	219096	
100 - 56	100 - 56	200.00	10.20 (kg)	M8 x 1.25 x 20	219062	
100 - 56	100 - 56	300.00	14.60 (kg)	M8 x 1.25 x 20	219063	

* $D_2 / D_4 = 1.949$ " (49.50 mm) for boring 1.969" (50.00 mm) diameter applications.

NOTE: Balance refers to a specific residual imbalance of ≤ 10 g mm/kg.



I = Imperial (in)
M = Metric (mm)

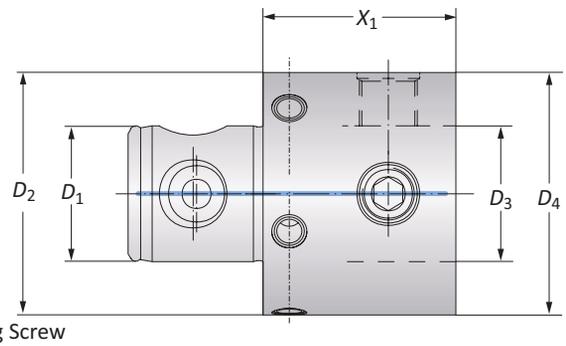
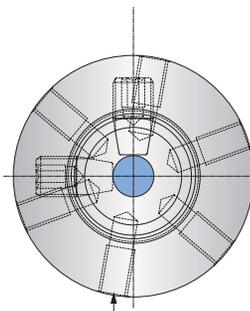
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-When using Alu-Line components, do not exceed recommended 5xD length-to-diameter ratio.
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-When using heavy metal components, do not exceed recommended 8xD length-to-diameter ratio.
-When using a carbide shank, do not exceed recommended 9xD length-to-diameter ratio.
-When using a NOVI^{TECH} module, do not exceed recommended 10xD length-to-diameter ratio.
-Refer to examples on pages B10-M: 8-10 for calculating length-to-diameter ratio.
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Extensions

Balanced Alu-Line



MVS Connection		Modules		Weight	Balancing Screw	Part No.
$D_2 D_1$	$D_4 D_3$	X_1				
50 - 28	50 - 28	1.575	0.440 (lbs)	M6 x 1 x 8	319021	
50 - 28	50 - 28	2.953	0.881 (lbs)	M6 x 1 x 10	319022	
50 - 28	50 - 28	3.937	1.322 (lbs)	M6 x 1 x 10	319023	
63 - 36	63 - 36	1.969	0.881 (lbs)	M6 x 1 x 8	319002	
63 - 36	63 - 36	4.921	2.425 (lbs)	M6 x 1 x 10	319003	
80 - 36	80 - 36	1.969	1.543 (lbs)	M6 x 1 x 10	319004	
80 - 36	80 - 36	2.953	2.204 (lbs)	M6 x 1 x 10	319016	
i 80 - 36	80 - 36	4.921	3.968 (lbs)	M6 x 1 x 10	319005	
80 - 36	80 - 36	7.874	5.952 (lbs)	M6 x 1 x 10	319017	
80 - 36	80 - 36	10.827	8.157 (lbs)	M6 x 1 x 10	319006	
100 - 56	100 - 56	2.953	3.306 (lbs)	M8 x 1.25 x 20	319019	
100 - 56	100 - 56	3.937	4.850 (lbs)	M8 x 1.25 x 20	319007	
100 - 56	100 - 56	5.906	6.613 (lbs)	M8 x 1.25 x 20	319018	
100 - 56	100 - 56	7.874	8.377 (lbs)	M8 x 1.25 x 20	319008	
100 - 56	100 - 56	11.811	11.900 (lbs)	M8 x 1.25 x 20	319009	
<hr/>						
50 - 28	50 - 28	40.00	0.20 (kg)	M6 x 1 x 8	319021	
50 - 28	50 - 28	75.00	0.40 (kg)	M6 x 1 x 10	319022	
50 - 28	50 - 28	100.00	0.60 (kg)	M6 x 1 x 10	319023	
63 - 36	63 - 36	50.00	0.40 (kg)	M6 x 1 x 8	319002	
63 - 36	63 - 36	125.00	1.10 (kg)	M6 x 1 x 10	319003	
80 - 36	80 - 36	50.00	0.70 (kg)	M6 x 1 x 10	319004	
80 - 36	80 - 36	75.00	1.00 (kg)	M6 x 1 x 10	319016	
m 80 - 36	80 - 36	125.00	1.80 (kg)	M6 x 1 x 10	319005	
80 - 36	80 - 36	200.00	2.70 (kg)	M6 x 1 x 10	319017	
80 - 36	80 - 36	275.00	3.70 (kg)	M6 x 1 x 10	319006	
100 - 56	100 - 56	75.00	1.50 (kg)	M8 x 1.25 x 20	319019	
100 - 56	100 - 56	100.00	2.20 (kg)	M8 x 1.25 x 20	319007	
100 - 56	100 - 56	150.00	3.00 (kg)	M8 x 1.25 x 20	319018	
100 - 56	100 - 56	200.00	3.80 (kg)	M8 x 1.25 x 20	319008	
100 - 56	100 - 56	300.00	5.40 (kg)	M8 x 1.25 x 20	319009	

NOTE: Balance refers to a specific residual imbalance of ≤ 10 g mm/kg.

i = Imperial (in)
m = Metric (mm)

IMPORTANT: Max spindle speed refers to maximum possible speed for an individual boring head and is not a recommended parameter. Refer to page B10-M: 12 for recommended application-specific parameters. Factory technical assistance is available for your specific applications through our Application Engineering department. ext: 7611 | email: appeng@alliedmachine.com

⚠ WARNING Exceeding weight capacity for machine tool spindle and tool changer can cause machine damage and/or serious injury. To prevent:

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 - When using a NOVI^{TECH} module, do not exceed recommended 10xD length-to-diameter ratio.
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SECTION

B10-F

Master Shanks with MVS Connection

Wohlhaupter® Master Shanks with MVS Connection



The MVS Connection

Wohlhaupter MVS connection shanks provide a high level of accuracy when building or replacing components. Our master shanks adapt to any machine tool spindle, making it easy to find the shank you need.

Your safety and the safety of others is very important. This catalog contains important safety messages. Always read and follow all safety precautions.



This triangle is a safety hazard symbol. It alerts you to potential safety hazards that can cause tool failure and serious injury.

When you see this symbol in the catalog, look for a related safety message that may be near this triangle or referred to in the nearby text.

There are safety signal words also used in the catalog. Safety messages follow these words.

WARNING

WARNING (shown above) means that failure to follow the precautions in this message could result in tool failure and serious injury.

NOTICE means that failure to follow the precautions in this message could result in damage to the tool or machine but not result in personal injury.

NOTE and **IMPORTANT** are also used. These are important that you read and follow but are not safety-related.

Visit www.alliedmachine.com for the most up-to-date information and procedures.

Applicable Industries



Aerospace



Agriculture



Automotive



Firearms



General
Machining



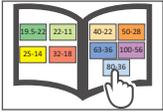
Oil & Gas



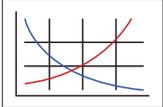
Renewable
Energy

Reference Icons

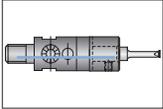
The following icons will appear throughout the catalog to help you navigate between products.



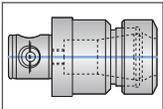
MVS Connection Color Guide
Detailed instructions and information regarding the MVS connection(s)



Recommended Cutting Data
Speed and feed recommendations for optimum and safe boring



249 (248) Boring Head
249 (248) boring head that connects into the adapter shanks



Clamping Elements
Collet chucks for carbide shanks



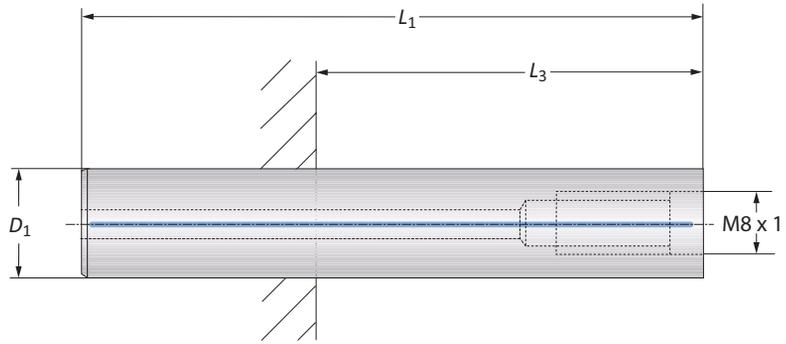
Coolant-Through Option
Indicates that the product is coolant through

Master Shanks with MVS Connection Table of Contents

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249 (248) Shanks

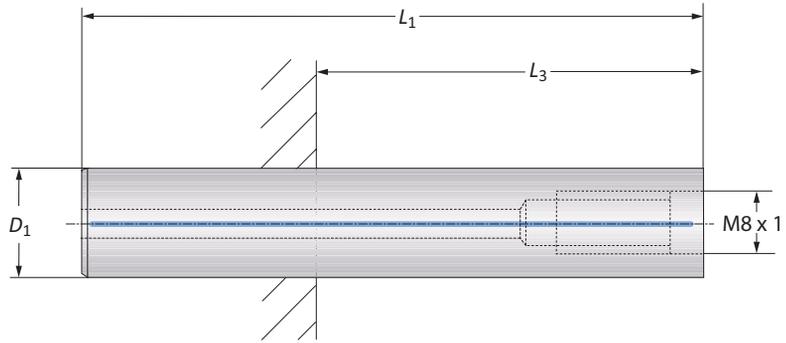
Steel | Carbide



Steel Shanks

Connection	Shank			L_3 min*			Weight	Part No.	
	D_1	L_1	L_3 max*	SK 40+50	HSK-A 63	HSK-A 100			
i	M8 x 1	0.591	3.346	1.456	-	-	-	0.220 (lbs)	248136
	M8 x 1	0.709	3.937	2.047	-	0.196	0.472	0.440 (lbs)	248137
	M8 x 1	0.906	4.606	2.716	-	0.866	1.141	0.881 (lbs)	248138
m	M8 x 1	15.00	85.00	37.00	-	-	-	0.10 (kg)	248136
	M8 x 1	18.00	100.00	52.00	-	5.00	12.00	0.20 (kg)	248137
	M8 x 1	23.00	117.00	69.00	-	22.00	29.00	0.40 (kg)	248138

* L_3 dimensions apply to collet chucks.



Carbide Shanks

Connection	Shank			L_3 min*				Weight	Part No.	
	D_1	L_1	L_3 max*	SK 40	SK 50	HSK-A 63	HSK-A 100			
i	M8 x 1	0.591	5.118	3.228	0.787	0.787	1.377	1.653	0.661 (lbs)	248142
	M8 x 1	0.709	6.102	4.212	1.535	0.826	2.362	2.637	1.322 (lbs)	248143
	M8 x 1	0.906	7.086	5.196	2.519	1.811	3.346	3.622	2.425 (lbs)	248144
	M8 x 1	0.906	9.527	7.637	4.960	4.251	5.787	6.062	3.086 (lbs)	248145
m	M8 x 1	15.00	130.00	82.00	20.00	20.00	35.00	42.00	0.30 (kg)	248142
	M8 x 1	18.00	155.00	107.00	39.00	21.00	60.00	67.00	0.60 (kg)	248143
	M8 x 1	23.00	180.00	132.00	64.00	46.00	85.00	92.00	1.10 (kg)	248144
	M8 x 1	23.00	242.00	194.00	126.00	108.00	147.00	154.00	1.40 (kg)	248145

* L_3 dimensions apply to collet chucks.

B10-M: 12-19

Key on B10-F: 1

B10-A: 30

B10: vi-vii

i = Imperial (in)
m = Metric (mm)

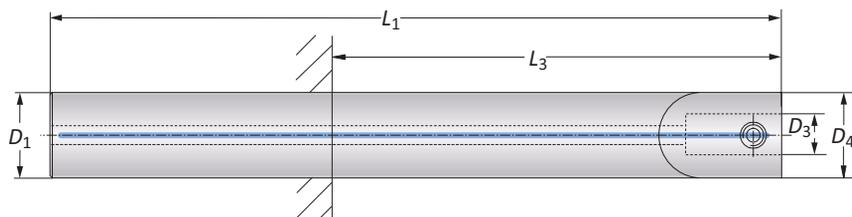
WARNING Exceeding weight capacity for machine tool spindle and tool changer can cause machine damage and/or serious injury. To prevent:

- Consult machine tool builder for machine's weight limitations.
 - Refer to example on page B10-M: 11 for calculating tool assembly weight.
- Factory technical assistance is also available for specific applications through our Application Engineering department. ext: 7611 | email: appeng@alliedmachine.com

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 - When using a NOVI^{TECH} module, do not exceed recommended 10xD length-to-diameter ratio.
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Carbide Master Shanks



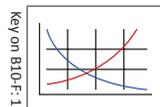
Connection	Shank				L_3 min				Weight	Part No.
	D_4 D_3	L_1	D_1	L_3 max	SK 40	SK 50	HSK-A 63	HSK-A 100		
i	18 - 11	6.102	0.709	4.213	1.535	1.024	2.362	2.638	1.102 (lbs)	299009*
	22 - 11	5.512	0.866	3.622	1.102	1.102	1.772	2.047	1.543 (lbs)	299001*
	22 - 11	7.480	0.866	5.591	2.913	2.205	3.740	4.016	1.984 (lbs)	299002*
	22 - 11	9.049	0.866	7.205	4.528	3.819	5.354	5.630	2.425 (lbs)	299003*
	25 - 14	6.496	0.984	4.606	1.929	1.417	2.756	3.031	2.205 (lbs)	299004*
	25 - 14	8.465	0.984	6.575	3.898	3.189	4.724	5.000	2.866 (lbs)	299005*
	32 - 18	8.268	1.260	-	5.354	5.354	5.572	5.394	4.630 (lbs)	299006**
	32 - 18	10.236	1.260	-	7.323	7.323	7.441	7.362	5.732 (lbs)	299007**
40 - 22	16.399	1.575	-	-	13.110	-	13.110	11.460 (lbs)	299008**	
m	18 - 11	155.00	18.00	107.00	39.00	26.00	60.00	67.00	0.50 (kg)	299009*
	22 - 11	140.00	22.00	92.00	28.00	28.00	45.00	52.00	0.70 (kg)	299001*
	22 - 11	190.00	22.00	142.00	74.00	56.00	95.00	102.00	0.90 (kg)	299002*
	22 - 11	231.00	22.00	183.00	115.00	97.00	136.00	143.00	1.10 (kg)	299003*
	25 - 14	165.00	25.00	117.00	49.00	36.00	70.00	77.00	1.00 (kg)	299004*
	25 - 14	215.00	25.00	167.00	99.00	81.00	120.00	127.00	1.30 (kg)	299005*
	32 - 18	210.00	32.00	-	136.00	136.00	139.00	137.00	2.10 (kg)	299006**
	32 - 18	260.00	32.00	-	186.00	186.00	189.00	187.00	2.60 (kg)	299007**
40 - 22	415.00	40.00	-	-	333.00	-	333.00	5.20 (kg)	299008**	

NOTE: Adapter shanks are used for extensions up to 10xD.

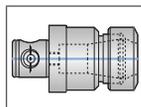
*Recommended clamping element: collet chuck ISO 15488 (DIN 6499-B) (pg. B10-I: 4).

**Recommended clamping element: collet chuck ISO 10897 (DIN 6388) (pg. B10-I: 4).

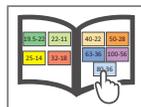
B10-M: 12-19



B10-I: 4



B10: vi-vii



i = Imperial (in)

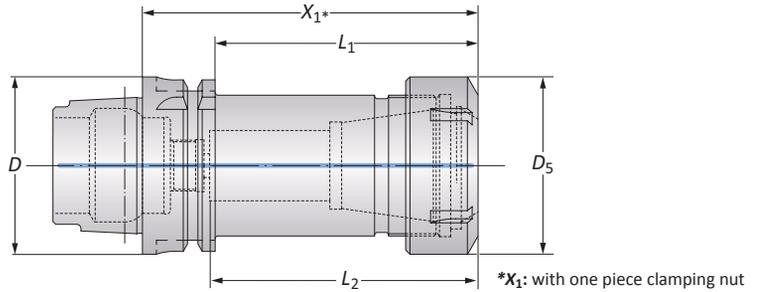
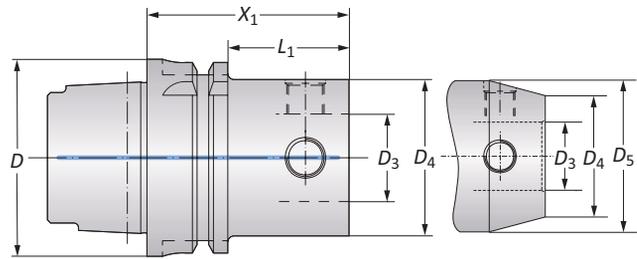
m = Metric (mm)

⚠ WARNING Exceeding weight capacity for machine tool spindle and tool changer can cause machine damage and/or serious injury. To prevent:
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HSK Master Shanks (DIN 69893)

Imperial | Balanced

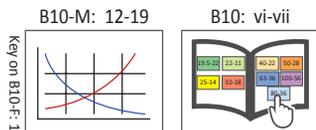


Taper Size	Connection	Shank				Weight	Part No.
		D	D ₄ D ₃	X ₁	L ₁		
40	40 - 22	2.205	-	-	-	0.881 (lbs)	246016
40	50 - 28	2.756	-	-	-	1.543 (lbs)	246004
50	40 - 22	2.205	1.181	-	-	1.322 (lbs)	246015
50	50 - 28	2.559	-	-	-	1.763 (lbs)	245011
63	25 - 14	1.811	0.787	-	-	1.543 (lbs)	246012
63	32 - 18	2.205	1.181	-	-	1.763 (lbs)	246013
63	40 - 22	2.205	1.181	-	-	1.764 (lbs)	246014
63	50 - 28	2.559	1.535	-	-	2.425 (lbs)	245012
63	63 - 36	3.150	-	-	-	3.306 (lbs)	245013
63	80 - 36	3.150	-	-	-	4.629 (lbs)	246009
63	ER 40	4.724	3.700	3.740	2.480	3.747 (lbs)	252090**
100	50 - 28	2.559	1.417	-	-	5.291 (lbs)	245014
100	50 - 28	7.087	5.944	-	2.362	11.020 (lbs)	246020
100	50 - 28*	7.087	5.944	-	-	6.393 (lbs)	246021
100	63 - 36	3.150	2.007	-	-	6.393 (lbs)	245015
100	63 - 36	8.071	6.929	-	3.070	17.190 (lbs)	246019
100	63 - 36	8.071	6.929	-	-	17.190 (lbs)	246022
100	80 - 36	3.150	2.007	-	-	8.157 (lbs)	245016
100	80 - 36	10.03	8.897	-	3.543	27.770 (lbs)	246018
100	80 - 36	10.03	8.897	-	-	22.920 (lbs)	246023
100	100 - 56	3.937	-	-	-	11.020 (lbs)	246010
100	100 - 56	11.810	8.700	-	-	38.580 (lbs)	246017
100	ER 40	4.724	3.582	3.464	2.480	7.716 (lbs)	252091**

NOTE: Balanced refers to a specific residual imbalance of ≤4.00 gmm/kg.

*D₄ = 49.50 mm

**Balanced without clamping nut.



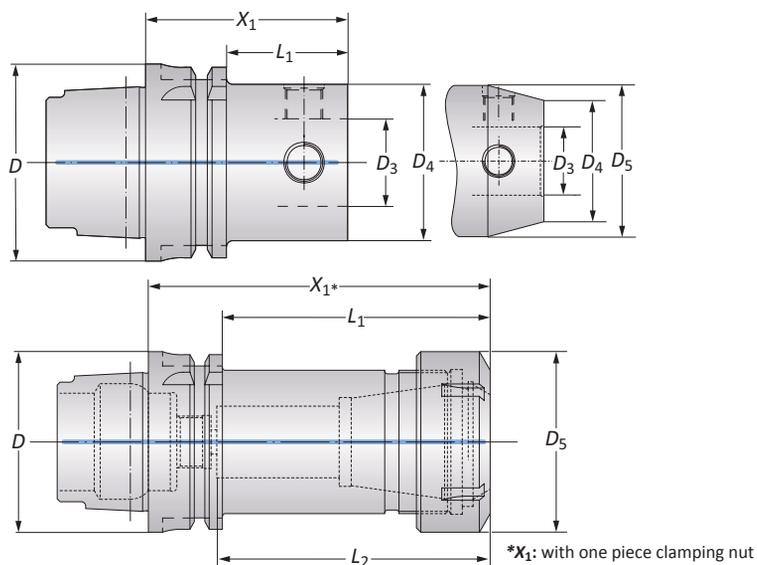
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HSK Master Shanks (DIN 69893)

Metric | Balanced

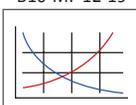


Taper Size	Connection	Shank				Weight	Part No.
		D	D ₄ D ₃	X ₁	L ₁		
40	40 - 22	40.00	-	-	-	0.40 (kg)	246016
40	50 - 28	70.00	-	-	-	0.70 (kg)	246004
50	40 - 22	56.00	30.00	-	-	0.60 (kg)	246015
50	50 - 28	65.00	-	-	-	0.80 (kg)	245011
63	25 - 14	46.00	20.00	-	-	0.70 (kg)	246012
63	32 - 18	56.00	30.00	-	-	0.80 (kg)	246013
63	40 - 22	56.00	30.00	-	-	0.80 (kg)	246014
63	50 - 28	65.00	39.00	-	-	1.10 (kg)	245012
63	63 - 36	80.00	-	-	-	1.50 (kg)	245013
63	80 - 36	80.00	-	-	-	2.10 (kg)	246009
63	ER 40	120.00	94.00	95.00	63.00	1.70 (kg)	252090**
100	50 - 28	65.00	36.00	-	-	2.40 (kg)	245014
100	50 - 28	180.00	151.00	-	60.00	5.00 (kg)	246020
100	50 - 28*	180.00	151.00	-	-	4.00 (kg)	246021
100	63 - 36	80.00	51.00	-	-	2.90 (kg)	245015
100	63 - 36	205.00	176.00	-	78.00	7.80 (kg)	246019
100	63 - 36	205.00	176.00	-	-	7.80 (kg)	246022
100	80 - 36	80.00	51.00	-	-	3.70 (kg)	245016
100	80 - 36	255.00	226.00	-	90.00	12.60 (kg)	246018
100	80 - 36	255.00	226.00	-	-	10.40 (kg)	246023
100	100 - 56	100.00	-	-	-	5.00 (kg)	246010
100	100 - 56	300.00	221.00	-	-	17.50 (kg)	246017
100	ER 40	120.00	91.00	88.00	63.00	3.50 (kg)	252091**

NOTE: Balanced refers to a specific residual imbalance of ≤4.00 gmm/kg.

*D₄ = 49.50 mm

**Balanced without clamping nut.

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Key on B10-F: 1

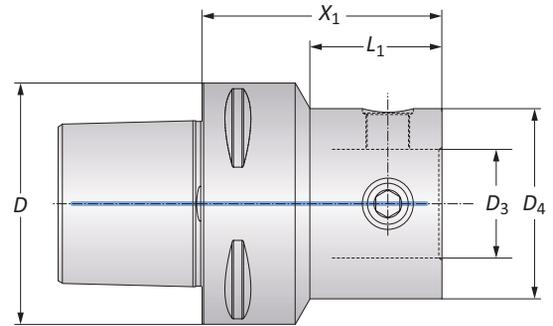
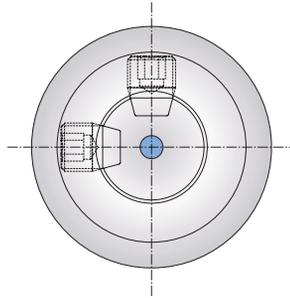
ⓘ = Imperial (in)
Ⓜ = Metric (mm)

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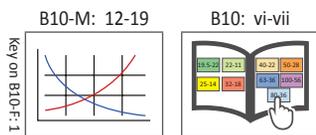
Polygon Shaft Master Shanks (PSC) (ISO 26623-1)

Balanced



PSC	Connection	Shank		Weight	Part No.		
		D	$D_4 D_3$			X_1	L_1
		50	40 - 22	2.126	1.224	1.543 (lbs)	227014
		50	50 - 28	2.559	-	2.205 (lbs)	227001
		50	63 - 36	3.150	-	3.307 (lbs)	227002
		50	80 - 36	3.150	-	5.512 (lbs)	227012
		63	25 - 14	2.126	0.838	1.984 (lbs)	227010
		63	32 - 18	2.126	0.917	2.205 (lbs)	227009
i		63	40 - 22	2.559	1.433	2.425 (lbs)	227008
		63	50 - 28	2.559	1.555	2.866 (lbs)	227003
		63	63 - 36	3.150	-	3.968 (lbs)	227004
		63	80 - 36	3.150	-	5.732 (lbs)	227005
		80	50 - 28	2.559	1.047	4.850 (lbs)	227011
		80	63 - 36	3.150	1.783	5.732 (lbs)	227006
		80	80 - 36	3.150	-	7.275 (lbs)	227007
		80	100 - 56	3.937	-	10.759 (lbs)	227013
<hr/>							
		50	40 - 22	54.00	31.10	0.70 (kg)	227014
		50	50 - 28	65.00	-	1.00 (kg)	227001
		50	63 - 36	80.00	-	1.50 (kg)	227002
		50	80 - 36	80.00	-	2.50 (kg)	227012
		63	25 - 14	54.00	21.10	0.90 (kg)	227010
		63	32 - 18	54.00	23.00	1.00 (kg)	227009
m		63	40 - 22	65.00	36.40	1.10 (kg)	227008
		63	50 - 28	65.00	39.00	1.30 (kg)	227003
		63	63 - 36	80.00	-	1.80 (kg)	227004
		63	80 - 36	80.00	-	2.60 (kg)	227005
		80	50 - 28	65.00	25.00	2.20 (kg)	227011
		80	63 - 36	80.00	45.10	2.60 (kg)	227006
		80	80 - 36	80.00	-	3.30 (kg)	227007
		80	100 - 56	100.00	-	4.88 (kg)	227013

NOTE: Balanced refers to a specific residual imbalance of ≤ 4.00 gmm/kg.



i = Imperial (in)
m = Metric (mm)

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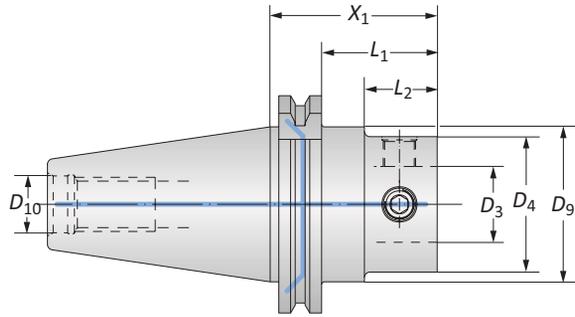
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Dual Contact CAT Master Shanks with Imperial Threads

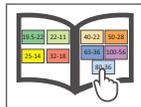
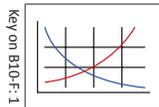


Taper Size	Connection		Shank				Weight	Part No.	
	D ₄ D ₃	X ₁	L ₁	L ₂	D ₉	D ₁₀			
i	40	50 - 28	2.440	1.688	1.062	1.752	5/8 - 11	2.866 (lbs)	353062
	40	50 - 28	5.394	4.642	4.016	1.752	5/8 - 11	5.292 (lbs)	353076
	40	63 - 36	3.228	2.440	1.850	1.752	5/8 - 11	3.968 (lbs)	353063
	50	50 - 28	2.440	1.689	1.062	2.752	1 - 8	7.275 (lbs)	353061
	50	50 - 28*	7.953	7.201	6.575	2.752	1 - 8	11.687 (lbs)	353077
	50	63 - 36	2.835	2.083	1.457	2.752	1 - 8	7.938 (lbs)	353078
	50	63 - 36	8.740	7.988	7.362	2.752	1 - 8	15.656 (lbs)	353079
	50	80 - 36	2.834	2.082	1.456	2.752	1 - 8	9.039 (lbs)	353060
	50	80 - 36	10.709	9.957	9.331	2.752	1 - 8	26.240 (lbs)	353080
	50	100 - 56	4.134	3.382	2.756	2.752	1 - 8	13.230 (lbs)	353081
50	100 - 56	12.008	11.256	10.630	2.752	1 - 8	39.470 (lbs)	353082	
m	40	50 - 28	62.00	42.90	27.00	44.50	5/8 - 11	1.30 (kg)	353062
	40	50 - 28	137.00	117.90	102.00	44.50	5/8 - 11	2.40 (kg)	353076
	40	63 - 36	82.00	62.90	47.00	44.50	5/8 - 11	1.80 (kg)	353063
	50	50 - 28	62.00	42.90	27.00	69.90	1 - 8	3.30 (kg)	353061
	50	50 - 28*	202.00	182.90	167.00	69.90	1 - 8	5.30 (kg)	353077
	50	63 - 36	72.00	52.90	37.00	69.90	1 - 8	3.60 (kg)	353078
	50	63 - 36	222.00	202.90	187.00	69.90	1 - 8	7.10 (kg)	353079
	50	80 - 36	72.00	52.90	37.00	69.90	1 - 8	4.10 (kg)	353060
	50	80 - 36	272.00	252.90	237.00	69.90	1 - 8	11.90 (kg)	353080
	50	100 - 56	105.00	85.90	70.00	69.90	1 - 8	6.00 (kg)	353081
50	100 - 56	305.00	285.90	270.00	69.90	1 - 8	17.90 (kg)	353082	

*D₄ = 49.50 mm

B10-M: 12-19

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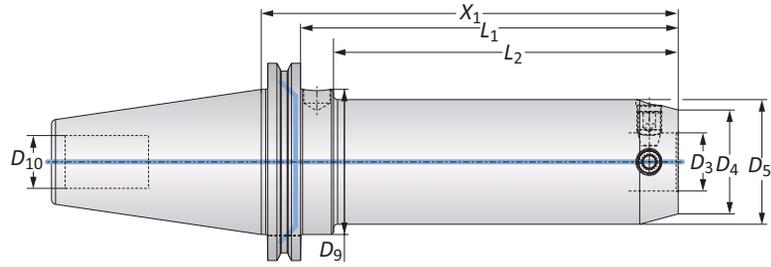


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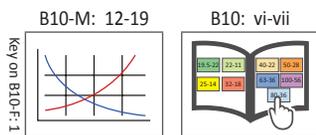
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CAT Master Shanks with Imperial Threads



Taper Size	Connection		Shank					Weight	Part No.
	D_4 D_3	X_1	L_1	L_2	D_5	D_9	D_{10}		
30	40 - 22	2.362	1.612	-	-	-	1/2 - 13	1.322 (lbs)	353001
30	50 - 28	2.756	2.006	-	-	-	1/2 - 13	1.763 (lbs)	353002
40	25 - 14	2.165	1.415	0.787	-	1.750	5/8 - 11	2.204 (lbs)	353011
40	25 - 14	5.551	4.800	4.173	1.102	1.750	5/8 - 11	3.306 (lbs)	353012
40	32 - 18	2.559	1.809	1.181	-	1.750	5/8 - 11	2.425 (lbs)	353013
40	32 - 18	6.732	5.982	5.354	1.378	1.750	5/8 - 11	4.188 (lbs)	353014
40	40 - 22	2.165	1.415	0.787	-	1.750	5/8 - 11	2.491 (lbs)	353003
40	40 - 22	6.378	5.628	-	1.850	1.750	5/8 - 11	5.511 (lbs)	353015
40	50 - 28	2.441	1.691	-	-	1.750	5/8 - 11	2.821 (lbs)	353004
40	50 - 28	5.394	4.644	-	-	1.750	5/8 - 11	5.291 (lbs)	353016
40	63 - 36	3.228	2.478	-	-	1.750	5/8 - 11	4.034 (lbs)	353005
40	63 - 36	6.181	5.431	-	-	1.750	5/8 - 11	7.936 (lbs)	353017
50	40 - 22	2.165	1.415	0.787	-	2.750	1 - 8	7.297 (lbs)	353006
50	40 - 22	6.378	5.628	5.000	1.850	2.750	1 - 8	9.920 (lbs)	353018
50	50 - 28	2.441	1.691	1.063	-	2.750	1 - 8	7.583 (lbs)	353007
50	50 - 28*	7.953	7.203	6.575	-	2.750	1 - 8	11.680 (lbs)	353025
50	50 - 28	7.953	7.203	6.575	2.362	2.750	1 - 8	14.100 (lbs)	353019
50	63 - 36	2.835	2.085	1.457	-	2.750	1 - 8	8.223 (lbs)	353008
50	63 - 36	8.740	7.990	7.362	-	2.750	1 - 8	15.650 (lbs)	353023
50	63 - 36	8.740	7.990	-	3.071	2.750	1 - 8	20.500 (lbs)	353020
50	80 - 36	2.835	2.085	-	-	2.750	1 - 8	9.413 (lbs)	353009
50	80 - 36	10.709	9.959	-	-	2.750	1 - 8	26.230 (lbs)	353024
50	80 - 36	10.709	9.959	-	3.543	2.750	1 - 8	31.300 (lbs)	353021
50	100 - 56	4.134	3.384	-	-	2.750	1 - 8	13.600 (lbs)	353010
50	100 - 56	12.008	11.258	-	-	2.750	1 - 8	39.460 (lbs)	353022

* D_4 = 49.50 mm



i = Imperial (in)
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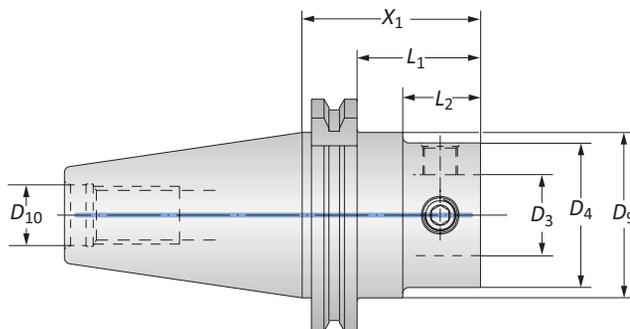
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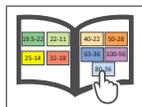
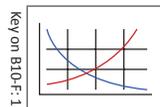
CAT Master Shanks with Metric Threads



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	$D_4 D_3$	X_1	L_1	L_2	D_9	D_{10}			
m	40	50 - 28	62.00	42.90	-	44.45	M16 x 2	1.30 (kg)	132022T016960
	40	63 - 36	82.00	62.90	-	44.45	M16 x 2	1.80 (kg)	132066T016960
	50	50 - 28	62.00	42.90	27.00	69.85	M24 x 3	3.40 (kg)	132022T016962
	50	63 - 36	72.00	52.90	37.00	69.85	M24 x 3	3.70 (kg)	132066T016962
	50	80 - 36	72.00	52.90	-	69.85	M24 x 3	4.20 (kg)	132088T016962
	50	100 - 56	105.00	85.90	-	69.85	M24 x 3	5.20 (kg)	132076T016962

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i = Imperial (in)

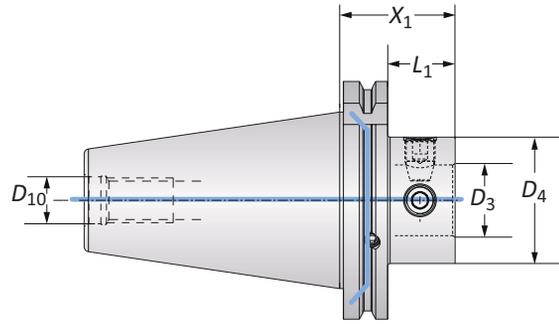
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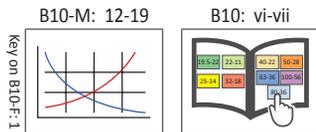
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Dual Contact SK Master Shanks (DIN 69871-AD / B -D)



	Taper Size	Connection	Shank			Weight	Part No.
		$D_4 D_3$	X_1	L_1	D_{10}		
i	40	50 - 28	1.811	1.059	M16 x 2	2.426 (lbs)	353064
	40	63 - 36	2.598	1.846	M16 x 2	6.395 (lbs)	353065
	50	50 - 28	1.811	1.059	M24 x 3	6.395 (lbs)	353066
	50	63 - 36	2.205	1.453	M24 x 3	7.056 (lbs)	353067
	50	80 - 36	2.205	1.453	M24 x 3	8.159 (lbs)	353068
	50	100 - 56	3.543	2.791	M24 x 3	11.687 (lbs)	353069
m	40	50 - 28	46.00	26.90	M16 x 2	1.10 (kg)	353064
	40	63 - 36	66.00	46.90	M16 x 2	1.50 (kg)	353065
	50	50 - 28	46.00	26.90	M24 x 3	2.90 (kg)	353066
	50	63 - 36	56.00	36.90	M24 x 3	3.20 (kg)	353067
	50	80 - 36	56.00	36.90	M24 x 3	3.70 (kg)	353068
	50	100 - 56	90.00	70.90	M24 x 3	5.30 (kg)	353069



i = Imperial (in)
m = Metric (mm)

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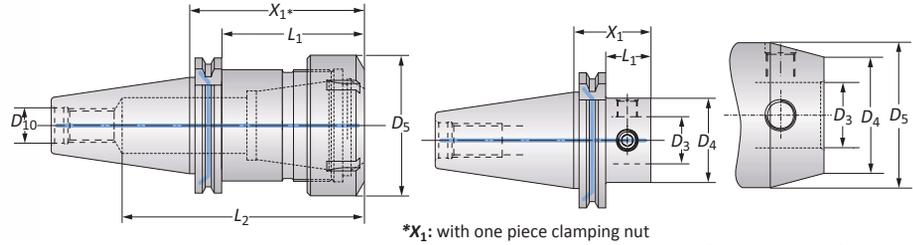
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SK Master Shanks (DIN 69871-AD / B -D)

Balanced



Taper Size	Connection	Shank					Weight	Part No.	
		D ₄ D ₃	X ₁	L ₁	L ₂	D ₅			
30	40 - 22	1.811	1.059	-	-	-	M12 x 1.75	1.103 (lbs)	327001
30	50 - 28	2.283	-	-	-	-	M12 x 1.75	1.764 (lbs)	327002
40	32 - 18	2.165	1.413	-	-	1.575	M16 x 2	2.426 (lbs)	327003
40	40 - 22	1.811	1.059	-	-	-	M16 x 2	2.205 (lbs)	327004
40	50 - 28	1.811	1.059	-	-	-	M16 x 2	2.426 (lbs)	327005
40	63 - 36	2.598	1.846	-	-	-	M16 x 2	3.087 (lbs)	327006
40	80 - 36	2.598	-	-	-	-	M16 x 2	4.190 (lbs)	327007
40	ER 40	3.149	2.397	4.566	-	2.480	M16 x 2	2.860 (lbs)	259079**
50	50 - 28	1.811	1.059	-	-	-	M24 x 3	6.395 (lbs)	327017
50	50 - 28	7.323	6.571	-	-	2.362	M24 x 3	13.230 (lbs)	327025
50	50 - 28*	7.323	6.571	-	-	-	M24 x 3	10.805 (lbs)	327033
50	63 - 36	2.205	1.453	-	-	-	M24 x 3	7.056 (lbs)	327018
50	63 - 36	8.110	7.358	-	-	3.071	M24 x 3	19.625 (lbs)	327026
50	63 - 36	8.110	7.358	-	-	-	M24 x 3	15.215 (lbs)	327034
50	80 - 36	2.205	1.453	-	-	-	M24 x 3	8.159 (lbs)	327010
50	80 - 36	10.079	9.327	-	-	3.543	M24 x 3	29.988 (lbs)	327027
50	80 - 36	10.079	9.327	-	-	-	M24 x 3	25.353 (lbs)	327035
50	100 - 56	3.543	-	-	-	-	M24 x 3	11.687 (lbs)	327011
50	100 - 56	11.417	10.665	-	-	-	M24 x 3	37.706 (lbs)	327028
50	ER 40	3.149	2.173	5.275	-	2.480	M24 x 3	6.834 (lbs)	259080**
30	40 - 22	46.00	26.90	-	-	-	M12 x 1.75	0.50 (kg)	327001
30	50 - 28	58.00	-	-	-	-	M12 x 1.75	0.80 (kg)	327002
40	32 - 18	55.00	35.90	-	-	40.00	M16 x 2	1.10 (kg)	327003
40	40 - 22	46.00	26.90	-	-	-	M16 x 2	1.00 (kg)	327004
40	50 - 28	46.00	26.90	-	-	-	M16 x 2	1.10 (kg)	327005
40	63 - 36	66.00	46.90	-	-	-	M16 x 2	1.40 (kg)	327006
40	80 - 36	66.00	-	-	-	-	M16 x 2	1.90 (kg)	327007
40	ER 40	80.00	60.90	116.00	-	63.00	M16 x 2	1.30 (kg)	259079**
50	50 - 28	46.00	26.90	-	-	-	M24 x 3	2.90 (kg)	327017
50	50 - 28	186.00	166.90	-	-	60.00	M24 x 3	6.00 (kg)	327025
50	50 - 28*	186.00	166.90	-	-	-	M24 x 3	4.90 (kg)	327033
50	63 - 36	56.00	36.90	-	-	-	M24 x 3	3.20 (kg)	327018
50	63 - 36	206.00	186.90	-	-	78.00	M24 x 3	8.90 (kg)	327026
50	63 - 36	206.00	186.90	-	-	-	M24 x 3	6.90 (kg)	327034
50	80 - 36	56.00	36.90	-	-	-	M24 x 3	3.70 (kg)	327010
50	80 - 36	256.00	236.90	-	-	90.00	M24 x 3	13.60 (kg)	327027
50	80 - 36	256.00	236.90	-	-	-	M24 x 3	11.50 (kg)	327035
50	100 - 56	90.00	-	-	-	-	M24 x 3	5.30 (kg)	327011
50	100 - 56	290.00	270.90	-	-	-	M24 x 3	17.10 (kg)	327028
50	ER 40	80.00	55.20	134.00	-	63.00	M24 x 3	3.10 (kg)	259080**

NOTE: Balanced refers to a specific residual imbalance of ≤4.00 gmm/kg.

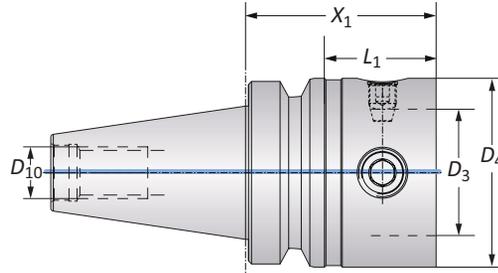
* D₄ = (49.50 mm)

**Balanced without clamping nut.

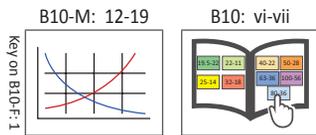
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 -When using a carbide shank, do not exceed recommended 9xD length-to-diameter ratio.
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Dual Contact BT Master Shanks (JIS B 6339)



	Connection		Shank			Weight	Part No.
	Taper Size	D_4 D_3	X_1	L_1	D_{10}		
i	40	50 - 28	2.126	1.063	M16 x 2	2.646 (lbs)	353070
	40	63 - 36	2.520	1.457	M16 x 2	3.308 (lbs)	353071
	50	50 - 28	2.559	1.055	M24 x 3	8.820 (lbs)	353072
	50	63 - 36	2.953	1.449	M24 x 3	9.261 (lbs)	353073
	50	80 - 36	2.953	1.449	M24 x 3	10.584 (lbs)	353074
	50	100 - 56	3.543	2.039	M24 x 3	12.128 (lbs)	353075
m	40	50 - 28	54.00	27.00	M16 x 2	1.20 (kg)	353070
	40	63 - 36	64.00	37.00	M16 x 2	1.50 (kg)	353071
	50	50 - 28	65.00	26.80	M24 x 3	4.00 (kg)	353072
	50	63 - 36	75.00	36.80	M24 x 3	4.20 (kg)	353073
	50	80 - 36	75.00	36.80	M24 x 3	4.80 (kg)	353074
	50	100 - 56	90.00	51.80	M24 x 3	5.50 (kg)	353075



i = Imperial (in)
m = Metric (mm)

WARNING Exceeding weight capacity for machine tool spindle and tool changer can cause machine damage and/or serious injury. To prevent:

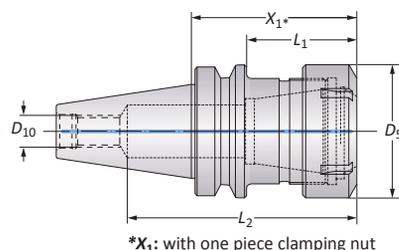
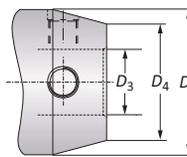
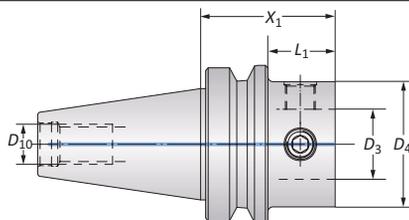
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 - When using heavy metal components, do not exceed recommended 8xD length-to-diameter ratio.
 - When using a carbide shank, do not exceed recommended 9xD length-to-diameter ratio.
 - When using a NOVI^{TECH} module, do not exceed recommended 10xD length-to-diameter ratio.
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BT Master Shanks (JIS B 6339)

Balanced



Taper Size	Connection	Shank					Weight	Part No.
		D_4 D_3	X_1	L_1	L_2	D_5		
30	40 - 22	1.575	0.710	-	-	M12 x 1.75	1.102 (lbs)	327012
30	50 - 28	1.811	-	-	-	M12 x 1.75	1.323 (lbs)	327013
40	40 - 22	1.811	0.750	-	-	M16 x 2	2.425 (lbs)	327016
40	50 - 28	2.126	1.060	-	-	M16 x 2	2.646 (lbs)	327019
40	63 - 36	2.520	-	-	-	M16 x 2	3.307 (lbs)	327020
40	ER 40	2.755	1.692	4.094	2.480	M16 x 2	2.645 (lbs)	259081*
50	50 - 28	2.559	1.060	-	-	M24 x 3	8.599 (lbs)	327021
50	50 - 28	8.071	6.567	-	2.362	M24 x 3	15.435 (lbs)	327029**
50	50 - 28	8.071	6.567	-	1.949	M24 x 3	13.010 (lbs)	327036**
50	63 - 36	2.953	1.449	-	-	M24 x 3	9.261 (lbs)	327022
50	63 - 36	8.858	7.354	-	3.071	M24 x 3	21.830 (lbs)	327030**
50	63 - 36	8.858	7.354	-	-	M24 x 3	17.199 (lbs)	327037**
50	80 - 36	2.953	1.449	-	-	M24 x 3	10.363 (lbs)	327023
50	80 - 36	10.827	9.323	-	3.543	M24 x 3	32.634 (lbs)	327031**
50	80 - 36	10.827	9.323	-	-	M24 x 3	32.634 (lbs)	327038**
50	100 - 56	3.543	-	-	-	M24 x 3	12.127 (lbs)	327024
50	100 - 56	11.417	9.913	-	-	M24 x 3	38.147 (lbs)	327032**
50	ER 40	3.149	1.645	5.314	2.480	M24 x 3	8.377 (lbs)	259082*
30	40 - 22	40.00	18.00	-	-	M12 x 1.75	0.50 (kg)	327012
30	50 - 28	46.00	-	-	-	M12 x 1.75	0.60 (kg)	327013
40	40 - 22	46.00	19.00	-	-	M16 x 2	1.10 (kg)	327016
40	50 - 28	54.00	27.00	-	-	M16 x 2	1.20 (kg)	327019
40	63 - 36	64.00	-	-	-	M16 x 2	1.50 (kg)	327020
40	ER 40	70.00	43.00	104.00	63.00	M16 x 2	1.20 (kg)	259081*
50	50 - 28	65.00	26.80	-	-	M24 x 3	3.90 (kg)	327021
50	50 - 28	205.00	166.80	-	60.00	M24 x 3	7.00 (kg)	327029**
50	50 - 28	205.00	166.80	-	49.50	M24 x 3	5.90 (kg)	327036**
50	63 - 36	75.00	36.80	-	-	M24 x 3	4.20 (kg)	327022
50	63 - 36	225.00	186.80	-	78.00	M24 x 3	9.90 (kg)	327030**
50	63 - 36	225.00	186.80	-	-	M24 x 3	7.80 (kg)	327037**
50	80 - 36	75.00	36.80	-	-	M24 x 3	4.70 (kg)	327023
50	80 - 36	275.00	236.80	-	90.00	M24 x 3	14.80 (kg)	327031**
50	80 - 36	275.00	236.80	-	-	M24 x 3	14.80 (kg)	327038**
50	100 - 56	90.00	-	-	-	M24 x 3	5.50 (kg)	327024
50	100 - 56	290.00	251.80	-	-	M24 x 3	17.30 (kg)	327032**
50	ER 40	80.00	41.80	135.00	63.00	M24 x 3	3.80 (kg)	259082*

NOTE: Balanced refers to a specific residual imbalance of ≤ 4.00 gmm/kg.

*Balanced without clamping nut.

**Available upon request.

i = Imperial (in)

m = Metric (mm)

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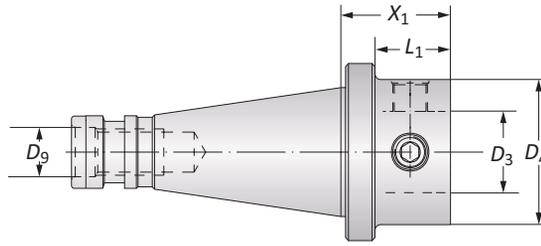
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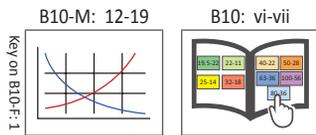
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NMTB Master Shanks



	Connection		Shank			Weight	Part No.
	Taper Size	D ₄ D ₃	X ₁	L ₁	D ₉		
i	40	50 - 28	1.496	1.039	5/8 - 11	2.900 (lbs)	132022T004498
	40	63 - 36	1.890	1.433	5/8 - 11	3.300 (lbs)	132066T004498
	50	50 - 28	1.654	1.060	1 - 8	6.600 (lbs)	132022T004480
	50	63 - 36	2.047	1.450	1 - 8	7.700 (lbs)	132066T004480
	50	80 - 36	2.047	1.450	1 - 8	8.800 (lbs)	132088T004480
	50	100 - 56	3.543	2.945	1 - 8	10.800 (lbs)	132076T004480
m	40	50 - 28	38.00	26.40	5/8 - 11	1.30 (kg)	132022T004498
	40	63 - 36	48.00	36.40	5/8 - 11	1.50 (kg)	132066T004498
	50	50 - 28	42.00	26.80	1 - 8	3.00 (kg)	132022T004480
	50	63 - 36	52.00	36.80	1 - 8	3.50 (kg)	132066T004480
	50	80 - 36	52.00	36.80	1 - 8	4.00 (kg)	132088T004480
	50	100 - 56	90.00	74.80	1 - 8	4.90 (kg)	132076T004480



i = Imperial (in)
m = Metric (mm)

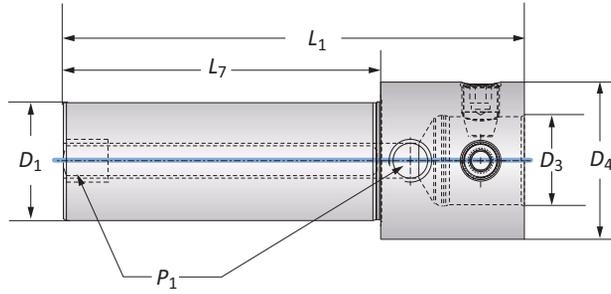
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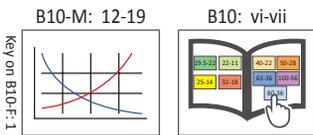
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Imperial Straight Master Shanks



	Connection	Shank				Weight	Part No.
	D_4 D_3	L_7	D_1	P_1	L_1		
i	40 - 22	3-½	1-¼	¼-27 NPTF	5.080	1.764 (lbs)	K71547
	50 - 28	4	1-½	¼-18 NPTF	5.810	3.086 (lbs)	K71548
	63 - 36	4-½	2	¼-18 NPTF	6.700	5.952 (lbs)	K71549
	80 - 36	4-½	2	¼-18 NPTF	6.700	7.716 (lbs)	K71550



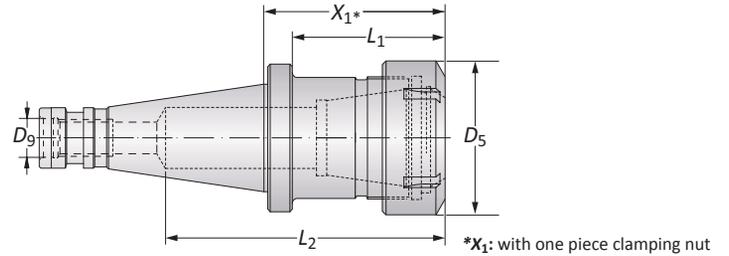
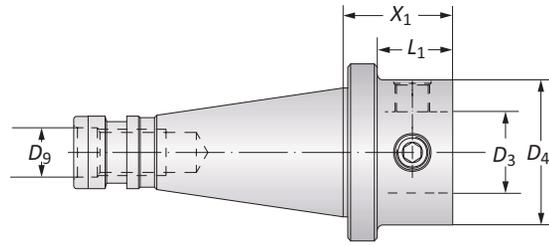
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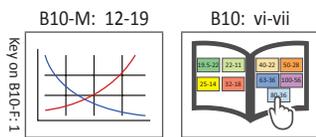
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DIN 2080 Master Shanks



Taper Size	Connection $D_4 D_3$	Shank					Weight	Part No.
		X_1	L_1	L_2	D_5	D_9		
40	50 - 28	1.496	1.039	-	-	M16 x 2	2.866 (lbs)	132022T010229
40	63 - 36	1.889	1.433	-	-	M16 x 2	3.306 (lbs)	132066T010229
50	50 - 28	1.653	1.055	-	-	M24 x 3	6.613 (lbs)	132022T003704
50	63 - 36	2.047	1.448	-	-	M24 x 3	7.716 (lbs)	132066T003704
50	80 - 36	2.047	1.448	-	-	M24 x 3	8.818 (lbs)	132088T003704
50	100 - 56	3.543	2.945	-	-	M24 x 3	10.800 (lbs)	132076T003704
50	ER 40	3.149	2.551	5.276	2.480	M24 x 3	7.275 (lbs)	259084
40	50 - 28	38.00	26.40	-	-	M16 x 2	1.30 (kg)	132022T010229
40	63 - 36	48.00	36.40	-	-	M16 x 2	1.50 (kg)	132066T010229
50	50 - 28	42.00	26.80	-	-	M24 x 3	3.00 (kg)	132022T003704
50	63 - 36	52.00	36.80	-	-	M24 x 3	3.50 (kg)	132066T003704
50	80 - 36	52.00	36.80	-	-	M24 x 3	4.00 (kg)	132088T003704
50	100 - 56	90.00	74.80	-	-	M24 x 3	4.90 (kg)	132076T003704
50	ER 40	80.00	64.80	134.00	63.00	M24 x 3	3.30 (kg)	259084

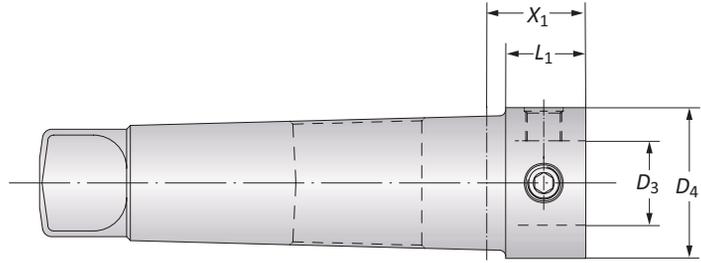


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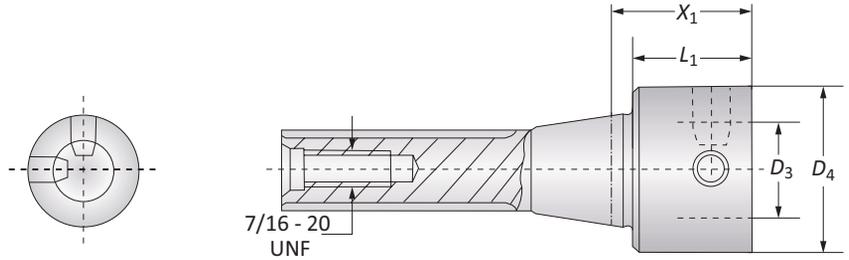
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DIN 1806 Morse Taper Master Shanks | R8 Master Shanks



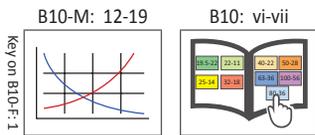
DIN 1806 Master Shanks

	Morse Taper Size	Connection	Shank		Weight	Part No.
		$D_4 D_3$	X_1	L_1		
i	4	50 - 28	1.693	1.440	2.425 (lbs)	132022T003590
	5	50 - 28	1.299	1.050	3.968 (lbs)	132022T003920
	5	63 - 36	2.087	1.840	4.850 (lbs)	132066T003920
m	4	50 - 28	43.00	36.50	1.10 (kg)	132022T003590
	5	50 - 28	33.00	26.70	1.80 (kg)	132022T003920
	5	63 - 36	53.00	46.70	2.20 (kg)	132066T003920



R8 Master Shanks

	Connection	Shank		Weight	Part No.
	$D_4 D_3$	X_1	L_1		
i	50 - 28	1.770	1.417	2.204 (lbs)	132022T007166
	63 - 36	2.362	2.008	2.866 (lbs)	132066T007166
m	50 - 28	45.00	36.00	1.00 (kg)	132022T007166
	63 - 36	60.00	51.00	1.30 (kg)	132066T007166



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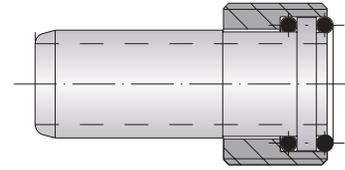
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Accessories

Coolant Adapter Sets | Service Keys | ISO 15488 (DIN 6499-B) Collet Chuck Accessories

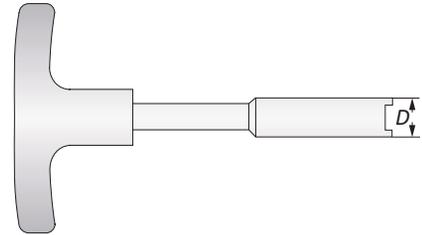
Coolant Adapter Sets

HSK Shank Size	Thread	Part No.
32	M10 x 1.5 x 1.0	262002
40	M12 x 1.75 x 1.0	262003
50	M16 x 2 x 1.0	262004
63	M18 x 2.5 x 1.0	262005
80	M20 x 2.5 x 1.5	262006
100	M24 x 3 x 1.5	262007



Service Keys

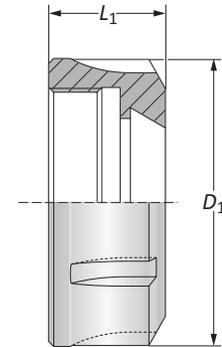
HSK Shank Size	D	Part No.
32	8.50	315234
40	10.50	315235
50	14.50	215726
63	16.50	215727*
80	18.00	415127
100	22.00	215728



*Two piece

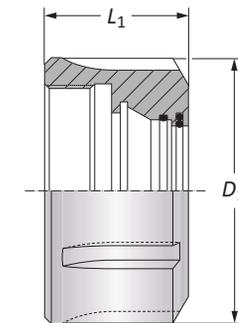
ISO 15488 (DIN 6499-B) One Piece Clamping Nut

	Nominal Size	Clamping Nut		Part No.
		L ₁	D ₁	
i	ER 40	1.004	2.480	215926
m	ER 40	25.50	63.00	215926



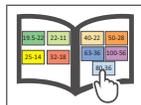
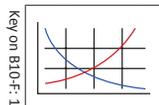
ISO 15488 (DIN 6499-B) Sealing Disk Clamping Nut

	Nominal Size	Sealing Disk Clamping Nut		Part No.
		L ₁	D ₁	
i	ER 40	1.339	2.480	278001
m	ER 40	34.00	63.00	278001



B10-M: 12-19

B10: vi-vii



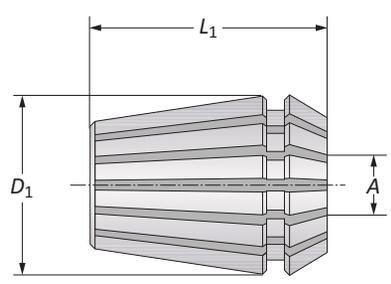
i = Imperial (in)
m = Metric (mm)

Accessories

ISO 15488 (DIN 6499-B) Collet Chuck Accessories

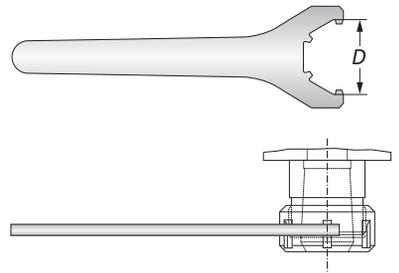
ISO 15488 (DIN6499-B) Collets

	Clamping Range	Collet		Part No.
	A	L ₁	D ₁	
i	0.591 - 0.551	1.811	1.575	071790
	0.709 - 0.669	1.811	1.575	071793
	0.787 - 0.748	1.811	1.575	071795
	0.906 - 0.866	1.811	1.575	071798
m	15.00 - 14.00	46.00	40.00	071790
	18.00 - 17.00	46.00	40.00	071793
	20.00 - 19.00	46.00	40.00	071795
	23.00 - 22.00	46.00	40.00	071798



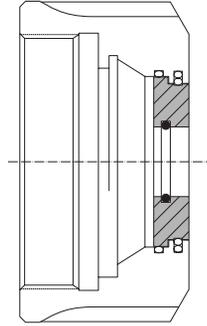
ISO 15488 (DIN 6499-B) Service Keys

	Nominal Size	Service Key	Part No.
m	ER 40	D 63.00	215931

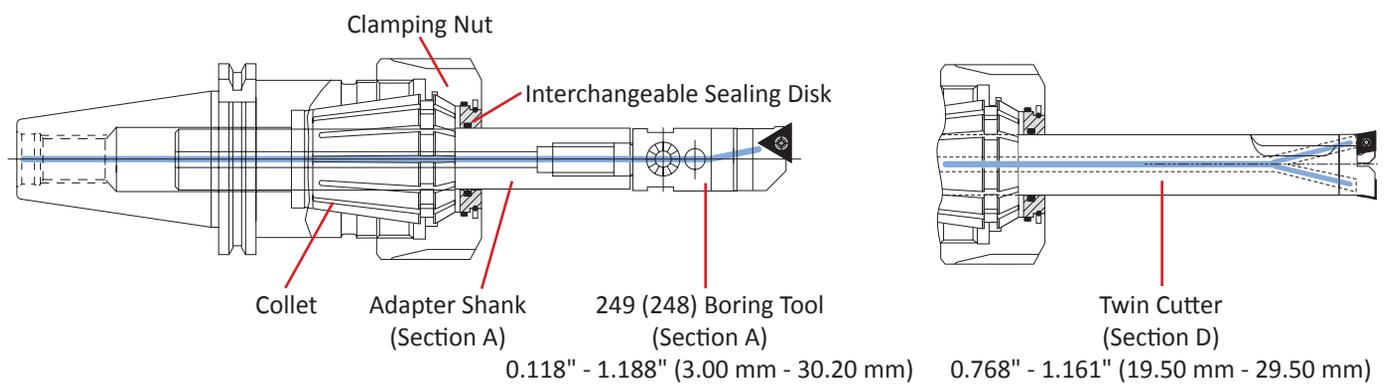


ISO 15488 (DIN 6499-B) Sealing Disks

	Clamping Range	Part No.
i	0.591 - 0.551	278029
	0.709 - 0.669	278035
	0.787 - 0.748	278039
	0.906 - 0.866	278045
m	15.00 - 14.50	278029
	18.00 - 17.50	278035
	20.00 - 19.50	278039
	23.00 - 22.50	278045



Application with clamping nuts and sealing disks when using central coolant feed:



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Key on B10-F: 1 B10: vi-vii

i = Imperial (in)
m = Metric (mm)

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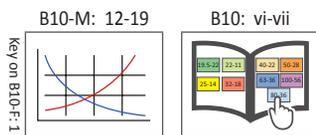
Accessories

Mounting Fixtures



Mounting Fixture		
Code	Type	Part No.
Basic Body*	-	098060
Adapter	30 Taper	098073
Adapter	40 Taper	098061
Adapter	50 Taper	098062
Adapter	HSK-A 32	098063
Adapter	HSK-A 40	098064
Adapter	HSK-A 50	098065
Adapter	HSK-A 63	098066
Adapter	HSK-A 80	098067
Adapter	HSK-A 100	098068
Adapter	PSC 50	098069
Adapter	PSC 63	098070
Adapter	PSC 80	098071

*Basic body and adapters sold separately.



i = Imperial (in)
m = Metric (mm)

⚠ WARNING Exceeding weight capacity for machine tool spindle and tool changer can cause machine damage and/or serious injury. To prevent:

- Consult machine tool builder for machine's weight limitations.
 - Refer to example on page B10-M: 11 for calculating tool assembly weight.
- Factory technical assistance is also available for specific applications through our Application Engineering department. ext: 7611 | email: appeng@alliedmachine.com

⚠ WARNING Tool failure can cause serious injury. To prevent:

- Do not exceed recommended 10xD length-to-diameter ratio or exceed 4 total components (including shank).
 - When using Alu-Line components, do not exceed recommended 5xD length-to-diameter ratio.
 - When using tool steel components, do not exceed recommended 6xD length-to-diameter ratio.
 - When using heavy metal components, do not exceed recommended 8xD length-to-diameter ratio.
 - When using a carbide shank, do not exceed recommended 9xD length-to-diameter ratio.
 - When using a NOVI^{TECH} module, do not exceed recommended 10xD length-to-diameter ratio.
 - Refer to examples on pages B10-M: 8-10 for calculating length-to-diameter ratio.
- Factory technical assistance is available for your specific applications through our Application Engineering department. ext: 7611 | email: appeng@alliedmachine.com

SECTION

B10-G

Large Diameter Boring

Wohlhaupter® Large Diameter Boring

Basic D 40 | Basic D 60 | Eco D 60 | Flex D 60

▶ Diameter Range: 7.874" - 128.150" (200.00 mm - 3255.00 mm)



Boring Big?

Wohlhaupter has continued to expand our large diameter boring capabilities with Alu-Line. Our Alu-Line serrated slides and tool bodies are made of lightweight aluminum alloy to minimize the weight while still getting the heavy boring job done. The versatile serrated slides and serrated tool bodies allow for boring 7.874" (200.00 mm) up to 128.150" (3255.00 mm), offering the most powerful and versatile tool ranges to our customers.

Your safety and the safety of others is very important. This catalog contains important safety messages. Always read and follow all safety precautions.



This triangle is a safety hazard symbol. It alerts you to potential safety hazards that can cause tool failure and serious injury.

When you see this symbol in the catalog, look for a related safety message that may be near this triangle or referred to in the nearby text.

There are safety signal words also used in the catalog. Safety messages follow these words.

WARNING

WARNING (shown above) means that failure to follow the precautions in this message could result in tool failure and serious injury.

NOTICE means that failure to follow the precautions in this message could result in damage to the tool or machine but not result in personal injury.

NOTE and **IMPORTANT** are also used. These are important that you read and follow but are not safety-related.

Visit www.alliedmachine.com for the most up-to-date information and procedures.

Applicable Industries



Aerospace



Agriculture



Automotive



Firearms



General
Machining



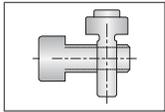
Oil & Gas



Renewable
Energy

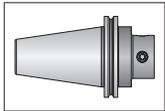
Reference Icons

The following icons will appear throughout the catalog to help you navigate between products.



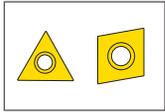
Clamping Elements

For use with insert holders and boring heads



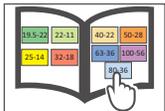
Shanks

A variety of shanks for different machines



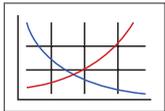
Inserts

For use with insert holder boring heads and boring bars using indexable inserts



MVS Connection Color Guide

Detailed instructions and information regarding the MVS connection(s)



Recommended Cutting Data

Speed and feed recommendations for optimum and safe boring



Coolant-Through Option

Indicates that the product is coolant through

Large Diameter Boring Table of Contents

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Series	Diameter Range	
	Imperial (inch)	Metric (mm)
Basic D 40 Slides	7.874 - 20.472	200.00 - 520.00
Basic D 60 Slides	7.874 - 19.882	200.00 - 505.00
Eco D 60 Slides	18.307 - 40.157	465.00 - 1020.00
Flex D 60 Slides	19.685 - 128.150	500.00 - 3255.00

Large Diameter Boring Product Overview

Large Diameter BORING

Boring big? We've got you covered.

Our versatile tooling system can provide the power and precision your large diameter boring jobs demand. The large diameter boring system offers four different Alu-Line serrated slides, a wide range of rough and finish boring insert holders, vernier and digital cassettes, and combined rough and finish insert holders.

- Diameter range: 7.874" - 128.150" (200.00 mm - 3255.00 mm).
- Basic, Eco, and Flex serrated slides.
- Roughing, finishing, or combined roughing and finishing can be achieved in one pass.
- Digital readout cassettes available for quick and easy adjustments.
- Alu-Line serrated slides and tool bodies are made of lightweight aluminum.



► **Basic D 40 Serrated Slides for Finish Boring**



350021 (349021)
 Ø 7.874" - 11.023"
 (Ø 200.00 mm - 280.00 mm)



350023 (349023)
 Ø 14.173" - 17.322"
 (Ø 360.00 mm - 440.00 mm)



350022 (349022)
 Ø 11.023" - 14.173"
 (Ø 280.00 mm - 360.00 mm)



350024 (349024)
 Ø 17.322" - 20.472"
 (Ø 440.00 mm - 520.00 mm)

► **Basic D 60 Serrated Slides for Rough and Finish Boring**



350051 (349051)
 Ø 7.874" - 11.023"
 (Ø 200.00 mm - 280.00 mm)



350053 (349053)
 Ø 13.779" - 16.929"
 (Ø 350.00 mm - 430.00 mm)



350052 (349052)
 Ø 10.826" - 13.976"
 (Ø 275.00 mm - 355.00 mm)



350054 (349054)
 Ø 16.732" - 19.881"
 (Ø 425.00 mm - 505.00 mm)

► **Eco D 60 Serrated Slides for Rough and Finish Boring**



350005 (349005)
 Ø 18.307" - 29.330"
 (Ø 465.00 mm - 745.00 mm)



350014 (349014) / 350015 (350015)
 Serrated slide for base slides
 350005 (349005) / 350006 (349006)



350006 (349006)
 Ø 29.133" - 40.157"
 (Ø 740.00 mm - 1020.00 mm)

► **Flex D 60 Serrated Slides for Rough and Finish Boring**



350031 (349031)
 Ø 19.685" - 41.535"
 (Ø 500.00 mm - 1055.00 mm)



350035 (349035)
 Serrated slide for base slides
 350031 (349031) | 350032 (349032)
 350033 (349033) | 350034 (349034)



350032 (349032)
 Ø 29.724" - 63.188"
 (Ø 755.00 mm - 1605.00 mm)



350036 (349036)
 Serrated slide for base slides
 350031 (349031) | 350032 (349032)
 350033 (349033) | 350034 (349034)



350033 (349033)
 Ø 52.165" - 95.669"
 (Ø 1325.00 mm - 2430.00 mm)



350037 (349037)
 Serrated slide for base slides
 350032 (349032) | 350033 (349033)
 350034 (349034)



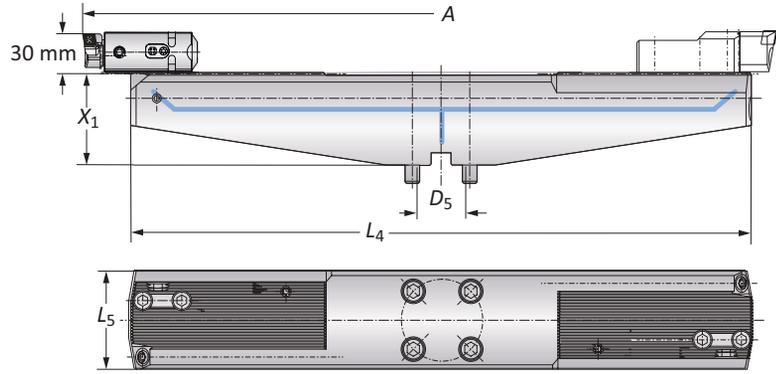
350034 (349034)
 Ø 84.645" - 128.149"
 (Ø 2150.00 mm - 3255.00 mm)



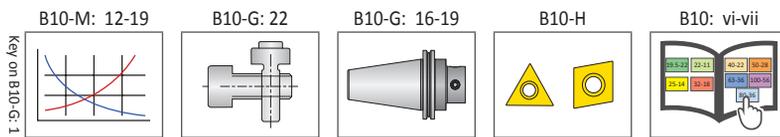
350038 (349038)
 Serrated slide for base slides
 350033 (349033) | 350034 (349034)

Alu-Line Basic D 40 Serrated Slides

Diameter Range: 7.874" - 20.472" (200.00 mm - 520.00 mm)



	Connection	Boring Range	Serrated Slide			Weight	Part No.
			D_5	A	X_1		
i	D 40	7.874 - 11.024	2.953	7.480	3.149	6.173 (lbs)	350021
	D 40	11.024 - 14.173	2.953	10.620	3.149	8.377 (lbs)	350022
	D 40	14.173 - 17.323	2.953	13.770	3.149	11.023 (lbs)	350023
	D 40	17.323 - 20.472	2.953	16.320	3.149	13.228 (lbs)	350024
m	D 40	200.00 - 280.00	75.00	190.00	80.00	2.80 (kg)	349021
	D 40	280.00 - 360.00	75.00	270.00	80.00	3.80 (kg)	349022
	D 40	360.00 - 440.00	75.00	350.00	80.00	5.00 (kg)	349023
	D 40	440.00 - 520.00	75.00	430.00	80.00	6.00 (kg)	349024



i = Imperial (in)
m = Metric (mm)

WARNING Exceeding weight capacity for machine tool spindle and tool changer can cause machine damage and/or serious injury. To prevent:

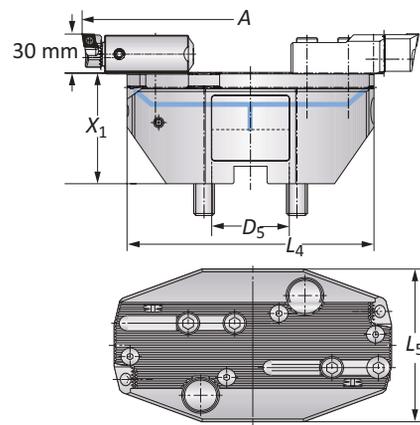
- Consult machine tool builder for machine's weight limitations.
 - Refer to example on page B10-M: 11 for calculating tool assembly weight.
- Factory technical assistance is also available for specific applications through our Application Engineering department. ext: 7611 | email: appeng@alliedmachine.com

WARNING Tool failure can cause serious injury. To prevent:

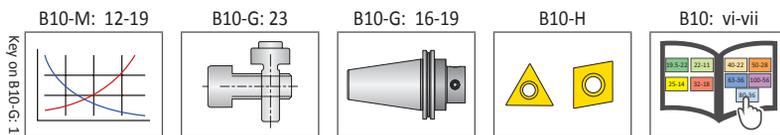
- Do not exceed recommended 10xD length-to-diameter ratio or exceed 4 total components (including shank).
 - When using Alu-Line components, do not exceed recommended 5xD length-to-diameter ratio.
 - When using tool steel components, do not exceed recommended 6xD length-to-diameter ratio.
 - When using heavy metal components, do not exceed recommended 8xD length-to-diameter ratio.
 - When using a carbide shank, do not exceed recommended 9xD length-to-diameter ratio.
 - When using a NOVI^{TECH} module, do not exceed recommended 10xD length-to-diameter ratio.
 - Refer to examples on pages B10-M: 8-10 for calculating length-to-diameter ratio.
- Factory technical assistance is available for your specific applications through our Application Engineering department. ext: 7611 | email: appeng@alliedmachine.com

Alu-Line Basic D 60 Serrated Slides

Diameter Range: 7.874" - 19.882" (200.00 mm - 505.00 mm)



	Connection	Boring Range	Serrated Slide			Weight	Part No.
	D_5	A	X_1	L_4	L_5		
i	D 60	7.874 - 11.024	3.346	7.520	4.330	9.038 (lbs)	350051
	D 60	10.827 - 13.976	3.346	10.394	4.330	11.464 (lbs)	350052
	D 60	13.780 - 16.929	3.346	13.346	4.921	15.211 (lbs)	350053
	D 60	16.732 - 19.882	3.346	16.299	4.921	17.637 (lbs)	350054
m	D 60	200.00 - 280.00	85.00	191.00	110.00	4.10 (kg)	349051
	D 60	275.00 - 355.00	85.00	264.00	110.00	5.20 (kg)	349052
	D 60	350.00 - 430.00	85.00	339.00	125.00	6.90 (kg)	349053
	D 60	425.00 - 505.00	85.00	414.00	125.00	8.00 (kg)	349054



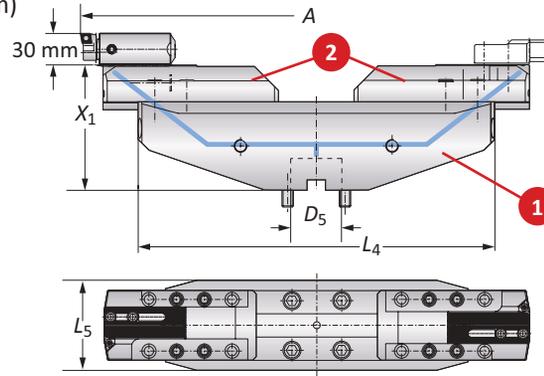
i = Imperial (in)
m = Metric (mm)

⚠ WARNING Exceeding weight capacity for machine tool spindle and tool changer can cause machine damage and/or serious injury. To prevent:
 -Consult machine tool builder for machine's weight limitations.
 -Refer to example on page B10-M: 11 for calculating tool assembly weight.
 Factory technical assistance is also available for specific applications through our Application Engineering department. ext: 7611 | email: appeng@alliedmachine.com

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 -Do not exceed recommended 10xD length-to-diameter ratio or exceed 4 total components (including shank).
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 -When using tool steel components, do not exceed recommended 6xD length-to-diameter ratio.
 -When using heavy metal components, do not exceed recommended 8xD length-to-diameter ratio.
 -When using a carbide shank, do not exceed recommended 9xD length-to-diameter ratio.
 -When using a NOVI^{TECH} module, do not exceed recommended 10xD length-to-diameter ratio.
 -Refer to examples on pages B10-M: 8-10 for calculating length-to-diameter ratio.
 Factory technical assistance is available for your specific applications through our Application Engineering department. ext: 7611 | email: appeng@alliedmachine.com

Alu-Line Eco D 60 Serrated Slides

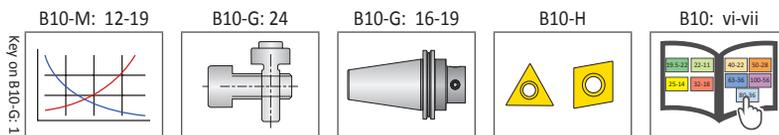
Diameter Range: 18.307" - 40.157" (465.00 mm - 1020.00 mm)



	Connection	Boring Range	Serrated Slide			1 Base Slide		2 Serrated Slide (Alu-Line)*		2 Serrated Slide (steel)**	
			D_5	A	X_1	L_4	L_5	Weight	Part No.	Weight	Part No.
i	D 60	18.307 - 29.331	6.102	17.590	5.078	26.010 (lbs)	350005	4.850 (lbs)	350015	12.560 (lbs)	350014
	D 60	29.134 - 40.157	6.102	28.420	5.078	39.680 (lbs)	350006	4.850 (lbs)	350015	12.560 (lbs)	350014
m	D 60	465.00 - 745.00	155.00	447.00	129.00	11.80 (kg)	349005	2.20 (kg)	349015	5.70 (kg)	349014
	D 60	740.00 - 1020.00	155.00	722.00	129.00	18.00 (kg)	349006	2.20 (kg)	349015	5.70 (kg)	349014

*Finish boring: serrated slide in Alu-Line.

**Rough boring: serrated slide in steel.



i = Imperial (in)
m = Metric (mm)

WARNING Exceeding weight capacity for machine tool spindle and tool changer can cause machine damage and/or serious injury. To prevent:

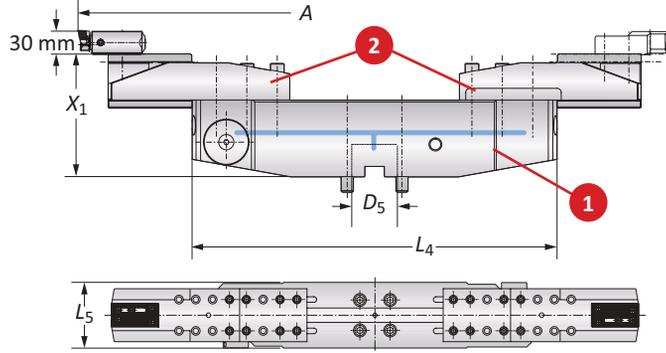
- Consult machine tool builder for machine's weight limitations.
 - Refer to example on page B10-M: 11 for calculating tool assembly weight.
- Factory technical assistance is also available for specific applications through our Application Engineering department. ext: 7611 | email: appeng@alliedmachine.com

WARNING Tool failure can cause serious injury. To prevent:

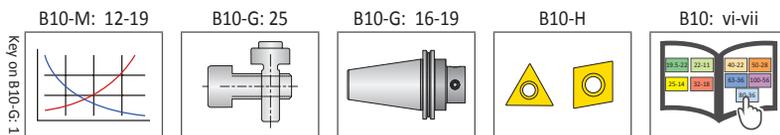
- Do not exceed recommended 10xD length-to-diameter ratio or exceed 4 total components (including shank).
 - When using Alu-Line components, do not exceed recommended 5xD length-to-diameter ratio.
 - When using tool steel components, do not exceed recommended 6xD length-to-diameter ratio.
 - When using heavy metal components, do not exceed recommended 8xD length-to-diameter ratio.
 - When using a carbide shank, do not exceed recommended 9xD length-to-diameter ratio.
 - When using a NOVI^{TECH} module, do not exceed recommended 10xD length-to-diameter ratio.
 - Refer to examples on pages B10-M: 8-10 for calculating length-to-diameter ratio.
- Factory technical assistance is available for your specific applications through our Application Engineering department. ext: 7611 | email: appeng@alliedmachine.com

Alu-Line Flex D 60 Serrated Slides

Diameter Range: 19.685" - 128.150" (500.00 mm - 3255.00 mm)



	Connection	Boring Range	Serrated Slide			Weight (1 + 2)	Part No.	
	D ₅	A	X ₁	L ₄	L ₅		1 Base Slide	2 Serrated Slide
i	D 60	19.685 - 30.709	6.299	18.898	5.118	53.360 (lbs)	350031	350035
	D 60	37.402 - 41.535	7.283	18.898	5.118	91.060 (lbs)	350031	350036
	D 60	30.512 - 41.535	7.283	29.724	6.102	93.710 (lbs)	350032	350035
	D 60	41.339 - 52.362	8.268	29.724	6.102	131.400 (lbs)	350032	350036
	D 60	56.772 - 63.189	8.858	29.724	6.102	190.200 (lbs)	350032	350037
	D 60	52.165 - 63.189	8.268	51.378	7.283	194.400 (lbs)	350033	350035
	D 60	52.165 - 74.016	9.252	51.378	7.283	232.100 (lbs)	350033	350036
	D 60	62.992 - 84.843	9.843	51.378	7.283	291.000 (lbs)	350033	350037
	D 60	78.346 - 95.669	10.039	51.378	7.283	374.400 (lbs)	350033	350038
	D 60	84.646 - 95.669	9.252	83.858	8.858	424.400 (lbs)	350034	350035
	D 60	84.646 - 106.496	10.236	83.858	8.858	462.100 (lbs)	350034	350036
	D 60	84.646 - 117.323	10.827	83.858	8.858	520.300 (lbs)	350034	350037
	D 60	84.646 - 128.150	11.024	83.858	8.858	604.100 (lbs)	350034	350038
m	D 60	500.00 - 780.00	160.00	480.00	130.00	24.20 (kg)	349031	349035
	D 60	950.00 - 1055.00	185.00	480.00	130.00	41.30 (kg)	349031	349036
	D 60	775.00 - 1055.00	185.00	755.00	155.00	42.50 (kg)	349032	349035
	D 60	1050.00 - 1330.00	210.00	755.00	155.00	59.60 (kg)	349032	349036
	D 60	1442.00 - 1605.00	225.00	755.00	155.00	86.30 (kg)	349032	349037
	D 60	1325.00 - 1605.00	210.00	1305.00	185.00	88.20 (kg)	349033	349035
	D 60	1325.00 - 1880.00	235.00	1305.00	185.00	105.30 (kg)	349033	349036
	D 60	1600.00 - 2155.00	250.00	1305.00	185.00	132.00 (kg)	349033	349037
	D 60	1990.00 - 2430.00	255.00	1305.00	185.00	169.80 (kg)	349033	349038
	D 60	2150.00 - 2430.00	235.00	2130.00	225.00	192.50 (kg)	349034	349035
	D 60	2150.00 - 2705.00	260.00	2130.00	225.00	209.60 (kg)	349034	349036
	D 60	2150.00 - 2980.00	275.00	2130.00	225.00	236.00 (kg)	349034	349037
	D 60	2150.00 - 3255.00	280.00	2130.00	225.00	274.00 (kg)	349034	349038



i = Imperial (in)
m = Metric (mm)

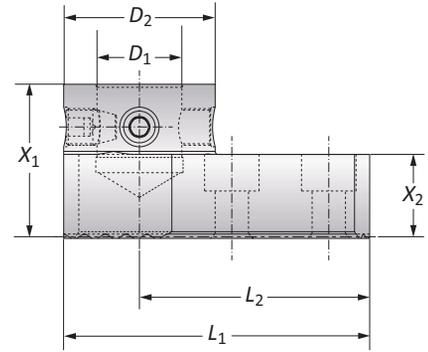
WARNING Exceeding weight capacity for machine tool spindle and tool changer can cause machine damage and/or serious injury. To prevent:
 -Consult machine tool builder for machine's weight limitations.
 -Refer to example on page B10-M: 11 for calculating tool assembly weight.
 Factory technical assistance is also available for specific applications through our Application Engineering department. ext: 7611 | email: appeng@alliedmachine.com

WARNING Tool failure can cause serious injury. To prevent:
 -Do not exceed recommended 10xD length-to-diameter ratio or exceed 4 total components (including shank).
 -When using Alu-Line components, do not exceed recommended 5xD length-to-diameter ratio.
 -When using tool steel components, do not exceed recommended 6xD length-to-diameter ratio.
 -When using heavy metal components, do not exceed recommended 8xD length-to-diameter ratio.
 -When using a carbide shank, do not exceed recommended 9xD length-to-diameter ratio.
 -When using a NOVI^{TECH} module, do not exceed recommended 10xD length-to-diameter ratio.
 -Refer to examples on pages B10-M: 8-10 for calculating length-to-diameter ratio.
 Factory technical assistance is available for your specific applications through our Application Engineering department. ext: 7611 | email: appeng@alliedmachine.com

Serrated Adapter with MVS Connection

Mounting Adapter

MVS Connection	Mounting Adapters				Weight	Part No.
D_2 D_1	X_1	X_2	L_1	L_2		
i 50 - 28	1.969	1.063	3.976	2.992	2.866 (lbs)	349046
m 50 - 28	50.00	27.00	101.00	76.00	1.30 (kg)	349046



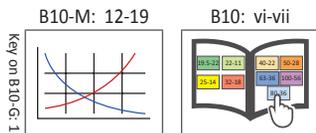
Inside Boring

Slide	Boring Heads	ID Bore Range	
		inch	mm
349/350051	320005/465006/565045	8.465 - 12.323	215.00 - 313.00
349/350052	320005/465006/565045	11.417 - 15.276	290.00 - 388.00
349/350053	320005/465006/565045	14.370 - 18.228	365.00 - 463.00
349/350054	320005/465006/565045	17.323 - 21.181	440.00 - 538.00
349/350005 with 349/350015	320005/465006/565045	18.898 - 30.630	480.00 - 778.00

Outside Boring

Slide	Boring Heads	OD Bore Range	
		inch	mm
349/350051	320005/465006/565045	2.638 - 6.496	67.00 - 165.00
349/350052	320005/465006/565045	5.591 - 9.449	142.00 - 240.00
349/350053	320005/465006/565045	8.543 - 12.402	217.00 - 315.00
349/350054	320005/465006/565045	11.496 - 15.354	292.00 - 390.00
349/350005 with 349/350015	320005/465006/565045	13.071 - 24.803	332.00 - 630.00

NOTE: LH only spindle rotation.



i = Imperial (in)
m = Metric (mm)

WARNING Exceeding weight capacity for machine tool spindle and tool changer can cause machine damage and/or serious injury. To prevent:

- Consult machine tool builder for machine's weight limitations.
 - Refer to example on page B10-M: 11 for calculating tool assembly weight.
- Factory technical assistance is also available for specific applications through our Application Engineering department. ext: 7611 | email: appeng@alliedmachine.com

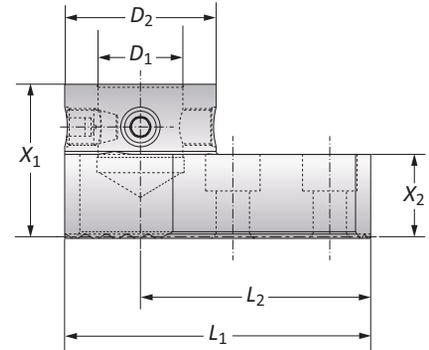
WARNING Tool failure can cause serious injury. To prevent:

- Do not exceed recommended 10xD length-to-diameter ratio or exceed 4 total components (including shank).
 - When using Alu-Line components, do not exceed recommended 5xD length-to-diameter ratio.
 - When using tool steel components, do not exceed recommended 6xD length-to-diameter ratio.
 - When using heavy metal components, do not exceed recommended 8xD length-to-diameter ratio.
 - When using a carbide shank, do not exceed recommended 9xD length-to-diameter ratio.
 - When using a NOVI^{TECH} module, do not exceed recommended 10xD length-to-diameter ratio.
 - Refer to examples on pages B10-M: 8-10 for calculating length-to-diameter ratio.
- Factory technical assistance is available for your specific applications through our Application Engineering department. ext: 7611 | email: appeng@alliedmachine.com

Serrated Adapter with MVS Connection

Mounting Adapter

	MVS Connection	Mounting Adapters				Weight	Part No.
	D_2 D_1	X_1	X_2	L_1	L_2		
i	50 - 28	1.969	1.063	3.976	2.992	2.866 (lbs)	349046
m	50 - 28	50.00	27.00	101.00	76.00	1.30 (kg)	349046



Inside Boring

Slide	Boring Heads	ID Bore Range	
		inch	mm
349/350051	320005/465006/565045	2.559 - 5.039	65.00 - 128.00
349/350052	320005/465006/565045	4.134 - 7.992	105.00 - 203.00
349/350053	320005/465006/565045	7.087 - 10.945	180.00 - 278.00
349/350054	320005/465006/565045	10.039 - 13.898	255.00 - 353.00
349/350005 with 349/350015	320005/465006/565045	11.614 - 23.346	295.00 - 593.00

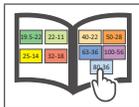
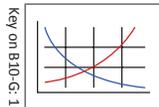
Outside Boring

Slide	Boring Heads	OD Bore Range	
		inch	mm
349/350051	320005/465006/565045	-	-
349/350052	320005/465006/565045	0.000 - 2.165	0.00 - 55.00
349/350053	320005/465006/565045	1.260 - 5.118	32.00 - 130.00
349/350054	320005/465006/565045	4.213 - 8.071	107.00 - 205.00
349/350005 with 349/350015	320005/465006/565045	5.787 - 17.520	147.00 - 445.00

NOTE: LH only spindle rotation.

B10-M: 12-19

B10: vi-vii



i = Imperial (in)
m = Metric (mm)

⚠ WARNING Exceeding weight capacity for machine tool spindle and tool changer can cause machine damage and/or serious injury. To prevent:
 -Consult machine tool builder for machine's weight limitations.
 -Refer to example on page B10-M: 11 for calculating tool assembly weight.
 Factory technical assistance is also available for specific applications through our Application Engineering department. ext: 7611 | email: appeng@alliedmachine.com

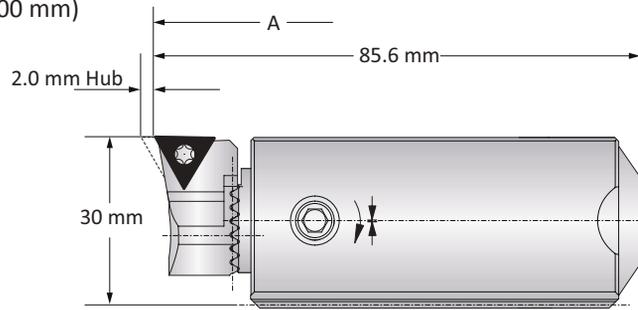
⚠ WARNING Tool failure can cause serious injury. To prevent:
 -Do not exceed recommended 10xD length-to-diameter ratio or exceed 4 total components (including shank).
 -When using Alu-Line components, do not exceed recommended 5xD length-to-diameter ratio.
 -When using tool steel components, do not exceed recommended 6xD length-to-diameter ratio.
 -When using heavy metal components, do not exceed recommended 8xD length-to-diameter ratio.
 -When using a carbide shank, do not exceed recommended 9xD length-to-diameter ratio.
 -When using a NOVI^{TECH} module, do not exceed recommended 10xD length-to-diameter ratio.
 -Refer to examples on pages B10-M: 8-10 for calculating length-to-diameter ratio.
 Factory technical assistance is available for your specific applications through our Application Engineering department. ext: 7611 | email: appeng@alliedmachine.com

538 (537) Analog Cassettes

Diameter Range: 3.937" - 128.150" (100.00 mm - 3255.00 mm)

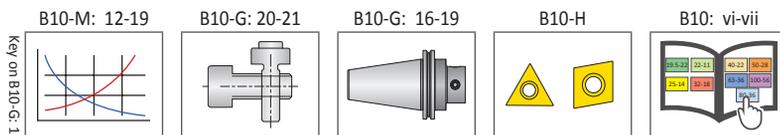


Form 101



Form 20

Slide Type	Boring Range			Part No.		
	A	Weight	Insert Form	Insert Holder	Clamping Piece	Cassette
Serrated Tool Bodies	3.937 - 8.071	1.323 (lbs)	20	210020	137026	538051
	3.937 - 8.071	1.323 (lbs)	101	210063	137026	538051
	3.937 - 8.071	1.323 (lbs)	103	210064	137026	538051
Basic / Eco Slides	7.874 - 40.157	1.323 (lbs)	20	210020	137027	538051
	7.874 - 40.157	1.323 (lbs)	101	210063	137027	538051
	7.874 - 40.157	1.323 (lbs)	103	210064	137027	538051
Flex Slides	19.685 - 128.150	1.323 (lbs)	20	210020	137019	538051
	19.685 - 128.150	1.323 (lbs)	101	210063	137019	538051
	19.685 - 128.150	1.323 (lbs)	103	210064	137019	538051
Serrated Tool Bodies	100.00 - 205.00	0.60 (kg)	20	210020	137026	537051
	100.00 - 205.00	0.60 (kg)	101	210063	137026	537051
	100.00 - 205.00	0.60 (kg)	103	210064	137026	537051
Basic / Eco Slides	200.00 - 1020.00	0.60 (kg)	20	210020	137027	537051
	200.00 - 1020.00	0.60 (kg)	101	210063	137027	537051
	200.00 - 1020.00	0.60 (kg)	103	210064	137027	537051
Flex Slides	500.00 - 3255.00	0.60 (kg)	20	210020	137019	537051
	500.00 - 3255.00	0.60 (kg)	101	210063	137019	537051
	500.00 - 3255.00	0.60 (kg)	103	210064	137019	537051



i = Imperial (in)
m = Metric (mm)
Inserts sold separately

WARNING Exceeding weight capacity for machine tool spindle and tool changer can cause machine damage and/or serious injury. To prevent:
 -Consult machine tool builder for machine's weight limitations.
 -Refer to example on page B10-M: 11 for calculating tool assembly weight.
 Factory technical assistance is also available for specific applications through our Application Engineering department. ext: 7611 | email: appeng@alliedmachine.com

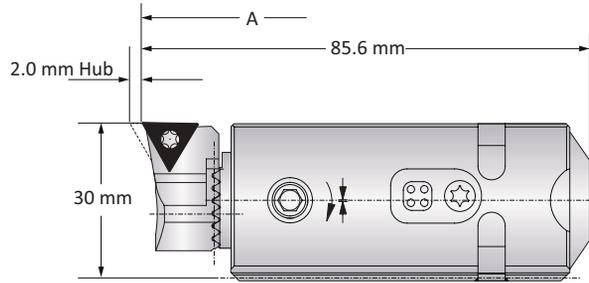
WARNING Tool failure can cause serious injury. To prevent:
 -Do not exceed recommended 10xD length-to-diameter ratio or exceed 4 total components (including shank).
 -When using Alu-Line components, do not exceed recommended 5xD length-to-diameter ratio.
 -When using tool steel components, do not exceed recommended 6xD length-to-diameter ratio.
 -When using heavy metal components, do not exceed recommended 8xD length-to-diameter ratio.
 -When using a carbide shank, do not exceed recommended 9xD length-to-diameter ratio.
 -When using a NOVI^{TECH} module, do not exceed recommended 10xD length-to-diameter ratio.
 -Refer to examples on pages B10-M: 8-10 for calculating length-to-diameter ratio.
 Factory technical assistance is available for your specific applications through our Application Engineering department. ext: 7611 | email: appeng@alliedmachine.com

538 (537) Cassettes with 3E^{TECH+}

Diameter Range: 3.937" - 128.150" (100.00 mm - 3255.00 mm)



Form 101



Form 20

Slide Type	Boring Range		Insert Form	Part No.			
	A	Weight		Insert Holder	Clamping Pieces	Cassette	
Serrated Tool Bodies	3.937 - 8.071	1.323 (lbs)	20	210020	137026	538052	
	3.937 - 8.071	1.323 (lbs)	101	210063	137026	538052	
	3.937 - 8.071	1.323 (lbs)	103	210064	137026	538052	
Basic / Eco Slides	7.874 - 40.157	1.323 (lbs)	20	210020	137027	538052	
	7.874 - 40.157	1.323 (lbs)	101	210063	137027	538052	
	7.874 - 40.157	1.323 (lbs)	103	210064	137027	538052	
Flex Slides	19.685 - 128.150	1.323 (lbs)	20	210020	137019	538052	
	19.685 - 128.150	1.323 (lbs)	101	210063	137019	538052	
	19.685 - 128.150	1.323 (lbs)	103	210064	137019	538052	
Serrated Tool Bodies	100.00 - 205.00	0.60 (kg)	20	210020	137026	537052	
	100.00 - 205.00	0.60 (kg)	101	210063	137026	537052	
	100.00 - 205.00	0.60 (kg)	103	210064	137026	537052	
	Basic / Eco Slides	200.00 - 1020.00	0.60 (kg)	20	210020	137027	537052
		200.00 - 1020.00	0.60 (kg)	101	210063	137027	537052
		200.00 - 1020.00	0.60 (kg)	103	210064	137027	537052
	Flex Slides	500.00 - 3255.00	0.60 (kg)	20	210020	137019	537052
		500.00 - 3255.00	0.60 (kg)	101	210063	137019	537052
		500.00 - 3255.00	0.60 (kg)	103	210064	137019	537052

3E^{TECH+} Digital Readout Module

Part No.	Charging Unit*
536015	536016



NOTE: WEEE-Reg.-Nr. DE 15820388

*Charging unit sold separately.

NOTE: 3E^{TECH+} adjustment accuracy of 0.00005" or 0.001 mm on diameter.

Key on B10-G-1

B10-M: 12-19

B10-G: 20-21

B10-G: 16-19

B10-H

B10: vi-vii

ⓘ = Imperial (in)
 ⓘ = Metric (mm)
 Inserts sold separately

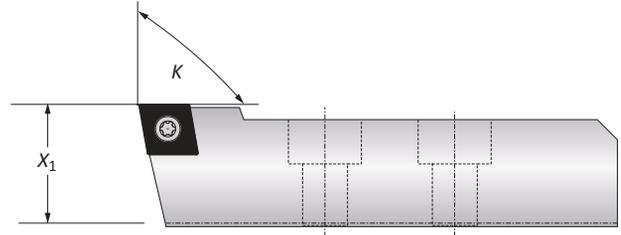
⚠ WARNING Exceeding weight capacity for machine tool spindle and tool changer can cause machine damage and/or serious injury. To prevent:
 -Consult machine tool builder for machine's weight limitations.
 -Refer to example on page B10-M: 11 for calculating tool assembly weight.
 Factory technical assistance is also available for specific applications through our Application Engineering department. ext: 7611 | email: appeng@alliedmachine.com

⚠ WARNING Tool failure can cause serious injury. To prevent:
 -Do not exceed recommended 10xD length-to-diameter ratio or exceed 4 total components (including shank).
 -When using Alu-Line components, do not exceed recommended 5xD length-to-diameter ratio.
 -When using tool steel components, do not exceed recommended 6xD length-to-diameter ratio.
 -When using heavy metal components, do not exceed recommended 8xD length-to-diameter ratio.
 -When using a carbide shank, do not exceed recommended 9xD length-to-diameter ratio.
 -When using a NOVI^{TECH+} module, do not exceed recommended 10xD length-to-diameter ratio.
 -Refer to examples on pages B10-M: 8-10 for calculating length-to-diameter ratio.
 Factory technical assistance is available for your specific applications through our Application Engineering department. ext: 7611 | email: appeng@alliedmachine.com

Insert Holders for Rough Machining

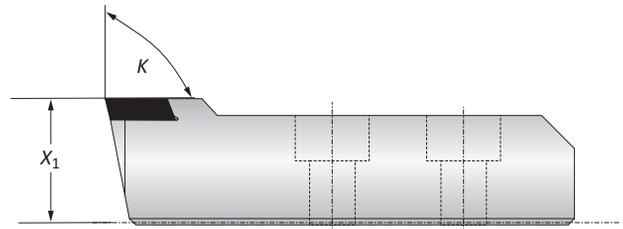
90° Insert Holders

Insert Holder		Weight	ISO Code	Insert Form	Part No.	
K	X ₁					
i	90°	1.180	1.322 (lbs)	CC..09T3..	103	149090
	90°	1.180	1.322 (lbs)	CC..1204..	104	149099
	90°	1.150	1.322 (lbs)	CC..1204..	104	149083
	90°	1.180	1.322 (lbs)	CC..1605..	105	149093
m	90°	30.00	0.60 (kg)	CC..09T3..	103	149090
	90°	30.00	0.60 (kg)	CC..1204..	104	149099
	90°	29.30	0.60 (kg)	CC..1204..	104	149083
	90°	30.00	0.60 (kg)	CC..1605..	105	149093



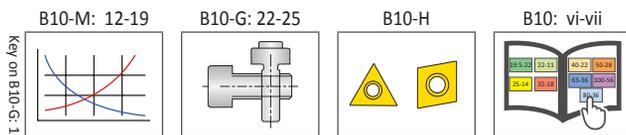
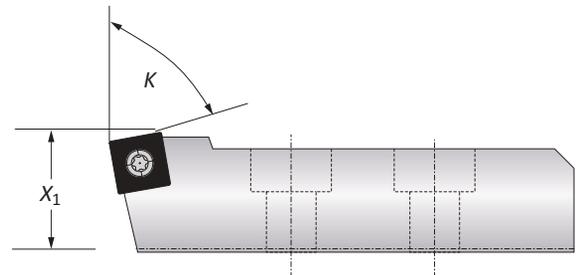
90° Tangential Insert Holders

Insert Holder		Weight	ISO Code	Insert Form	Part No.	
K	X ₁					
i	90°	1.180	1.322 (lbs)	Tangential	05	149010
	90°	1.150	1.322 (lbs)	Tangential	05	149020
m	90°	30.00	0.60 (kg)	Tangential	05	149010
	90°	29.30	0.60 (kg)	Tangential	05	149020



80° Insert Holders

Insert Holder		Weight	ISO Code	Insert Form	Part No.	
K	X ₁					
i	80°	1.180	1.322 (lbs)	SC..1204..	113	149089
	80°	1.180	1.322 (lbs)	SC..150512	114	149094
	80°	1.180	1.322 (lbs)	SN..1506..	134	149096
m	80°	30.00	0.60 (kg)	SC..1204..	113	149089
	80°	30.00	0.60 (kg)	SC..150512	114	149094
	80°	30.00	0.60 (kg)	SN..1506..	134	149096



i = Imperial (in)
m = Metric (mm)
Inserts sold separately

WARNING Exceeding weight capacity for machine tool spindle and tool changer can cause machine damage and/or serious injury. To prevent:

- Consult machine tool builder for machine's weight limitations.
 - Refer to example on page B10-M: 11 for calculating tool assembly weight.
- Factory technical assistance is also available for specific applications through our Application Engineering department. ext: 7611 | email: appeng@alliedmachine.com

WARNING Tool failure can cause serious injury. To prevent:

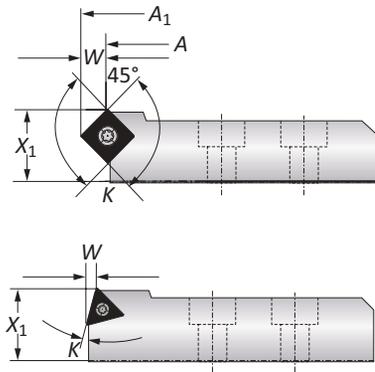
- Do not exceed recommended 10xD length-to-diameter ratio or exceed 4 total components (including shank).
 - When using Alu-Line components, do not exceed recommended 5xD length-to-diameter ratio.
 - When using tool steel components, do not exceed recommended 6xD length-to-diameter ratio.
 - When using heavy metal components, do not exceed recommended 8xD length-to-diameter ratio.
 - When using a carbide shank, do not exceed recommended 9xD length-to-diameter ratio.
 - When using a NOVI^{TECH} module, do not exceed recommended 10xD length-to-diameter ratio.
 - Refer to examples on pages B10-M: 8-10 for calculating length-to-diameter ratio.
- Factory technical assistance is available for your specific applications through our Application Engineering department. ext: 7611 | email: appeng@alliedmachine.com



Insert Holders for Rough Machining | Boring Range Example

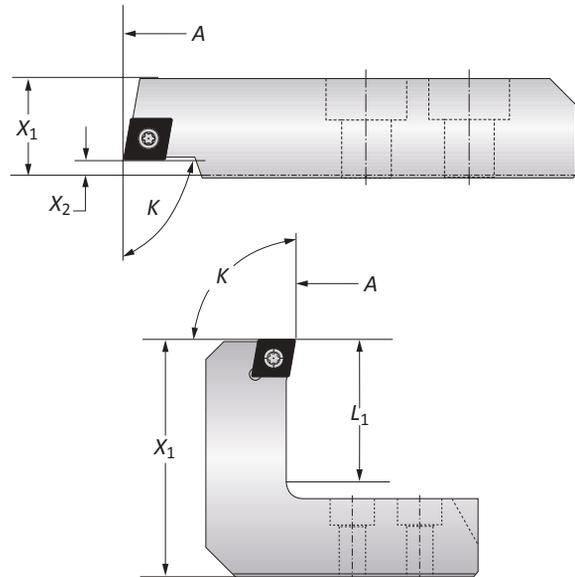
Chamfering Insert Holders

		Insert Holder				Weight	ISO Code	Insert Form	Part No.
		K	X ₁	A/A ₁	W				
i	15°	1.180	+0.275	0.157	1.322 (lbs)	TC..16T3..	163	201065	
	20°	1.180	+0.354	0.208	1.322 (lbs)	TC..16T3..	163	201025	
	30°	1.180	+0.551	0.303	1.322 (lbs)	TC..16T3..	163	201075	
	45°	1.180	+0.787	0.389	1.322 (lbs)	SC..1505..	114	201015	
m	15°	30.00	+7.00	4.00	0.60 (kg)	TC..16T3..	163	201065	
	20°	30.00	+9.00	5.30	0.60 (kg)	TC..16T3..	163	201025	
	30°	30.00	+14.00	7.70	0.60 (kg)	TC..16T3..	163	201075	
	45°	30.00	+20.00	9.90	0.60 (kg)	SC..1505..	114	201015	



Back-Boring Insert Holders

		Insert Holder				Weight	ISO Code	Insert Form	Part No.
		K	X ₁	X ₂	A				
i	90°	3.540	0.196	+1.574	1.763 (lbs)	CC..1204..	104	251010	
	90°	3.540	0.196	+2.952	1.984 (lbs)	CC..1204..	104	251011	
m	90°	30.00	5.00	+40.00	0.80 (kg)	CC..1204..	104	251010	
	90°	30.00	5.00	+75.00	0.90 (kg)	CC..1204..	104	251011	



OD Turning Insert Holders

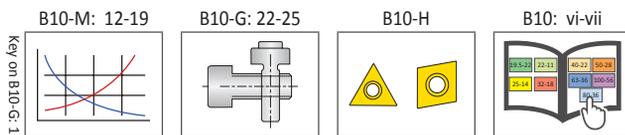
		Insert Holder				Weight	ISO Code	Insert Form	Part No.
		K	X ₁	L ₁	A				
i	90°	198.400	2.440	-1.968	2.204 (lbs)	CC..1204..	104	149040	
m	90°	90.00	62.00	-50.00	1.00 (kg)	CC..1204..	104	149040	

Boring Range Example

		Serrated Slide		Insert Holder		Total Bore Range
		Part No.	Bore Range	Part No.	Modified Bore Range	
i		350051	7.874 - 11.023	201065	+0.280	8.150 - 11.300
		350051	7.874 - 11.023	251010	+1.600	9.450 - 12.600
		350051	7.874 - 11.023	149040	-2.000	5.900 - 9.055
m		349051	200.00 - 280.00	201065	+7.00	207.00 - 287.00
		349051	200.00 - 280.00	251010	+40.00	240.00 - 320.00
		349051	200.00 - 280.00	149040	-50.00	150.00 - 230.00

NOTE: Boring range for serrated slides or base slides are found on pg. B10-G: 4 - 7.

NOTE: Additional insert holders available upon request.

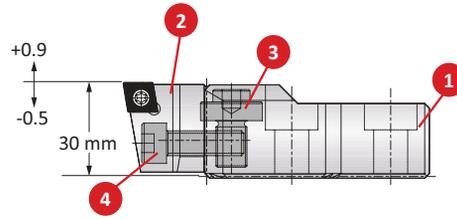


i = Imperial (in)
m = Metric (mm)
Inserts sold separately

WARNING Exceeding weight capacity for machine tool spindle and tool changer can cause machine damage and/or serious injury. To prevent:
-Consult machine tool builder for machine's weight limitations.
-Refer to example on page B10-M: 11 for calculating tool assembly weight.
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-When using heavy metal components, do not exceed recommended 8xD length-to-diameter ratio.
-When using a carbide shank, do not exceed recommended 9xD length-to-diameter ratio.
-When using a NOVI^{TECH} module, do not exceed recommended 10xD length-to-diameter ratio.
-Refer to examples on pages B10-M: 8-10 for calculating length-to-diameter ratio.
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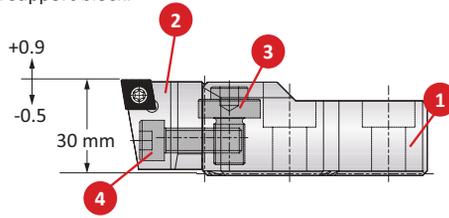
Insert Holders for Height Adjustments and Axial Grooving



Insert Form 103

Boring Range	1. Support		2 Insert Holder		3 Adjusting Screw		4 Fixing Screw	
	Part No.	Insert Form	Part No.	Part No.	Service Key	Part No.	Service Key	
i 7.874 - 128.150	149055	103	149058	315355	s6 / B	070369	s6 / B	
m 200.00 - 3255.00	149055	103	149058	315355	s6 / B	070369	s6 / B	

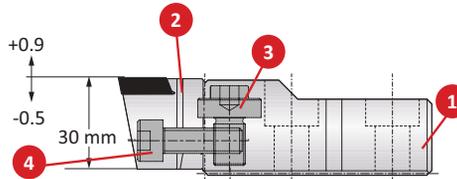
NOTE: Adjusting and fixing screws will be received with support block.



Insert Form 104

Boring Range	1 Support		2 Insert Holder		3 Adjusting Screw		4 Fixing Screw	
	Part No.	Insert Form	Part No.	Part No.	Service Key	Part No.	Service Key	
i 7.874 - 128.150	149055	104	149056	315355	s6 / B	070369	s6 / B	
m 200.00 - 3255.00	149055	104	149056	315355	s6 / B	070369	s6 / B	

NOTE: Adjusting and fixing screws will be received with support block.



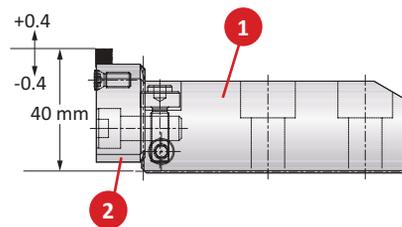
Insert Form 05

Boring Range	1 Support		2 Insert Holder		3 Adjusting Screw		4 Fixing Screw	
	Part No.	Insert Form	Part No.	Part No.	Service Key	Part No.	Service Key	
i 7.874 - 128.150	149055	05	149085	315355	s6 / B	070369	s6 / B	
m 200.00 - 3255.00	149055	05	149085	315355	s6 / B	070369	s6 / B	

NOTE: Adjusting and fixing screws will be received with support block.

Insert Holders for Axial Grooving

Insert Holder	1 Support	2 Insert Holder	Weight	Insert Form
	Part No.	Part No.		
i 1.574	226014	226031	0.661 (lbs)	304
m 40.00	226014	226031	0.30 (kg)	304



i = Imperial (in)
m = Metric (mm)
 Inserts sold separately

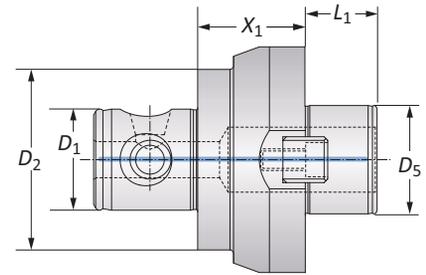
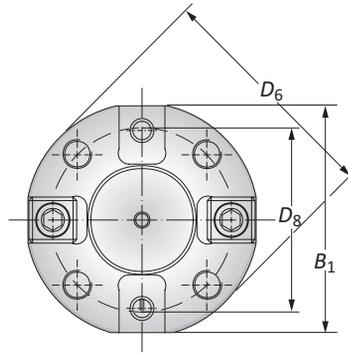
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 - When using a carbide shank, do not exceed recommended 9xD length-to-diameter ratio.
 - When using a NOVI^{TECH} module, do not exceed recommended 10xD length-to-diameter ratio.
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- Factory technical assistance is available for your specific applications through our Application Engineering department. ext: 7611 | email: appeng@alliedmachine.com

MVS Holding Arbors



	MVS Connection	Holding Arbor Connection	Holding Arbor						Weight	Part No.
			X_1	L_1	D_5	D_6	D_8	B_1		
i	80 - 36	D 40 Alu-Line	0.748	1.181	1.575	3.503	2.625	3.150	1.102 (lbs)	309001 ⁽¹⁾⁽²⁾
	80 - 36	D 60	2.362	1.574	2.362	5.082	4.000	4.921	9.038 (lbs)	209060 ⁽¹⁾
	100 - 56	D 40 Alu-Line	1.181	1.181	1.575	3.503	2.625	3.149	2.204 (lbs)	309041 ⁽²⁾
	100 - 56	D 60	2.362	1.575	2.362	5.082	4.000	4.921	13.880 (lbs)	209043
	100 - 56	D 60 Alu-Line	2.362	1.575	2.362	5.082	4.000	4.921	4.850 (lbs)	309043 ⁽²⁾
m	80 - 36	D 40 Alu-Line	19.00	30.00	40.00	89.00	66.70	80.00	0.50 (kg)	309001 ⁽¹⁾⁽²⁾
	80 - 36	D 60	60.00	40.00	60.00	129.10	101.60	125.00	4.10 (kg)	209060 ⁽¹⁾
	100 - 56	D 40 Alu-Line	30.00	30.00	40.00	89.00	66.70	80.00	1.00 (kg)	309041 ⁽²⁾
	100 - 56	D 60	60.00	40.00	60.00	129.10	101.60	125.00	6.30 (kg)	209043
	100 - 56	D 60 Alu-Line	60.00	40.00	60.00	129.10	101.60	125.00	2.20 (kg)	309043 ⁽²⁾

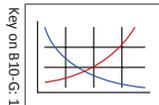
(1) For light machining only.

(2) Lightweight aluminum construction only in connection with our serrated slides:

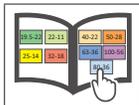
Basic D 40 Serrated Slides: \varnothing 7.874" - 20.472" (200.00 mm - 520.00 mm) (Page B10-G: 4).

Basic D 60 Serrated Slides: \varnothing 7.874" - 19.882" (200.00 mm - 505.00 mm) (Page B10-G: 5).

B10-M: 12-19



B10: vi-vii



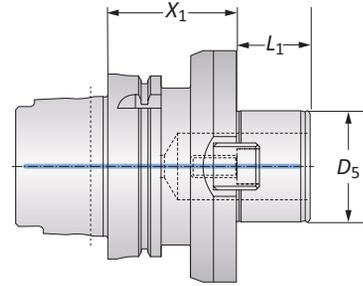
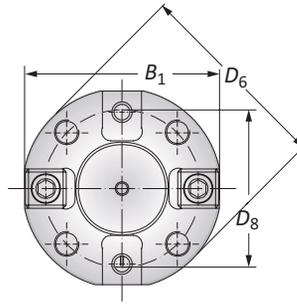
i = Imperial (in)
m = Metric (mm)

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 -Refer to example on page B10-M: 11 for calculating tool assembly weight.
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 -When using a NOVI^{TECH} module, do not exceed recommended 10xD length-to-diameter ratio.
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Master Shanks D 40 / D 60

HSK-A (DIN 69 893) Shanks



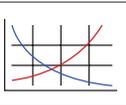
HSK-A (DIN 69 893) Shanks

Taper Size	Connection	Shank							Weight	Part No.
		X_1	L_1	D_5	D_6	D_8	B_1			
i	63	D 40	2.362	1.181	1.575	3.504	2.626	3.150	4.200 (lbs)	358015
	100	D 40	2.362	1.181	1.575	3.504	2.626	3.150	7.900 (lbs)	258021
	100	D 60	2.756	1.575	2.362	5.083	4.000	4.921	11.500 (lbs)	258061
	100	D 60	2.756	1.575	2.362	5.083	4.000	4.331	11.000 (lbs)	258098
m	63	D 40	60.00	30.00	40.00	89.00	66.70	80.00	1.90 (kg)	358015
	100	D 40	60.00	30.00	40.00	89.00	66.70	80.00	3.60 (kg)	258021
	100	D 60	70.00	40.00	60.00	129.10	101.60	125.00	5.20 (kg)	258061
	100	D 60	70.00	40.00	60.00	129.10	101.60	110.00	5.00 (kg)	258098

B10-M: 12-19

B10: vi-vii

Key on B10-G: 1



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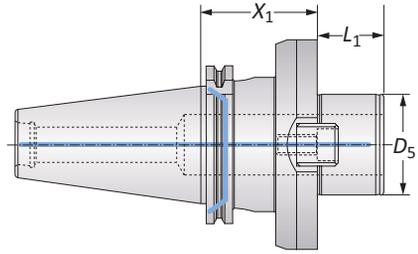
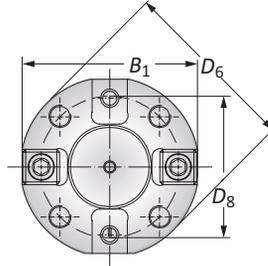
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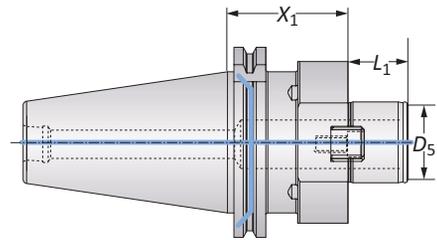
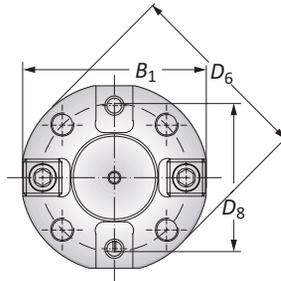
Master Shanks D 40 / D 60

CAT 40 / 50 Shanks with Imperial Threads | CAT 50 Shank with Metric Threads



CAT 40 / 50 Shanks with Imperial Threads

Taper Size	Connection	Shank							Weight	Part No.
		X_1	L_1	D_5	D_6	D_8	B_1			
i	40	D 40	1.970	1.181	1.575	3.504	2.626	3.150	4.000 (lbs)	357004
	50	D 40	1.970	1.181	1.575	3.504	2.626	3.150	8.400 (lbs)	357001
	50	D 60	2.756	1.575	2.362	5.083	4.000	4.331	11.700 (lbs)	357002
	50	D 60	2.756	1.575	2.362	5.083	4.000	4.921	12.100 (lbs)	357003

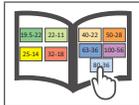
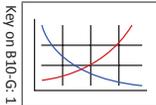


CAT 50 Shanks with Metric Threads

Taper Size	Connection	Shank							Weight	Part No.
		X_1	L_1	D_5	D_6	D_8	B_1			
m	50	D 40	60.00	30.00	40.00	89.00	66.70	80.00	4.60 (kg)	326083

B10-M: 12-19

B10: vi-vii



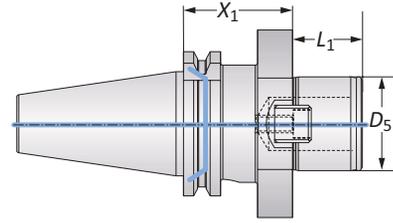
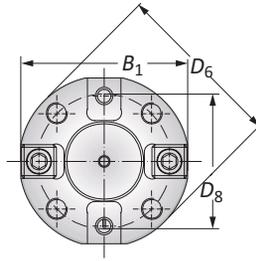
i = Imperial (in)
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Master Shanks D 40 / D 60

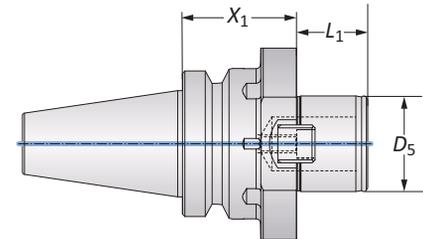
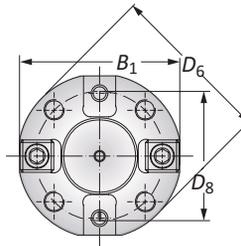
SK (DIN 69 871-AD/B) | BT / JIS B 6339 Shanks



SK (DIN 69 871-AD/B) Shanks

	Taper Size	Connection	Shank						Weight	Part No.
			X_1	L_1	D_5	D_6	D_8	B_1		
i	40	D 40	1.969	1.181	1.575	3.504	2.626	3.150	4.190 (lbs)	326080*
	50	D 40	1.969	1.181	1.575	3.504	2.626	3.150	9.040 (lbs)	K42796
	50	D 60	2.756	1.575	2.362	5.083	4.000	4.921	12.790 (lbs)	326087
	50	D 60	2.756	1.575	2.362	5.083	4.000	4.331	12.130 (lbs)	326088
m	40	D 40	50.00	30.00	40.00	89.00	66.70	80.00	1.90 (kg)	326080*
	50	D 40	50.00	30.00	40.00	89.00	66.70	80.00	4.10 (kg)	K42796
	50	D 60	70.00	40.00	60.00	129.10	101.60	125.00	5.80 (kg)	326087
	50	D 60	70.00	40.00	60.00	129.10	101.60	110.00	5.50 (kg)	326088

*For light machining only

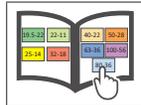
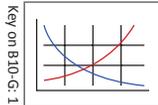


BT / JIS B 6339 Shanks

	Taper Size	Connection	Shank						Weight	Part No.
			X_1	L_1	D_5	D_6	D_8	B_1		
i	40	D 40	1.969	1.181	1.575	3.504	2.626	3.150	4.000 (lbs)	326084
	50	D 40	2.165	1.181	1.575	3.504	2.626	3.150	9.900 (lbs)	326082
	50	D 60	3.150	1.575	2.362	5.083	4.000	-	17.600 (lbs)	326062
m	40	D 40	50.00	30.00	40.00	89.00	66.70	80.00	1.80 (kg)	326084
	50	D 40	55.00	30.00	40.00	89.00	66.70	80.00	4.50 (kg)	326082
	50	D 60	80.00	40.00	60.00	19.10	101.60	-	8.00 (kg)	326062

B10-M: 12-19

B10: vi-vii



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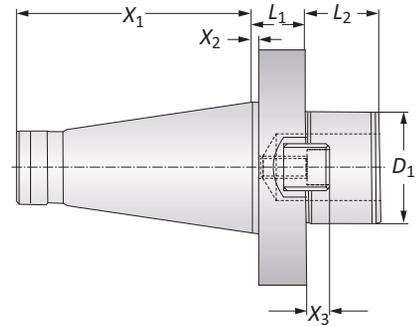
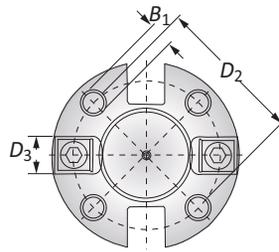
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- When using a carbide shank, do not exceed recommended 9xD length-to-diameter ratio.
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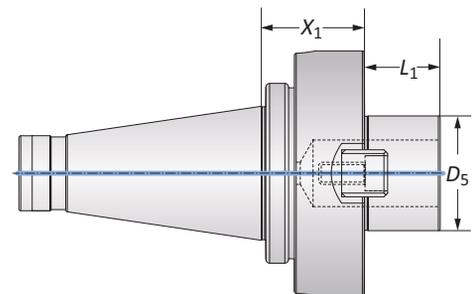
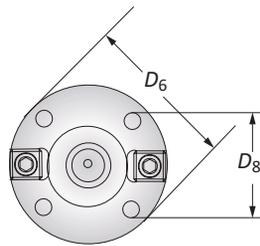
Master Shanks D 40 / D 60

NMTB Shanks | DIN 2080 Shanks



NMTB Shanks

	Taper Size	Connection	Shank								Weight	Part No.	
			X_1	X_2	L_1	L_2	D_1	X_3	D_2	D_3			B_1
i	50	D 60	4.992	0.126	1.142	1.575	2.362	0.492	4.000	1.000	M16	17.637 (lbs)	198051T004480
m	50	D 60	126.80	3.20	29.00	40.00	60.00	12.50	101.60	25.40	M16	8.00 (kg)	198051T004480

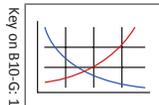


DIN 2080 Shanks

	Taper Size	Connection	Shank						Weight	Part No.
			X_1	L_1	D_5	D_6	D_8	B_1		
i	50	D 60	2.165	1.575	2.362	5.039	4.000	-	14.991 (lbs)	326035
m	50	D 60	55.00	40.00	60.00	128.00	101.60	-	6.80 (kg)	326035

B10-M: 12-19

B10: vi-vii



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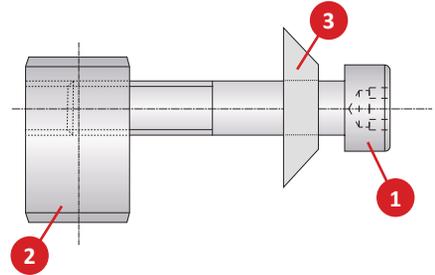
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 -When using Alu-Line components, do not exceed recommended 5xD length-to-diameter ratio.
 -When using tool steel components, do not exceed recommended 6xD length-to-diameter ratio.
 -When using heavy metal components, do not exceed recommended 8xD length-to-diameter ratio.
 -When using a carbide shank, do not exceed recommended 9xD length-to-diameter ratio.
 -When using a NOVI^{TECH} module, do not exceed recommended 10xD length-to-diameter ratio.
 -Refer to examples on pages B10-M: 8-10 for calculating length-to-diameter ratio.
 Factory technical assistance is available for your specific applications through our Application Engineering department. ext: 7611 | email: appeng@alliedmachine.com

538 (537) Accessories

Clamping Pieces | Counterweights | Insert Holders for Abrasive Materials

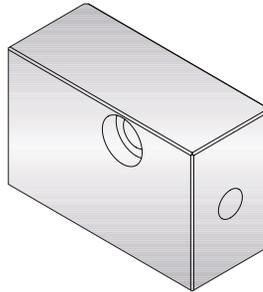
538 (537) Clamping Pieces

Slide Type	Complete Part No.	Replacement Components				
		Service Key	1 Cap Screw	2 Clamping Nut	3 Disk Spring	
Serrated Tool Bodies	137026	115578	s6 / B	215101	140118	337105
Basic and Eco Slides	137027			215102	215105	337105
Flex Slides	137019			415900	215105	337105



538 (537) Counterweights

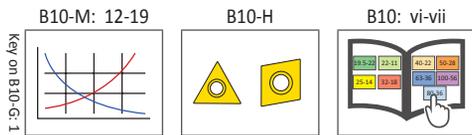
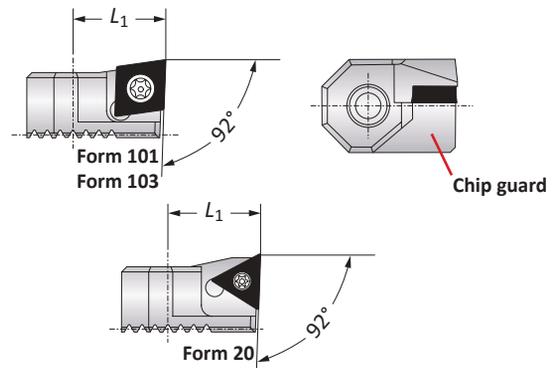
Boring Range	Part No.
i 3.937 - 128.15	538055
m 100.00 - 3255.00	537055



NOTE: Clamping piece sold separately.

Insert Holders for Abrasive Materials

Boring Range	L ₁	Weight	Insert Form	Part No.
i 3.937 - 128.150	0.708	0.066 (lbs)	20	211061
i 3.937 - 128.150	0.708	0.066 (lbs)	101	211063
i 3.937 - 128.150	0.708	0.066 (lbs)	103	211065
m 100.00 - 3255.00	18.00	0.03 (kg)	20	211061
m 100.00 - 3255.00	18.00	0.03 (kg)	101	211063
m 100.00 - 3255.00	18.00	0.03 (kg)	103	211065



i = Imperial (in)
m = Metric (mm)
Inserts sold separately

WARNING Exceeding weight capacity for machine tool spindle and tool changer can cause machine damage and/or serious injury. To prevent:

- Consult machine tool builder for machine's weight limitations.
- Refer to example on page B10-M: 11 for calculating tool assembly weight.

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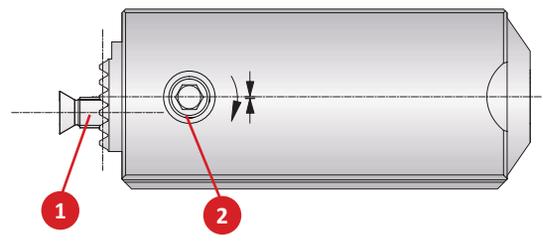
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- When using a carbide shank, do not exceed recommended 9xD length-to-diameter ratio.
- When using a NOVI^{TECH} module, do not exceed recommended 10xD length-to-diameter ratio.
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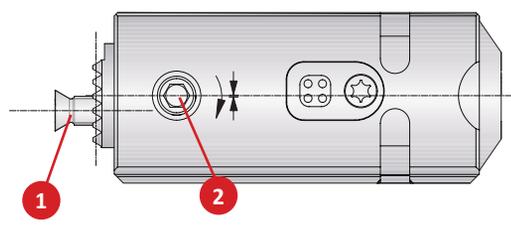
Factory technical assistance is available for your specific applications through our Application Engineering department. ext: 7611 | email: appeng@alliedmachine.com

538 (537) Accessories | 3E^{TECH+} Accessories

Accessories



538 (537) Analog Cassette



538 (537) Cassette

538 (537) Accessories

Cassette Part No.	1 Countersunk Screw		2 Clamping Screw	
	Part No.	Service Key	Part No.	Service Key
i 538051	215462	T20 / H	115249	s4 / F
	538052	215462	315789	s4 / F
m 537051	215462	T20 / H	115249	s4 / F
	537052	215462	315789	s4 / F

3E^{TECH+} Accessories

1 Charging Unit Part No. 536016
--



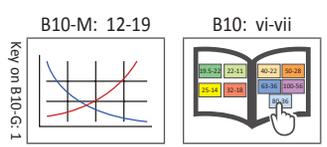
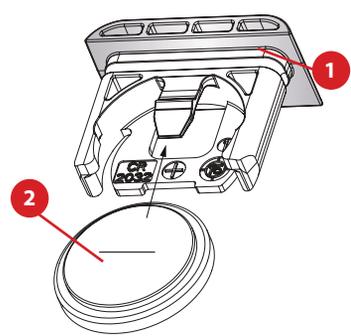
NOTE: Charging unit sold separately from 3E^{TECH+}.

NOTE: 3E^{TECH+} adjustment accuracy of 0.00005" or 0.001 mm on diameter.

3E^{TECH} (Old Display) Accessories

1 Sealing Ring Part No. 215483	2 Battery CR2032 Part No. 515491
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NOTE: Not required for 3E^{TECH+} (new display).



i = Imperial (in)
m = Metric (mm)

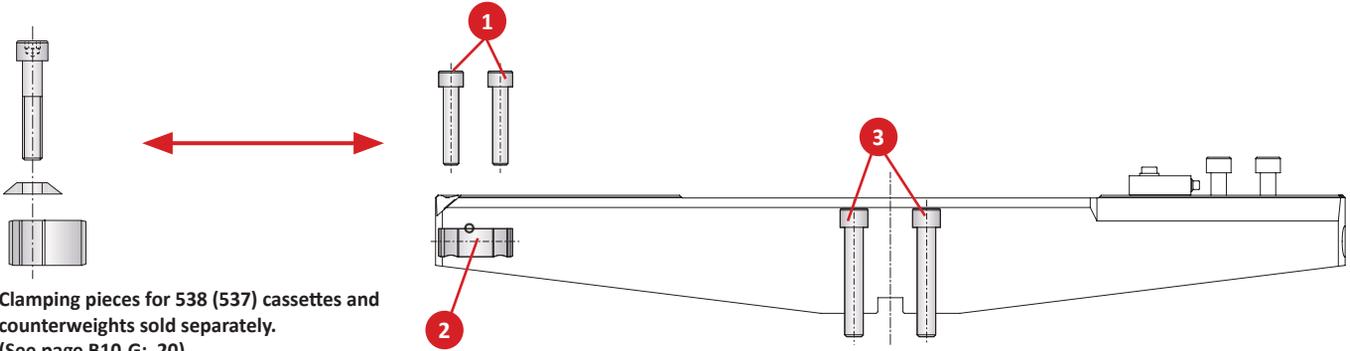
WARNING Exceeding weight capacity for machine tool spindle and tool changer can cause machine damage and/or serious injury. To prevent:
 -Consult machine tool builder for machine's weight limitations.
 -Refer to example on page B10-M: 11 for calculating tool assembly weight.
 Factory technical assistance is also available for specific applications through our Application Engineering department. ext: 7611 | email: appeng@alliedmachine.com

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 -When using heavy metal components, do not exceed recommended 8xD length-to-diameter ratio.
 -When using a carbide shank, do not exceed recommended 9xD length-to-diameter ratio.
 -When using a NOVI^{TECH+} module, do not exceed recommended 10xD length-to-diameter ratio.
 -Refer to examples on pages B10-M: 8-10 for calculating length-to-diameter ratio.
 Factory technical assistance is available for your specific applications through our Application Engineering department. ext: 7611 | email: appeng@alliedmachine.com

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Serrated Slide Basic D 40 Accessories

Clamping Pieces



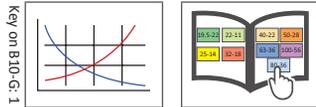
Clamping pieces for 538 (537) cassettes and counterweights sold separately. (See page B10-G: 20).

Clamping Pieces

Connection	Serrated Slide Part No.	1 Cap Screw		2 Clamping Nut Part No.	3 Thread Pin		Cap Screw		
		Part No.	Service Key		Part No.	Service Key	Part No.	Service Key	
i	D 40	350021	115118	s8 / B	115669	349010	s4 / F	315186	s10 / C
	D 40	350022	115118	s8 / B	115669	349011	s4 / F	315186	s10 / C
	D 40	350023	115118	s8 / B	115669	349012	s4 / F	315186	s10 / C
	D 40	350024	115118	s8 / B	115669	349013	s4 / F	315186	s10 / C
m	D 40	349021	115118	s8 / B	115669	349010	s4 / F	315186	s10 / C
	D 40	349022	115118	s8 / B	115669	349011	s4 / F	315186	s10 / C
	D 40	349023	115118	s8 / B	115669	349012	s4 / F	315186	s10 / C
	D 40	349024	115118	s8 / B	115669	349013	s4 / F	315186	s10 / C

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i = Imperial (in)
m = Metric (mm)

WARNING Exceeding weight capacity for machine tool spindle and tool changer can cause machine damage and/or serious injury. To prevent:

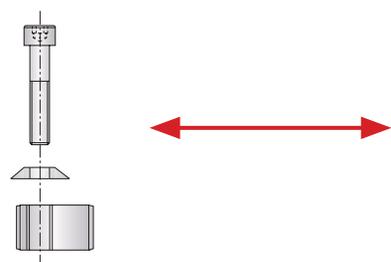
- Consult machine tool builder for machine's weight limitations.
 - Refer to example on page B10-M: 11 for calculating tool assembly weight.
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WARNING Tool failure can cause serious injury. To prevent:

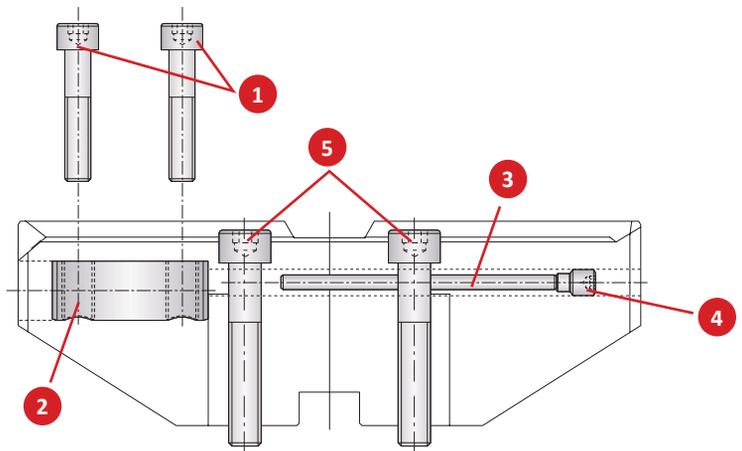
- Do not exceed recommended 10xD length-to-diameter ratio or exceed 4 total components (including shank).
 - When using Alu-Line components, do not exceed recommended 5xD length-to-diameter ratio.
 - When using tool steel components, do not exceed recommended 6xD length-to-diameter ratio.
 - When using heavy metal components, do not exceed recommended 8xD length-to-diameter ratio.
 - When using a carbide shank, do not exceed recommended 9xD length-to-diameter ratio.
 - When using a NOVI^{TECH} module, do not exceed recommended 10xD length-to-diameter ratio.
 - Refer to examples on pages B10-M: 8-10 for calculating length-to-diameter ratio.
- Factory technical assistance is available for your specific applications through our Application Engineering department. ext: 7611 | email: appeng@alliedmachine.com

Serrated Slide Basic D 60 Accessories

Clamping Pieces | Cover Plates



Clamping pieces for 538 (537) cassettes and counterweights sold separately. (See page B10-G: 20).

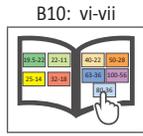
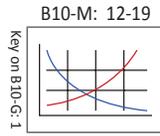
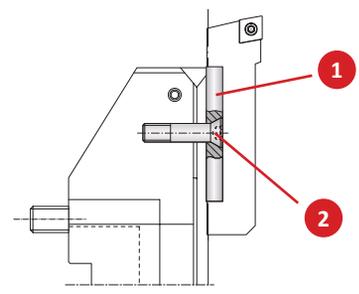


Clamping Pieces

Connection	Serrated Slide Part No.	1 Cap Screw		2 Clamping Nut Part No.	3 Adjustment Pin Part No.	4 Thread Pin		5 Cap Screw		
		Part No.	Service Key			Part No.	Service Key	Part No.	Service Key	
i	D 60	350051	115118	s8 / B	115669	141112	115196	s4 / F	115170	s14 / C
	D 60	350052	115118	s8 / B	115669	141113	115196	s4 / F	115170	s14 / C
	D 60	350053	115118	s8 / B	115669	141114	115196	s4 / F	115170	s14 / C
	D 60	350054	115118	s8 / B	115669	141115	115196	s4 / F	115170	s14 / C
m	D 60	349051	115118	s8 / B	115669	141112	115196	s4 / F	115170	s14 / C
	D 60	349052	115118	s8 / B	115669	141113	115196	s4 / F	115170	s14 / C
	D 60	349053	115118	s8 / B	115669	141114	115196	s4 / F	115170	s14 / C
	D 60	349054	115118	s8 / B	115669	141115	115196	s4 / F	115170	s14 / C

Cover Plates for Basic D 60 Serrated Slides

Connection	Serrated Slide Part No.	1 Cover Plate		2 Countersunk Screw Part No.	Service Key
		Part No.	Service Key		
i	D 60	350051	349016	063106	s4 / B
	D 60	350052	349017	063106	s4 / B
	D 60	350053	349017	063106	s4 / B
	D 60	350054	349017	063106	s4 / B
m	D 60	349051	349016	063106	s4 / B
	D 60	349052	349017	063106	s4 / B
	D 60	349053	349017	063106	s4 / B
	D 60	349054	349017	063106	s4 / B



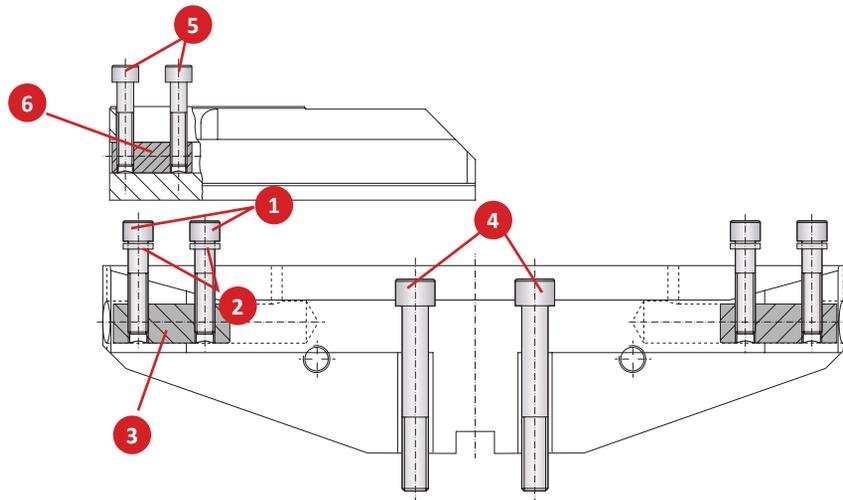
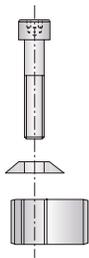
i = Imperial (in)
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 -Consult machine tool builder for machine's weight limitations.
 -Refer to example on page B10-M: 11 for calculating tool assembly weight.
 Factory technical assistance is also available for specific applications through our Application Engineering department. ext: 7611 | email: appeng@alliedmachine.com

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 -Do not exceed recommended 10xD length-to-diameter ratio or exceed 4 total components (including shank).
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 -When using tool steel components, do not exceed recommended 6xD length-to-diameter ratio.
 -When using heavy metal components, do not exceed recommended 8xD length-to-diameter ratio.
 -When using a carbide shank, do not exceed recommended 9xD length-to-diameter ratio.
 -When using a NOVI^{TECH} module, do not exceed recommended 10xD length-to-diameter ratio.
 -Refer to examples on pages B10-M: 8-10 for calculating length-to-diameter ratio.
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Serrated Slide Eco D 60 Accessories

Clamping Pieces



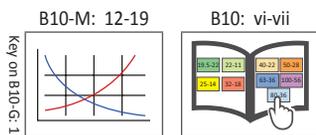
Clamping pieces for 538 (537) cassettes and counterweights sold separately. (See page B10-G: 20).

Base Slide Clamping Pieces

Connection	Base Slide Part No.	1 Cap Screw		2 Disc Part No.	3 Clamping Nut Part No.	4 Cap Screw		
		Part No.	Service Key			Part No.	Service Key	
i	D 60	350005	115771	s10 / C	115737	415181	077128	s14 / C
	D 60	350006	115771	s10 / C	115737	415181	077128	s14 / C
m	D 60	349005	115771	s10 / C	115737	415181	077128	s14 / C
	D 60	349006	115771	s10 / C	115737	415181	077128	s14 / C

Serrated Slide Clamping Pieces

Part No.	Serrated Slide Part No.	5 Cap Screw		6 Clamping Nut Part No.
		Part No.	Service Key	
i	350014	115118	s8 / B	115669
	350015	115118	s8 / B	115669
m	349014	115118	s8 / B	115669
	349015	115118	s8 / B	115669



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WARNING Exceeding weight capacity for machine tool spindle and tool changer can cause machine damage and/or serious injury. To prevent:

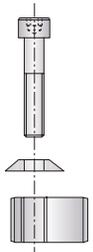
- Consult machine tool builder for machine's weight limitations.
 - Refer to example on page B10-M: 11 for calculating tool assembly weight.
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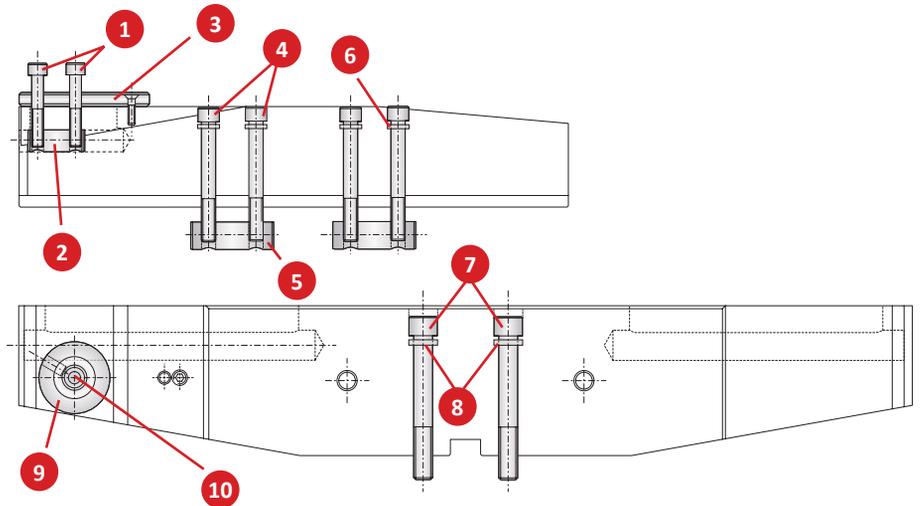
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 - When using a carbide shank, do not exceed recommended 9xD length-to-diameter ratio.
 - When using a NOVI^{TECH} module, do not exceed recommended 10xD length-to-diameter ratio.
 - Refer to examples on pages B10-M: 8-10 for calculating length-to-diameter ratio.
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Serrated Slide Flex D 60 Accessories

Clamping Pieces



Clamping pieces for 538 (537) cassettes and counterweights sold separately (See page B10-G: 20).



Serrated Slide Clamping Pieces

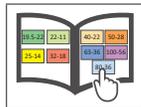
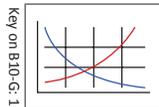
	Serrated Slide	1 Cap Screw		2 Clamping Nut	3 Adapter		4 Cap Screw		5 Clamping Nut	6 Disk
	Part No.	Part No.	Service Key	Part No.	Part No.	Service Key	Part No.	Service Key	Part No.	Part No.
i	350035	115307	s8 / B	115669	349043	s4 / B	315186	s10 / C	349202	115737
	350036	115307	s8 / B	115669	349043	s4 / B	077110	s10 / C	415181	115737
	350037	115307	s8 / B	115669	349043	s4 / B	315403	s10 / C	415181	115737
	350038	115307	s8 / B	115669	349043	s4 / B	315415	s10 / C	415181	115737
m	349035	115307	s8 / B	115669	349043	s4 / B	315186	s10 / C	349202	115737
	349036	115307	s8 / B	115669	349043	s4 / B	077110	s10 / C	415181	115737
	349037	115307	s8 / B	115669	349043	s4 / B	315403	s10 / C	415181	115737
	349038	115307	s8 / B	115669	349043	s4 / B	315415	s10 / C	415181	115737

Base Slide Clamping Pieces

	Connection	Base Slide	7 Cap Screw		8 Disk	9 Injector	10 Countersunk Screw	
		Part No.	Part No.	Service Key	Part No.	Part No.	Part No.	Service Key
i	D 60	350031	115736	s14 / C	068168	349201	415898	s6 / B
	D 60	350032	415913	s14 / C	068168	349201	415898	s6 / B
	D 60	350033	215509	s14 / C	068168	349201	415898	s6 / B
	D 60	350034	415636	s14 / C	068168	349201	415898	s6 / B
m	D 60	349031	115736	s14 / C	068168	349201	415898	s6 / B
	D 60	349032	415913	s14 / C	068168	349201	415898	s6 / B
	D 60	349033	215509	s14 / C	068168	349201	415898	s6 / B
	D 60	349034	415636	s14 / C	068168	349201	415898	s6 / B

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i = Imperial (in)
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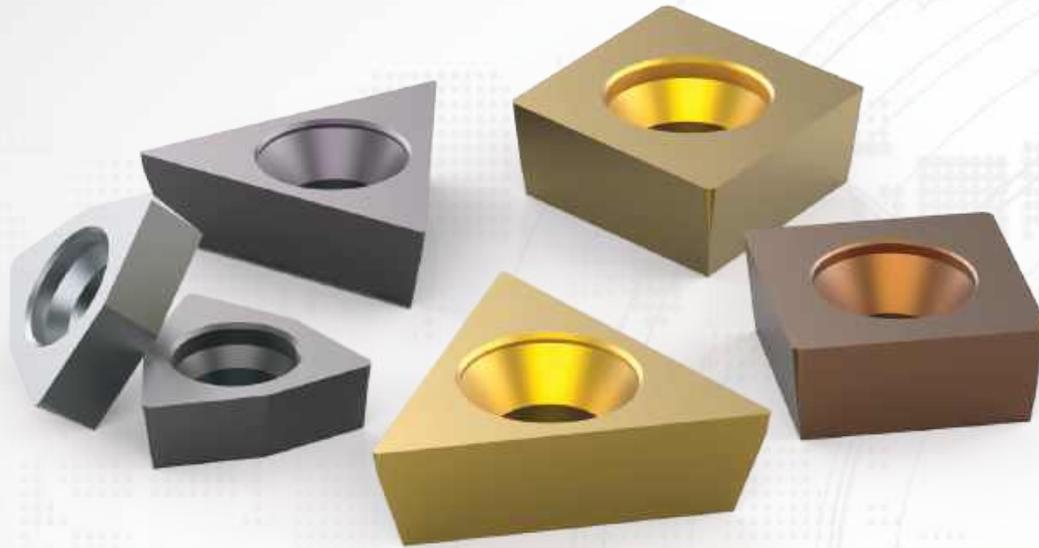
SECTION

B10-H

Inserts

Wohlhaupter® Inserts

Replaceable Boring Inserts



Cutting-Edge Technology

Wohlhaupter has the cutting-edge technology to achieve all of your boring applications. With precision in mind, our inserts are available in multiple insert geometries, coatings, and nose radii. Wohlhaupter inserts are offered in uncoated and coated carbide, cermet, and CBN and PCD materials.

Try our easy-to-use boring insert selector available online or to download from the app store to find the perfect inserts for your boring applications.

www.alliedmachine.com/bis

Applicable Industries



Aerospace



Agriculture



Automotive



Firearms



General
Machining



Oil & Gas



Renewable
Energy

Your safety and the safety of others is very important. This catalog contains important safety messages. Always read and follow all safety precautions.



This triangle is a safety hazard symbol. It alerts you to potential safety hazards that can cause tool failure and serious injury.

When you see this symbol in the catalog, look for a related safety message that may be near this triangle or referred to in the nearby text.

There are safety signal words also used in the catalog. Safety messages follow these words.

WARNING

WARNING (shown above) means that failure to follow the precautions in this message could result in tool failure and serious injury.

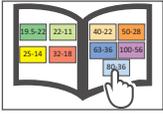
NOTICE means that failure to follow the precautions in this message could result in damage to the tool or machine but not result in personal injury.

NOTE and **IMPORTANT** are also used. These are important that you read and follow but are not safety-related.

Visit www.alliedmachine.com for the most up-to-date information and procedures.

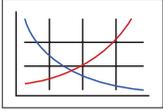
Reference Icons

The following icons will appear throughout the catalog to help you navigate between products.



MVS Connection Color Guide

Detailed instructions and information regarding the MVS connection(s)



Recommended Cutting Data

Speed and feed recommendations for optimum and safe boring

Wohlhaupter® Inserts Table of Contents

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WOHLHAUPTER®

Boring Insert Selector

Find the best insert for your application.

- Generate the correct boring insert for your job in just six easy steps
- Choose type, shape, substrate, insert form, nose radius, and material
- Order easily by adding the item to your cart

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Wohlhaupter Insert Product Nomenclature

Reference Key

Symbol	Insert Type
▼	Roughing - Main Application
▽	Roughing - Extended Application
▼▼	Universal - Main Application
▽▽	Universal - Extended Application
▼▼▼	Finishing - Main Application
▽▽▽	Finishing - Extended Application

Reference Key

Symbol	Machining Conditions
●	Good - Main Application
○	Good - Extended Application
●	Average - Main Application
○	Average - Extended Application
⚙	Difficult - Main Application
⚙	Difficult - Extended Application

Reference Key

Symbol	Wohlhaupter Insert Grades
WHW	Uncoated carbide (HW)
WHC	Coated carbide (HC)
WHT	Uncoated cermet (HT)
WTC	Coated cermet (HC)
WCN	Ceramic cutting material (CN)
WBN	Cubic boron nitride CBN (BN)
WBC	Coated CBN (BC)
PCD	Polycrystalline diamond PCD (DP)

Wohlhaupter Inserts

F101	04	M	N	-	158	W	D
1	2	3	4		5	6	7

1. Wohlhaupter Insert Form	
211	262
20	264
161	112
163	113
47	114
101	04
103	05
104	89
105	90
123	91
124	304
39	325
75	

2. Corner Radius
Metric (mm)
005 = 0.05 mm
01 = 0.10 mm
02 = 0.20 mm
03 = 0.30 mm
04 = 0.40 mm
06 = 0.60 mm
08 = 0.80 mm
12 = 1.20 mm
16 = 1.60 mm
20 = 2.00 mm
24 = 2.40 mm

3. Tolerance Group		
	Metric (mm)	
	Length of edge	±0.025
G	IC	±0.025
	Thickness	±0.13
	Length of edge	±0.08-0.15*
M	IC	±0.05-0.10*
	Thickness	±0.13
	Length of edge	±0.013
F	IC	±0.005
	Thickness	±0.025
	Length of edge	±0.13
C	IC	±0.025
	Thickness	±0.025
*Varies upon insert size		

4. Machining Direction
N = Neutral
L = Left
R = Right

5. Geometry						
Carbide	Carbide	Tangential	Ceramic	PCD	CBN	
108	155	880	711	530	538	
109	158	811		720	741	
112	161			730	742	
114	161			735	745	
117	174W				747	
121	192				748	
122	199				749	
126	200				768	
127	650					
128	711					
129	840					
145	850					
	860					

6./7. Optional Information
W = Wiper Geometry
D = Double Tipped
T = Triple Tipped

ISO Insert Nomenclature

DIN ISO 1832

C	C	M	T	09	T3	02
1	2	3	4	5	6	7

1. Basic Insert Form	2. Clearance Angle	3. Tolerance Group	4. Mounting Style										
<p>C = Rhomboid 80°</p> <p>D = Rhomboid 55°</p> <p>L = Rectangular</p> <p>R = Round</p> <p>S = Square</p> <p>T = Triangular</p> <p>V = Rhomboid 35°</p> <p>W = Trigon</p>	<p>B = 5°</p> <p>C = 7°</p> <p>N = 0°</p> <p>P = 11°</p> <p>O = 10°</p>	<p>Metric (mm)</p> <p>Length of edge ±0.025</p> <p>G IC ±0.025</p> <p>Thickness ±0.13</p> <hr/> <p>Length of edge ±0.08-0.15*</p> <p>M IC ±0.05-0.10*</p> <p>Thickness ±0.13</p> <hr/> <p>Length of edge ±0.013</p> <p>F IC ±0.005</p> <p>Thickness ±0.025</p> <hr/> <p>Length of edge ±0.13</p> <p>C IC ±0.025</p> <p>Thickness ±0.025</p> <p>*Varies upon insert size</p>	<table border="1"> <tr> <td>T = One-sided countersunk</td> <td>Cylindrical fixing hole Countersunk 40° - 60°</td> </tr> <tr> <td>H = One-sided chipbreaker</td> <td>Cylindrical fixing hole Countersunk 70° - 90°</td> </tr> <tr> <td>W = Without chipbreaker</td> <td>Cylindrical fixing hole Countersunk 40° - 60°</td> </tr> <tr> <td>X = Special design</td> <td>Special insert design</td> </tr> <tr> <td>A = Without chipbreaker</td> <td>Cylindrical fixing hole Without countersunk</td> </tr> </table>	T = One-sided countersunk	Cylindrical fixing hole Countersunk 40° - 60°	H = One-sided chipbreaker	Cylindrical fixing hole Countersunk 70° - 90°	W = Without chipbreaker	Cylindrical fixing hole Countersunk 40° - 60°	X = Special design	Special insert design	A = Without chipbreaker	Cylindrical fixing hole Without countersunk
T = One-sided countersunk	Cylindrical fixing hole Countersunk 40° - 60°												
H = One-sided chipbreaker	Cylindrical fixing hole Countersunk 70° - 90°												
W = Without chipbreaker	Cylindrical fixing hole Countersunk 40° - 60°												
X = Special design	Special insert design												
A = Without chipbreaker	Cylindrical fixing hole Without countersunk												

5. Insert Size / Cutting Edge							
Metric (mm)	C	D	R	S	T	V	W
3.97 mm					006		02
5.00 mm					F20		
6.00 mm					F21		
6.35 mm	06				11	11	
7.94 mm				07			
9.52 mm	09	11		09	16	16	
10.00 mm		10					
12.00 mm	12	12					
12.70 mm	16	15		12			
15.87 mm			15	15			
16.00 mm			16				
19.05 mm		19		19			
20.00 mm			20				
25.00 mm			25				
25.40 mm				25			

6. Insert Thickness
Metric (mm)
01 = 1.59 mm
02 = 2.38 mm
T2 = 2.78 mm
03 = 3.18 mm
T3 = 3.97 mm
04 = 4.76 mm
05 = 5.56 mm
06 = 6.35 mm
07 = 7.94 mm

7. Corner Radius
Metric (mm)
005 = 0.05 mm
01 = 0.10 mm
02 = 0.20 mm
03 = 0.30 mm
04 = 0.40 mm
06 = 0.60 mm
08 = 0.80 mm
12 = 1.20 mm
16 = 1.60 mm
20 = 2.00 mm
24 = 2.40 mm

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Wohlhaupter Insert Grades

Uncoated Carbides

Uncoated Carbides

Cutting Material	Description	Material	ISO Application							
			05	10	15	20	25	30	35	40
WHW01 (HW)	<ul style="list-style-type: none"> Fine-grain carbide Finishing and light roughing Nonferrous metals, cast materials and difficult-to-machine alloys 	P								
		M								
		K								
		N								
		S								
		H								
WHW16 (HW)	<ul style="list-style-type: none"> Fine-grain carbide Finishing and light roughing Nonferrous metals, cast materials and difficult-to-machine alloys 	P								
		M								
		K								
		N								
		S								
		H								
WHW20 (HW)	<ul style="list-style-type: none"> Tough fine-grain carbide Finishing, roughing and grooving Steel and cast materials, cast steel Nonferrous materials and difficult-to-machine alloys 	P								
		M								
		K								
		N								
		S								
		H								

Wohlhaupter Insert Grades

Coated Carbides

Coated Carbides

Cutting Material	Description	Material	ISO Application							
			05	10	15	20	25	30	35	40
WHC05 (HC)	<ul style="list-style-type: none"> PVD coating with nano-composite structure Finishing and roughing Steels, stainless steels, cast materials, and difficult-to-machine alloys 	P								
		M								
		K								
		N								
		S								
		H								
WHC18 (HC)	<ul style="list-style-type: none"> PVD-TiB2 coating Finishing and light roughing Nonferrous metals 	P								
		M								
		K								
		N								
		S								
		H								
WHC19 (HC)	<ul style="list-style-type: none"> Newest generation multilayer PVD coating Finishing and roughing Extremely universal and the first choice for poor machining conditions Excellent in cast steels, stainless steels, and super alloys 	P								
		M								
		K								
		N								
		S								
		H								
WHC20 (HC)	<ul style="list-style-type: none"> Multilayer CVD coating Finishing Steels and stainless steels 	P								
		M								
		K								
		N								
		S								
		H								
WHC30 (HC)	<ul style="list-style-type: none"> CVD coating Roughing Steel and cast steel 	P								
		M								
		K								
		N								
		S								
		H								
WHC77 (HC)	<ul style="list-style-type: none"> Fine-grained substrate with modified cobalt to increase strength MT-CVD coating combines advantages of TiCN and Al₂O₃ Versatile material designed for turning gray and ductile iron Rough and finish machining Medium to high cutting speeds Continuous and light to medium interrupted cuts 	P								
		M								
		K								
		N								
		S								
		H								
WHC79 (HC)	<ul style="list-style-type: none"> Multilayer MT CVD coating Roughing and finishing Steels, stainless steels and cast materials 	P								
		M								
		K								
		N								
		S								
		H								
WHC81 (HC)	<ul style="list-style-type: none"> Thick MT CVD coating with adominal AL203 High cutting speeds possible Excellent choice for cast materials 	P								
		M								
		K								
		N								
		S								
		H								
WHC88 (HC)	<ul style="list-style-type: none"> Multilayer PVD coating Finishing & roughing Universal usage 	P								
		M								
		K								
		N								
		S								
		H								

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Wohlhaupter Insert Grades

Coated Carbides

Coated Carbides

Cutting Material	Description	Material	ISO Application							
			05	10	15	20	25	30	35	40
WHC98 (HC)	<ul style="list-style-type: none"> PVD TiAlN coating Roughing & finishing Steels, stainless steels & difficult-to-machine materials 	P								
		M								
		K								
		N								
		S								
		H								
WHC111 (HC)	<ul style="list-style-type: none"> PVD TiAlN coating Finishing Machining of steels after heat treating with high Cr content up to 60 HRC Hard - soft transitions, difficult-to-machine alloys and stainless steels 	P								
		M								
		K								
		N								
		S								
		H								
WHC114 (HC)	<ul style="list-style-type: none"> Multilayer PVD coating Finishing and roughing Steels, stainless steels, and difficult-to-machine materials 	P								
		M								
		K								
		N								
		S								
		H								
WHC136 (HC)	<ul style="list-style-type: none"> Stronger PVD coating with improved coating adhesion High oxidation resistance allows a wide range of applications 	P								
		M								
		K								
		N								
		S								
		H								
WHC164 (HC)	<ul style="list-style-type: none"> Thick MT-CVD coating with a dominant Al₂O₃ Primarily developed for the material groups P, K, and H Full and discontinuous cut High cutting speeds and feeds possible 	P								
		M								
		K								
		N								
		S								
		H								
WHC168 (HC)	<ul style="list-style-type: none"> Multilayer MT CVD coating Excellent combination of toughness and reliability Steels, cast materials and alternatively for stainless steel 	P								
		M								
		K								
		N								
		S								
		H								
WHC170 (HC)	<ul style="list-style-type: none"> Multilayer MT CVD coating Excellent toughness First choice for strong interruptions Cast materials and steel 	P								
		M								
		K								
		N								
		S								
		H								
WHC198 (HC)	<ul style="list-style-type: none"> Upgraded PVD grade with hard AlTiN coating Optimized cutting edge stability General machining of steel, stainless steel, high-temperature resistant alloys, titanium, iron, cast iron, and nonferrous materials 	P								
		M								
		K								
		N								
		S								
		H								

Wohlhaupter Insert Grades

Uncoated Cermet | Coated Cermet

Uncoated Cermet

Cutting Material	Description	Material	ISO Application							
			05	10	15	20	25	30	35	40
WHT10 (HT)	<ul style="list-style-type: none"> • Uncoated cermet • Finishing • Steels, stainless steels and cast materials 	P								
		M								
		K								
		N								
		S								
		H								
WHT12 (HC)	<ul style="list-style-type: none"> • Uncoated cermet • Finishing • Steels, cast materials, sintered metals, and nonferrous metals 	P								
		M								
		K								
		N								
		S								
		H								
WHT32 (HC)	<ul style="list-style-type: none"> • Uncoated cermet • Finishing • Steels and cast materials 	P								
		M								
		K								
		N								
		S								
		H								

Coated Cermet

Cutting Material	Description	Material	ISO Application							
			05	10	15	20	25	30	35	40
WTC15 (TC)	<ul style="list-style-type: none"> • New PVD brilliant coating • Reduce friction coefficient in turning applications • Coated cermet general purpose grade for material group P • Achieves excellent surface finish with excellent wear resistance • Usable in stainless steels 	P								
		M								
		K								
		N								
		S								
		H								
WTC121 (TC)	<ul style="list-style-type: none"> • PVD coated cermet • Finishing of steels and stainless steels 	P								
		M								
		K								
		N								
		S								
		H								

Wohlhaupter Insert Grades

Uncoated Cubic Boron Nitride | Coated Cubic Boron Nitride

Uncoated Cubic Boron Nitride

Cutting Material	Description	Material	ISO Application							
			05	10	15	20	25	30	35	40
WBN150 (BN)	<ul style="list-style-type: none"> Uncoated CBN grade Roughing and finishing smooth and slightly discontinuous cuts Hardened steels 52 - 64 HRC Grain size 2 µm CBN content: 50% 	P								
		M								
		K								
		N								
		S								
		H								
WBN200 (BN)	<ul style="list-style-type: none"> Uncoated CBN grade Roughing and finishing highly discontinuous cuts Hardened steels 52 - 64 HRC Grain size 3 µm CBN content: 65% 	P								
		M								
		K								
		N								
		S								
		H								
WBN300 (BN)	<ul style="list-style-type: none"> Uncoated CBN grade Roughing and finishing smooth cuts Hardened steels 52 - 64 HRC Grain size 0.5 - 1.0 µm CBN content: approximately 50% 	P								
		M								
		K								
		N								
		S								
		H								
WBN450 (BN)	<ul style="list-style-type: none"> Uncoated CBN grade Roughing and finishing smooth and discontinuous cuts Pearlite grey cast iron and sintered metals Grain size 2 µm CBN content: 90% 	P								
		M								
		K								
		N								
		S								
		H								
WBN448 (BN)	<ul style="list-style-type: none"> Uncoated CBN grade Roughing & finishing smooth & discontinuous cuts Pearlite grey cast iron & sintered metals and ductile iron CBN content: 90% 	P								
		M								
		K								
		N								
		S								
		H								

Coated Cubic Boron Nitride

Cutting Material	Description	Material	ISO Application							
			05	10	15	20	25	30	35	40
WBC300 (BC)	<ul style="list-style-type: none"> Coated CBN Roughing and finishing smooth cuts Hardened steels 52 - 64 HRC Grain size 1 µm CBN content: 50% 	P								
		M								
		K								
		N								
		S								
		H								

Wohlhaupter Insert Grades

Polycrystalline Diamond | Ceramic Cutting Material

Polycrystalline Diamond

Cutting Material	Description	Material	ISO Application							
			05	10	15	20	25	30	35	40
PCD D30 (DP)	<ul style="list-style-type: none"> • PCD medium grain grade • Finishing • Al alloys and Mg alloys up to 12% Si • Grain size 10 µm 	P								
		M								
		K								
		N								
		S								
		H								
PCD D50 (DP)	<ul style="list-style-type: none"> • PCD mixed-grain grade • Finishing • CFRP, GRP, MMC, Al alloys over 12% Si • Grain size 2 - 30 µm 	P								
		M								
		K								
		N								
		S								
		H								

Ceramic Cutting Material

Cutting Material	Description	Material	ISO Application							
			05	10	15	20	25	30	35	40
WCN40 (CN)	<ul style="list-style-type: none"> • Uncoated silicon-nitride ceramic • Roughing • Pearlite grey cast iron 	P								
		M								
		K								
		N								
		S								
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Wohlhaupter Insert Geometries

Cermet | Carbide

Cermet | Carbide

Geometry	Description	Application	Available Form
108 	<ul style="list-style-type: none"> Sintered chip breaker for higher feeds Suitable for highly discontinuous cuts 	▼▼▼ ▼	F101, F103, F104, F112, F113
109 	<ul style="list-style-type: none"> Sintered geometry with V-shaped chip breaker for roughing and finishing Good chip control even for shallow depth of cut 	▼▼▼ ▼	F101, F103, F104
112 	<ul style="list-style-type: none"> Sintered chip breaker Finishing and light roughing 	▼▼▼ ▼	F101, F03
121 	<ul style="list-style-type: none"> Positive geometry with stable cutting edge Finishing in different material groups Good chip control 	▼▼▼	F20, F211
122 	<ul style="list-style-type: none"> Sintered chip breaker Good chip control - even with long-chipping materials 	▼▼▼	F101, F103, F161
126 	<ul style="list-style-type: none"> Sintered version with a wide range of applications 	▼	F105
127 	<ul style="list-style-type: none"> Highly positive sintered geometry For nonferrous metals and cast iron 	▼▼▼ ▼	F37, F39, F101, F103, F104, F112, F113
128 	<ul style="list-style-type: none"> Highly positive sintered geometry Polished for finishing nonferrous metals, cast iron, and steel 	▼▼▼	F20
129 	<ul style="list-style-type: none"> Highly positive chip breaking geometry Polished for nonferrous metals, cast iron, and steel Ideal for structural steel applications 	▼▼▼ ▼	F37, F39, F101, F103
145 	<ul style="list-style-type: none"> Geometry for finishing in smooth and discontinuous cut Good chip control - even with long-chipping materials 	▼▼▼ ▼	F101, F103, F112, F113, F161
146 	<ul style="list-style-type: none"> Positive geometry with stable cutting edge Universal usage for roughing, finishing and chamfering 	▼▼▼ ▼	F037, F039, F101, F103, F104, F112, F113,

Wohlhaupter Insert Geometries

Cermet | Carbide

Cermet | Carbide

Geometry	Description	Application	Available Form
155 	<ul style="list-style-type: none"> • Positive sintered geometry • Special cutting edge design in combination with the chip breaker design enables exceptional chip control even at shallow cutting depths and light feeds 		F20, F101, F103, F39
158 	<ul style="list-style-type: none"> • Stable sintered geometry for roughing and finishing with and without discontinuous cuts 		F101, F103, F104, F105, F113, F114, F163
174W 	<ul style="list-style-type: none"> • Wiper geometry for highly productive turning and boring • Can be used with pitch angle 92° - 95° • Good chip breaking properties even at lower feed rates 		F101, F103
192 	<ul style="list-style-type: none"> • Sintered version for a variety of applications • Low cutting pressure because of sharp cutting edge prep 		F39, F101, F103, F104, F112, F113, F163, F161, F262, F264
199 	<ul style="list-style-type: none"> • Positive sintered geometry for wide variety of applications • Special chip breaker allows chip control with different radial depth of cut 		F101, F103, F104, F112, F113
200 	<ul style="list-style-type: none"> • Highly positive sintered geometry • Applicable for various material groups for low cutting pressure 		F39, F101, F103, F104, F264
650 	<ul style="list-style-type: none"> • Obliquely ground chip breaker reduces cutting forces • Finishing and smooth interrupted cuts 		F20, F211
711 	<ul style="list-style-type: none"> • Negative geometry with 0 rake suitable for fine finishing and semi roughing • Machined materials in groups K and H • Continuous and moderately interrupted cut 		F101, F103, F104, F113, F163
840 	<ul style="list-style-type: none"> • Parallel ground chip breaker • For finish operations with stable cutting edge 		F20
850 	<ul style="list-style-type: none"> • Parallel ground chip breaker • Good chip control with short to medium feeds 		F161
860 	<ul style="list-style-type: none"> • Parallel ground chip breaker reduces cutting forces • Stable for a wide range of applications 		F101, F103, F104, F105, F325

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Wohlhaupter Insert Geometries

Tangential | Ceramic

Tangential

Geometry	Description	Application	Available Form
880 	<ul style="list-style-type: none"> Large parallel ground chip breaker with 10° rake angle for reduced cutting force 	▼	F04, F05
811 	<ul style="list-style-type: none"> Smooth geometry without additional ground chip breaker Reinforced cutting edges provide stability Excellent for cast materials 	▼	F05

Ceramic

Geometry	Description	Application	Available Form
711 	<ul style="list-style-type: none"> Smooth geometry with 0° rake angle High cutting edge stability particularly in discontinuous cuts 	▼	F75, F103, F104, F123

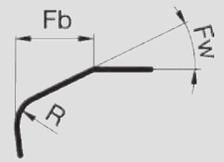
Wohlhaupter Insert Geometries

PCD | CBN

PCD

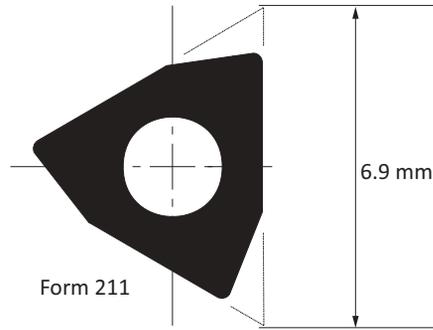
Geometry	Description	Application	Available Form
720 	<ul style="list-style-type: none"> • Smooth geometry in positive version with 7° rake angle for PCD • Sharp cutting edge 	▼▼▼	F20, F101, F103
730 	<ul style="list-style-type: none"> • Smooth geometry with 0° rake angle for PCD • Sharp cutting edge 	▼▼▼	F20, F39, F75, F101, F103, F123, F211, F262, F264
735 	<ul style="list-style-type: none"> • Smooth geometry • Laser-cut chip breaker for PCD • Suitable for long-chipping aluminum wrought alloys 	▼▼▼	F20, F39, F101, F103, F211, F262, F264

CBN

Geometry	Description				Application	Available Form
		R	Fb	Fw		
741 	<ul style="list-style-type: none"> • Smooth geometry with 0° rake angle for CBN • Rounded cutting edge with 30° chamfer 	0.015	0.15	30°	▼▼▼	F20, F101, F103
742 	<ul style="list-style-type: none"> • Smooth geometry with 0° rake angle for CBN • Rounded cutting edge with 15° chamfer 	0.015	0.1	15°	▼▼▼	F20, F101, F103
745 	<ul style="list-style-type: none"> • Smooth geometry with 0° rake angle for CBN • Rounded cutting edge with 30° chamfer 	0.015	0.05	30°	▼▼▼	F20, F211
747 	<ul style="list-style-type: none"> • Smooth geometry with 0° rake angle for CBN • Rounded cutting edge with a small 20° chamfer 	0.015	0.1	20°	▼▼▼	F39, F104, F262, F264
748 	<ul style="list-style-type: none"> • Smooth geometry with 0° rake angle for CBN • Rounded cutting edge • No chamfer 	0.015			▼▼▼	F20, F101, F103, F211
749 	<ul style="list-style-type: none"> • Smooth geometry with 0° rake angle for CBN • Rounded cutting edge with a large 20° chamfer 	0.015	0.2	20°	▼▼▼	F75, F123, F264
768 	<ul style="list-style-type: none"> • Smooth geometry with 7° rake angle for CBN • Rounded cutting edge 	0.015			▼▼▼	F20, F101, F103

Insert Form 211

Cermet | Carbide



						Cermet					Carbide													
						Uncoated			Coated		Uncoated		Coated											
						WHT10	WHT12	WHT32	WTC15	WTC121	WHW01	WHW16	WHC05	WHC18	WHC19	WHC79	WHC98	WHC111	WHC114	WHC136	WHC164			
Geometry	Radius		Description	ISO Code	Part No.																			
	in	mm																						
Steel	P					▼▼							▼▼	▼▼				▼▼		▼▼				
Stainless Steel	M												▼▼	▼▼				▼▼		▼▼				
Cast Iron	K					▼▼						▼▼	▼▼	▼▼				▼▼		▼▼				
Nonferrous Materials	N					▼▼						▼▼	▼▼					▼▼		▼▼				
Titanium	S											▼▼	▼▼	▼▼				▼▼		▼▼				
Hard Materials	H																	▼▼		▼▼				
121	0.004	0.10	F21101GN121	WBGX020101	397675										⚙			⚙						
121	0.008	0.20	F21102GN121	WBGX020102	397676										⚙			⚙						
650	0.004	0.10	F21101GL650	WBGX020101	097755		●				●		●	●						●				
650	0.008	0.20	F21102GL650	WBGX020102	097454		●				●		●							●				

Reference Key

Symbol	Machining Conditions
●	Good - Main Application
⚙	Average - Main Application
⚙	Difficult - Main Application

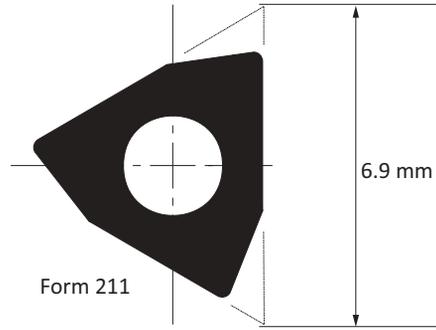
Reference Key

Symbol	Insert Type
▼▼	Finishing - Main Application
▼▼	Finishing - Extended Application

Insert Form	Countersunk Screw		Torque Driver	Service Key	Technical Data	
	Torque	Key Size				
211	215377	M2 x 0.4 x 4	415507	115537	0.6 Nm	T6

Insert Form 211

CBN | PCD



						Ceramic		CBN				PCD			
						Uncoated	Coated	Uncoated		Coated					
Steel						P									
Stainless Steel						M									
Cast Iron						K				▼▼▼					
Nonferrous Materials						N						▼▼▼▼▼			
Titanium						S									
Hard Materials						H			▼▼▼						
Geometry	Radius		Description	ISO Code	Part No.			WBN150	WBN200	WBN300	WBN450			PKDD30	PKDD50
	in	mm													
730	0.004	0.10	F21101GN730	WBGX020101	397763									●	
730	0.008	0.20	F21102GN730	WBGX020102	097557									●	●
735	0.008	0.20	F21102GN735	WBGX020102	397237									●	
748	0.004	0.10	F21101GN748	WBGX020101	097486			●			●				
748	0.008	0.20	F21102GN748	WBGX020102	097552			●			●				

Insert Form	Countersunk Screw		Torque Driver	Service Key	Technical Data	
					Torque	Key Size
211	215377	M2 x 0.4 x 4	415507	115537	0.6 Nm	T6

Reference Key

Symbol	Machining Conditions
●	Average - Main Application

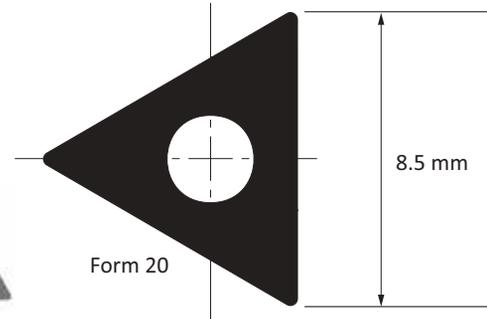
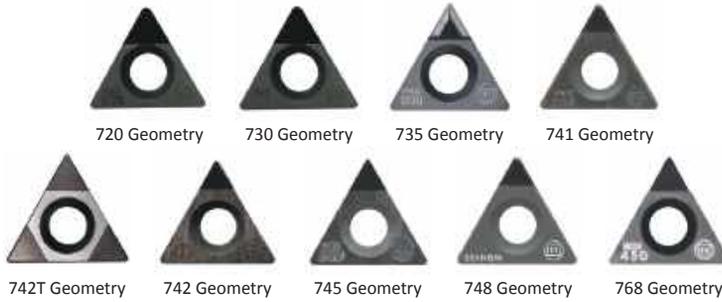
Reference Key

Symbol	Insert Type
▼▼▼	Finishing - Main Application

A
B
C
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Insert Form 20

CBN | PCD



						CBN					PCD		
						Uncoated			Coated				
						WBN150	WBN200	WBN300	WBN450	WBN448	WBC300	PKDD30	PKDD50
Geometry	Radius		Description	ISO Code	Part No.								
	in	mm											
Steel													
Stainless Steel													
Cast Iron						▼▼▼	▼▼▼	▼▼▼					
Nonferrous Materials											▼▼▼	▼▼▼	
Titanium													
Hard Materials							▼▼▼	▼▼▼		▼▼▼			
720	0.008	0.20	F02002GN720	TOGX080202	297692							●	
720	0.016	0.40	F02004GN720	TOGX080204	297845							●	
730	0.008	0.20	F02002GN730	TOGX080202	097487							●	●
730	0.016	0.40	F02004GN730	TOGX080204	097686							●	●
730	0.031	0.80	F02008GN730	TOGX080208	097877							●	●
735	0.008	0.20	F02002GN735	TOGX080202	397133							●	
735	0.016	0.40	F02004GN735	TOGX080204	397301							●	
741	0.008	0.20	F02002GN741	TOGX080202	297260		●						
741	0.016	0.40	F02004GN741	TOGX080204	297262		●						
742	0.008	0.20	F02002GN742	TOGX080202	297264			●					
742	0.016	0.40	F02004GN742	TOGX080204	397610			●					
742T	0.008	0.20	F02002GN742T	TOGX080202	397961				●	●			
742T	0.016	0.40	F02004GN742T	TOGX080204	397551				●	●			
745	0.004	0.10	F02001GN745	TOGX080201	297259		●						
748	0.008	0.20	F02002GN748	TOGX080202	297780				●				
748	0.016	0.40	F02004GN748	TOGX080204	297782				●				
768	0.008	0.20	F02002GN768	TOGX080202	397146				●				
768	0.016	0.40	F02004GN768	TOGX080204	397192				●				

Insert Form	Countersunk Screw		Torque Driver	Service Key	Technical Data	
					Torque	Key Size
20	115535	M2 x 0.4 x 5	415508	115591	0.9 Nm	T7

Reference Key

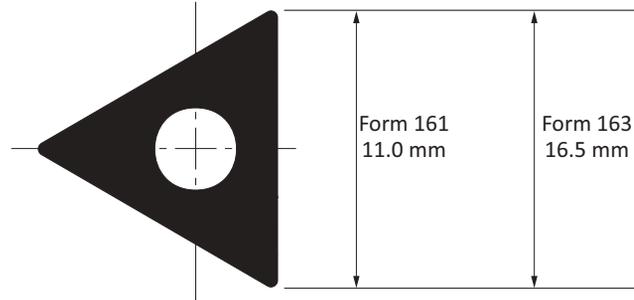
Symbol	Machining Conditions
●	Good - Main Application
●	Average - Main Application

Reference Key

Symbol	Insert Type
▼▼▼	Finishing - Main Application
▼▼▼	Finishing - Extended Application

Insert Forms 161, 163

Cermet | Carbide



						Cermet					Carbide													
						Uncoated			Coated		Uncoated	Coated												
						WHT10	WHT12	WHT32	WTC15	WTC121	WHW01	WHW16	WHC05	WHC19	WHC88	WHC77	WHC79	WHC111	WHC114	WHC136	WHC164			
Geometry	Radius		Description	ISO Code	Part No.																			
	in	mm																						
122	0.016	0.40	F16104MN122	TCMT110204	097953	●																		
129	0.008	0.20	F16102GN129	TCGT110202	397769						●	●												
129	0.016	0.40	F16104GN129	TCGT110204	397770						●	●												
129	0.016	0.40	F16304GN129	TCGT16T304	397771						●	●												
145	0.016	0.40	F16104GN145	TCGT110204	297993													●						
146	0.016	0.40	F16104MN146	TCMT110204	397977										⚙									
146	0.031	0.80	F16108MN146	TCMT110208	397026										⚙									
146	0.016	0.40	F16304MN146	TCMT16T304	397990										⚙									
146	0.031	0.80	F16308MN146	TCMT16T308	397974										⚙									
158	0.016	0.40	F16304MN158	TCMT16T304	297604												●							
192	0.016	0.40	F16104MN192	TCMT110204	397663										⚙	●						●		
192	0.016	0.40	F16304MN192	TCMT16T304	397654										⚙							●		
192	0.031	0.80	F16308MN192	TCMT16T308	397772										⚙									
711	0.016	0.40	F16304MN711	TCMT16T304	397898											●								
711	0.031	0.80	F16304MN711	TCMT16T308	397899											●								
850	0.008	0.20	F16102GL850	TCGT110202	097512		●																	

Reference Key

Symbol	Machining Conditions
●	Good - Main Application
●	Average - Main Application
⚙	Difficult - Main Application

Reference Key

Symbol	Insert Type
▼▼	Finishing - Main Application
▽▽	Finishing - Extended Application

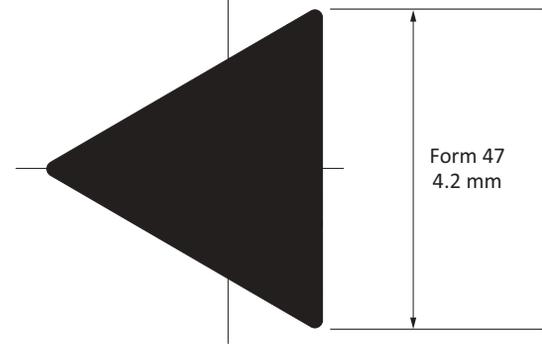
Insert Form	Countersunk Screw		Torque Driver	Service Key	Technical Data	
					Torque	Key Size
161	115676	M2.5 x 0.45 x 5	415514	115590	1.2 Nm	T8
163	115673	M3.5 x 0.6 x 9	415510	115664	3.0 Nm	T15

Insert Form 47

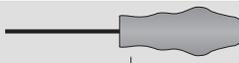
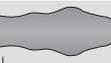
Cermet | Carbide



650 Geometry



						Carbide									
						Uncoated					Coated				
Material	ISO Code	Symbol				WHW01	WHW16	WHC05	WHC18	WHC20	WHC79	WHC111	WHC114	WHC136	WHC164
Steel	P	▽▽▽								●					
Stainless Steel	M	▽▽▽													
Cast Iron	K	▽▽▽													
Nonferrous Materials	N	▽▽▽													
Titanium	S	▽▽▽													
Hard Materials	H														
Geometry	Radius		ISO Code	Description	Part No.	WHW01	WHW16	WHC05	WHC18	WHC20	WHC79	WHC111	WHC114	WHC136	WHC164
650	in	mm													
650	0.004	0.10	TOFX040101	F04701FL650	097832	●				●					
650	0.008	0.20	TOFX040102	F04702FL650	097833	●				●					

					Technical Data	
Insert Form	Countersunk Screw	Clamping Jaw	Torque Driver	Service Key	Torque	Key Size
47	315324 M1.8 x 0.35 x 4	315323	-	115537	0.5 Nm	T6

Reference Key

Symbol	Machining Conditions
●	Good - Main Application

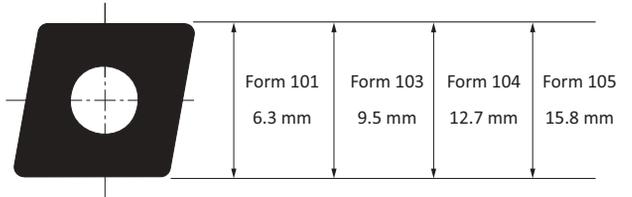
Reference Key

Symbol	Insert Type
▽▽▽	Finishing - Main Application

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Insert Forms 101, 103, 104, 105

Cermet | Carbide



						Cermet						Carbide										
						Uncoated			Coated			Uncoated			Coated							
Steel						▼▼▼			▼						▼▼▼			▼▼▼				
Stainless Steel															▼▼▼			▼▼▼				
Cast Iron						▼▼▼			▼▼▼			▼▼▼			▼▼▼			▼▼▼				
Nonferrous Materials						▼▼▼			▼▼▼			▼▼▼			▼▼▼			▼▼▼				
Titanium												▼▼▼			▼▼▼			▼▼▼				
Hard Materials																		▼▼▼				
Geometry	Radius		Description	ISO Description	Part No.	WHT10	WHT12	WHT16	WHT32	WTC15	WTC121	WHW01	WHW16	WHC05	WHC18	WHC19	WHC79	WHC98	WHC111	WHC114	WHC136	WHC164
	in	mm																				
108	0.008	0.20	F10102MN108	CCMT060202	297833													●				
108	0.016	0.40	F10104MN108	CCMT060204	297537													●				
108	0.016	0.40	F10304MN108	CCMT09T304	297891													●				
108	0.031	0.80	F10308MN108	CCMT09T308	397118													●				
108	0.016	0.40	F10404MN108	CCMT120404	297725													●				
108	0.031	0.80	F10408MN108	CCMT120408	297724													●				
109	0.008	0.20	F10102MN109	CCMT060202	397352																	●
109	0.016	0.40	F10104MN109	CCMT060204	397765																	●
109	0.016	0.40	F10304MN109	CCMT09T304	397354																	●
109	0.031	0.80	F10308MN109	CCMT09T308	397355																	●
109	0.016	0.40	F10404MN109	CCMT120404	397356																	●
109	0.031	0.80	F10408MN109	CCMT120408	397357																	●
112	0.008	0.20	F10102GN112	CCGT060202	297485				●													
112	0.016	0.40	F10104MN112	CCMT060204	297434				●													
112	0.008	0.20	F10302GN112	CCGT09T302	297534				●													
112	0.016	0.40	F10304MN112	CCMT09T304	297387				●													
122	0.008	0.20	F10102MN122	CCMT060202	097899	●																
122	0.016	0.40	F10104MN122	CCMT060204	097926	●																
122	0.008	0.20	F10302MN122	CCMT09T302	097862	●																
122	0.016	0.40	F10304MN122	CCMT09T304	097957	●																
126	0.031	0.80	F10508MN126	CCMT160508	297557																	●
126	0.047	1.20	F10512MN126	CCMT160512	297558																	●
127	0.008	0.20	F10102GN127	CCGT060202	097529							●		●								
127	0.016	0.40	F10104GN127	CCGT060204	097445							●		●								
127	0.008	0.20	F10302GN127	CCGT09T302	297550							●		●								
127	0.016	0.40	F10304GN127	CCGT09T304	097497							●		●								
127	0.016	0.40	F10404GN127	CCGT120404	097496							●		●								

Reference Key

Symbol	Machining Conditions
●	Good - Main Application
●	Average - Main Application

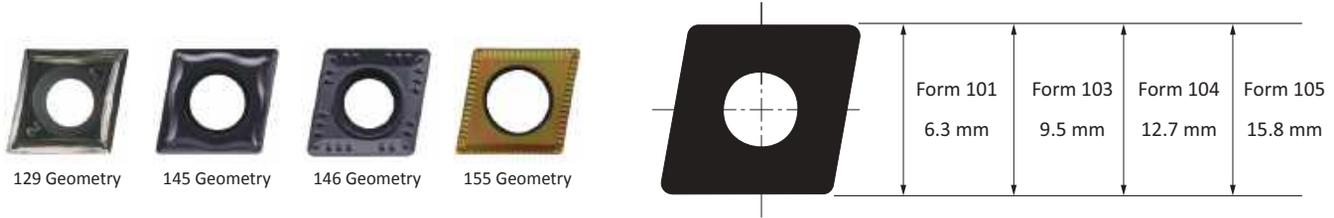
Reference Key

Symbol	Insert Type
▼	Roughing - Main Application
▽	Roughing - Extended Application
▼▼▼	Finishing - Main Application
▽▽▽	Finishing - Extended Application

Insert Form	Countersunk Screw		Torque Driver	Service Key	Technical Data	
	Torque	Key Size				
101	115676	M2.5 x 0.45 x 5	415514	115590	1.2 Nm	T8
103	115672(ϕ37 mm)	M3.5 x 0.6 x 7.5	415510	115664	3.0 Nm	T15
103	115673(>math>\phi</math>36 mm)	M3.5 x 0.6 x 9	415510	115664	3.0 Nm	T15
104	215149	M4.5 x 0.75 x 11.5	415543	215150	5.0 Nm	T20
105	215149	M4.5 x 0.75 x 11.5	415543	215150	5.0 Nm	T20

Insert Forms 101, 103, 104, 105

Cermet | Carbide



						Cermet				Carbide																	
						Uncoated		Coated		Uncoated				Coated													
						WHT10	WHT32	WTC15	WTC121	WHW01	WHW16	WHC05	WHC18	WHC19	WHC79	WHC81	WHC88	WHC98	WHC111	WHC114	WHC136	WHC164					
Geometry	Radius		Description	ISO Description	Part No.																						
	in	mm																									
Steel	P							▼▼▼			▽				▼▼▼	▼▼▼		▼▼▼									
Stainless Steel	M							▽▽▽			▽▽▽					▼▼▼	▼▼▼		▼▼▼								
Cast Iron	K							▽▽▽		▽▼	▼▼▼				▼▼▼			▼▼▼									
Nonferrous Materials	N									▼▼▼		▼▼▼															
Titanium	S								▽▽▽	▽▽▽							▼▼▼		▼▼▼								
Hard Materials	H														▽▽▽	▽			▼▼▼								
129	0.002	0.05	F101005GN129	CCGT0602005	397738					●	●																
129	0.004	0.10	F10101GN129	CCGT060201	397737					●	●																
129	0.008	0.20	F10102GN129	CCGT060202	297545					●	●	●															
129	0.016	0.40	F10104GN129	CCGT060204	297546					●	●	●															
129	0.008	0.20	F10302GN129	CCGT09T302	297547					●	●	●															
129	0.016	0.40	F10304GN129	CCGT09T304	297548					●	●	●															
145	0.016	0.40	F10104GN145	CCGT060204	297980															●							
145	0.031	0.80	F10108GN145	CCGT060208	397742															●							
145	0.016	0.40	F10304GN145	CCGT09T304	297994															●							
145	0.031	0.80	F10308GN145	CCGT09T308	297995															●							
146	0.016	0.40	F10104MN146	CCMT060204	397953											●	⚙										
146	0.016	0.40	F10304MN146	CCMT09T304	397142											●	⚙										
146	0.031	0.80	F10308MN146	CCMT09T308	397946											●	⚙										
146	0.016	0.40	F10404MN146	CCMT120404	397469												⚙										
146	0.031	0.80	F10408MN146	CCMT120408	397143												⚙										
146	0.047	1.20	F10412MN146	CCMT120412	397939												⚙										
155	0.008	0.20	F10102MN155	CCMT060202	397662																						
155	0.016	0.40	F10104MN155	CCMT060204	397739																						
155	0.016	0.40	F10304MN155	CCMT09T304	397740																						

Insert Form	Countersunk Screw		Torque Driver	Service Key	Technical Data	
	Torque	Key Size				
101	115676	M2.5 x 0.45 x 5	415514	115590	1.2 Nm	T8
103	115672($\phi 37$ mm)	M3.5 x 0.6 x 7.5	415510	115664	3.0 Nm	T15
103	115673(>math>\phi 36</math> mm)	M3.5 x 0.6 x 9	415510	115664	3.0 Nm	T15
104	215149	M4.5 x 0.75 x 11.5	415543	215150	5.0 Nm	T20
105	215149	M4.5 x 0.75 x 11.5	415543	215150	5.0 Nm	T20

Reference Key

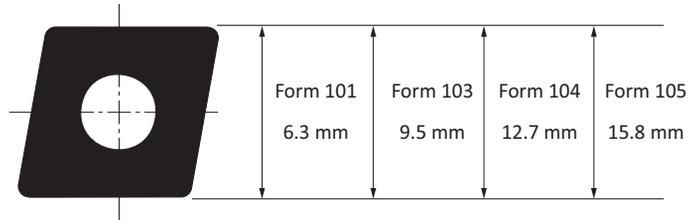
Symbol	Machining Conditions
●	Good - Main Application
◐	Average - Main Application

Reference Key

Symbol	Insert Type
▼	Roughing - Main Application
▽	Roughing - Extended Application
▼▼▼	Finishing - Main Application
▽▽▽	Finishing - Extended Application

Insert Forms 101, 103, 104, 105

Carbide



Carbide																		
						Uncoated		Coated										
Material	ISO Code	Radius		Description	ISO Code	Part No.	WHW01	WHW16	WHC05	WHC18	WHC19	WHC79	WHC98	WHC111	WHC114	WHC136	WHC164	
Steel	P	0.008	0.20	F10102MN158	CCMT060202	297248			▽▽▽			▽▽▽		▽▽▽				▽▽▽
Stainless Steel	M	0.016	0.40	F10104MN158	CCMT060204	297377			▽▽▽		▽▽▽			▽▽▽				
Cast Iron	K	0.016	0.40	F10304MN158	CCMT09T304	297239			▽▽▽		▽▽▽			▽▽▽				▽▽▽
Nonferrous Materials	N	0.031	0.80	F10308MN158	CCMT09T308	297240			▽▽▽		▽▽▽			▽▽▽				
Titanium	S	0.016	0.40	F10404MN158	CCMT120404	297242			▽▽▽		▽▽▽			▽▽▽				
Titanium	S	0.031	0.80	F10408MN158	CCMT120408	297241			▽▽▽		▽▽▽			▽▽▽				
Titanium	S	0.031	0.80	F10508MN158	CCMT160508	297559			●		●			●				
Hard Materials	H	0.047	1.20	F10512MN158	CCMT160512	297560								▽▽▽				▽▽▽
174W		0.016	0.40	F10104MN174W	CCMT060204	397766					⚙							⚙
174W		0.016	0.40	F10304MN174W	CCMT09T304	397767					⚙							⚙
174W		0.031	0.80	F10308MN174W	CCMT09T308	397768					⚙							⚙
192		0.008	0.20	F10102MN192	CCMT060202	297531					⚙							⚙
192		0.016	0.40	F10104MN192	CCMT060204	297658					⚙							⚙
192		0.031	0.80	F10108MN192	CCMT060208	297588					⚙							⚙
192		0.008	0.20	F10302MN192	CCMT09T302	297958					⚙							⚙
192		0.016	0.40	F10304MN192	CCMT09T304	297653					⚙							⚙
192		0.031	0.80	F10308MN192	CCMT09T308	397614					⚙							⚙
192		0.016	0.40	F10404MN192	CCMT120404	397666					⚙							⚙
192		0.031	0.80	F10408MN192	CCMT120408	297878					⚙							⚙
192		0.047	1.20	F10412MN192	CCMT120412	397632					⚙							⚙

Reference Key

Symbol	Machining Conditions
●	Good - Main Application
◐	Average - Main Application
⚙	Difficult - Main Application

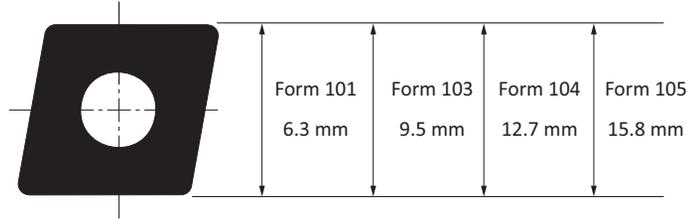
Reference Key

Symbol	Insert Type
▽	Roughing - Main Application
▽▽	Roughing - Extended Application
▽▽▽	Finishing - Main Application
▽▽▽▽	Finishing - Extended Application

Insert Form	Countersunk Screw		Torque Driver		Service Key		Technical Data	
	Part No.	Dimensions	Part No.	Part No.	Torque	Key Size		
101	115676	M2.5 x 0.45 x 5	415514	115590	1.2 Nm	T8		
103	115672(<Ø37 mm)	M3.5 x 0.6 x 7.5	415510	115664	3.0 Nm	T15		
103	115673(>Ø36 mm)	M3.5 x 0.6 x 9	415510	115664	3.0 Nm	T15		
104	215149	M4.5 x 0.75 x 11.5	415543	215150	5.0 Nm	T20		
105	215149	M4.5 x 0.75 x 11.5	415543	215150	5.0 Nm	T20		

Insert Forms 101, 103, 104, 105

Cermet | Carbide



						Cermet						Carbide												
						Uncoated			Coated			Uncoated			Coated									
Material	ISO Code	Geometry	Radius	Description	ISO Code	Part No.	WHT10	WHT12	WHT16	WHT32	WTC15	WTC121	WHW01	WHW16	WHC05	WHC18	WHC19	WHC77	WHC79	WHC98	WHC111	WHC114	WHC136	WHC164
Steel	P	199	0.008	F10102MN199	CCMT060202	397164						▼▼▼			▼▼▼						▼▼▼	▼▼▼	▼▼▼	▼▼▼
Stainless Steel	M	199	0.016	F10104MN199	CCMT060204	397165						▽▽▽			▽▽▽						▽▽▽	▽▽▽	▽▽▽	▽▽▽
Cast Iron	K	199	0.008	F10302MN199	CCMT09T302	397702						▽			▼▼▼						▼▼▼	▼▼▼	▼▼▼	▼▼▼
Nonferrous Materials	N	199	0.016	F10304MN199	CCMT09T304	397166						▼▼▼												
Titanium	S	199	0.016	F10404MN199	CCMT120404	397191									▽▽▽							▼▼▼	▼▼▼	▼▼▼
Hard Materials	H	199	0.031	F10408MN199	CCMT120408	397168															▼▼▼	▼▼▼	▼▼▼	▼▼▼
		200	0.008	F10102GN200	CCGT060202	397585															●	●		
		200	0.016	F10104GN200	CCGT060204	397586															●	●		
		200	0.008	F10302GN200	CCGT09T302	397587															●	●		
		200	0.016	F10304GN200	CCGT09T304	397588															●	●		
		200	0.016	F10404GN200	CCGT120404	397589															●	●		
		711	0.016	F10104MN711	CCMT060204	097637																		
		711	0.016	F10404MN711	CCMW120404	097692															●	●		
		711	0.031	F10308MN711	CCMT09T308	297910															●	●		
		711	0.031	F10408MN711	CCMT120408	297911															●	●		
		860	0.004	F10101GL860	CCGT060201	097324						●	●	●	●									●
		860	0.008	F10102GL860	CCGT060202	097241						●	●	●	●									●
		860	0.016	F10104GL860	CCGT060204	097242						●	●	●	●									●
		860	0.008	F10302GL860	CCGT09T302	097245						●	●	●	●									●
		860	0.016	F10304GL860	CCGT09T304	097244						●	●	●	●									●
		860	0.016	F10404GL860	CCGT120404	097738						●	●	●	●									●
		860	0.031	F10408GL860	CCGT120408	097247						●	●	●	●									●
		860	0.031	F10508ML860	CCMT160508	097249						●	●	●	●									●

Insert Form	Countersunk Screw		Torque Driver	Service Key	Technical Data	
	Part No.	Description			Torque	Key Size
101	115676	M2.5 x 0.45 x 5	415514	115590	1.2 Nm	T8
103	115672($\leq \varnothing 37 \text{ mm}$)	M3.5 x 0.6 x 7.5	415510	115664	3.0 Nm	T15
103	115673(>math>\varnothing 36 \text{ mm}</math>)	M3.5 x 0.6 x 9	415510	115664	3.0 Nm	T15
104	215149	M4.5 x 0.75 x 11.5	415543	215150	5.0 Nm	T20
105	215149	M4.5 x 0.75 x 11.5	415543	215150	5.0 Nm	T20

Reference Key

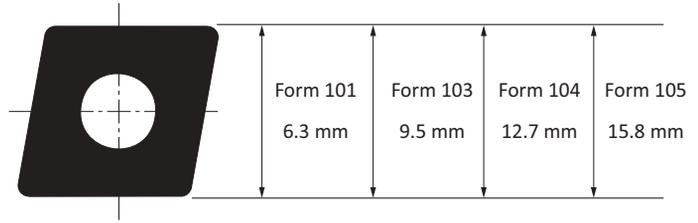
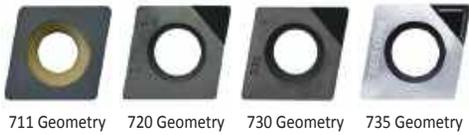
Symbol	Machining Conditions
●	Good - Main Application
●	Average - Main Application

Reference Key

Symbol	Insert Type
▼	Roughing - Main Application
▽	Roughing - Extended Application
▼▼▼	Finishing - Main Application
▽▽▽	Finishing - Extended Application

Insert Forms 101, 103, 104

Ceramic | CBN | PCD



		Ceramic		CBN				PCD				
		Uncoated	Coated	Uncoated		Coated						
Steel	P											
Stainless Steel	M											
Cast Iron	K	▼			▼▼▼							
Nonferrous Materials	N						▼▼▼▼▼					
Titanium	S							▼▼				
Hard Materials	H											
Geometry	Radius		Description	ISO Code	Part No.	WCN40	WBN150	WBN200	WBN300	WBN450	PKDD30	PKDD50
711	0.016	0.40	F10304GN711	CCGW09T304	297561	⚙️						
711	0.031	0.80	F10308GN711	CCGW09T308	297192	⚙️						
711	0.031	0.80	F10408GN711	CCGW120408	297249	⚙️						
711	0.047	1.20	F10412GN711	CCGW120412	297234	⚙️						
720	0.008	0.20	F10102GN720	CCGT060202	297501						⚙️	
720	0.016	0.40	F10104GN720	CCGT060204	297502						⚙️	
720	0.008	0.20	F10302GN720	CCGT09T302	297578						⚙️	
720	0.016	0.40	F10304GN720	CCGT09T304	297483						⚙️	
730	0.008	0.20	F10102GN730	CCGW060202	097462						⚙️	⚙️
730	0.016	0.40	F10104GN730	CCGW060204	297164						⚙️	⚙️
730	0.031	0.80	F10108GN730	CCGW060208	297165						⚙️	
730	0.008	0.20	F10302GN730	CCGW09T302	397251						⚙️	
730	0.016	0.40	F10304GN730	CCGW09T304	297533						⚙️	
730	0.016	0.40	F10404GN730	CCGW120404	397257						⚙️	⚙️
730	0.031	0.80	F10408GN730	CCGW120408	297871						⚙️	⚙️
735	0.008	0.20	F10102GN735	CCGT060202	297872						⚙️	
735	0.016	0.40	F10104GN735	CCGT060204	397244						⚙️	
735	0.008	0.20	F10302GN735	CCGT09T302	397252						⚙️	
735	0.016	0.40	F10304GN735	CCGT09T304	297870						⚙️	

Reference Key

Symbol	Machining Conditions
●	Good - Main Application
◐	Average - Main Application
⚙️	Difficult - Main Application

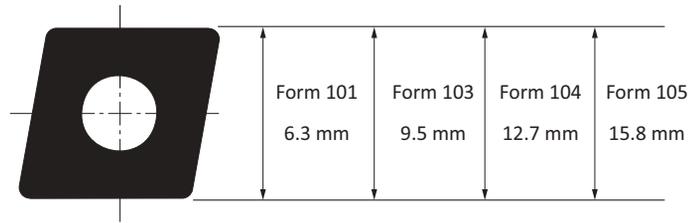
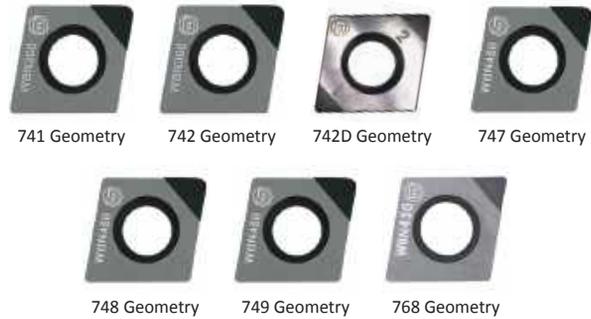
Reference Key

Symbol	Insert Type
▼	Roughing - Main Application
▽	Roughing - Extended Application
▼▼▼	Finishing - Main Application
▽▽▽	Finishing - Extended Application

Insert Form	Countersunk Screw		Torque Driver		Service Key		Technical Data	
	Part No.	Size	Part No.	Part No.	Torque	Key Size		
101	115676	M2.5 x 0.45 x 5	415514	115590	1.2 Nm	T8		
103	115672 (ϕ37 mm)	M3.5 x 0.6 x 7.5	415510	115664	3.0 Nm	T15		
103	115673 (>math>\phi</math>36 mm)	M3.5 x 0.6 x 9	415510	115664	3.0 Nm	T15		
104	215149	M4.5 x 0.75 x 11.5	415543	215150	5.0 Nm	T20		

Insert Forms 101, 103, 104

CBN



						CBN						
						Uncoated					Coated	
						WB150	WB200	WB300	WB450	WB448	WB300	
Geometry	Radius		Description	ISO Code	Part No.							
	in	mm										
Steel	P											
Stainless Steel	M											
Cast Iron	K					▽▽▽	▽	▽▽▽	▽▽▽	▽▽▽		
Nonferrous Materials	N											
Titanium	S											
Hard Materials	H					▽▽▽	▽▽▽	▽▽▽			▽▽▽	
741	0.008	0.20	F10102GN741	CCGW060202	297290							
741	0.016	0.40	F10104GN741	CCGW060204	297291		●					
741	0.016	0.40	F10304GN741	CCGW09T304	297303		●					
742	0.008	0.20	F10102GN742	CCGW060202	297293			●				
742	0.016	0.40	F10104GN742	CCGW060204	297294			●				
742	0.016	0.40	F10304GN742	CCGW09T304	297306			●				
742D	0.008	0.20	F10102GN742D	CCGW060202	397949					●	●	
742D	0.016	0.40	F10104GN742D	CCGW060204	397999					●	●	
742D	0.016	0.40	F10304GN742D	CCGW090204	397931					●	●	
742D	0.031	0.80	F10308GN742D	CCGW090208	397958					●	●	
747	0.016	0.40	F10404GN747	CCGW120404	397260	●			●			
748	0.008	0.20	F10102GN748	CCGW060202	297787				●			
748	0.016	0.40	F10104GN748	CCGW060204	297788				●			
748	0.008	0.20	F10302GN748	CCGW09T302	297790				●			
748	0.016	0.40	F10304GN748	CCGW09T304	297419				●			
749	0.031	0.80	F10408GN749	CCGW120408	397261	●			●			
768	0.008	0.20	F10102GN768	CCGT060202	297486				●			
768	0.016	0.40	F10104GN768	CCGT060204	297659				●			
768	0.008	0.20	F10302GN768	CCGT09T302	397439				●			
768	0.016	0.40	F10304GN768	CCGT09T304	297660				●			

Reference Key

Symbol	Machining Conditions
●	Good - Main Application
●	Average - Main Application

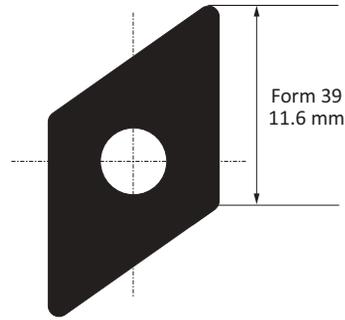
Reference Key

Symbol	Insert Type
▽	Roughing - Main Application
▽	Roughing - Extended Application
▽▽▽	Finishing - Main Application
▽▽▽	Finishing - Extended Application

Insert Form	Countersunk Screw		Torque Driver		Service Key		Technical Data	
	Torque	Key Size	Torque	Key Size	Torque	Key Size		
101	115676	M2.5 x 0.4 x 5	415514	115590	1.2 Nm	T8		
103	115672($\phi 37\text{ mm}$)	M3.5 x 0.6 x 7.5	415510	115664	3.0 Nm	T15		
103	115673(>math>\phi 36\text{ mm}</math>)	M3.5 x 0.6 x 9	415510	115664	3.0 Nm	T15		
104	215149	M4.5 x 0.75 x 11.5	415543	215150	5.0 Nm	T20		

Insert Form 37, 39

Cermet | Carbide



						Cermet						Carbide										
						Uncoated			Coated			Uncoated		Coated								
						Material																
Steel						P			▼▼▼			▼▼▼		▼▼▼								
Stainless Steel						M			▽▽▽			▽▽▽		▽▽▽								
Cast Iron						K			▽▽▽			▽▽▽		▽▼▼								
Nonferrous Materials						N						▼▼▼		▼▼▼								
Titanium						S						▽▽▽		▼▼▼								
Hard Materials						H						▽▽▽		▼▼▼								
Geometry	Radius		Description	ISO Code	Part No.	WHT10	WHT12	WHT16	WHT32	WTC15	WTC121	WHW01	WHW16	WHC05	WHC19	WHC81	WHC88	WHC98	WHC111	WHC114	WHC136	WHC164
	in	mm				WHT10	WHT12	WHT16	WHT32	WTC15	WTC121	WHW01	WHW16	WHC05	WHC19	WHC81	WHC88	WHC98	WHC111	WHC114	WHC136	WHC164
121	0.008	0.20	F03902MN121	DCMT11T302	397787										⚙️							
121	0.016	0.40	F03904MN121	DCMT11T304	397788										⚙️							
127	0.008	0.20	F03702GN127	DCGT070202	397234								●									
127	0.016	0.40	F03704GN127	DCGT070204	097787								●									
127	0.008	0.20	F03902GN127	DCGT11T302	397235								●									
127	0.016	0.40	F03904GN127	DCGT11T304	097559								●									
129	0.008	0.20	F03702GN129	DCGT070202	397708								●									
129	0.008	0.20	F03902GN129	DCGT11T302	397816								●	●								
129	0.016	0.40	F03904GN129	DCGT11T304	397817								●	●								
146	0.016	0.40	F03704MN146	DCMT070204	397968											●	⚙️					
146	0.031	0.80	F03708MN146	DCMT070208	397047												⚙️					
146	0.016	0.40	F03904MN146	DCMT11T304	397591											●	⚙️					
146	0.031	0.80	F03908MN146	DCMT11T308	397598											●	⚙️					
155	0.008	0.20	F03902MN155	DCMT11T302	397809					●												
155	0.016	0.40	F03904MN155	DCMT11T304	397810					●												
192	0.008	0.20	F03902MN192	DCMT11T302	397783										⚙️							●
192	0.016	0.40	F03904MN192	DCMT11T304	297721										⚙️							●
192	0.031	0.80	F03908MN192	DCMT11T308	397784										⚙️							●
200	0.008	0.20	F03902GN200	DCGT11T302	397785														●			
200	0.016	0.40	F03904GN200	DCGT11T304	397786														●			

Reference Key

Symbol	Machining Conditions
●	Good - Main Application
◐	Average - Main Application
⚙️	Difficult - Main Application

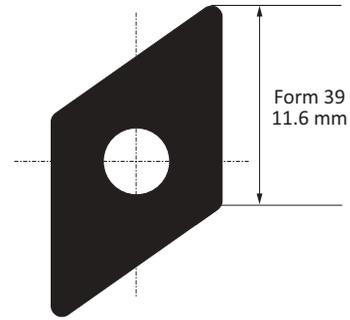
Reference Key

Symbol	Insert Type
▼	Roughing - Main Application
▽	Roughing - Extended Application
▼▼▼	Finishing - Main Application
▽▽▽	Finishing - Extended Application

Insert Form	Countersunk Screw		Torque Driver	Service Key	Technical Data	
	Part No.	Size	Part No.	Part No.	Torque	Key Size
39	115673	M3.5 x 0.6 x 9	414510	115664	3.0 Nm	T15

Insert Form 37, 39

CBN | PCD



						CBN					PCD		
						Uncoated			Coated				
Steel		P											
Stainless Steel		M											
Cast Iron		K	▽▽▽			▽▽▽							
Nonferrous Materials		N									▽▽▽		
Titanium		S											
Hard Materials		H	▽▽▽										
Geometry	Radius		Description	ISO Code	Part No.	WBN150	WBN200	WBN300	WBN450	WBN200		PKDD30	PKDD50
730	0.008	0.20	F03902GN730	DCGW11T302	397269							●	
730	0.016	0.40	F03904GN730	DCGW11T304	397270							●	
735	0.008	0.20	F03902GN735	DCGT11T302	397271							●	
735	0.016	0.40	F03904GN735	DCGT11T304	397272							●	
747	0.008	0.20	F03902GN747	DCGW11T302	397273	●			●				
747	0.016	0.40	F03904GN747	DCGW11T304	397274	●			●				

Reference Key

Symbol	Machining Conditions
●	Average - Main Application
⊕	Difficult - Main Application

Reference Key

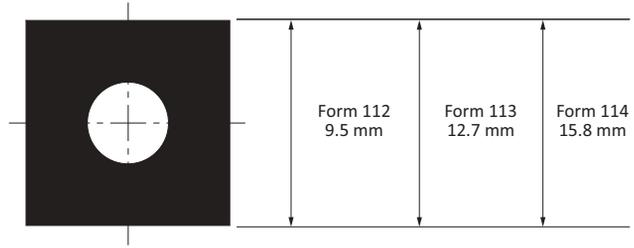
Symbol	Insert Type
▽	Roughing - Main Application
▽	Roughing - Extended Application
▽▽▽	Finishing - Main Application
▽▽▽	Finishing - Extended Application

Insert Form	Countersunk Screw		Torque Driver	Service Key	Technical Data	
39	115673	M3.5 x 0.6 x 9	414510	115664	Torque	Key Size
					3.0 Nm	T15

A
B
C
D
E
F
G
H
I
J
K
L
M
INDEX

Insert Forms 112, 113, 114

Carbide



		Carbide																	
		Uncoated			Coated														
Material	Grade	WHW01	WHW16	WHC05	WHC19	WHC30	WHC77	WHC79	WHC81	WHC88	WHC98	WHC111	WHC114	WHC136	WHC164				
Steel	P				▽▽▽	▽▽▽	▽▽▽	▽▽▽	▽▽▽	▽▽▽	▽▽▽	▽▽▽	▽▽▽	▽▽▽	▽▽▽				
Stainless Steel	M				▽▽▽	▽▽▽	▽▽▽	▽▽▽	▽▽▽	▽▽▽	▽▽▽	▽▽▽	▽▽▽	▽▽▽	▽▽▽				
Cast Iron	K	▽▽▽			▽▽▽	▽▽▽	▽▽▽	▽▽▽	▽▽▽	▽▽▽	▽▽▽	▽▽▽	▽▽▽	▽▽▽	▽▽▽				
Nonferrous Materials	N	▽▽▽																	
Titanium	S	▽▽▽			▽▽▽	▽▽▽				▽▽▽		▽▽▽	▽▽▽		▽▽▽				
Hard Materials	H						▽▽▽		▽▽▽			▽▽▽	▽▽▽		▽▽▽				
Geometry	Radius		Description	ISO Code	Part No.	WHW01	WHW16	WHC05	WHC19	WHC30	WHC77	WHC79	WHC81	WHC88	WHC98	WHC111	WHC114	WHC136	WHC164
108	0.016	0.40	F11204MN108	SCMT09T304	297535										●				
108	0.031	0.80	F11308MN108	SCMT120408	397110										●				
127	0.016	0.40	F11204GN127	SCGT09T304	097539		●												
127	0.016	0.40	F11304GN127	SCGT120404	397590		●												
127	0.031	0.80	F11308GN127	SCGT120408	097566		●												
145	0.031	0.80	F11208GN145	SCGT09T308	297996											●			
145	0.031	0.80	F11308GN145	SCGT120408	297997											●			
146	0.016	0.40	F11204MN146	SCMT09T304	397940								●	✖					
146	0.031	0.80	F11208MN146	SCMT09T308	397992								●	✖					
146	0.016	0.40	F11304MN146	SCMT12T304	397049								●	✖					
146	0.031	0.80	F11308MN146	SCMT12T308	397969								●	✖					
158	0.031	0.80	F11308MN158	SCMT120408	297497							●							
158	0.047	1.20	F11412MN158	SCMT150512	097252					✖									
192	0.016	0.40	F11204MN192	SCMT09T304	397741				✖										●
192	0.031	0.80	F11208MN192	SCMT09T308	397640				✖										●
192	0.031	0.80	F11308MN192	SCMT120408	397709				✖										●
192	0.047	1.20	F11312MN192	SCMT120412	397710				✖										●
199	0.016	0.40	F11204MN199	SCMT09T304	397703													●	
199	0.031	0.80	F11208MN199	SCMT09T308	397704													●	
199	0.031	0.80	F11308MN199	SCMT120408	397705													●	
711	0.031	0.80	F11308MN711	SCMT120408	297212						●								

Reference Key

Symbol	Machining Conditions
●	Good - Main Application
●	Average - Main Application
✖	Difficult - Main Application

Reference Key

Symbol	Insert Type
▽	Roughing - Main Application
▽	Roughing - Extended Application
▽▽▽	Finishing - Extended Application

Insert Form	Countersunk Screw		Torque Driver	Service Key	Technical Data	
	Part No.	Description			Torque	Key Size
112	115672 ($\phi 37\text{ mm}$)	M3.5 x 0.6 x 7.5	415510	115664	3.0 Nm	T15
112	115673 (>math>\phi 36\text{ mm}</math>)	M3.5 x 0.6 x 9	415510	115664	3.0 Nm	T15
113	215149	M4.5 x 0.75 x 11.5	415543	215150	5.0 Nm	T20
114	215149	M4.5 x 0.75 x 11.5	415543	215150	5.0 Nm	T20

Insert Forms 04, 05

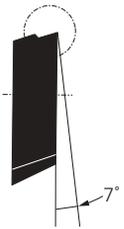
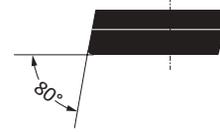
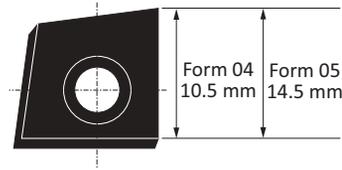
Carbide



880 Geometry



811 Geometry



						Carbide											
						Uncoated			Coated								
						WHW16	WHC05	WHC18	WHC19	WHC79	WHC98	WHC111	WHC114	WHC170	WHC168	WHC198	
Steel	P														▼	▼	
Stainless Steel	M														▽	▽	
Cast Iron	K														▼	▼	
Nonferrous Materials	N															▽	
Titanium	S															▽	
Hard Materials	H																
Geometry	Radius		Description	ISO Code	Part No.	WHW16	WHC05	WHC18	WHC19	WHC79	WHC98	WHC111	WHC114	WHC170	WHC168	WHC198	
	in	mm															
880	0.016	0.40	F00404ML880	-	397595												●
880	0.016	0.40	F00504ML880	-	397593										⚙	⚙	●
880	0.031	0.80	F00508ML880	-	397594									⚙	⚙	⚙	●
811	0.031	0.80	F00508ML811	-	397844										⚙	⚙	●

Insert Form	Countersunk Screw		Torque Driver	Service Key	Technical Data	
	Torque	Key Size				
04	415977	M4 x 0.7 x 7.9	415510	115664	3.0 Nm	T15
05	415949	M4 x 0.7 x 11	415543	215150	5.0 Nm	T20

Reference Key

Symbol	Machining Conditions
●	Average - Main Application
⚙	Difficult - Main Application

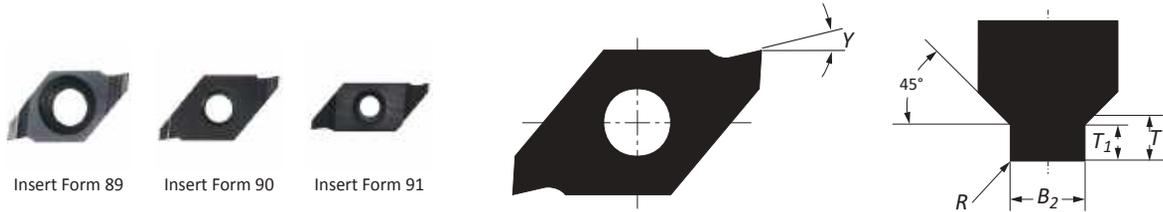
Reference Key

Symbol	Insert Type
▼	Roughing - Main Application
▽	Roughing - Extended Application

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Radial Grooving Insert Forms 89, 90, 91

Carbide



									Carbide													
									Uncoated				Coated									
									WHW01	WHW16	WHW20	WHC05	WHC18	WHC19	WHC79	WHC98	WHC111	WHC114	WHC136	WHC164		
Insert Form	Boring \varnothing	B_2	Y	R	T_1	T	Ring Width	Part No.														
Steel P																				▼▼		
Stainless Steel M																				▽▽		
Cast Iron K																				▼▼		
Nonferrous Materials N																						
Titanium S																				▼▼		
Hard Materials H																						
i	89	0.944 - 1.023	0.056	13°	0.004	0.021	0.025	0.047	297937													
	89	1.102 - 1.181	0.056	13°	0.004	0.025	0.029	0.047	297938												●	
	89	1.220 - 1.259	0.056	13°	0.004	0.030	0.035	0.047	297939												●	
	89	1.338	0.068	13°	0.004	0.030	0.035	0.059	297940												●	
	89	1.377 - 1.496	0.068	13°	0.004	0.036	0.041	0.059	297941												●	
	90	1.574 - 1.889	0.078	9°	0.006	0.046	0.051	0.068	297942													●
	90	1.968 - 2.480	0.090	9°	0.006	0.056	0.062	0.078	297943													●
	91	2.559 - 3.070	0.109	9°	0.008	0.056	0.062	0.098	297944													●
	91	3.149 - 3.228	0.109	9°	0.008	0.066	0.072	0.098	297945													●
	91	3.346 - 3.937	0.129	9°	0.008	0.066	0.072	0.118	297946													●
91	4.015 - 5.708	0.168	9°	0.008	0.076	0.084	0.157	297947													●	
m	89	24.00 - 26.00	1.44	13°	0.10	0.54	0.65	1.20	297937												●	
	89	28.00 - 30.00	1.44	13°	0.10	0.64	0.75	1.20	297938												●	
	89	31.00 - 32.00	1.44	13°	0.10	0.78	0.91	1.20	297939												●	
	89	34.00	1.74	13°	0.10	0.78	0.91	1.50	297940												●	
	89	35.00 - 38.00	1.74	13°	0.10	0.93	1.06	1.50	297941												●	
	90	40.00 - 48.00	1.99	9°	0.15	1.18	1.31	1.75	297942												●	
	90	50.00 - 63.00	2.29	9°	0.15	1.43	1.58	2.00	297943												●	
	91	65.00 - 78.00	2.79	9°	0.20	1.43	1.58	2.50	297944												●	
	91	80.00 - 82.00	2.79	9°	0.20	1.68	1.84	2.50	297945												●	
	91	85.00 - 100.00	3.29	9°	0.20	1.68	1.84	3.00	297946												●	
91	102.00 - 145.00	4.29	9°	0.20	1.94	2.14	4.00	297947												●		

Insert Form	Countersunk Screw		Torque Driver	Service Key	Technical Data	
	Part No.	Dimensions			Torque	Key Size
89	115676	M2.5 x 0.45 x 5	415514	115590	1.2 Nm	T8
90	115531	M3 x 0.5 x 7.5	415514	115590	1.2 Nm	T8
91	115802	M3 x 0.5 x 12	415514	115590	1.2 Nm	T8

Reference Key

Symbol	Machining Conditions
●	Average - Main Application

Reference Key

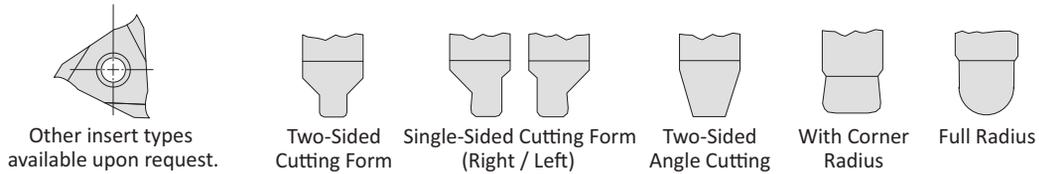
Symbol	Insert Type
▼▼	Universal - Main Application
▽▽	Universal - Extended Application

Axial Grooving Insert Blanks Form 304

Carbide



			Carbide											
			Uncoated			Coated								
Material	Code		WHW01	WHW16	WHW20	WHC05	WHC18	WHC19	WHC79	WHC98	WHC111	WHC114	WHC136	WHC164
Steel	P													
Stainless Steel	M													
Cast Iron	K				▽▽									
Nonferrous Materials	N				▽▽									
Titanium	S				▽▽									
Hard Materials	H													
Geometry	S ₁	Part No.	WHW01	WHW16	WHW20	WHC05	WHC18	WHC19	WHC79	WHC98	WHC111	WHC114	WHC136	WHC164
	0.137	297150			●									
	0.169	297151			●									
	0.208	297152			●									
	0.255	297154			●									
	0.295	297493			●									
	0.137	397850			●									
	0.169	397851			●									
	0.208	397852			●									
	0.255	397853			●									
	0.295	397854			●									
	3.50	297150			●									
	4.30	297151			●									
	5.30	297152			●									
	6.50	297154			●									
	7.50	297493			●									
	3.50	397850			●									
	4.30	397851			●									
	5.30	397852			●									
	6.50	397853			●									
	7.50	397854			●									



Reference Key

Symbol	Machining Conditions
●	Average - Main Application

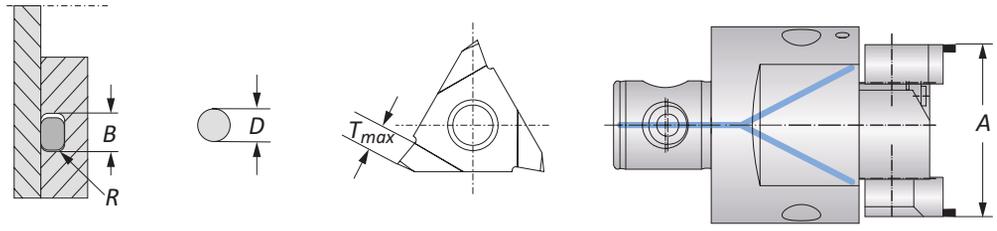
Reference Key

Symbol	Insert Type
▽▽	Universal - Main Application
▽	Universal - Extended Application

Insert Form	Countersunk Screw	Torque Driver	Service Key	Technical Data	
304	215392 M5 x 0.8 x 12.9	415543	215150	Torque: 5.0 Nm	Key Size: T20

Axial Grooving O-Rings for Single Cutter Tools Insert Form 304

Carbide



		Carbide																			
		Uncoated					Coated														
Steel		P																			
Stainless Steel		M																			
Cast Iron		K																			
Nonferrous Materials		N																			
Titanium		S																			
Hard Materials		H																			
Geometry	A	O-Ring Cross Section	B + 0.05	B _{max}	T _{max}	R ± 0.05	Part No.	WHW01	WHW16	WHW20	WHC05	WHC18	WHC19	WHC79	WHC98	WHC111	WHC114	WHC136	WHC164		
i		0.787 - 2.125	0.039	0.059	0.059	0.064	0.008	297969												▼	
		0.787 - 2.125	0.059	0.086	0.086	0.092	0.012	297970												▽	
		0.787 - 2.125	0.078	0.114	0.114	0.124	0.016	297971												▼	
		0.787 - 2.125	0.098	0.137	0.137	0.151	0.020	297972												▼	
		0.787 - 2.125	0.118	0.161	0.161	0.175	0.024	297973												▼	
		0.787 - 2.125	0.157	0.212	0.212	0.194	0.031	297974													▼
		0.787 - 2.125	0.196	0.267	0.267	0.194	0.031	297975													▼
m		20.00 - 54.00	1.00	1.50	1.50	1.65	0.20	297969												●	
		20.00 - 54.00	1.50	2.20	2.20	2.35	0.30	297970												●	
		20.00 - 54.00	2.00	2.90	2.90	3.15	0.40	297971												●	
		20.00 - 54.00	2.50	3.50	3.50	3.85	0.50	297972												●	
		20.00 - 54.00	3.00	4.10	4.10	4.45	0.60	297973												●	
		20.00 - 54.00	4.00	5.40	5.40	4.95	0.80	297974													●
		20.00 - 54.00	5.00	6.80	6.80	4.95	0.80	297975													●

				Technical Data		
Insert Form	Countersunk Screw		Torque Driver	Service Key	Torque	Key Size
304	215392	M5 x 0.8 x 12.9	415543	215150	5.0 Nm	T20

Reference Key

Symbol	Machining Conditions
●	Average - Main Application

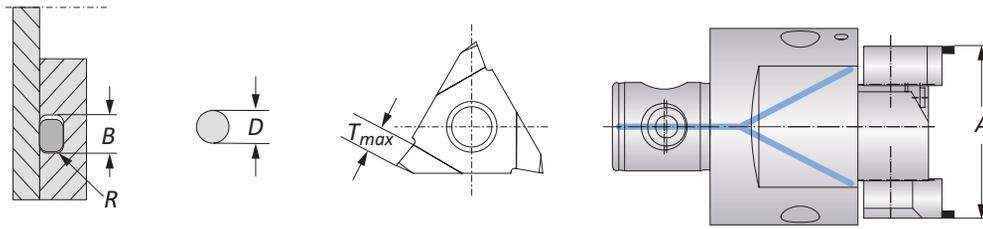
Reference Key

Symbol	Insert Type
▼	Universal - Main Application
▽	Universal - Extended Application

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Axial Grooving O-Rings for Twin Cutter Tools Insert Form 304

Carbide



		Carbide																	
		Uncoated							Coated										
Material	Code	WHW01	WHW16	WHW20	WHC05	WHC18	WHC19	WHC79	WHC98	WHC111	WHC114	WHC136	WHC164	Application					
Steel	P													▼▼					
Stainless Steel	M													▽▽					
Cast Iron	K													▼▼					
Nonferrous Materials	N																		
Titanium	S													▼▼					
Hard Materials	H																		
Geometry	A Boring Range	O-Ring Cross Section	B + 0.05	B_max	T_max	R ± 0.05	Part No.	WHW01	WHW16	WHW20	WHC05	WHC18	WHC19	WHC79	WHC98	WHC111	WHC114	WHC136	WHC164
i	2.086 - 39.37	0.039 - 0.059	0.059	0.098	0.064	0.008	297976												
	2.086 - 39.37	0.039 - 0.059	0.086	0.145	0.092	0.012	297977												●
	2.086 - 39.37	0.039 - 0.059	0.133	0.224	0.143	0.020	297978												●
	2.086 - 39.37	0.039 - 0.059	0.212	0.358	0.194	0.031	297979												●
m	53.00 - 1000.00	1.00 - 1.50	1.50	2.50	1.65	0.20	297976												●
	53.00 - 1000.00	1.50 - 2.40	2.20	3.70	2.35	0.30	297977												●
	53.00 - 1000.00	2.40 - 4.00	3.40	5.70	3.65	0.50	297978												●
	53.00 - 1000.00	4.00 - 5.50	5.40	9.10	4.95	0.80	297979												●

Reference Key

Symbol	Machining Conditions
●	Average - Main Application

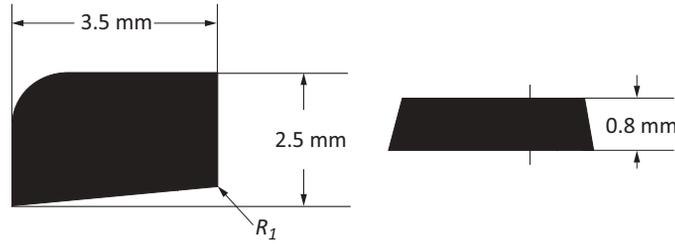
Reference Key

Symbol	Insert Type
▼▼	Universal - Main Application
▽▽	Universal - Extended Application

Insert Form	Countersunk Screw	Torque Driver	Service Key	Technical Data	
				Torque	Key Size
304	215392 M5 x 0.8 x 12.9	415543	215150	5.0 Nm	T20

Insert Form 325

Carbide



				Carbide											
				Uncoated						Coated					
Material	Code			WHW01	WHW16	WHW20	WHC05	WHC18	WHC19	WHC79	WHC98	WHC111	WHC114	WHC136	WHC164
Steel	P													▼▼	
Stainless Steel	M													▼▼	
Cast Iron	K					▼▼								▼▼	
Nonferrous Materials	N					▼▼									
Titanium	S													▼▼	
Hard Materials	H														
Geometry	Radius R_1	Description	Part No.	WHW01	WHW16	WHW20	WHC05	WHC18	WHC19	WHC79	WHC98	WHC111	WHC114	WHC136	WHC164
 860	0.004	F32501CN860	097831			●								●	
 860	0.10	F32501CN860	097831			●								●	

					Technical Data	
Insert Form	Countersunk Screw	Clamping Jaw	Torque Driver	Service Key	Torque	Key Size
325	315321 M1.6 x 0.35 x 3	315320	-	315322	0.3 Nm	0.5x3

Reference Key

Symbol	Machining Conditions
●	Average - Main Application

Reference Key

Symbol	Insert Type
▼▼	Finishing - Main Application
▼▼	Finishing - Extended Application

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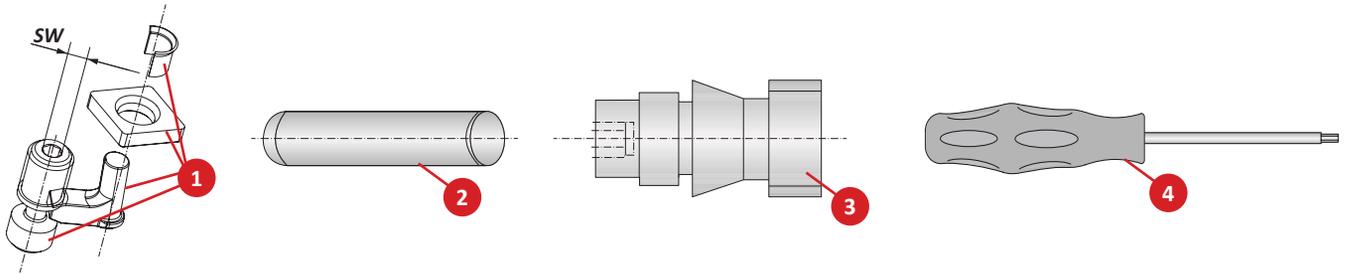
Insert Accessories

Countersunk Screws | Torque Drivers

Insert Form	Countersunk Screw		Clamping Jaw	Torque Driver		Technical Data	
						Service Key	Torque
04	415977	M4 x 0.7 x 7.9	–	415510	115664	3.0 Nm	T15
05	415949	M4 x 0.7 x 11	–	415543	215150	5.0 Nm	T20
20	115535	M2 x 0.4 x 5	–	415508	115591	0.9 Nm	T7
39	115673	M3.5 x 0.6 x 9	–	414510	115664	3.0 Nm	T15
47	315324	M1.8 x 0.35 x 4	315323	–	115537	0.5 Nm	T6
89	115676	M2.5 x 0.45 x 5	–	415514	115590	1.2 Nm	T8
90	115531	M3 x 0.5 x 7.5	–	415514	115590	1.2 Nm	T8
91	115802	M3 x 0.5 x 12	–	415514	115590	1.2 Nm	T8
101	115676	M2.5 x 0.45 x 5	–	415514	115590	1.2 Nm	T8
103	115672($\lt; \varnothing 37 \text{ mm}$)	M3.5 x 0.6 x 7.5	–	415510	115664	3.0 Nm	T15
103	115673(>math>\gt; \varnothing 36 \text{ mm}</math>)	M3.5 x 0.6 x 9	–	415510	115664	3.0 Nm	T15
104	215149	M4.5 x 0.75 x 11.5	–	415543	215150	5.0 Nm	T20
105	215149	M4.5 x 0.75 x 11.5	–	415543	215150	5.0 Nm	T20
111	115531	M3 x 0.5 x 7.5	–	415514	115590	1.2 Nm	T8
112	115672($\lt; \varnothing 37 \text{ mm}$)	M3.5 x 0.6 x 7.5	–	415510	115664	3.0 Nm	T15
112	115673(>math>\gt; \varnothing 36 \text{ mm}</math>)	M3.5 x 0.6 x 9	–	415510	115664	3.0 Nm	T15
113	215149	M4.5 x 0.75 x 11.5	–	415543	215150	5.0 Nm	T20
114	215149	M4.5 x 0.75 x 11.5	–	415543	215150	5.0 Nm	T20
161	115676	M2.5 x 0.45 x 5	–	415514	115590	1.2 Nm	T8
163	115673	M3.5 x 0.6 x 9	–	415510	115664	3.0 Nm	T15
211	215377	M2 x 0.4 x 4	–	415507	115537	0.6 Nm	T6
262	215987	M2.5 x 0.45 x 6	–	415514	115590	1.2 Nm	T8
264	115673	M3.5 x 0.6 x 9	–	415510	115664	3.0 Nm	T15
304	215392	M5 x 0.8 x 12.9	–	415543	215150	5.0 Nm	T20
325	315321	M1.6 x 0.35 x 3	315320	–	315322	0.3 Nm	0.5x3
394	215915	M2.5 x 0.45 x 7	–	415514	115590	1.1 Nm	T8
395	215985	M3 x 0.5 x 7.5	–	415514	115590	1.2 Nm	T8
396	415320	M3.5 x 0.6 x 11	–	415510	115664	3.0 Nm	T15
397	215149	M4.5 x 0.75 x 11.5	–	415543	215150	5.0 Nm	T20

Insert Accessories

Countersunk Screws | Torque Drivers



Insert Form	1. Clamping Set		2. Mounting Arbor for Sleeve		3. Clamping Bolt		4. Service Key	
	Part No.	Key Size	Part No.	Part No.	Key Size	Part No.	Key Size	
75	315004	s3	415642	-	-	415578	s3	
123	315003	s3	415642	115775	s2.5	415578 115575	s3 s2.5	
124	315054	s3	415644	115776	s3	415578 115630	s3 s3	

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Technical Information

Surface Finish | General Formulas

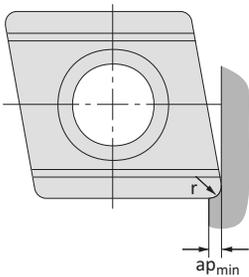
The corner radius of replaceable inserts is very important in finish machining. Large corner radii (0.031" (0.8 mm)) or higher allow for high feed rates with good surface quality.

The expected surface quality can be estimated by using the function of corner radius and feed rate formula.

	<p>1. The larger the corner radius and the lighter the feed rate is, the better the surface quality.</p>
	<p>2. If the feed is approximately 1/3 of the corner radius, the better the machining time and surface finish will be in finish machining applications.</p>
	<p>3. A larger corner radius increases radial forces, which can negatively affect dimensional accuracy. Large corner radii also require increased depth of cut.</p>



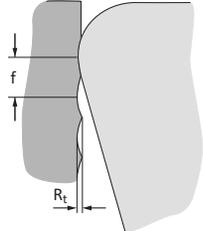
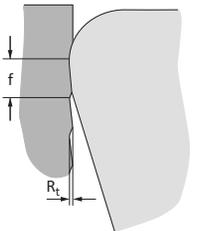
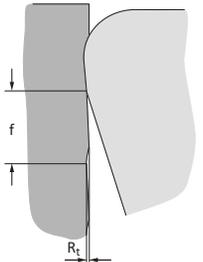
Minimum depth of cut (a_p) should at least match the corner radius. This minimizes the radial forces.

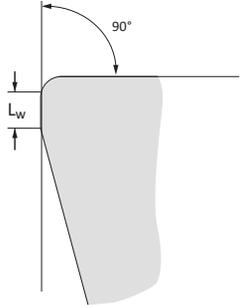


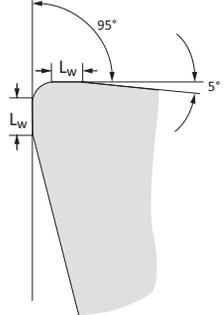
General Formulas		
Cutting Speed	$\frac{V_c = D \times \pi \times n}{1000}$	(m/min)
RPM	$\frac{n = V_c \times 1000}{D \times \pi}$	(min ⁻¹)
Feed Speed	$V_f = f \times n$	(mm/min)
	$D = \text{Machining } \varnothing$	(mm)
	$f = \text{Feed}$	(mm/u)
	$V_c = \text{Cutting Speed}$	(m/min)
	$n = \text{RPM}$	(min ⁻¹)

Technical Information

Wiper Geometries

Replaceable Inserts with Wiper Geometry	
Insert with conventional corner radius with feed (f)	
Insert with wiper geometry radius with same feed (f)	
Insert with wiper geometry with increased feed (f)	

Wiper Geometry for 90° Approach Angle	
<p>Replaceable inserts produce a right-angled step at the bottom of the hole. When used in a Wohlhaupter standard insert holder that has a 90° approach angle, the secondary wiper cutting edge is nearly parallel with the wall of the hole.</p> <p>Wiper geometry for 90° approach angle L_w = length of the wiper secondary cutting edge</p>	

Wiper Geometry for 95° Approach Angle	
<p>Wiper inserts can also be used with 95° insert holders, which are included in the Wohlhaupter standard insert range.</p> <p>Wiper geometry for 95° approach angle (left and right cutting) L_w = length of the secondary wiper cutting edge</p>	

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Rough Machining Recommended Cutting Data | Imperial (inch)

ISO	Material	(BHN) Hardness	Grade	*Speed SFM	Recommended Feed (inch / tooth) Nose Radii			
					0.008"	0.016"	0.032"	0.047"
P	Free-Machining Steel 1118, 1215, 12L14, etc.	100 - 250	Carbide	490 - 750	0.004 - 0.006	0.004 - 0.012	0.008 - 0.020	0.004 - 0.031
			Cermet	490 - 820	0.004 - 0.006	0.004 - 0.012	0.008 - 0.020	0.004 - 0.031
	Low-Carbon Steel 1010, 1020, 1025, 1522, 1144, etc.	85 - 275	Carbide	460 - 820	0.004 - 0.006	0.004 - 0.012	0.008 - 0.020	0.004 - 0.031
	Medium-Carbon Steel 1030, 1040, 1050, 1527, 1140, 1151, etc.	125 - 325	Carbide	460 - 820	0.004 - 0.006	0.004 - 0.012	0.008 - 0.020	0.004 - 0.031
	Alloy Steel 4140, 5140, 8640, etc.	125 - 375	Carbide	390 - 660	0.004 - 0.006	0.004 - 0.012	0.008 - 0.020	0.004 - 0.031
	High-Strength Alloy 4340, 4330V, 300M, etc.	225 - 400	Carbide	330 - 590	0.004 - 0.006	0.004 - 0.012	0.008 - 0.020	0.004 - 0.031
Structural Steel A36, A285, A516, etc.	100 - 350	Carbide	490 - 850	0.004 - 0.006	0.004 - 0.012	0.008 - 0.020	0.004 - 0.031	
		Cermet	490 - 920	0.004 - 0.006	0.004 - 0.012	0.008 - 0.020	0.004 - 0.031	
Tool Steel H-13, H-21, A-4, O-2, S-3, etc.	150 - 250	Carbide	330 - 590	0.004 - 0.006	0.004 - 0.012	0.008 - 0.020	0.004 - 0.031	
S	High-Temp Alloy Hastelloy B, Inconel 600, etc.	140 - 310	Carbide	70 - 160	0.004 - 0.006	0.004 - 0.008	0.006 - 0.014	0.008 - 0.016
	Titanium Alloy	140 - 310	Carbide	130 - 260	0.004 - 0.006	0.004 - 0.008	0.006 - 0.014	0.008 - 0.016
Aerospace Alloy S82	185 - 350	Carbide	130 - 260	0.004 - 0.006	0.004 - 0.008	0.006 - 0.014	0.008 - 0.016	
M	Stainless Steel 400 Series 416, 420, etc.	185 - 350	Carbide	160 - 330	0.004 - 0.006	0.004 - 0.010	0.004 - 0.014	0.008 - 0.024
	Stainless Steel 300 Series 304, 316, 17-4PH, etc.	135 - 275	Carbide	260 - 490	0.004 - 0.006	0.004 - 0.010	0.004 - 0.014	0.008 - 0.024
Super Duplex Stainless Steel	135 - 275	Carbide	200 - 330	0.004 - 0.006	0.004 - 0.010	0.004 - 0.014	0.008 - 0.024	

*Not to exceed max recommended RPM for boring head found in corresponding Wohlhaupter Operation Manual.

Deep Hole Boring Speed Adjustment

Recommended Speed Example

⚠ For Dynamic Boring Tool NOVI ^{TECH} ® Length			
Boring Type	8xD	9xD	10xD
Roughing	0.80	0.60	0.40
Finishing	0.90	0.70	0.50

If the recommended speed for a finish boring assembly under 5xD is 120 m/min, then the speed for a 10xD finish boring assembly in the same application would be 60 m/min (120 m/min x 0.50 = 60 m/min).

5xD = 120 m/min

10xD = 60 m/min

*Not to exceed recommended RPM printed on NOVI^{TECH}® module.

IMPORTANT: Max spindle speed refers to maximum possible speed for individual boring head and is not a recommended parameter. Factory technical assistance is available for your specific applications through our Application Engineering department. ext: 7611 | email: appeng@alliedmachine.com

⚠ WARNING Tool failure can cause serious injury. To prevent:

- Do not exceed recommended 10xD length-to-diameter ratio or exceed four total components (including shank).
- When using Alu-Line components, do not exceed recommended 5xD length-to-diameter ratio.
- When using tool steel components, do not exceed recommended 6xD length-to-diameter ratio.
- When using heavy metal components, do not exceed recommended 8xD length-to-diameter ratio.
- When using a carbide shank, do not exceed recommended 9xD length-to-diameter ratio.
- When using a NOVI^{TECH}® module, do not exceed recommended 10xD length-to-diameter ratio.

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Rough Machining Recommended Cutting Data | Imperial (inch)

ISO	Material	(BHN) Hardness	Grade	*Speed SFM	Recommended Feed (inch / tooth) Nose Radii			
					0.008"	0.016"	0.032"	0.047"
H	Wear Plate Hardox®, AR400, T-1, etc.	400 - 600	Carbide	100 - 160	0.002 - 0.006	0.004 - 0.008	0.004 - 0.008	0.004 - 0.010
			CBN	200 - 460	0.002 - 0.006	0.004 - 0.008	0.004 - 0.008	0.004 - 0.010
	Hardened Steel	300 - 500	Carbide	130 - 200	0.002 - 0.006	0.004 - 0.008	0.004 - 0.008	0.004 - 0.010
			CBN	200 - 460	0.002 - 0.006	0.004 - 0.008	0.004 - 0.008	0.004 - 0.010
K	SG / Nodular Cast Iron	120 - 320	Carbide	430 - 820	0.004 - 0.006	0.006 - 0.014	0.008 - 0.020	0.008 - 0.031
			Ceramic	660 - 1310	0.004 - 0.006	0.006 - 0.014	0.008 - 0.020	0.008 - 0.031
	Grey / White Iron	180 - 320	Carbide	490 - 920	0.004 - 0.006	0.006 - 0.014	0.008 - 0.020	0.008 - 0.031
			Ceramic	1310 - 3280	0.004 - 0.006	0.006 - 0.014	0.008 - 0.020	0.008 - 0.031
N	Cast Aluminum	30 - 180	Carbide	820 - 2620	0.004 - 0.006	0.006 - 0.014	0.008 - 0.024	0.008 - 0.031
			PCD	1310 - 3940	0.004 - 0.006	0.006 - 0.014	0.008 - 0.024	0.008 - 0.031
	Wrought Aluminum	30 - 180	Carbide	660 - 1640	0.004 - 0.006	0.006 - 0.014	0.006 - 0.020	0.008 - 0.031
	Aluminum Bronze	100 - 250	Carbide	390 - 820	0.004 - 0.006	0.006 - 0.010	0.006 - 0.016	0.008 - 0.024
	Brass	100	Carbide	660 - 1640	0.004 - 0.006	0.006 - 0.010	0.006 - 0.016	0.008 - 0.031
Copper	60	Carbide	330 - 490	0.004 - 0.006	0.006 - 0.010	0.006 - 0.014	0.008 - 0.016	

*Not to exceed max recommended RPM for boring head found in corresponding Wohlhaupter Operation Manual.

Deep Hole Boring Speed Adjustment

⚠ For Dynamic Boring Tool NOVI ^{TECH} Length			
Boring Type	8xD	9xD	10xD
Roughing	0.80	0.60	0.40
Finishing	0.90	0.70	0.50

*Not to exceed recommended RPM printed on NOVI^{TECH} module.

Recommended Speed Example

If the recommended speed for a finish boring assembly under 5xD is 120 m/min, then the speed for a 10xD finish boring assembly in the same application would be 60 m/min (120 m/min x 0.50 = 60 m/min).

5xD = 120 m/min

10xD = 60 m/min

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- When using heavy metal components, do not exceed recommended 8xD length-to-diameter ratio.
- When using a carbide shank, do not exceed recommended 9xD length-to-diameter ratio.
- When using a NOVI^{TECH} module, do not exceed recommended 10xD length-to-diameter ratio.

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Finish Machining Recommended Cutting Data | Imperial (inch)

ISO	Material	(BHN) Hardness	Grade	*Speed SFM	Recommended Feed (inch / tooth) Nose Radii			
					0.004"	0.008"	0.016"	0.031"
P	Free-Machining Steel 1118, 1215, 12L14, etc.	100 - 250	Carbide	525 - 975	0.001 - 0.003	0.002 - 0.005	0.004 - 0.006	0.006 - 0.009
	Low-Carbon Steel 1010, 1020, 1025, 1522, 1144, etc.	85 - 275	Carbide	475 - 925	0.001 - 0.002	0.002 - 0.004	0.003 - 0.005	0.005 - 0.008
	Medium-Carbon Steel 1030, 1040, 1050, 1527, 1140, 1151, etc.	125 - 325	Carbide	475 - 825	0.001 - 0.002	0.002 - 0.004	0.003 - 0.005	0.005 - 0.008
	Alloy Steel 4140, 5140, 8640, etc.	125 - 375	Carbide	400 - 700	0.001 - 0.002	0.002 - 0.004	0.003 - 0.005	0.005 - 0.008
	High-Strength Alloy 4340, 4330V, 300M, etc.	225 - 400	Carbide	325 - 600	0.001 - 0.002	0.002 - 0.004	0.003 - 0.005	0.005 - 0.008
	Structural Steel A36, A285, A516, etc.	100 - 350	Carbide	475 - 925	0.001 - 0.002	0.002 - 0.004	0.003 - 0.005	0.005 - 0.008
	Tool Steel H-13, H-21, A-4, O-2, S-3, etc.	150 - 250	Carbide	325 - 600	0.001 - 0.002	0.002 - 0.003	0.003 - 0.004	0.004 - 0.006
S	High-Temp Alloy Hastelloy B, Inconel 600, etc.	140 - 310	Carbide	100 - 225	0.001 - 0.002	0.002 - 0.003	0.003 - 0.005	0.004 - 0.006
	Titanium Alloy	140 - 310	Carbide	125 - 300	0.001 - 0.002	0.002 - 0.003	0.003 - 0.005	0.004 - 0.006
	Aerospace Alloy S82	185 - 350	Carbide	125 - 300	0.001 - 0.002	0.002 - 0.003	0.003 - 0.005	0.004 - 0.006
M	Stainless Steel 400 Series 416, 420, etc.	185 - 350	Carbide	164 - 394	0.001 - 0.002	0.002 - 0.004	0.003 - 0.004	0.004 - 0.006
	Stainless Steel 300 Series 304, 316, 17-4PH, etc.	135 - 275	Carbide	300 - 525	0.001 - 0.002	0.002 - 0.004	0.003 - 0.004	0.004 - 0.006
	Super Duplex Stainless Steel	135 - 275	Carbide	197 - 525	0.001 - 0.002	0.002 - 0.004	0.003 - 0.004	0.004 - 0.006

*Not to exceed max recommended RPM for boring head found in corresponding Wohlhaupter Operation Manual.

Deep Hole Boring Speed Adjustment

Recommended Speed Example

⚠ For Dynamic Boring Tool NOVI ^{TECH} ® Length			
Boring Type	8xD	9xD	10xD
Roughing	0.80	0.60	0.40
Finishing	0.90	0.70	0.50

If the recommended speed for a finish boring assembly under 5xD is 120 m/min, then the speed for a 10xD finish boring assembly in the same application would be 60 m/min (120 m/min x 0.50 = 60 m/min).

5xD = 120 m/min

10xD = 60 m/min

*Not to exceed recommended RPM printed on NOVI^{TECH}® module.

IMPORTANT: Max spindle speed refers to maximum possible speed for individual boring head and is not a recommended parameter. Factory technical assistance is available for your specific applications through our Application Engineering department. ext: 7611 | email: appeng@alliedmachine.com

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- When using tool steel components, do not exceed recommended 6xD length-to-diameter ratio.
- When using heavy metal components, do not exceed recommended 8xD length-to-diameter ratio.
- When using a carbide shank, do not exceed recommended 9xD length-to-diameter ratio.
- When using a NOVI^{TECH}® module, do not exceed recommended 10xD length-to-diameter ratio.

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Finish Machining Recommended Cutting Data | Imperial (inch)

ISO	Material	(BHN) Hardness	Grade	*Speed SFM	Recommended Feed (inch / tooth) Nose Radii			
					0.004"	0.008"	0.016"	0.031"
H	Wear Plate Hardox®, AR400, T-1, etc.	400 - 600	Carbide	100 - 200	0.001 - 0.002	0.002 - 0.003	0.003 - 0.004	0.004 - 0.006
			CBN	225 - 600	0.001 - 0.002	0.002 - 0.003	0.003 - 0.004	0.004 - 0.006
	Hardened Steel	300 - 500	Carbide	125 - 275	0.001 - 0.002	0.002 - 0.003	0.003 - 0.004	0.004 - 0.006
			CBN	225 - 600	0.001 - 0.002	0.002 - 0.003	0.003 - 0.004	0.004 - 0.006
K	SG / Nodular Cast Iron	120 - 320	Carbide	475 - 850	0.001 - 0.002	0.002 - 0.004	0.003 - 0.005	0.005 - 0.008
	Grey / White Iron	180 - 320	Carbide	600 - 1050	0.001 - 0.002	0.002 - 0.004	0.003 - 0.005	0.005 - 0.008
			CBN	1325 - 3275	0.001 - 0.002	0.002 - 0.004	0.003 - 0.005	0.005 - 0.008
N	Cast Aluminum	30 - 180	Carbide	850 - 2800	0.001 - 0.002	0.002 - 0.004	0.003 - 0.005	0.005 - 0.008
			PCD	1625 - 6550	0.001 - 0.002	0.002 - 0.004	0.003 - 0.005	0.005 - 0.008
	Wrought Aluminum	30 - 180	Carbide	675 - 1975	0.001 - 0.003	0.002 - 0.005	0.004 - 0.006	0.006 - 0.009
	Aluminum Bronze	100 - 250	Carbide	475 - 925	0.001 - 0.002	0.002 - 0.004	0.004 - 0.005	0.005 - 0.008
	Brass	100	Carbide	675 - 1975	0.001 - 0.002	0.002 - 0.004	0.003 - 0.005	0.005 - 0.008
Copper	60	Carbide	325 - 600	0.001 - 0.002	0.002 - 0.003	0.003 - 0.004	0.004 - 0.005	

*Not to exceed max recommended RPM for boring head found in corresponding Wohlhaupter Operation Manual.

Deep Hole Boring Speed Adjustment

⚠ For Dynamic Boring Tool NOVI^{TECH} Length

Boring Type	8xD	9xD	10xD
Roughing	0.80	0.60	0.40
Finishing	0.90	0.70	0.50

*Not to exceed recommended RPM printed on NOVI^{TECH} module.

Recommended Speed Example

If the recommended speed for a finish boring assembly under 5xD is 120 m/min, then the speed for a 10xD finish boring assembly in the same application would be 60 m/min (120 m/min x 0.50 = 60 m/min).

5xD = 120 m/min

10xD = 60 m/min

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- When using a carbide shank, do not exceed recommended 9xD length-to-diameter ratio.
- When using a NOVI^{TECH} module, do not exceed recommended 10xD length-to-diameter ratio.

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Rough Machining Recommended Cutting Data | Metric (mm)

ISO	Material	(BHN) Hardness	Grade	*Speed M / Min	Recommended Feed (mm / tooth) Nose Radii			
					0.2 mm	0.4 mm	0.8 mm	1.2 mm
P	Free-Machining Steel 1118, 1215, 12L14, etc.	100 - 250	Carbide	150 - 230	0.10 - 0.15	0.10 - 0.30	0.20 - 0.50	0.10 - 0.80
	Cermet		150 - 250	0.10 - 0.15	0.10 - 0.30	0.20 - 0.50	0.10 - 0.80	
	Low-Carbon Steel 1010, 1020, 1025, 1522, 1144, etc.	85 - 275	Carbide	140 - 250	0.10 - 0.15	0.10 - 0.30	0.20 - 0.50	0.10 - 0.80
	Medium-Carbon Steel 1030, 1040, 1050, 1527, 1140, 1151, etc.		Carbide	140 - 250	0.10 - 0.15	0.10 - 0.30	0.20 - 0.50	0.10 - 0.80
	Alloy Steel 4140, 5140, 8640, etc.	125 - 375	Carbide	120 - 200	0.10 - 0.15	0.10 - 0.30	0.20 - 0.50	0.10 - 0.80
	High-Strength Alloy 4340, 4330V, 300M, etc.		Carbide	100 - 180	0.10 - 0.15	0.10 - 0.30	0.20 - 0.50	0.10 - 0.80
	Structural Steel A36, A285, A516, etc.	100 - 350	Carbide	150 - 260	0.10 - 0.15	0.10 - 0.30	0.20 - 0.50	0.10 - 0.80
	Cermet		150 - 280	0.10 - 0.15	0.10 - 0.30	0.20 - 0.50	0.10 - 0.80	
	Tool Steel H-13, H-21, A-4, O-2, S-3, etc.	150 - 250	Carbide	100 - 180	0.10 - 0.15	0.10 - 0.30	0.20 - 0.50	0.10 - 0.80
	High-Temp Alloy Hastelloy B, Inconel 600, etc.		Carbide	20 - 50	0.10 - 0.15	0.10 - 0.2	0.15 - 0.35	0.20 - 0.40
S	Titanium Alloy	140 - 310	Carbide	40 - 80	0.10 - 0.15	0.10 - 0.2	0.15 - 0.35	0.20 - 0.40
	Aerospace Alloy S82	185 - 350	Carbide	40 - 80	0.10 - 0.15	0.10 - 0.2	0.15 - 0.35	0.20 - 0.40
	Stainless Steel 400 Series 416, 420, etc.	185 - 350	Carbide	50 - 100	0.10 - 0.15	0.10 - 0.25	0.10 - 0.35	0.20 - 0.60
Stainless Steel 300 Series 304, 316, 17-4PH, etc.	Carbide		80 - 150	0.10 - 0.15	0.10 - 0.25	0.10 - 0.35	0.20 - 0.60	
Super Duplex Stainless Steel	Carbide		60 - 100	0.10 - 0.15	0.10 - 0.25	0.10 - 0.35	0.20 - 0.60	

*Not to exceed max recommended RPM for boring head found in corresponding Wohlhaupter Operation Manual.

Deep Hole Boring Speed Adjustment

Recommended Speed Example

⚠ For Dynamic Boring Tool NOVI ^{TECH} ® Length			
Boring Type	8xD	9xD	10xD
Roughing	0.80	0.60	0.40
Finishing	0.90	0.70	0.50

If the recommended speed for a finish boring assembly under 5xD is 120 m/min, then the speed for a 10xD finish boring assembly in the same application would be 60 m/min (120 m/min x 0.50 = 60 m/min).	
5xD = 120 m/min	10xD = 60 m/min

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- When using heavy metal components, do not exceed recommended 8xD length-to-diameter ratio.
- When using a carbide shank, do not exceed recommended 9xD length-to-diameter ratio.
- When using a NOVI^{TECH}® module, do not exceed recommended 10xD length-to-diameter ratio.

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Rough Machining Recommended Cutting Data | Metric (mm)

ISO	Material	(BHN) Hardness	Grade	*Speed M / Min	Recommended Feed (mm / tooth) Nose Radii			
					0.2 mm	0.4 mm	0.8 mm	1.2 mm
H	Wear Plate Hardox®, AR400, T-1, etc.	400 - 600	Carbide	30 - 50	0.05 - 0.15	0.10 - 0.20	0.10 - 0.20	0.10 - 0.25
			CBN	60 - 140	0.05 - 0.15	0.10 - 0.20	0.10 - 0.20	0.10 - 0.25
	Hardened Steel	300 - 500	Carbide	40 - 60	0.05 - 0.15	0.10 - 0.20	0.10 - 0.20	0.10 - 0.25
			CBN	60 - 140	0.05 - 0.15	0.10 - 0.20	0.10 - 0.20	0.10 - 0.25
K	SG / Nodular Cast Iron	120 - 320	Carbide	130 - 250	0.10 - 0.15	0.15 - 0.35	0.20 - 0.50	0.20 - 0.80
			Ceramic	200 - 400	0.10 - 0.15	0.15 - 0.35	0.20 - 0.50	0.20 - 0.80
	Grey / White Iron	180 - 320	Carbide	150 - 280	0.10 - 0.15	0.15 - 0.35	0.20 - 0.60	0.20 - 0.80
			Ceramic	400 - 1000	0.10 - 0.15	0.15 - 0.35	0.20 - 0.60	0.20 - 0.80
N	Cast Aluminum	30 - 180	Carbide	250 - 800	0.10 - 0.15	0.15 - 0.35	0.20 - 0.60	0.20 - 0.80
			PCD	400 - 1200	0.10 - 0.15	0.15 - 0.35	0.20 - 0.60	0.20 - 0.80
	Wrought Aluminum	30 - 180	Carbide	200 - 500	0.10 - 0.15	0.15 - 0.35	0.15 - 0.50	0.20 - 0.80
	Aluminum Bronze	100 - 250	Carbide	120 - 250	0.10 - 0.15	0.15 - 0.25	0.15 - 0.40	0.20 - 0.60
Brass	100	Carbide	200 - 500	0.10 - 0.15	0.15 - 0.25	0.15 - 0.40	0.20 - 0.80	
Copper	60	Carbide	100 - 150	0.10 - 0.15	0.15 - 0.25	0.15 - 0.35	0.20 - 0.40	

*Not to exceed max recommended RPM for boring head found in corresponding Wohlschlag Operation Manual.

Deep Hole Boring Speed Adjustment

⚠ For Dynamic Boring Tool NOVI^{TECH} Length

Boring Type	8xD	9xD	10xD
Roughing	0.80	0.60	0.40
Finishing	0.90	0.70	0.50

*Not to exceed recommended RPM printed on NOVI^{TECH} module.

Recommended Speed Example

If the recommended speed for a finish boring assembly under 5xD is 120 m/min, then the speed for a 10xD finish boring assembly in the same application would be 60 m/min (120 m/min x 0.50 = 60 m/min).

5xD = 120 m/min

10xD = 60 m/min

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- When using tool steel components, do not exceed recommended 6xD length-to-diameter ratio.
- When using heavy metal components, do not exceed recommended 8xD length-to-diameter ratio.
- When using a carbide shank, do not exceed recommended 9xD length-to-diameter ratio.
- When using a NOVI^{TECH} module, do not exceed recommended 10xD length-to-diameter ratio.

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Finish Machining Recommended Cutting Data | Metric (mm)

ISO	Material	(BHN) Hardness	Grade	*Speed M / Min	Recommended Feed (mm / tooth) Nose Radii			
					0.1 mm	0.2 mm	0.4 mm	0.8 mm
P	Free-Machining Steel 1118, 1215, 12L14, etc.	100 - 250	Carbide	150 - 300	0.02 - 0.08	0.05 - 0.13	0.10 - 0.15	0.15 - 0.23
	Low-Carbon Steel 1010, 1020, 1025, 1522, 1144, etc.	85 - 275	Carbide	145 - 280	0.02 - 0.05	0.05 - 0.10	0.08 - 0.13	0.13 - 0.20
	Medium-Carbon Steel 1030, 1040, 1050, 1527, 1140, 1151, etc.	125 - 325	Carbide	145 - 280	0.02 - 0.05	0.05 - 0.10	0.08 - 0.13	0.13 - 0.20
	Alloy Steel 4140, 5140, 8640, etc.	125 - 375	Carbide	120 - 215	0.02 - 0.05	0.05 - 0.10	0.08 - 0.13	0.13 - 0.20
	High-Strength Alloy 4340, 4330V, 300M, etc.	225 - 400	Carbide	100 - 180	0.02 - 0.05	0.05 - 0.10	0.08 - 0.13	0.13 - 0.20
	Structural Steel A36, A285, A516, etc.	100 - 350	Carbide	145 - 280	0.02 - 0.05	0.05 - 0.10	0.08 - 0.13	0.13 - 0.20
	Tool Steel H-13, H-21, A-4, O-2, S-3, etc.	150 - 250	Carbide	100 - 180	0.02 - 0.05	0.05 - 0.08	0.08 - 0.10	0.10 - 0.15
S	High-Temp Alloy Hastelloy B, Inconel 600, etc.	140 - 310	Carbide	30 - 70	0.02 - 0.05	0.05 - 0.08	0.08 - 0.13	0.10 - 0.15
	Titanium Alloy	140 - 310	Carbide	40 - 90	0.02 - 0.05	0.05 - 0.08	0.08 - 0.13	0.10 - 0.15
	Aerospace Alloy S82	185 - 350	Carbide	40 - 90	0.02 - 0.05	0.05 - 0.08	0.08 - 0.13	0.10 - 0.15
M	Stainless Steel 400 Series 416, 420, etc.	185 - 350	Carbide	50 - 120	0.02 - 0.05	0.05 - 0.10	0.08 - 0.10	0.10 - 0.15
	Stainless Steel 300 Series 304, 316, 17-4PH, etc.	135 - 275	Carbide	90 - 160	0.02 - 0.05	0.05 - 0.10	0.08 - 0.10	0.10 - 0.15
	Super Duplex Stainless Steel	135 - 275	Carbide	60 - 160	0.02 - 0.05	0.05 - 0.10	0.08 - 0.10	0.10 - 0.15

*Not to exceed max recommended RPM for boring head found in corresponding Wohlhaupter Operation Manual.

Deep Hole Boring Speed Adjustment

Recommended Speed Example

⚠ For Dynamic Boring Tool NOVI ^{TECH} ® Length			
Boring Type	8xD	9xD	10xD
Roughing	0.80	0.60	0.40
Finishing	0.90	0.70	0.50

If the recommended speed for a finish boring assembly under 5xD is 120 m/min, then the speed for a 10xD finish boring assembly in the same application would be 60 m/min (120 m/min x 0.50 = 60 m/min).

5xD = 120 m/min

10xD = 60 m/min

*Not to exceed recommended RPM printed on NOVI^{TECH}® module.

IMPORTANT: Max spindle speed refers to maximum possible speed for individual boring head and is not a recommended parameter. Factory technical assistance is available for your specific applications through our Application Engineering department. ext: 7611 | email: appeng@alliedmachine.com

⚠ WARNING Tool failure can cause serious injury. To prevent:

- Do not exceed recommended 10xD length-to-diameter ratio or exceed four total components (including shank).
- When using Alu-Line components, do not exceed recommended 5xD length-to-diameter ratio.
- When using tool steel components, do not exceed recommended 6xD length-to-diameter ratio.
- When using heavy metal components, do not exceed recommended 8xD length-to-diameter ratio.
- When using a carbide shank, do not exceed recommended 9xD length-to-diameter ratio.
- When using a NOVI^{TECH}® module, do not exceed recommended 10xD length-to-diameter ratio.

Factory technical assistance is available for your specific applications through our Application Engineering department. ext: 7611 | email: appeng@alliedmachine.com

Finish Machining Recommended Cutting Data | Metric (mm)

ISO	Material	(BHN) Hardness	Grade	*Speed M / Min	Recommended Feed (mm / tooth) Nose Radii			
					0.1 mm	0.2 mm	0.4 mm	0.8 mm
H	Wear Plate Hardox®, AR400, T-1, etc.	400 - 600	Carbide	30 - 60	0.02 - 0.05	0.05 - 0.08	0.08 - 0.10	0.10 - 0.15
			CBN	70 - 180	0.02 - 0.05	0.05 - 0.08	0.08 - 0.10	0.10 - 0.15
	Hardened Steel	300 - 500	Carbide	40 - 80	0.02 - 0.05	0.05 - 0.08	0.08 - 0.10	0.10 - 0.15
			CBN	70 - 180	0.02 - 0.05	0.05 - 0.08	0.08 - 0.10	0.10 - 0.15
K	SG / Nodular Cast Iron	120 - 320	Carbide	145 - 260	0.02 - 0.05	0.05 - 0.10	0.08 - 0.13	0.13 - 0.20
	Grey / White Iron	180 - 320	Carbide	180 - 320	0.02 - 0.05	0.05 - 0.10	0.08 - 0.13	0.13 - 0.20
			CBN	400 - 1000	0.02 - 0.05	0.05 - 0.10	0.08 - 0.13	0.13 - 0.20
N	Cast Aluminum	30 - 180	Carbide	260 - 850	0.02 - 0.05	0.05 - 0.10	0.08 - 0.13	0.13 - 0.20
			PCD	495 - 1995	0.02 - 0.05	0.05 - 0.10	0.08 - 0.13	0.13 - 0.20
	Wrought Aluminum	30 - 180	Carbide	205 - 600	0.02 - 0.05	0.05 - 0.13	0.10 - 0.15	0.15 - 0.23
	Aluminum Bronze	100 - 250	Carbide	145 - 280	0.02 - 0.05	0.05 - 0.10	0.10 - 0.13	0.13 - 0.20
	Brass	100	Carbide	205 - 600	0.02 - 0.05	0.05 - 0.10	0.08 - 0.13	0.13 - 0.20
Copper	60	Carbide	100 - 180	0.02 - 0.05	0.05 - 0.08	0.08 - 0.10	0.10 - 0.13	

*Not to exceed max recommended RPM for boring head found in corresponding Wohlhaupter Operation Manual.

Deep Hole Boring Speed Adjustment

⚠ For Dynamic Boring Tool NOVI^{TECH} Length

Boring Type	8xD	9xD	10xD
Roughing	0.80	0.60	0.40
Finishing	0.90	0.70	0.50

*Not to exceed recommended RPM printed on NOVI^{TECH} module.

Recommended Speed Example

If the recommended speed for a finish boring assembly under 5xD is 120 m/min, then the speed for a 10xD finish boring assembly in the same application would be 60 m/min (120 m/min x 0.50 = 60 m/min).

5xD = 120 m/min

10xD = 60 m/min

IMPORTANT: Max spindle speed refers to maximum possible speed for individual boring head and is not a recommended parameter. Factory technical assistance is available for your specific applications through our Application Engineering department. ext: 7611 | email: appeng@alliedmachine.com

⚠ WARNING Tool failure can cause serious injury. To prevent:

- Do not exceed recommended 10xD length-to-diameter ratio or exceed four total components (including shank).
- When using Alu-Line components, do not exceed recommended 5xD length-to-diameter ratio.
- When using tool steel components, do not exceed recommended 6xD length-to-diameter ratio.
- When using heavy metal components, do not exceed recommended 8xD length-to-diameter ratio.
- When using a carbide shank, do not exceed recommended 9xD length-to-diameter ratio.
- When using a NOVI^{TECH} module, do not exceed recommended 10xD length-to-diameter ratio.

Factory technical assistance is available for your specific applications through our Application Engineering department. ext: 7611 | email: appeng@alliedmachine.com

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Boring Insert Wear Patterns

Built-up Edge

Potential Problem

- Machined material adheres to the cutting edge of insert.
- When it breaks, the edge becomes brittle and cracks.
- This can negatively affect machined surface.



Possible Solution

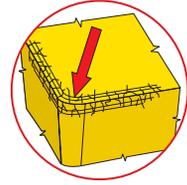
- Increase temperature by increasing speed or feed.
- Use an insert with higher lubricity coating.
- Choose a freer cutting insert geometry.



Comb Cracks

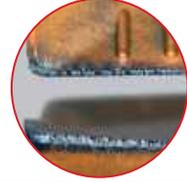
Potential Problem

- Caused by high stress on the cutting edge during interrupted cuts.



Possible Solution

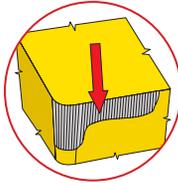
- Switch off coolant or increase coolant flow to obtain an even temperature level.
- Reduce cutting speed.
- Use tougher insert grade.



Flank Wear

Potential Problem

- Caused by friction between the insert and machined material.
- It cannot be fully eliminated, but it can be reduced.



Possible Solution

- Use a more wear-resistant grade
- Reduce cutting speed.
- Use coolant or increase coolant flow to the cutting edge.



Plastic Deformation

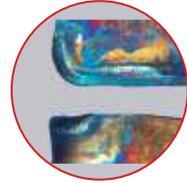
Potential Problem

- Caused by high thermal stress on the cutting edge from excessive feed rate and cutting speed.



Possible Solution

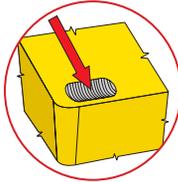
- Use a more wear-resistant grade.
- Reduce cutting speed.
- Reduce feed rate.
- Use coolant or increase coolant flow to the cutting edge.



Cratering

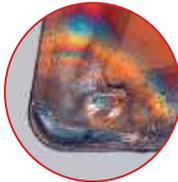
Potential Problem

- Appears when the geometry is too neutral or material is too hard for the substrate.



Possible Solution

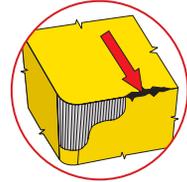
- Use a more wear-resistant grade.
- Reduce cutting speed or feed.
- Use coolant or increase coolant flow to the cutting edge.



Chipping of Cutting Edge (Out of Cut)

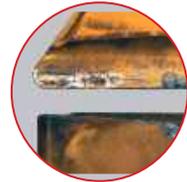
Potential Problem

- Caused by poor chip control.
- Can damage the portion of the cutting edge that might not be engaged in the cut.



Possible Solution

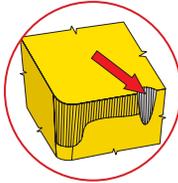
- Change feed rate to gain chip control.
- Select a tool with a different approach angle.
- Use an insert with a different geometry.
- Use a tougher grade of carbide.



Notch Wear

Potential Problem

- Occurs when cutting edge of insert comes in contact with surface of machined material.
- Caused by hardening of surface layer of material and burrs.
- Often appears on stainless austenitic steels and other high-temperature alloy steels.



Possible Solution

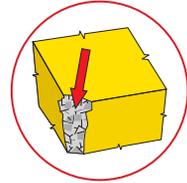
- Use a more wear-resistant grade (Al_2O_3).
- Select a tool with a smaller approach angle.
- Vary the radial depth of cut.
- Use coolant or increase coolant flow to the cutting edge.



Insert Fracture

Potential Problem

- Caused by workpiece material, grade, condition, the rigidity of the machine-tool workpiece, extent of wear, and cutting conditions.



Possible Solution

- Use a tougher grade of carbide.
- Reduce the feed and depth of cut.
- Use an insert with a stronger chip breaker.
- Use an insert with a bigger corner radius.



SECTION

B10-I

Modular Tool Holders

Wohlhaupter® Modular Tool Holders

Adapter Sleeves | Drill Chucks | Collet Chucks | Milling Arbors | Holding Arbors | Hydraulic Clamping Chucks
Tapping Chucks | Boring Bar Blanks



Clamping Tools with MVS Connection

Wohlhaupter offers a complete range of tool holders that incorporates the MVS connection. Our clamping tools allow for smaller MVS tools to connect and provide a quick and inexpensive alternative to special tooling. The clamping tools also feature coolant-through capabilities.

Your safety and the safety of others is very important. This catalog contains important safety messages. Always read and follow all safety precautions.



This triangle is a safety hazard symbol. It alerts you to potential safety hazards that can cause tool failure and serious injury.

When you see this symbol in the catalog, look for a related safety message that may be near this triangle or referred to in the nearby text.

There are safety signal words also used in the catalog. Safety messages follow these words.

WARNING

WARNING (shown above) means that failure to follow the precautions in this message could result in tool failure and serious injury.

NOTICE means that failure to follow the precautions in this message could result in damage to the tool or machine but not result in personal injury.

NOTE and **IMPORTANT** are also used. These are important that you read and follow but are not safety-related.

Visit www.alliedmachine.com for the most up-to-date information and procedures.

Applicable Industries



Aerospace



Agriculture



Automotive



Firearms



General
Machining



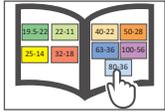
Oil & Gas



Renewable
Energy

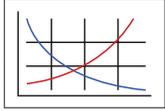
Reference Icons

The following icons will appear throughout the catalog to help you navigate between products.



MVS Connection Color Guide

Detailed instructions and information regarding the MVS connection(s)



Recommended Cutting Data

Speed and feed recommendations for optimum and safe boring



Coolant-Through Option

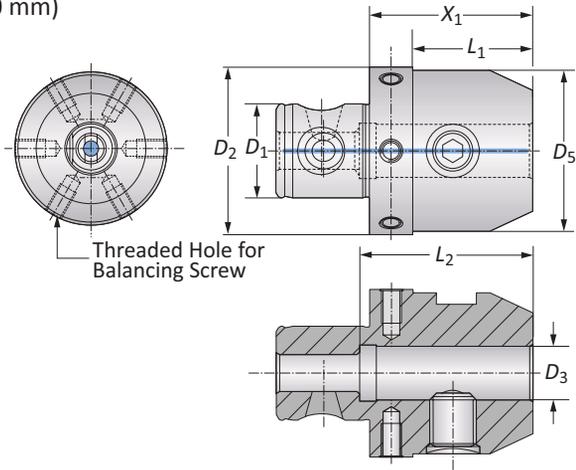
Indicates that the product is coolant through

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Adapter Side Lock for Cylindrical Shanks DIN 1835B

Clamping Diameter Range: 0.236" - 1.575" (6.00 mm - 40.00 mm)



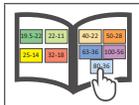
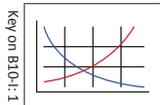
MVS Connection	Clamping Range	Adapter Sleeve				Weight	Balancing Screw	Part No.	
		$D_2 D_1$	D_3	X_1	L_1				L_2
	32 - 18	0.236	1.417	0.906	1.575	0.984	0.441 (lbs)	M5 x .8 x 6	228022
	32 - 18	0.315	1.417	0.906	1.575	1.102	0.441 (lbs)	M5 x .8 x 6	228023
	32 - 18	0.394	1.890	-	1.732	1.378	0.661 (lbs)	M5 x .8 x 6	228024
	40 - 22	0.472	2.047	-	1.929	1.654	1.102 (lbs)	M5 x .8 x 8	228025
	40 - 22	0.551	2.126	-	1.929	1.732	1.323 (lbs)	M5 x .8 x 8	228026
	50 - 28	0.236	1.417	0.906	1.575	0.984	0.882 (lbs)	M6 x 1 x 10	162015
	50 - 28	0.315	1.417	0.906	1.575	1.102	0.882 (lbs)	M6 x 1 x 10	162016
i	50 - 28	0.394	1.732	1.220	1.732	1.378	1.102 (lbs)	M6 x 1 x 10	162017
	50 - 28	0.472	1.732	1.220	1.929	1.654	1.102 (lbs)	M6 x 1 x 10	162018
	50 - 28	0.630	1.929	1.417	2.047	1.890	2.205 (lbs)	M6 x 1 x 10	162019
	50 - 28	0.709	1.929	1.417	2.047	1.890	2.205 (lbs)	M6 x 1 x 10	228014
	50 - 28	0.787	2.362	-	2.126	2.047	2.646 (lbs)	M6 x 1 x 10	162020
	63 - 36	0.787	1.929	1.417	2.126	2.047	2.425 (lbs)	M6 x 1 x 10	161024
	63 - 36	0.984	2.953	-	2.323	2.480	4.189 (lbs)	M6 x 1 x 15	161026
	63 - 36	1.260	2.953	-	2.480	2.835	4.851 (lbs)	M6 x 1 x 15	161027
	80 - 36	1.575	3.346	-	2.874	3.150	5.512 (lbs)	M6 x 1 x 15	161028
	32 - 18	6.00	36.00	23.00	40.00	25.00	0.20 (kg)	M5 x .8 x 6	228022
	32 - 18	8.00	36.00	23.00	40.00	28.00	0.20 (kg)	M5 x .8 x 6	228023
	32 - 18	10.00	48.00	-	44.00	35.00	0.30 (kg)	M5 x .8 x 6	228024
	40 - 22	12.00	52.00	-	49.00	42.00	0.50 (kg)	M5 x .8 x 8	228025
	40 - 22	14.00	54.00	-	49.00	44.00	0.60 (kg)	M5 x .8 x 8	228026
	50 - 28	6.00	36.00	23.00	40.00	25.00	0.40 (kg)	M6 x 1 x 10	162015
	50 - 28	8.00	36.00	23.00	40.00	28.00	0.40 (kg)	M6 x 1 x 10	162016
m	50 - 28	10.00	44.00	31.00	44.00	35.00	0.50 (kg)	M6 x 1 x 10	162017
	50 - 28	12.00	44.00	31.00	49.00	42.00	0.50 (kg)	M6 x 1 x 10	162018
	50 - 28	16.00	49.00	36.00	52.00	48.00	1.00 (kg)	M6 x 1 x 10	162019
	50 - 28	18.00	49.00	36.00	52.00	48.00	1.00 (kg)	M6 x 1 x 10	228014
	50 - 28	20.00	60.00	-	54.00	52.00	1.20 (kg)	M6 x 1 x 10	162020
	63 - 36	20.00	49.00	36.00	54.00	52.00	1.10 (kg)	M6 x 1 x 10	161024
	63 - 36	25.00	75.00	-	59.00	63.00	1.90 (kg)	M6 x 1 x 15	161026
	63 - 36	32.00	75.00	-	63.00	72.00	2.20 (kg)	M6 x 1 x 15	161027
	80 - 36	40.00	85.00	-	73.00	80.00	2.50 (kg)	M6 x 1 x 15	161028

NOTE: Balanced 10 gmm/kg.

NOTE: When using a ball pressure screw instead of a thread pin, it's similar to DIN 1835E, without axial adjustment. See ball pressure screws on page B10-I: 9.

B10-M: 12-19

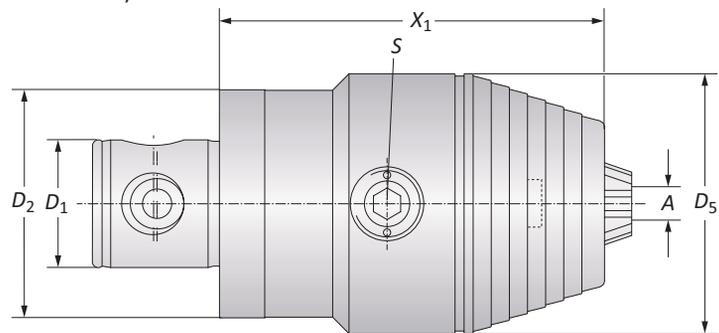
B10: vi-vii



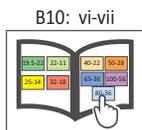
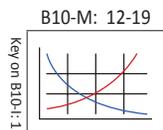
i = Imperial (in)
m = Metric (mm)

Drill Chucks for Clockwise and Counterclockwise Rotation

Clamping Diameter Range: 0.019" - 0.629" (0.50 mm - 16.00 mm)



	MVS Connection	Clamping Range	Drill Chuck			Weight	Part No.
	D ₂ D ₁		A	X ₁	D ₅		
i	50 - 28	0.019 - 0.511	3.150	1.969	s6 / B	2.425 (lbs)	209088
	50 - 28	0.098 - 0.629	3.346	2.244	s6 / B	2.866 (lbs)	209089
	63 - 36	0.019 - 0.511	3.150	1.969	s6 / B	2.866 (lbs)	209090
	63 - 36	0.098 - 0.629	3.346	2.244	s6 / B	3.307 (lbs)	209091
m	50 - 28	0.50 - 13.00	80.00	50.00	s6 / B	1.10 (kg)	209088
	50 - 28	2.50 - 16.00	85.00	57.00	s6 / B	1.30 (kg)	209089
	63 - 36	0.50 - 13.00	80.00	50.00	s6 / B	1.30 (kg)	209090
	63 - 36	2.50 - 16.00	85.00	57.00	s6 / B	1.50 (kg)	209091

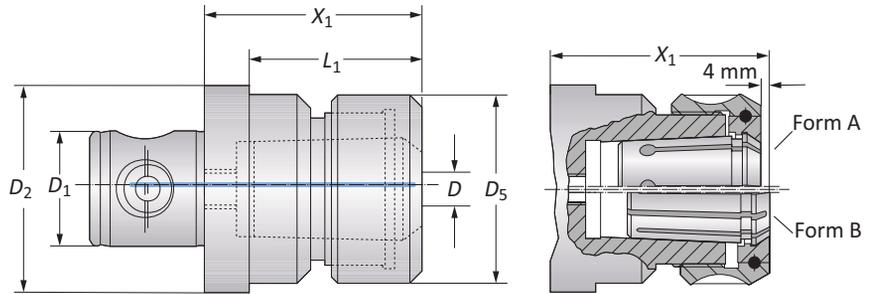


i = Imperial (in)
m = Metric (mm)

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Collet Chucks ISO 10897 (DIN 6388) | ISO 15488 (DIN 6499)

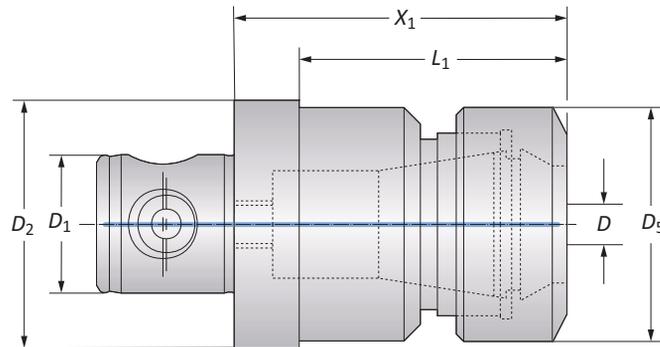
Clamping Diameter Range: 0.078" - 1.259" (2.00 mm - 32.00 mm)



Collet Chucks ISO 10897 (DIN 6388) | Diameter Range: 0.078" - 1.259" (2.00 mm - 32.00 mm)

MVS Connection	Clamping Range	Nominal Size	Collet Chuck			Weight	Part No.	
			D_2 D_1	D	X_1^*			L_1
i	40 - 22	0.078 - 0.629	16	2.520	-	1.693	1.102 (lbs)	209082
	50 - 28	0.078 - 0.629	16	2.480	1.968	1.693	1.984 (lbs)	162011
	50 - 28	0.078 - 0.984	25	2.913	-	2.362	2.205 (lbs)	209083
	63 - 36	0.078 - 0.984	25	2.913	-	2.362	3.087 (lbs)	161016
	63 - 36	0.157 - 1.259	32	3.504	-	2.835	3.969 (lbs)	161098
m	40 - 22	2.00 - 16.00	16	64.00	-	43.00	0.50 (kg)	209082
	50 - 28	2.00 - 16.00	16	63.00	50.00	43.00	0.90 (kg)	162011
	50 - 28	2.00 - 25.00	25	74.00	-	60.00	1.00 (kg)	209083
	63 - 36	2.00 - 25.00	25	74.00	-	60.00	1.40 (kg)	161016
	63 - 36	4.00 - 32.00	32	89.00	-	72.00	1.80 (kg)	161098

* X_1 Clamping nut with ball-bearing.



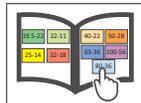
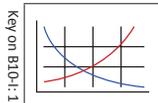
Collet Chucks ISO 15488 (DIN 6499) | Diameter Range: 0.039" - 1.023" (1.00 mm - 26.00 mm)

MVS Connection	Clamping Range	Nominal Size	Collet Chuck			Weight	Part No.	
			D_2 D_1	D	X_1^*			L_1
i	32 - 18	0.039 - 0.393	ER 16	2.125	1.614	1.102	0.441 (lbs)	228020
	40 - 22	0.078 - 0.629	ER 25	2.953	-	1.654	1.323 (lbs)	228021
	50 - 28	0.078 - 0.629	ER 25	2.953	2.441	1.654	1.764 (lbs)	228003
	50 - 28	0.078 - 0.787	ER 32	2.992	-	1.969	1.764 (lbs)	228004
	63 - 36	0.078 - 0.787	ER 32	2.992	2.480	1.969	2.646 (lbs)	228007
	63 - 36	0.157 - 1.023	ER 40	3.465	-	2.480	2.646 (lbs)	228006
m	32 - 18	1.00 - 10.00	ER 16	54.00	4100	28.00	0.20 (kg)	228020
	40 - 22	2.00 - 16.00	ER 25	75.00	-	42.00	0.60 (kg)	228021
	50 - 28	2.00 - 16.00	ER 25	75.00	62.00	42.00	0.80 (kg)	228003
	50 - 28	2.00 - 20.00	ER 32	76.00	-	50.00	0.80 (kg)	228004
	63 - 36	2.00 - 20.00	ER 32	76.00	63.00	50.00	1.20 (kg)	228007
	63 - 36	4.00 - 26.00	ER 40	88.00	-	63.00	1.20 (kg)	228006

* X_1 Clamping nut with sliding ring.

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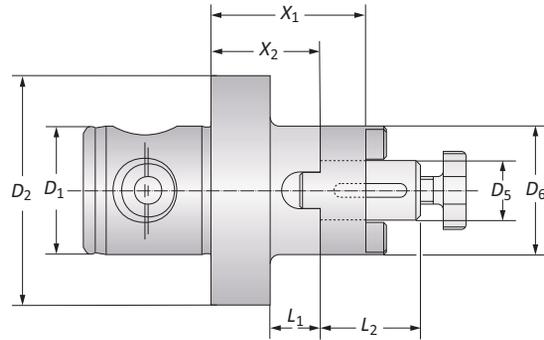
B10: vi-vii



i = Imperial (in)
m = Metric (mm)

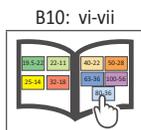
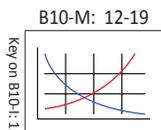
Milling Machine Arbors

For Milling Cutters with Longitudinal or Transverse Drive | Shell Mill Adapter Range: 0.512" - 1.575" (13.00 mm - 40.00 mm)



	MVS Connection	Adapter Range	Milling Arbor					Weight	Part No.
	D ₂ D ₁		D ₅	X ₁	X ₂	L ₁	L ₂		
i	50 - 28	0.512	1.339	0.945	0.433	0.866	1.102	0.882 (lbs)	162002
	50 - 28	0.630	1.575	1.181	0.669	1.063	1.260	1.102 (lbs)	162003
	50 - 28	0.866	1.575	1.102	0.591	1.220	1.575	1.323 (lbs)	162004
	63 - 36	0.630	1.575	1.181	0.669	1.063	1.260	1.764 (lbs)	161002
	63 - 36	0.866	1.575	1.102	0.591	1.220	1.575	1.984 (lbs)	161003
	63 - 36	1.063	1.575	1.102	0.591	1.299	1.890	2.425 (lbs)	161004
	63 - 36	1.260	1.575	1.024	0.512	1.496	2.283	2.866 (lbs)	161005
	80 - 36	1.575	2.087	1.535	-	1.614	2.756*	5.733 (lbs)	161006
m	50 - 28	13.00	34.00	24.00	11.00	22.00	28.00	0.40 (kg)	162002
	50 - 28	16.00	40.00	30.00	17.00	27.00	32.00	0.50 (kg)	162003
	50 - 28	22.00	40.00	28.00	15.00	31.00	40.00	0.60 (kg)	162004
	63 - 36	16.00	40.00	30.00	17.00	27.00	32.00	0.80 (kg)	161002
	63 - 36	22.00	40.00	28.00	15.00	31.00	40.00	0.90 (kg)	161003
	63 - 36	27.00	40.00	28.00	15.00	33.00	48.00	1.10 (kg)	161004
	63 - 36	32.00	40.00	26.00	13.00	38.00	58.00	1.30 (kg)	161005
	80 - 36	40.00	53.00	39.00	-	41.00	70.00*	2.60 (kg)	161006

*Ø 2.756" (70.00 mm) with clutch drive ring.

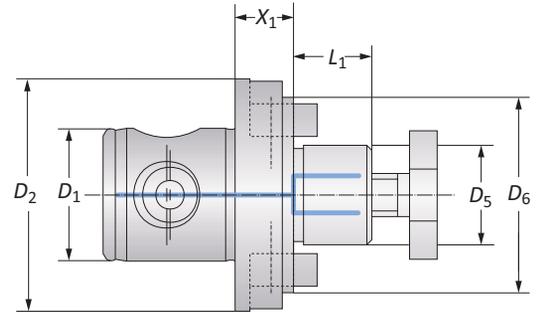
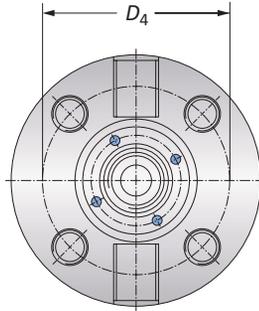


i = Imperial (in)
m = Metric (mm)

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Holding Arbors for Milling Cutters

Central Coolant Feed | Shell Mill Adapter Range: 0.630" - 1.575" (16.00 mm - 40.00 mm)

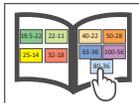
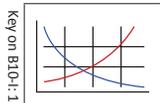


	MVS Connection	Adapter Range	Holding Arbor				Weight	Part No.
	D_2 D_1	D_5	X_1	L_1	D_4	D_6		
i	50 - 28	0.630	0.630	0.669	-	1.575	0.882 (lbs)	162032
	50 - 28	0.866	0.630	0.748	-	1.969	1.102 (lbs)	162033
	63 - 36	1.063	0.630	0.827	-	2.362	1.764 (lbs)	161082
	80 - 36	1.260	0.630	0.945	-	3.071	2.425 (lbs)	209080
	80 - 36	1.575	0.748	1.063	2.626	3.504	3.307 (lbs)	209081
m	50 - 28	16.00	16.00	17.00	-	40.00	0.40 (kg)	162032
	50 - 28	22.00	16.00	19.00	-	50.00	0.50 (kg)	162033
	63 - 36	27.00	16.00	21.00	-	60.00	0.80 (kg)	161082
	80 - 36	32.00	16.00	24.00	-	78.00	1.10 (kg)	209080
	80 - 36	40.00	19.00	27.00	66.70	89.00	1.50 (kg)	209081

NOTE: See page B10-G: 15 for holding arbor with MVS 100 - 56 connection .

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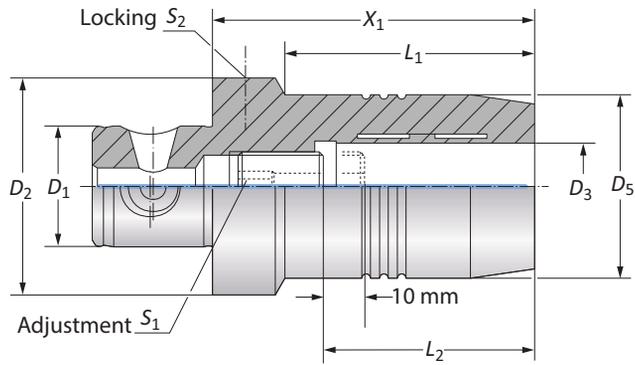
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i = Imperial (in)
m = Metric (mm)

Clamping Chucks | Tapping Chucks

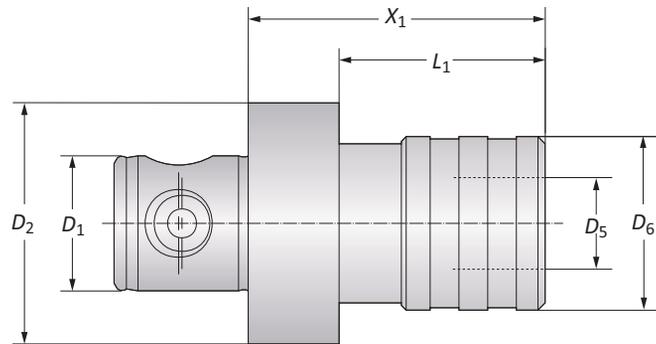
Clamping Range: 0.787" (20.00 mm)



Coolant-Through Hydraulic Clamping Chucks

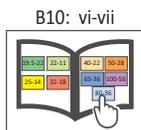
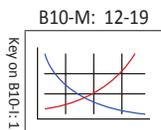
	MVS Connection	Clamping Range	Clamping Chuck						Weight	Part No.
	D ₂ D ₁		D ₃	X ₁	D ₅	L ₁	L ₂	S ₁		
i	50 - 28	0.787	2.953	1.654	2.283	2.008	s6	s5	1.764 (lbs)	209044
	63 - 36	0.787	2.953	1.654	2.087	2.008	s5	s5	2.425 (lbs)	209045
m	50 - 28	20.00	75.00	42.00	58.00	51.00	s6	s5	0.80 (kg)	209044
	63 - 36	20.00	75.00	42.00	53.00	51.00	s5	s5	1.10 (kg)	209045

NOTE: Balanced 10 gmm/kg.



Tapping Chucks (Non-Coolant)

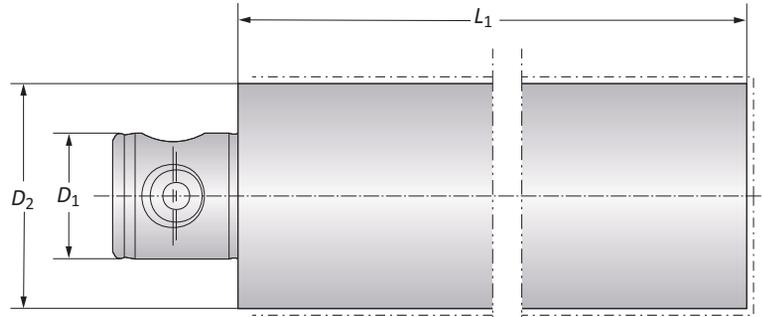
	MVS Connection	Quick Change Adapters		Tapping Chucks				Length Compensation		Weight	Part No.
		For Taps	Nominal Size	X ₁	L ₁	D ₅	D ₆	Pressure	Tension		
i	50 - 28	M 3 - M 12	1	2.441	1.929	0.748	1.634	0.295	0.295	1.543 (lbs)	209098
	50 - 28	M 6 - M 20	2	3.701	-	1.220	2.374	0.394	0.394	2.425 (lbs)	209099
	63 - 36	M 3 - M 12	1	2.205	1.693	0.748	1.634	0.295	0.295	1.764 (lbs)	231005
	63 - 36	M 6 - M 20	2	3.150	2.638	1.220	2.374	0.394	0.394	2.866 (lbs)	231006
	63 - 36	M 14 - M 33	3	5.984	-	1.890	3.386	0.689	0.689	9.040 (lbs)	231007
m	50 - 28	M 3 - M 12	1	62.00	49.00	19.00	41.50	7.50	7.50	0.70 (kg)	209098
	50 - 28	M 6 - M 20	2	94.00	-	31.00	60.30	10.00	10.00	1.10 (kg)	209099
	63 - 36	M 3 - M 12	1	56.00	43.00	19.00	41.50	7.50	7.50	0.80 (kg)	231005
	63 - 36	M 6 - M 20	2	80.00	67.00	31.00	60.30	10.00	10.00	1.30 (kg)	231006
	63 - 36	M 14 - M 33	3	152.00	-	48.00	86.00	17.50	17.50	4.10 (kg)	231007



i = Imperial (in)
m = Metric (mm)

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Boring Bar Blanks

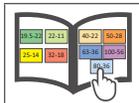
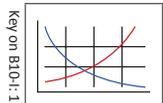


NOTE: The blanks are unhardened and unground in areas marked.

	MVS Connection	Boring Bar Blanks		
	$D_2 D_1$	L_1	Weight	Part No.
i	50 - 28	6.299	5.733 (lbs)	166103
	63 - 36	6.299	9.261 (lbs)	166104
	80 - 36	6.299	14.550 (lbs)	166105
m	50 - 28	160.00	2.60 (kg)	166103
	63 - 36	160.00	4.20 (kg)	166104
	80 - 36	160.00	6.60 (kg)	166105

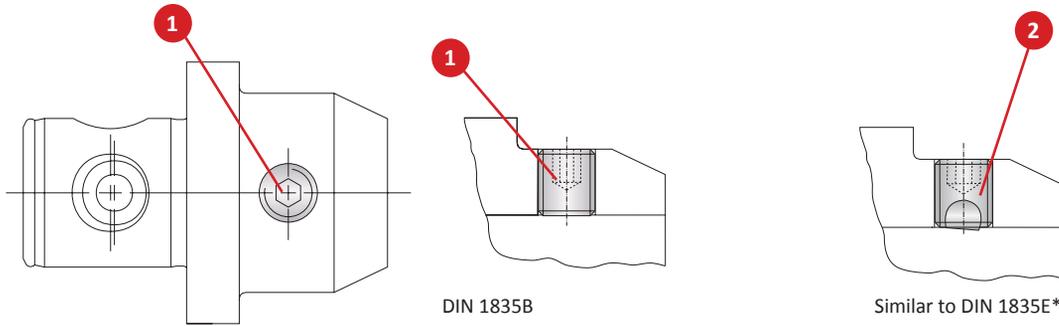
B10-M: 12-19

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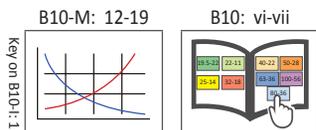
i = Imperial (in)
m = Metric (mm)

Accessories for Adapter Sleeves



Clamping Diameter	1 Thread Pin		2 Ball Pressure Screw			
	Part No.	Service Key	Part No.	Service Key	Thread	
i	0.236	115680	s3 / B	315788	s3 / B	M6 x 1
	0.315	115681	s4 / B	315789	s4 / B	M8 x 1.25
	0.394	115682	s5 / B	515535	s5 / B	M10 x 1.5
	0.472	115683	s6 / B	315790	s6 / B	M12 x 1.75
	0.551	115683	s6 / B	315790	s6 / B	M12 x 1.75
	0.630	115684	s6 / B	515675	s6 / B	M14 x 2
	0.709	115684	s6 / B	515675	s6 / B	M14 x 2
	0.787	115685	s8 / B	515676	s8 / B	M16 x 2
	0.984	115686	s10 / B	515677	s10 / B	M18 x 2 (2x)
	1.260	115687	s10 / B	515678	s10 / B	M20 x 2 (2x)
1.575	115687	s10 / B	515678	s10 / B	M20 x 2 (2x)	
m	6.00	115680	s3 / B	315788	s3 / B	M6 x 1
	8.00	115681	s4 / B	315789	s4 / B	M8 x 1.25
	10.00	115682	s5 / B	515535	s5 / B	M10 x 1.5
	12.00	115683	s6 / B	315790	s6 / B	M12 x 1.75
	14.00	115683	s6 / B	315790	s6 / B	M12 x 1.75
	16.00	115684	s6 / B	515675	s6 / B	M14 x 2
	18.00	115684	s6 / B	515675	s6 / B	M14 x 2
	20.00	115685	s8 / B	515676	s8 / B	M16 x 2
	25.00	115686	s10 / B	515677	s10 / B	M18 x 2 (2x)
	32.00	115687	s10 / B	515678	s10 / B	M20 x 2 (2x)
40.00	115687	s10 / B	515678	s10 / B	M20 x 2 (2x)	

*Without axial adjustment.

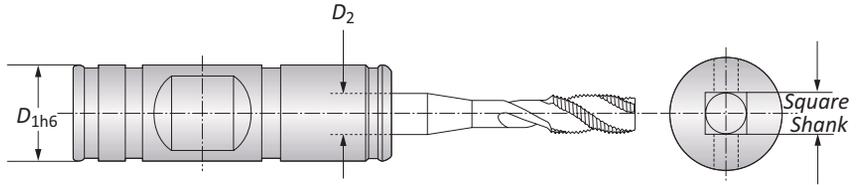


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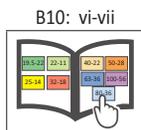
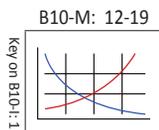
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Accessories for Adapter Sleeves

Adapter Sleeve for Tap Shanks Suitable for Reduction Sleeves with Shanks to DIN 1835-B



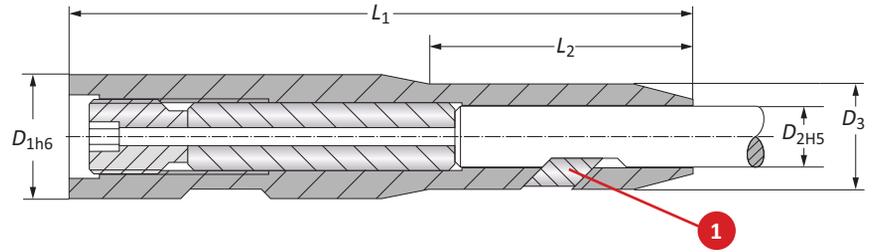
Adapter Sleeves		
D_{1h6}	$D_2 \times$ Square Shank	Part No.
0.315	0.098 x 0.082	271190
0.315	0.110 x 0.082	271191
0.394	0.137 x 0.106	271192
0.394	0.157 x 0.118	271193
0.394	0.177 x 0.133	271194
0.472	0.236 x 0.192	271195
0.551	0.275 x 0.216	271196
0.551	0.314 x 0.244	271197
0.630	0.354 x 0.275	271198
0.630	0.393 x 0.314	271199
i 0.709	0.433 x 0.354	271200
0.787	0.472 x 0.354	271201
0.984	0.551 x 0.433	271202
0.984	0.629 x 0.472	271203
1.260	0.708 x 0.570	271204
1.260	0.787 x 0.629	271205
1.260	0.866 x 0.708	271206
1.575	0.984 x 0.866	271207
1.575	1.102 x 0.866	271208
1.969	1.259 x 0.944	271209
1.969	1.417 x 1.141	271210
1.969	1.574 x 1.259	271211
<hr/>		
8.00	2.50 x 2.10	271190
8.00	2.80 x 2.10	271191
10.00	3.50 x 2.70	271192
10.00	4.00 x 3.00	271193
10.00	4.50 x 3.40	271194
12.00	6.00 x 4.90	271195
14.00	7.00 x 5.50	271196
14.00	8.00 x 6.20	271197
16.00	9.00 x 7.00	271198
16.00	10.00 x 8.00	271199
m 18.00	11.00 x 9.00	271200
20.00	12.00 x 9.00	271201
25.00	14.00 x 11.00	271202
25.00	16.00 x 12.00	271203
32.00	18.00 x 14.50	271204
32.00	20.00 x 16.00	271205
32.00	22.00 x 18.00	271206
40.00	25.00 x 20.00	271207
40.00	28.00 x 22.00	271208
50.00	32.00 x 24.00	271209
50.00	36.00 x 29.00	271210
50.00	40.00 x 32.00	271211



i = Imperial (in)
m = Metric (mm)

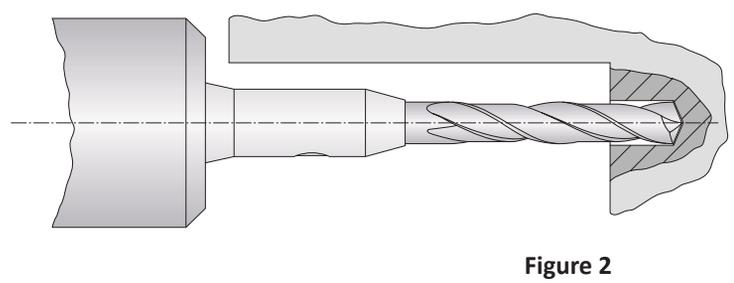
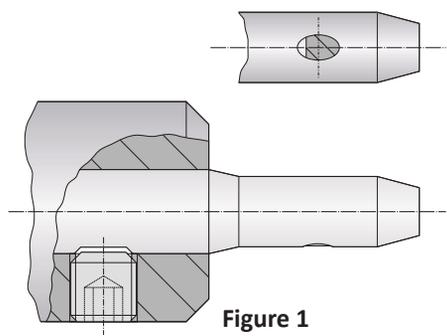
Accessories for Adapter Sleeves

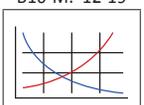
Micro Clamping Chucks Suitable for Reduction Sleeves with Shanks to DIN 1835-B



Micro Clamping Chuck					1 Clamping Wedge		
	D_{1h6}	D_{2H5}	D_3	L_1	L_2	Part No.	Part No.
i	0.630	0.236	0.472	3.937	1.575	219170	219070
	0.630	0.315	0.551	3.937	1.772	219171	219071
	0.787	0.394	0.669	3.937	1.693	219172	219072
	0.984	0.472	0.787	4.331	1.535	219173	219073
	0.984	0.551	0.866	4.331	1.811	219174	219074
	1.260	0.630	0.984	4.921	1.772	219174	219075
	1.260	0.709	1.063	5.118	2.126	219174	219076
	1.260	0.787	1.181	5.118	2.441	219175	219077
m	16.00	6.00	12.00	100.00	40.00	219170	219070
	16.00	8.00	14.00	100.00	45.00	219171	219071
	20.00	10.00	17.00	100.00	43.00	219172	219072
	25.00	12.00	20.00	110.00	39.00	219173	219073
	25.00	14.00	22.00	110.00	46.00	219174	219074
	32.00	16.00	25.00	125.00	45.00	219174	219075
	32.00	18.00	27.00	130.00	54.00	219174	219076
	32.00	20.00	30.00	130.00	62.00	219175	219077

NOTE: Clamping chucks are used in reduction sleeves for clamping tools with cylindrical shanks to DIN 1835-B (Fig. 1). The chucks' design allows the use of standard tools versus ordering special tools (Fig. 2).



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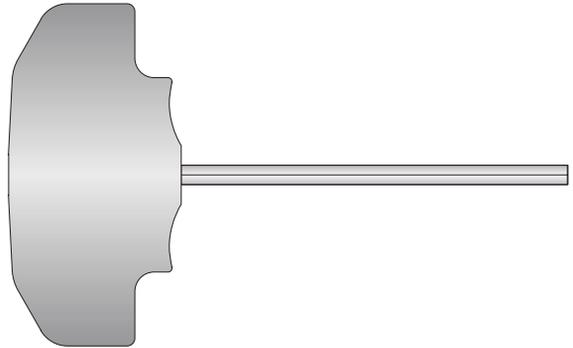
i = Imperial (in)
m = Metric (mm)

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Accessories for Drill Chucks

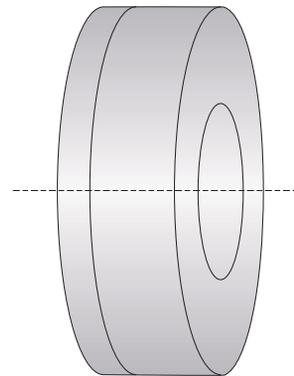
Service Keys for Drill Chucks

Service Key		Tightening Torque Nm	Part No.
Service Key	Type		
2.50	B	15	415577
6.00	B	15	115578



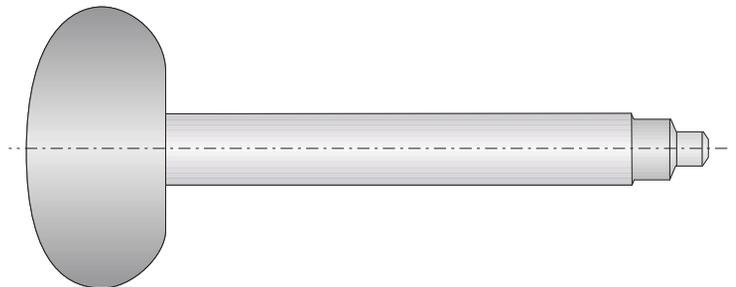
Gaskets for Drill Chucks

	Gasket		Part No.
	Gasket Diameter	Clamping Diameter	
i	0.118 - 0.236	0.019 - 0.511	387113
	0.236 - 0.511	0.019 - 0.511	387114
	0.118 - 0.236	0.098 - 0.629	387115
	0.236 - 0.629	0.098 - 0.629	387116
m	3.00 - 6.00	0.50 - 13.00	387113
	6.00 - 13.00	0.50 - 13.00	387114
	3.00 - 6.00	2.50 - 16.00	387115
	6.00 - 16.00	2.50 - 16.00	387116



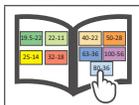
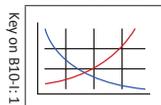
Assembly Tool for Gasket

Part No.
387112



B10-M: 12-19

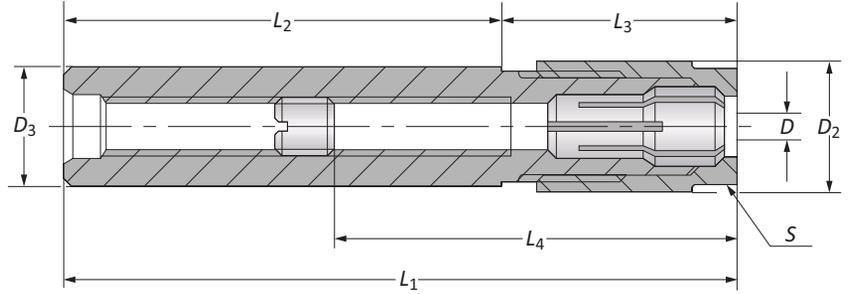
B10: vi-vii



i = Imperial (in)
m = Metric (mm)

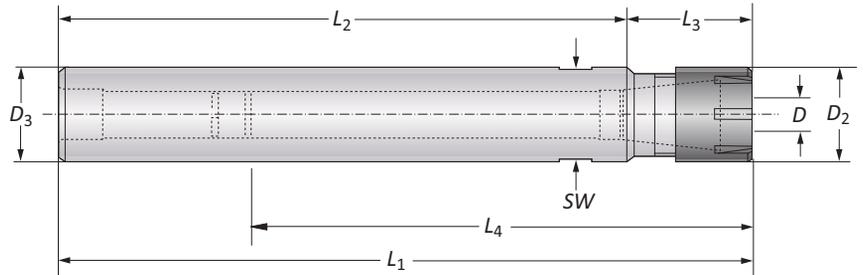
Collet Chucks for Erickson System | Cylindrical Collet Chucks for ISO 15488 (DIN 6499) Collets

Diameter Range: 0.039" - 0.393" (1.00 mm - 10.00 mm)



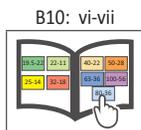
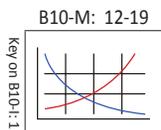
Collet Chucks for Erickson System

	Nominal Size	Clamping Range	Collet Chuck						Service Key	Weight	Part No.	
			D	D ₂	D ₃	L ₁	L ₂	L ₃				L ₄ Min
i	6	0.020 - 0.236	0.551	0.492	4.291	2.992	1.299	1.496	3.937	13	0.441 (lbs)	162080
	6	0.020 - 0.236	0.551	0.492	6.811	5.512	1.299	1.496	6.378	13	0.441 (lbs)	162081
	10	0.020 - 0.394	0.827	0.787	4606	2.992	1.614	1.575	4.055	19	0.661 (lbs)	162082
	10	0.020 - 0.394	0.827	0.787	7.126	5.512	1.614	1.575	6.575	19	0.661 (lbs)	162083
m	6	0.50 - 6.00	14.00	12.50	109.00	76.00	33.00	38.00	100.00	13	0.20 (kg)	162080
	6	0.50 - 6.00	14.00	12.50	173.00	140.00	33.00	38.00	162.00	13	0.20 (kg)	162081
	10	0.50 - 10.00	21.00	20.00	117.00	76.00	41.00	40.00	103.00	19	0.30 (kg)	162082
	10	0.50 - 10.00	21.00	20.00	181.00	140.00	41.00	40.00	167.00	19	0.30 (kg)	162083



Cylindrical Collet Chucks for ISO 15488 (DIN 6499) Collets

	Nominal Size	D	Collet Chuck						Hex Size	Part No.	
			D ₂	D ₃	L ₁	L ₂	L ₃	L ₄ Min			L ₄ Max
i	ER 8	0.039 - 0.196	0.472	0.315	4.961	3.937	1.024	1.437	1.437	09	209054
	ER 8	0.039 - 0.196	0.472	0.472	6.535	5.512	1.024	1.437	1.437	09	209055
	ER 11	0.039 - 0.275	0.630	0.630	4.193	3.150	1.043	0.906	2.559	11	209056
	ER 11	0.039 - 0.275	0.630	0.630	6.555	5.512	1.043	0.906	2.559	11	209057
	ER 16	0.039 - 0.393	0.866	0.787	4.665	3.150	1.516	1.299	4.016	17	209058
	ER 16	0.039 - 0.393	0.866	0.787	7.028	5.512	1.516	1.299	4.843	17	209059
m	ER 8	1.00 - 5.00	12.00	8.00	126.00	100.00	26.00	36.50	36.50	09	209054
	ER 8	1.00 - 5.00	12.00	12.00	166.00	140.00	26.00	36.50	36.50	09	209055
	ER 11	1.00 - 7.00	16.00	16.00	106.50	80.00	26.50	23.00	65.00	11	209056
	ER 11	1.00 - 7.00	16.00	16.00	166.50	140.00	26.50	23.00	65.00	11	209057
	ER 16	1.00 - 10.00	22.00	20.00	118.50	80.00	38.50	33.00	102.00	17	209058
	ER 16	1.00 - 10.00	22.00	20.00	178.50	140.00	38.50	33.00	123.00	17	209059

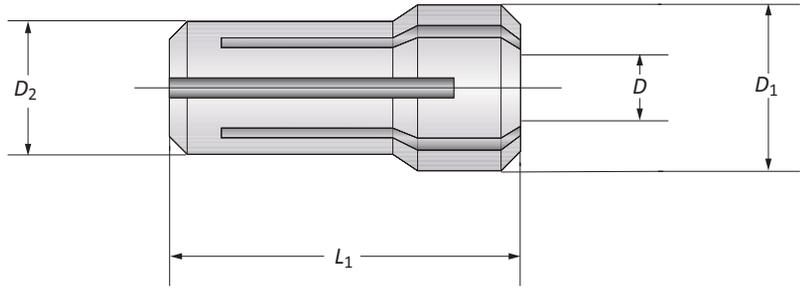


i = Imperial (in)
m = Metric (mm)

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Accessories for Collet Chucks

Diameter Range: 0.019" - 0.393" (0.50 mm - 10.00 mm)



Collet Sets for Erickson System

Nominal Size	Standard-No.	Set				Part No.
		D_1	D_2	L_1	D	
6	416 E	0.374	0.300	1.004	0.020 - 0.236	071016
	417 E	0.531	0.450	1.197	0.020 - 0.394	071017
10	416 E	9.50	7.62	25.50	0.50 - 6.00	071016
	417 E	13.50	11.43	30.40	0.50 - 10.00	071017

Collets for Erickson System

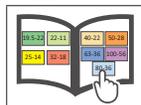
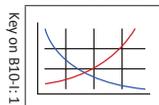
Collet Nominal Size	Diameter Range D	Part No.
6	0.020 - 0.039	071355
6	0.039 - 0.059	071356
6	0.059 - 0.079	071357
6	0.079 - 0.098	071358
6	0.098 - 0.118	071359
6	0.118 - 0.138	071360
6	0.138 - 0.157	071361
6	0.157 - 0.177	071362
6	0.177 - 0.197	071363
6	0.197 - 0.217	071364
6	0.217 - 0.236	071365
10	0.020 - 0.039	071368
10	0.039 - 0.059	071369
10	0.059 - 0.079	071370
10	0.079 - 0.098	071371
10	0.098 - 0.118	071372
10	0.118 - 0.138	071373
10	0.139 - 0.157	071374
10	0.157 - 0.177	071375
10	0.177 - 0.197	071376
10	0.197 - 0.217	071377
10	0.217 - 0.236	071378
10	0.236 - 0.256	071379
10	0.256 - 0.276	071380
10	0.276 - 0.295	071381
10	0.295 - 0.315	071382
10	0.315 - 0.335	071383
10	0.335 - 0.354	071384
10	0.354 - 0.374	071385
10	0.374 - 0.394	071681

Collets for Erickson System

Collet Nominal Size	Diameter Range D	Part No.
6	0.50 - 1.00	071355
6	1.00 - 1.50	071356
6	1.50 - 2.00	071357
6	2.00 - 2.50	071358
6	2.50 - 3.00	071359
6	3.00 - 3.50	071360
6	3.50 - 4.00	071361
6	4.00 - 4.50	071362
6	4.50 - 5.00	071363
6	5.00 - 5.50	071364
6	5.50 - 6.00	071365
10	0.50 - 1.00	071368
10	1.00 - 1.50	071369
10	1.50 - 2.00	071370
10	2.00 - 2.50	071371
10	2.50 - 3.00	071372
10	3.00 - 3.50	071373
10	3.50 - 4.00	071374
10	4.00 - 4.50	071375
10	4.50 - 5.00	071376
10	5.00 - 5.50	071377
10	5.50 - 6.00	071378
10	6.00 - 6.50	071379
10	6.50 - 7.00	071380
10	7.00 - 7.50	071381
10	7.50 - 8.00	071382
10	8.00 - 8.50	071383
10	8.50 - 9.00	071384
10	9.00 - 9.50	071385
10	9.50 - 10.00	071681

B10-M: 12-19

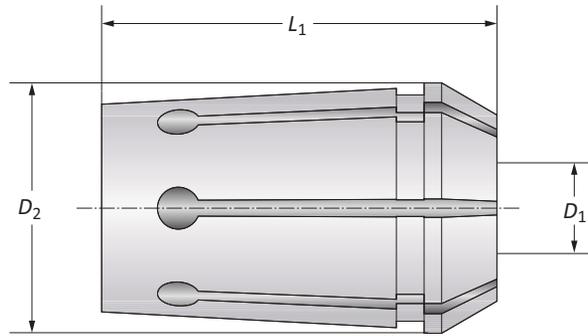
B10: vi-vii



i = Imperial (in)
m = Metric (mm)

Accessories for Collet Chucks

ISO 10897-A (DIN 6388-A)



Collet Sets

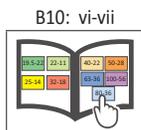
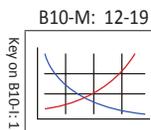
	Nominal Size	Standard-No.	Set			Part No.
			D_2	L_1	D_1	
i	A 16	410 E	0.891	1.574	0.079 - 0.630	071003
	A 25	444 E	1.295	2.047	0.079 - 0.984	071004
	A 32	450 E	1.625	2.362	0.157 - 1.259	071019
m	A 16	410 E	22.65	40.00	2.00 - 16.00	071003
	A 25	444 E	32.90	52.00	2.00 - 25.00	071004
	A 32	450 E	41.30	60.00	4.00 - 32.00	071019

Collets

	Nominal Size	Diameter	Part No.
		D_1	
i	A 16	0.079	071140
	A 16	0.098	071141
	A 16	0.118	071142
	A 16	0.138	071143
	A 16	0.157	071144
	A 16	0.177	071145
	A 16	0.197	071146
	A 16	0.217	071147
	A 16	0.236	071148
	A 16	0.256	071149
	A 16	0.276	071150
	A 16	0.295	071151
	A 16	0.315	071152
	A 16	0.335	071153
	A 16	0.354	071154
	A 16	0.374	071155
	A 16	0.394	071156
	A 16	0.413	071157
	A 16	0.433	071158
	A 16	0.453	071159
	A 16	0.472	071160
	A 16	0.492	071161
	A 16	0.512	071162
	A 16	0.531	071163
	A 16	0.551	071164
	A 16	0.571	071165
	A 16	0.591	071166
	A 16	0.610	071167
	A 16	0.630	071168

Collets

	Nominal Size	Diameter	Part No.
		D_1	
m	A 16	2.00	071140
	A 16	2.50	071141
	A 16	3.00	071142
	A 16	3.50	071143
	A 16	4.00	071144
	A 16	4.50	071145
	A 16	5.00	071146
	A 16	5.50	071147
	A 16	6.00	071148
	A 16	6.50	071149
	A 16	7.00	071150
	A 16	7.50	071151
	A 16	8.00	071152
	A 16	8.50	071153
	A 16	9.00	071154
	A 16	9.50	071155
	A 16	10.00	071156
	A 16	10.50	071157
	A 16	11.00	071158
	A 16	11.50	071159
	A 16	12.00	071160
	A 16	12.50	071161
	A 16	13.00	071162
	A 16	13.50	071163
	A 16	14.00	071164
	A 16	14.50	071165
	A 16	15.00	071166
	A 16	15.50	071167
	A 16	16.00	071168

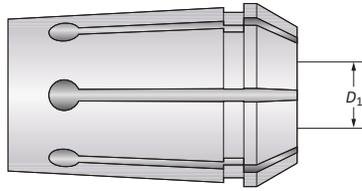


i = Imperial (in)
m = Metric (mm)

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Accessories for Collet Chucks

ISO 10897-A (DIN 6388-A)



Collets

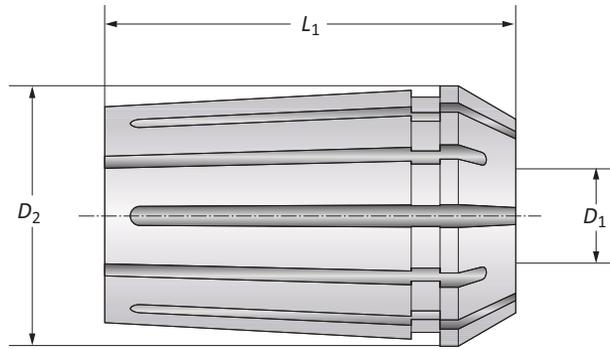
Nominal Size	Diameter D_1	Part No.
A 25	0.078	071169
A 25	0.118	071170
A 25	0.157	071171
A 25	0.196	071172
A 25	0.236	071173
A 25	0.275	071174
A 25	0.315	071175
A 25	0.354	071176
A 25	0.393	071177
A 25	0.433	071178
A 25	0.472	071179
A 25	0.511	071180
A 25	0.551	071181
A 25	0.590	071182
A 25	0.629	071183
A 25	0.669	071184
A 25	0.708	071185
A 25	0.748	071186
A 25	0.787	071187
A 25	0.826	071188
A 25	0.866	071189
A 25	0.905	071190
A 25	0.944	071191
A 25	0.984	071192
A 32	0.157	071612
A 32	0.196	071419
i A 32	0.236	071420
A 32	0.275	071613
A 32	0.315	071421
A 32	0.354	071614
A 32	0.393	071422
A 32	0.433	071666
A 32	0.472	071423
A 32	0.511	071667
A 32	0.551	071668
A 32	0.590	071669
A 32	0.629	071424
A 32	0.669	071670
A 32	0.708	071665
A 32	0.748	071671
A 32	0.787	071416
A 32	0.826	071672
A 32	0.866	071673
A 32	0.905	071674
A 32	0.944	071675
A 32	0.984	071417
A 32	1.023	071676
A 32	1.063	071677
A 32	1.102	071678
A 32	1.141	071679
A 32	1.181	071633
A 32	1.220	071680
A 32	1.259	071418

Collets

Nominal Size	Diameter D_1	Part No.
A 25	2.00	071169
A 25	3.00	071170
A 25	4.00	071171
A 25	5.00	071172
A 25	6.00	071173
A 25	7.00	071174
A 25	8.00	071175
A 25	9.00	071176
A 25	10.00	071177
A 25	11.00	071178
A 25	12.00	071179
A 25	13.00	071180
A 25	14.00	071181
A 25	15.00	071182
A 25	16.00	071183
A 25	17.00	071184
A 25	18.00	071185
A 25	19.00	071186
A 25	20.00	071187
A 25	21.00	071188
A 25	22.00	071189
A 25	23.00	071190
A 25	24.00	071191
A 25	25.00	071192
A 32	4.00	071612
A 32	5.00	071419
m A 32	6.00	071420
A 32	7.00	071613
A 32	8.00	071421
A 32	9.00	071614
A 32	10.00	071422
A 32	11.00	071666
A 32	12.00	071423
A 32	13.00	071667
A 32	14.00	071668
A 32	15.00	071669
A 32	16.00	071424
A 32	17.00	071670
A 32	18.00	071665
A 32	19.00	071671
A 32	20.00	071416
A 32	21.00	071672
A 32	22.00	071673
A 32	23.00	071674
A 32	24.00	071675
A 32	25.00	071417
A 32	26.00	071676
A 32	27.00	071677
A 32	28.00	071678
A 32	29.00	071679
A 32	30.00	071633
A 32	31.00	071680
A 32	32.00	071418

Accessories for Collet Chucks

ISO 10897-B (DIN 6388-B)



Collet Sets

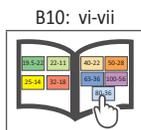
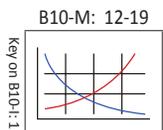
	Nominal Size	Standard-No.	Set			Part No.
			D_2	L_1	D_1	
i	B 16	415 E	0.892	1.575	0.059 - 0.630	071005
	B 25	462 E	1.295	2.047	0.138 - 0.984	071006
	B 32	467 E	1.626	2.362	0.217 - 1.260	071022
m	B 16	415 E	22.65	40.00	1.50 - 16.00	071005
	B 25	462 E	32.90	52.00	3.50 - 25.00	071006
	B 32	467 E	41.30	60.00	5.50 - 32.00	071022

Collets

	Nominal Size	Diameter	Part No.
		D_1	
i	B 16	0.059 - 0.079	071625
	B 16	0.079 - 0.098	071626
	B 16	0.098 - 0.118	071621
	B 16	0.118 - 0.138	071622
	B 16	0.138 - 0.157	071193
	B 16	0.157 - 0.177	071194
	B 16	0.177 - 0.197	071195
	B 16	0.197 - 0.217	071196
	B 16	0.217 - 0.236	071197
	B 16	0.236 - 0.256	071198
	B 16	0.256 - 0.276	071199
	B 16	0.276 - 0.295	071200
	B 16	0.295 - 0.315	071201
	B 16	0.315 - 0.335	071202
	B 16	0.335 - 0.354	071203
	B 16	0.354 - 0.374	071204
	B 16	0.374 - 0.394	071205
	B 16	0.394 - 0.413	071206
	B 16	0.413 - 0.433	071207
	B 16	0.433 - 0.453	071208
	B 16	0.453 - 0.472	071209
	B 16	0.472 - 0.492	071210
	B 16	0.492 - 0.512	071211
	B 16	0.512 - 0.531	071212
	B 16	0.531 - 0.551	071213
	B 16	0.551 - 0.571	071214
	B 16	0.571 - 0.591	071215
	B 16	0.591 - 0.610	071216
B 16	0.610 - 0.630	071217	

Collets

	Nominal Size	Diameter	Part No.
		D_1	
m	B 16	1.50 - 2.00	071625
	B 16	2.00 - 2.50	071626
	B 16	2.50 - 3.00	071621
	B 16	3.00 - 3.50	071622
	B 16	3.50 - 4.00	071193
	B 16	4.00 - 4.50	071194
	B 16	4.50 - 5.00	071195
	B 16	5.00 - 5.50	071196
	B 16	5.50 - 6.00	071197
	B 16	6.00 - 6.50	071198
	B 16	6.50 - 7.00	071199
	B 16	7.00 - 7.50	071200
	B 16	7.50 - 8.00	071201
	B 16	8.00 - 8.50	071202
	B 16	8.50 - 9.00	071203
	B 16	9.00 - 9.50	071204
	B 16	9.50 - 10.00	071205
	B 16	10.00 - 10.50	071206
	B 16	10.50 - 11.00	071207
	B 16	11.00 - 11.50	071208
	B 16	11.50 - 12.00	071209
	B 16	12.00 - 12.50	071210
	B 16	12.50 - 13.00	071211
	B 16	13.00 - 13.50	071212
	B 16	13.50 - 14.00	071213
	B 16	14.00 - 14.50	071214
	B 16	14.50 - 15.00	071215
B 16	15.00 - 15.50	071216	
B 16	15.50 - 16.00	071217	

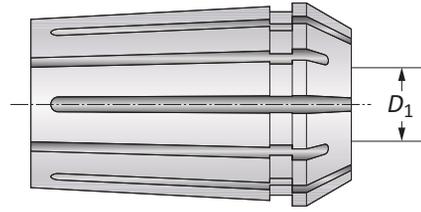


i = Imperial (in)
m = Metric (mm)

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Accessories for Collet Chucks

ISO 10897-B (DIN 6388-B)



Collets

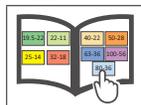
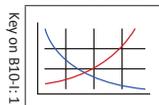
Nominal Size	Diameter D_1	Part No.
B 25	0.138 - 0.157	071627
B 25	0.157 - 0.177	071628
B 25	0.177 - 0.197	071218
B 25	0.197 - 0.217	071219
B 25	0.217 - 0.236	071220
B 25	0.236 - 0.256	071221
B 25	0.256 - 0.276	071222
B 25	0.276 - 0.295	071223
B 25	0.295 - 0.315	071224
B 25	0.315 - 0.335	071225
B 25	0.335 - 0.354	071226
B 25	0.354 - 0.374	071227
B 25	0.374 - 0.394	071228
B 25	0.394 - 0.413	071229
B 25	0.413 - 0.433	071230
B 25	0.433 - 0.453	071231
B 25	0.453 - 0.472	071232
B 25	0.472 - 0.492	071233
B 25	0.492 - 0.512	071234
B 25	0.512 - 0.531	071235
B 25	0.531 - 0.551	071236
i B 25	0.551 - 0.571	071237
B 25	0.571 - 0.591	071238
B 25	0.591 - 0.610	071239
B 25	0.610 - 0.630	071240
B 25	0.630 - 0.650	071241
B 25	0.650 - 0.669	071242
B 25	0.669 - 0.689	071243
B 25	0.689 - 0.709	071244
B 25	0.709 - 0.728	071245
B 25	0.728 - 0.748	071246
B 25	0.748 - 0.768	071247
B 25	0.768 - 0.787	071248
B 25	0.787 - 0.807	071249
B 25	0.807 - 0.827	071250
B 25	0.827 - 0.846	071251
B 25	0.846 - 0.866	071252
B 25	0.866 - 0.866	071253
B 25	0.866 - 0.906	071254
B 25	0.906 - 0.925	071255
B 25	0.925 - 0.945	071256
B 25	0.945 - 0.965	071257
B 25	0.965 - 0.984	071258

Collets

Nominal Size	Diameter D_1	Part No.
B 25	3.50 - 4.00	071627
B 25	4.00 - 4.50	071628
B 25	4.50 - 5.00	071218
B 25	5.00 - 5.50	071219
B 25	5.50 - 6.00	071220
B 25	6.00 - 6.50	071221
B 25	6.50 - 7.00	071222
B 25	7.00 - 7.50	071223
B 25	7.50 - 8.00	071224
B 25	8.00 - 8.50	071225
B 25	8.50 - 9.00	071226
B 25	9.00 - 9.50	071227
B 25	9.50 - 10.00	071228
B 25	10.00 - 10.50	071229
B 25	10.50 - 11.00	071230
B 25	11.00 - 11.50	071231
B 25	11.50 - 12.00	071232
B 25	12.00 - 12.50	071233
B 25	12.50 - 13.00	071234
B 25	13.00 - 13.50	071235
B 25	13.50 - 14.00	071236
m B 25	14.00 - 14.50	071237
B 25	14.50 - 15.00	071238
B 25	15.00 - 15.50	071239
B 25	15.50 - 16.00	071240
B 25	16.00 - 16.50	071241
B 25	16.50 - 17.00	071242
B 25	17.00 - 17.50	071243
B 25	17.50 - 18.00	071244
B 25	18.00 - 18.50	071245
B 25	18.50 - 19.00	071246
B 25	19.00 - 19.50	071247
B 25	19.50 - 20.00	071248
B 25	20.00 - 20.50	071249
B 25	20.50 - 21.00	071250
B 25	21.00 - 21.50	071251
B 25	21.50 - 22.00	071252
B 25	22.00 - 22.50	071253
B 25	22.50 - 23.00	071254
B 25	23.00 - 23.50	071255
B 25	23.50 - 24.00	071256
B 25	24.00 - 24.50	071257
B 25	24.50 - 25.00	071258

B10-M: 12-19

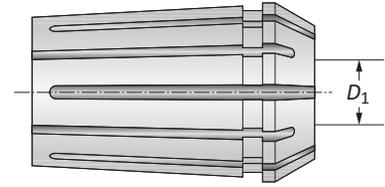
B10: vi-vii



i = Imperial (in)
m = Metric (mm)

Accessories for Collet Chucks

ISO 10897-B (DIN 6388-B)



Collets

Nominal Size	Diameter D_1	Part No.
B 32	0.217 - 0.236	071686
B 32	0.236 - 0.256	071687
B 32	0.256 - 0.276	071688
B 32	0.276 - 0.295	071689
B 32	0.295 - 0.315	071690
B 32	0.315 - 0.335	071691
B 32	0.335 - 0.354	071692
B 32	0.354 - 0.374	071693
B 32	0.374 - 0.394	071542
B 32	0.394 - 0.413	071543
B 32	0.413 - 0.433	071544
B 32	0.433 - 0.453	071545
B 32	0.453 - 0.472	071546
B 32	0.472 - 0.492	071547
B 32	0.492 - 0.512	071548
B 32	0.512 - 0.531	071549
B 32	0.531 - 0.551	071550
B 32	0.551 - 0.571	071551
B 32	0.571 - 0.591	071552
B 32	0.591 - 0.610	071553
B 32	0.610 - 0.630	071554
B 32	0.630 - 0.650	071555
B 32	0.650 - 0.669	071556
B 32	0.669 - 0.689	071557
B 32	0.689 - 0.709	071558
B 32	0.709 - 0.728	071559
i B 32	0.728 - 0.748	071560
B 32	0.748 - 0.768	071561
B 32	0.768 - 0.787	071562
B 32	0.787 - 0.807	071563
B 32	0.807 - 0.827	071564
B 32	0.827 - 0.846	071565
B 32	0.846 - 0.866	071566
B 32	0.866 - 0.866	071567
B 32	0.866 - 0.906	071568
B 32	0.906 - 0.925	071569
B 32	0.925 - 0.945	071570
B 32	0.945 - 0.965	071571
B 32	0.965 - 0.984	071572
B 32	0.984 - 1.004	071573
B 32	1.004 - 1.024	071574
B 32	1.024 - 1.043	071575
B 32	1.043 - 1.063	071576
B 32	1.063 - 1.083	071577
B 32	1.083 - 1.102	071578
B 32	1.102 - 1.122	071579
B 32	1.122 - 1.142	071580
B 32	1.142 - 1.161	071581
B 32	1.161 - 1.181	071582
B 32	1.181 - 1.201	071583
B 32	1.201 - 1.220	071584
B 32	1.220 - 1.240	071585
B 32	1.240 - 1.260	071586

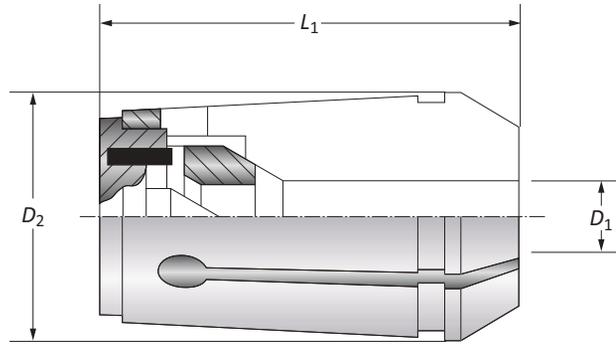
Collets

Nominal Size	Diameter D_1	Part No.
B 32	5.50 - 6.00	071686
B 32	6.00 - 6.50	071687
B 32	6.50 - 7.00	071688
B 32	7.00 - 7.50	071689
B 32	7.50 - 8.00	071690
B 32	8.00 - 8.50	071691
B 32	8.50 - 9.00	071692
B 32	9.00 - 9.50	071693
B 32	9.50 - 10.00	071542
B 32	10.00 - 10.50	071543
B 32	10.50 - 11.00	071544
B 32	11.00 - 11.50	071545
B 32	11.50 - 12.00	071546
B 32	12.00 - 12.50	071547
B 32	12.50 - 13.00	071548
B 32	13.00 - 13.50	071549
B 32	13.50 - 14.00	071550
B 32	14.00 - 14.50	071551
B 32	14.50 - 15.00	071552
B 32	15.00 - 15.50	071553
B 32	15.50 - 16.00	071554
B 32	16.00 - 16.50	071555
B 32	16.50 - 17.00	071556
B 32	17.00 - 17.50	071557
B 32	17.50 - 18.00	071558
B 32	18.00 - 18.50	071559
m B 32	18.50 - 19.00	071560
B 32	19.00 - 19.50	071561
B 32	19.50 - 20.00	071562
B 32	20.00 - 20.50	071563
B 32	20.50 - 21.00	071564
B 32	21.00 - 21.50	071565
B 32	21.50 - 22.00	071566
B 32	22.00 - 22.50	071567
B 32	22.50 - 23.00	071568
B 32	23.00 - 23.50	071569
B 32	23.50 - 24.00	071570
B 32	24.00 - 24.50	071571
B 32	24.50 - 25.00	071572
B 32	25.00 - 25.50	071573
B 32	25.50 - 26.00	071574
B 32	26.00 - 26.50	071575
B 32	26.50 - 27.00	071576
B 32	27.00 - 27.50	071577
B 32	27.50 - 28.00	071578
B 32	28.00 - 28.50	071579
B 32	28.50 - 29.00	071580
B 32	29.00 - 29.50	071581
B 32	29.50 - 30.00	071582
B 32	30.00 - 30.50	071583
B 32	30.50 - 31.00	071584
B 32	31.00 - 31.50	071585
B 32	31.50 - 32.00	071586

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Accessories for Collet Chucks

ISO 10897-A (DIN 6388-A)



Collet Sets for Clarkson System

	Nominal Size	Standard-No.	Sets			Part No.
			D_2	L_1	D_1	
i	A 16	421 E	0.892	1.654	0.236 - 0.472	071013
	A 25	459 E	1.295	2.047	0.236 - 0.984	071014
	A 32	460 E	1.626	2.480	0.236 - 1.260	071020
m	A 16	421 E	22.65	42.00	6.00 - 12.00	071013
	A 25	459 E	32.90	52.00	6.00 - 25.00	071014
	A 32	460 E	41.30	63.00	6.00 - 32.00	071020

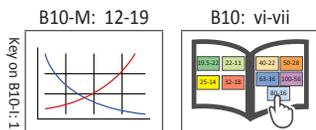
NOTE: Recommended to use clamping nuts with ball bearings to lock collets.

Collets for Clarkson System

Nominal Size	Diameter	
	D_1	Part No.
A 16	0.236	071304
A 16	0.315	071305
A 16	0.394	071306
A 16	0.472	071307
A 25	0.236	071308
A 25	0.315	071309
A 25	0.394	071310
A 25	0.472	071311
A 25	0.630	071312
i A 25	0.787	071313
A 25	0.984	071684
A 32	0.236	071427
A 32	0.315	071428
A 32	0.394	071429
A 32	0.472	071430
A 32	0.630	071431
A 32	0.787	071432
A 32	0.984	071433
A 32	1.260	071685

Collets for Clarkson System

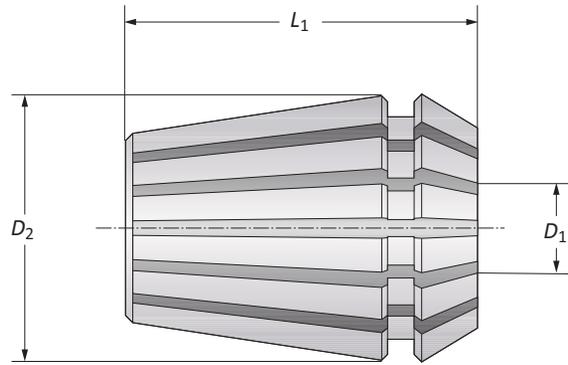
Nominal Size	Diameter	
	D_1	Part No.
A 16	6.00	071304
A 16	8.00	071305
A 16	10.00	071306
A 16	12.00	071307
A 25	6.00	071308
A 25	8.00	071309
A 25	10.00	071310
A 25	12.00	071311
A 25	16.00	071312
m A 25	20.00	071313
A 25	25.00	071684
A 32	6.00	071427
A 32	8.00	071428
A 32	10.00	071429
A 32	12.00	071430
A 32	16.00	071431
A 32	20.00	071432
A 32	25.00	071433
A 32	32.00	071685



i = Imperial (in)
m = Metric (mm)

Accessories for Collet Chucks

ISO 15488-B (DIN 6499-B)



Collet Sets

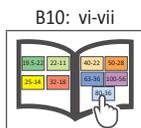
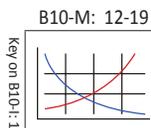
	Nominal Size	Standard-No.	Diameter		Collet Set		Part No.
			D_1	D_2	D_2	L_1	
i	ER 8	4004 E	0.039 - 0.197	0.335	0.531	071034	
	ER 11	4008 E	0.039 - 0.276	0.433	0.709	071028	
	ER 16	426 E	0.020 - 0.394	0.630	1.083	071029	
	ER 25	430 E	0.059 - 0.630	0.984	1.339	071031	
	ER 32	470 E	0.079 - 0.787	1.260	1.575	071032	
	ER 40	472 E	0.118 - 1.024	1.575	1.811	071033	
m	ER 8	4004 E	1.00 - 5.00	8.50	13.50	071034	
	ER 11	4008 E	1.00 - 7.00	11.00	18.00	071028	
	ER 16	426 E	0.50 - 10.00	16.00	27.50	071029	
	ER 25	430 E	1.50 - 16.00	25.00	34.00	071031	
	ER 32	470 E	2.00 - 20.00	32.00	40.00	071032	
	ER 40	472 E	3.00 - 26.00	40.00	46.00	071033	

Collets

	Nominal Size	Diameter	
		D_1	Part No.
i	ER 8	0.039	071986
	ER 8	0.059	071987
	ER 8	0.079	071988
	ER 8	0.098	071989
	ER 8	0.102 - 0.118	071990
	ER 8	0.122 - 0.138	071991
	ER 8	0.142 - 0.157	071992
	ER 8	0.161 - 0.177	071993
	ER 8	0.181 - 0.197	071994
	ER 11	0.039	071700
	ER 11	0.059	071701
	ER 11	0.079	071702
	ER 11	0.098	071703
	ER 11	0.102 - 0.118	071704
	ER 11	0.122 - 0.138	071705
	ER 11	0.142 - 0.157	071706
	ER 11	0.161 - 0.177	071707
	ER 11	0.181 - 0.197	071708
	ER 11	0.201 - 0.217	071709
	ER 11	0.220 - 0.354	071710
ER 11	0.240 - 0.256	071711	
ER 11	0.260 - 0.276	071712	

Collets

	Nominal Size	Diameter	
		D_1	Part No.
m	ER 8	1.00	071986
	ER 8	1.50	071987
	ER 8	2.00	071988
	ER 8	2.50	071989
	ER 8	2.60 - 3.00	071990
	ER 8	3.10 - 3.50	071991
	ER 8	3.60 - 4.00	071992
	ER 8	4.10 - 4.50	071993
	ER 8	4.60 - 5.00	071994
	ER 11	1.00	071700
	ER 11	1.50	071701
	ER 11	2.00	071702
	ER 11	2.50	071703
	ER 11	2.60 - 3.00	071704
	ER 11	3.10 - 3.50	071705
	ER 11	3.60 - 4.00	071706
	ER 11	4.10 - 4.50	071707
	ER 11	4.60 - 5.00	071708
	ER 11	5.10 - 5.50	071709
	ER 11	5.60 - 6.00	071710
ER 11	6.10 - 6.50	071711	
ER 11	6.60 - 7.00	071712	

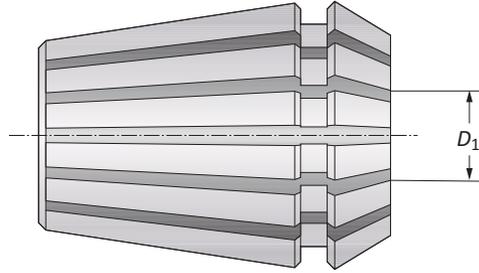


i = Imperial (in)
m = Metric (mm)

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Accessories for Collet Chucks

ISO 15488-B (DIN 6499-B)



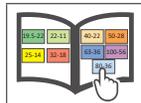
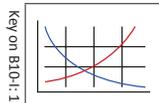
Collets

	Nominal Size	Diameter	Part No.
		D_1	
	ER 16	0.020 - 0.039	071713
	ER 16	0.039 - 0.059	071714*
	ER 16	0.039 - 0.079	071715
	ER 16	0.079 - 0.098	071716*
	ER 16	0.098 - 0.118	071717
	ER 16	0.118 - 0.138	071718*
	ER 16	0.138 - 0.157	071719
	ER 16	0.157 - 0.177	271132*
	ER 16	0.157 - 0.197	071720
i	ER 16	0.197 - 0.217	271133*
	ER 16	0.217 - 0.236	071721
	ER 16	0.236 - 0.256	271134*
	ER 16	0.236 - 0.276	071722
	ER 16	0.276 - 0.295	271135*
	ER 16	0.295 - 0.315	071723
	ER 16	0.315 - 0.335	271136*
	ER 16	0.335 - 0.354	071724
	ER 16	0.354 - 0.374	271137*
	ER 16	0.354 - 0.394	071725
<hr/>			
	ER 16	0.50 - 1.00	071713
	ER 16	1.00 - 1.50	071714*
	ER 16	1.00 - 2.00	071715
	ER 16	2.00 - 2.50	071716*
	ER 16	2.50 - 3.00	071717
	ER 16	3.00 - 3.50	071718*
	ER 16	3.50 - 4.00	071719
	ER 16	4.00 - 4.50	271132*
m	ER 16	4.00 - 5.00	071720
	ER 16	5.00 - 5.50	271133*
	ER 16	5.50 - 6.00	071721
	ER 16	6.00 - 6.50	271134*
	ER 16	6.00 - 7.00	071722
	ER 16	7.00 - 7.50	271135*
	ER 16	7.50 - 8.00	071723
	ER 16	8.00 - 8.50	271136*
	ER 16	8.50 - 9.00	071724
	ER 16	9.00 - 9.50	271137*
	ER 16	9.00 - 10.00	071725

*Items not contained in set.

B10-M: 12-19

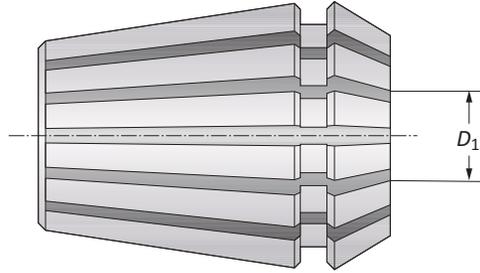
B10: vi-vii



i = Imperial (in)
m = Metric (mm)

Accessories for Collet Chucks

ISO 15488-B (DIN 6499-B)



Collets

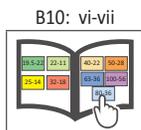
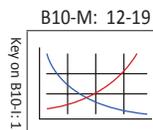
Nominal Size	Diameter D_1	Part No.
ER 25	0.059 - 0.079	071743
ER 25	0.079 - 0.098	071744*
ER 25	0.098 - 0.118	071745
ER 25	0.118 - 0.138	271128*
ER 25	0.138 - 0.157	071746
ER 25	0.157 - 0.177	271129*
ER 25	0.177 - 0.197	071747
ER 25	0.197 - 0.217	271130*
ER 25	0.217 - 0.236	071748
ER 25	0.236 - 0.256	271131*
ER 25	0.256 - 0.276	071749
ER 25	0.276 - 0.315	071750
ER 25	0.315 - 0.354	071751
ER 25	0.354 - 0.394	071752
ER 25	0.394 - 0.433	071753
ER 25	0.433 - 0.472	071754
ER 25	0.472 - 0.512	071755
ER 25	0.512 - 0.551	071756
ER 25	0.551 - 0.591	071757
ER 25	0.591 - 0.630	071758
i ER 32	0.079 - 0.118	071761
ER 32	0.118 - 0.157	071762
ER 32	0.157 - 0.197	071763
ER 32	0.197 - 0.236	071764
ER 32	0.236 - 0.276	071765
ER 32	0.276 - 0.315	071766
ER 32	0.315 - 0.354	071767
ER 32	0.354 - 0.394	071768
ER 32	0.394 - 0.433	071769
ER 32	0.433 - 0.472	071770
ER 32	0.472 - 0.512	071771
ER 32	0.512 - 0.551	071772
ER 32	0.551 - 0.591	071773
ER 32	0.591 - 0.630	071774
ER 32	0.630 - 0.669	071775
ER 32	0.669 - 0.709	071776
ER 32	0.709 - 0.748	071777
ER 32	0.748 - 0.787	071778
ER 32	0.669 - 0.709	071776
ER 32	0.709 - 0.748	071777
ER 32	0.748 - 0.787	071778

*Items not contained in set.

Collets

Nominal Size	Diameter D_1	Part No.
ER 25	1.50 - 2.00	071743
ER 25	2.00 - 2.50	071744*
ER 25	2.50 - 3.00	071745
ER 25	3.00 - 3.50	271128*
ER 25	3.50 - 4.00	071746
ER 25	4.00 - 4.50	271129*
ER 25	4.50 - 5.00	071747
ER 25	5.00 - 5.50	271130*
ER 25	5.50 - 6.00	071748
ER 25	6.00 - 6.50	271131*
ER 25	6.50 - 7.00	071749
ER 25	7.00 - 8.00	071750
ER 25	8.00 - 9.00	071751
ER 25	9.00 - 10.00	071752
ER 25	10.00 - 11.00	071753
ER 25	11.00 - 12.00	071754
ER 25	12.00 - 13.00	071755
ER 25	13.00 - 14.00	071756
ER 25	14.00 - 15.00	071757
ER 25	15.00 - 16.00	071758
m ER 32	2.00 - 3.00	071761
ER 32	3.00 - 4.00	071762
ER 32	4.00 - 5.00	071763
ER 32	5.00 - 6.00	071764
ER 32	6.00 - 7.00	071765
ER 32	7.00 - 8.00	071766
ER 32	8.00 - 9.00	071767
ER 32	9.00 - 10.00	071768
ER 32	10.00 - 11.00	071769
ER 32	11.00 - 12.00	071770
ER 32	12.00 - 13.00	071771
ER 32	13.00 - 14.00	071772
ER 32	14.00 - 15.00	071773
ER 32	15.00 - 16.00	071774
ER 32	16.00 - 17.00	071775
ER 32	17.00 - 18.00	071776
ER 32	18.00 - 19.00	071777
ER 32	19.00 - 20.00	071778

*Items not contained in set.

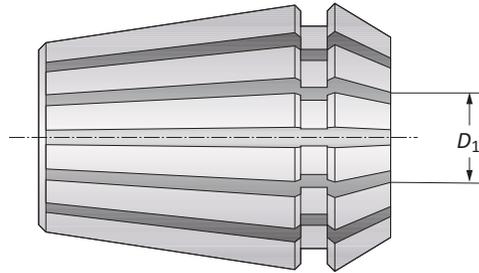


i = Imperial (in)
m = Metric (mm)

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Accessories for Collet Chucks

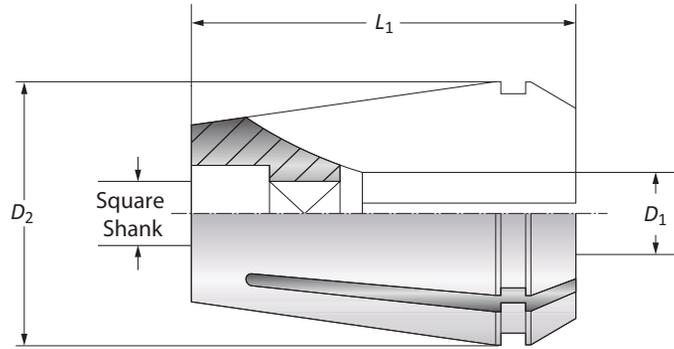
ISO 15488-B (DIN 6499-B)



Nominal Size	Diameter D_1	Part No.
ER 40	0.118 - 0.157	071779
ER 40	0.157 - 0.197	071780
ER 40	0.197 - 0.236	071781
ER 40	0.236 - 0.276	071782
ER 40	0.276 - 0.315	071783
ER 40	0.315 - 0.354	071784
ER 40	0.354 - 0.394	071785
ER 40	0.394 - 0.433	071786
ER 40	0.433 - 0.472	071787
ER 40	0.472 - 0.512	071788
ER 40	0.512 - 0.551	071789
i ER 40	0.551 - 0.591	071790
ER 40	0.591 - 0.630	071791
ER 40	0.630 - 0.669	071792
ER 40	0.669 - 0.709	071793
ER 40	0.709 - 0.748	071794
ER 40	0.748 - 0.787	071795
ER 40	0.787 - 0.827	071796
ER 40	0.827 - 0.866	071797
ER 40	0.866 - 0.906	071798
ER 40	0.906 - 0.945	071799
ER 40	0.945 - 0.984	071800
ER 40	0.984 - 1.024	071801
ER 40	3.00 - 4.00	071779
ER 40	4.00 - 5.00	071780
ER 40	5.00 - 6.00	071781
ER 40	6.00 - 7.00	071782
ER 40	7.00 - 8.00	071783
ER 40	8.00 - 9.00	071784
ER 40	9.00 - 10.00	071785
ER 40	10.00 - 11.00	071786
ER 40	11.00 - 12.00	071787
ER 40	12.00 - 13.00	071788
ER 40	13.00 - 14.00	071789
m ER 40	14.00 - 15.00	071790
ER 40	15.00 - 16.00	071791
ER 40	16.00 - 17.00	071792
ER 40	17.00 - 18.00	071793
ER 40	18.00 - 19.00	071794
ER 40	19.00 - 20.00	071795
ER 40	20.00 - 21.00	071796
ER 40	21.00 - 22.00	071797
ER 40	22.00 - 23.00	071798
ER 40	23.00 - 24.00	071799
ER 40	24.00 - 25.00	071800
ER 40	25.00 - 26.00	071801

Collet Sets for Taps DIN 371/374/376

ISO 15488-B (DIN 6499-B)



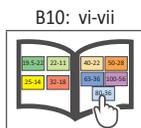
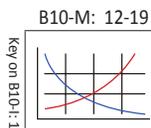
Collet Sets

	Nominal Size	Standard-No.	Clamping Range		Part No.
			D_1	D_2	
i	ER 16	426 EGB	0.177 - 0.276	0.630	071045
	ER 25	430 EGB	0.177 - 0.472	0.984	071047
	ER 32	470 EGB	0.177 - 0.630	1.260	071048
	ER 40	472 EGB	0.276 - 0.787	1.575	071049
m	ER 16	426 EGB	4.50 - 7.00	16.00	071045
	ER 25	430 EGB	4.50 - 12.00	25.00	071047
	ER 32	470 EGB	4.50 - 16.00	32.00	071048
	ER 40	472 EGB	7.00 - 20.00	40.00	071049

NOTE: To lock these collets, we recommend using the clamping nuts with sliding ring for higher clamping forces.

Taps

	Shank		Tap		
	D_1	Square Shank	DIN 371	DIN 374	DIN 376
i	0.177	0.134	M 4	M 6 x...	M 6
	0.217	0.169	-	M 7 x...	M 7
	0.236	0.193	M 4,5/5/6	M 8 x...	M 8
	0.276	0.217	M 7	M 9/10 x...	M 9/10
	0.315	0.244	M 8	M 6 x...	M 11
	0.354	0.276	M 9	M 6 x...	M 12
	0.394	0.315	M 10	-	-
	0.433	0.354	-	M 14 x...	M 14
	0.472	0.354	M 12	M 16 x...	M 16
	0.551	0.433	-	M 18 x...	M 18
	0.630	0.472	-	M 20 x...	M 20
	0.709	0.551	-	M 22/24 x...	M 22/24
	0.787	0.630	-	M 27 x...	M 27
m	4.50	3.40	M 4	M 6 x...	M 6
	5.50	4.30	-	M 7 x...	M 7
	6.00	4.90	M 4,5/5/6	M 8 x...	M 8
	7.00	5.50	M 7	M 9/10 x...	M 9/10
	8.00	6.20	M 8	M 6 x...	M 11
	9.00	7.00	M 9	M 6 x...	M 12
	10.00	8.00	M 10	-	-
	11.00	9.00	-	M 14 x...	M 14
	12.00	9.00	M 12	M 16 x...	M 16
	14.00	11.00	-	M 18 x...	M 18
	16.00	12.00	-	M 20 x...	M 20
	18.00	14.00	-	M 22/24 x...	M 22/24
	20.00	16.00	-	M 27 x...	M 27

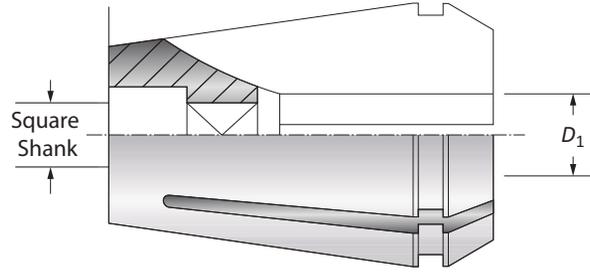


i = Imperial (in)
m = Metric (mm)

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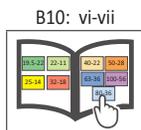
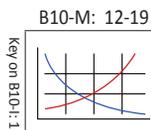
Accessories for Collet Sets for Taps DIN 371/374/376

ISO 15488-B (DIN 6499-B)



Nominal Size	Suitable Taps		Part No.
	D_1	Square Shank	
ER 16	0.177	0.134	071901
ER 16	0.217	0.169	071902
ER 16	0.236	0.193	071903
ER 16	0.276	0.217	071904
ER 25	0.177	0.134	071912
ER 25	0.217	0.169	071913
ER 25	0.236	0.193	071914
ER 25	0.276	0.217	071915
ER 25	0.315	0.244	071916
ER 25	0.354	0.276	071917
ER 25	0.394	0.315	071918
ER 25	0.433	0.354	071919
ER 25	0.472	0.354	071920
ER 32	0.177	0.134	071921
ER 32	0.217	0.169	071922
ER 32	0.236	0.193	071923
ER 32	0.276	0.217	071924
ER 32	0.315	0.244	071925
ER 32	0.354	0.276	071926
ER 32	0.394	0.315	071927
ER 32	0.433	0.354	071928
ER 32	0.472	0.354	071929
ER 32	0.551	0.433	071930
ER 32	0.630	0.472	071931
ER 40	0.276	0.217	071932
ER 40	0.315	0.244	071933
ER 40	0.354	0.276	071934
ER 40	0.394	0.315	071935
ER 40	0.433	0.354	071936
ER 40	0.472	0.354	071937
ER 40	0.551	0.433	071938
ER 40	0.630	0.472	071939
ER 40	0.709	0.571	071940
ER 40	0.787	0.630	071941

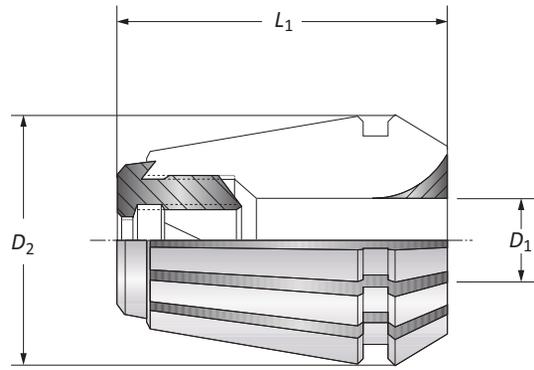
Nominal Size	Suitable Taps		Part No.
	D_1	Square Shank	
ER 16	4.50	3.40	071901
ER 16	5.50	4.30	071902
ER 16	6.00	4.90	071903
ER 16	7.00	5.50	071904
ER 25	4.50	3.40	071912
ER 25	5.50	4.30	071913
ER 25	6.00	4.90	071914
ER 25	7.00	5.50	071915
ER 25	8.00	6.20	071916
ER 25	9.00	7.00	071917
ER 25	10.00	8.00	071918
ER 25	11.00	9.00	071919
ER 25	12.00	9.00	071920
ER 32	4.50	3.40	071921
ER 32	5.50	4.30	071922
ER 32	6.00	4.90	071923
ER 32	7.00	5.50	071924
ER 32	8.00	6.20	071925
ER 32	9.00	7.00	071926
ER 32	10.00	8.00	071927
ER 32	11.00	9.00	071928
ER 32	12.00	9.00	071929
ER 32	14.00	11.00	071930
ER 32	16.00	12.00	071931
ER 40	7.00	5.50	071932
ER 40	8.00	6.20	071933
ER 40	9.00	7.00	071934
ER 40	10.00	8.00	071935
ER 40	11.00	9.00	071936
ER 40	12.00	9.00	071937
ER 40	14.00	11.00	071938
ER 40	16.00	12.00	071939
ER 40	18.00	14.50	071940
ER 40	20.00	16.00	071941



i = Imperial (in)
m = Metric (mm)

Accessories for Collet Chucks: ISO 15488-B (DIN 6499-B)

Collets



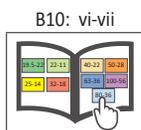
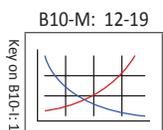
Collets for Mill Cutters with Pull Thread System

	Nominal Size	Standard-No.	Clamping Range D_2	Collet		Part No.
				L_1	D_1	
i	ER 32	470 ECL	1.260	1.811	0.236 - 0.630	071052
	ER 40	472 ECL	1.575	2.047	0.236 - 0.984	071053
m	ER 32	470 ECL	32.00	46.00	6.00 - 16.00	071052
	ER 40	472 ECL	40.00	52.00	6.00 - 25.00	071053

Collets

	Collet		Part No.
	Nominal Size	D_1	
i	ER 32	0.236	071826
	ER 32	0.315	071827
	ER 32	0.394	071828
	ER 32	0.472	071829
	ER 32	0.630	071830
	ER 40	0.236	071831
	ER 40	0.315	071832
	ER 40	0.394	071833
	ER 40	0.472	071834
	ER 40	0.630	071835
m	ER 40	0.787	071836
	ER 40	0.984	071837
	ER 32	6.00	071826
	ER 32	8.00	071827
	ER 32	10.00	071828
	ER 32	12.00	071829
	ER 32	16.00	071830
	ER 40	6.00	071831
	ER 40	8.00	071832
	ER 40	10.00	071833
ER 40	12.00	071834	
ER 40	16.00	071835	
ER 40	20.00	071836	
ER 40	25.00	071837	

NOTE: To lock these collets, we recommend using the clamping nuts with sliding ring for higher clamping forces.



i = Imperial (in)
m = Metric (mm)

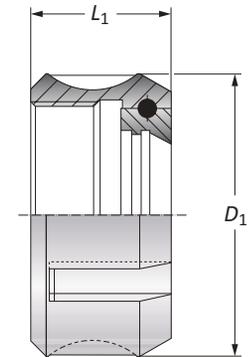
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Accessories for Collet Chucks: ISO 10897 (DIN 6388)

Clamping Nuts

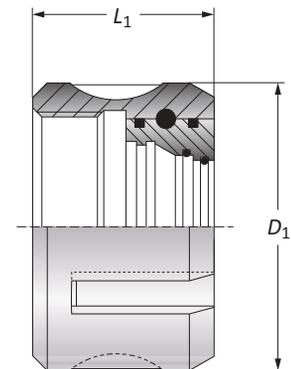
Clamping Nuts: DIN 6388 / ISO 10897 - 1:10

	Nominal Size	Clamping Nut				Part No.
		D_1	L_1	Clamping Range	Torque	
i	16	1.693	0.945	0.079 - 0.630	73.8 lb-ft	068048
	25	2.362	1.181	0.079 - 0.984	123.8 lb-ft	068052
	32	2.835	1.319	0.157 - 1.260	162.3 lb-ft	161099
m	16	43.00	24.00	2.00 - 16.00	100 Nm	068048
	25	60.00	30.00	2.00 - 25.00	180 Nm	068052
	32	72.00	33.50	4.00 - 32.00	220 Nm	161099



Clamping Nuts for Sealing Discs: DIN 6388 / ISO 10897 - 1:10

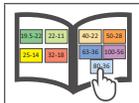
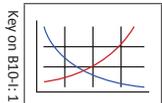
	Nominal Size	Clamping Nut				Part No.
		D_1	L_1	Clamping Range	Torque	
i	16	1.693	1.240	0.079 - 0.591	73.8 lb-ft	275001
	25	2.362	1.496	0.079 - 0.984	123.8 lb-ft	275003
	32	2.835	1.654	0.157 - 1.260	162.3 lb-ft	276001
m	16	43.00	31.50	2.00 - 16.00	100 Nm	275001
	25	60.00	38.00	2.00 - 25.00	180 Nm	275003
	32	72.00	42.00	4.00 - 32.00	220 Nm	276001



NOTE: With ball bearing, for use with sealing discs.

B10-M: 12-19

B10: vi-vii



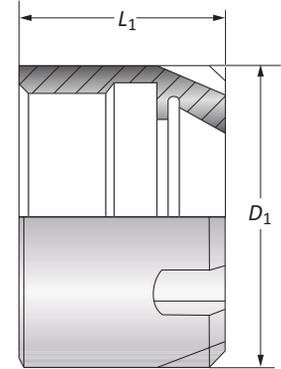
i = Imperial (in)
m = Metric (mm)

Accessories for Collet Chucks: ISO 10897 (DIN 6388)

Clamping Nuts

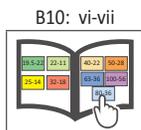
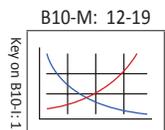
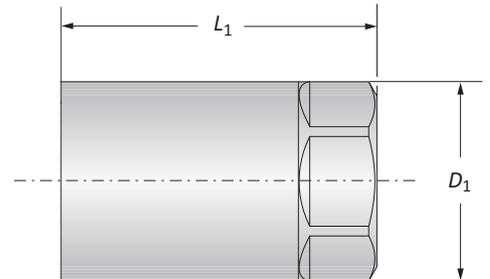
Mini Clamping Nuts

	Nominal Size	Clamping Nut				Part No.
		D_1	L_1	Clamping Range	Torque	
i	ER 08	0.472	0.425	0.039 - 0.157	5.9 lb-ft	415357
	ER 11	0.630	0.472	0.039 - 0.276	11.8 lb-ft	415358
	ER 16	0.866	0.709	0.039 - 0.394	18.4 lb-ft	415359
m	ER 08	12.00	10.80	1.00 - 4.00	8 Nm	415357
	ER 11	16.00	12.00	1.00 - 7.00	16 Nm	415358
	ER 16	22.00	18.00	1.00 - 10.00	25 Nm	415359



Clamping Nuts for Erickson Collet Chuck System

	Nominal Size	Clamping Nut			Part No.
		D_1	L_1	Clamping Range	
i	6	0.551	1.102	0.039 - 0.256	162095
	10	0.827	1.417	0.039 - 0.394	162093
m	6	14.00	28.00	1.00 - 6.50	162095
	10	21.00	36.00	1.00 - 10.00	162093



i = Imperial (in)
m = Metric (mm)

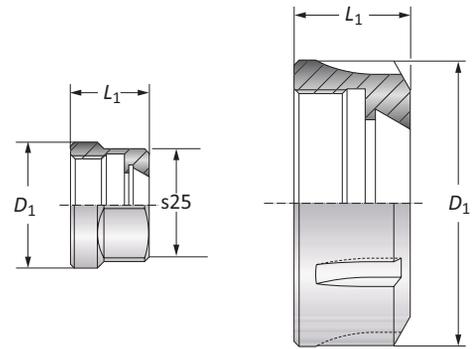
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Accessories for Collet Chucks: ISO 15488 (DIN 6499)

Clamping Nuts

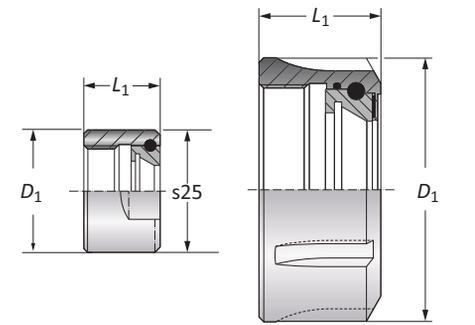
One Piece Clamping Nuts: DIN 6499 / ISO 15488 - 8°

	Nominal Size	Clamping Nut				Part No.
		D_1	L_1	Clamping Range	Torque	
i	ER 16	1.102	0.689	0.039 - 0.394	44.3 lb-ft	215922
	ER 25	1.654	0.787	0.079 - 0.630	73.8 lb-ft	215924
	ER 32	1.969	0.886	0.079 - 0.787	103.3 lb-ft	215925
	ER 40	2.480	1.004	0.118 - 1.024	132.8 lb-ft	215926
m	ER 16	28.00	17.50	1.00 - 10.00	60 Nm	215922
	ER 25	42.00	20.00	2.00 - 16.00	100 Nm	215924
	ER 32	50.00	22.50	2.00 - 20.00	140 Nm	215925
	ER 40	63.00	25.50	3.00 - 26.00	180 Nm	215926



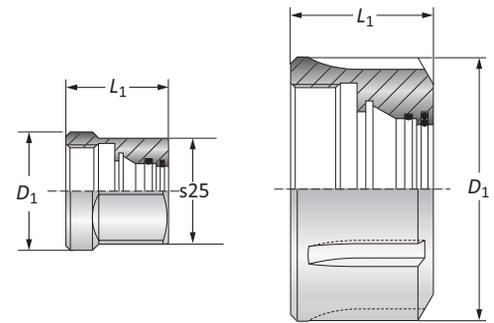
Clamping Nuts with Sliding Ring: DIN 6499 / ISO 15488 - 8°

	Nominal Size	Clamping Nut				Part No.
		D_1	L_1	Clamping Range	Torque	
i	ER 16	1.102	0.984	0.039 - 0.394	44.3 lb-ft	315015
	ER 25	1.654	1.083	0.079 - 0.630	73.8 lb-ft	315016
	ER 32	1.969	1.201	0.079 - 0.787	103.3 lb-ft	315017
	ER 40	2.480	1.339	0.118 - 1.024	132.8 lb-ft	315018
m	ER 16	28.00	20.30	1.00 - 10.00	60 Nm	315015
	ER 25	42.00	22.40	2.00 - 16.00	100 Nm	315016
	ER 32	50.00	25.00	2.00 - 20.00	140 Nm	315017
	ER 40	63.00	28.30	3.00 - 26.00	180 Nm	315018



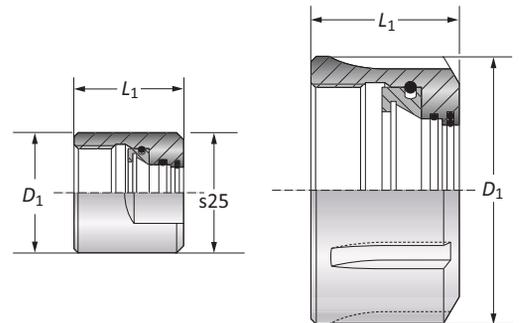
One Piece Clamping Nuts for use with Sealing Disks: DIN 6499 / ISO 15488 - 8°

	Nominal Size	Clamping Nut				Part No.
		D_1	L_1	Clamping Range	Torque	
i	ER 16	1.102	0.984	0.039 - 0.394	44.3 lb-ft	277001
	ER 25	1.654	1.083	0.079 - 0.630	73.8 lb-ft	277005
	ER 32	1.969	1.201	0.079 - 0.787	103.3 lb-ft	277007
	ER 40	2.480	1.339	0.118 - 1.024	132.8 lb-ft	278001
m	ER 16	28.00	25.00	1.00 - 10.00	60 Nm	277001
	ER 25	42.00	27.50	2.00 - 16.00	100 Nm	277005
	ER 32	50.00	30.50	2.00 - 20.00	140 Nm	277007
	ER 40	63.00	34.00	3.00 - 26.00	180 Nm	278001



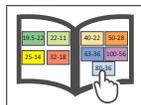
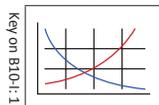
Clamping Nuts with Sliding Ring for use with Sealing Disks: DIN 6499 / ISO 15488 - 8°

	Nominal Size	Clamping Nuts : ISO 15488 (DIN 6499)				Part No.
		D_1	L_1	Clamping Range	Torque	
i	ER 16	1.102	0.984	0.039 - 0.394	44.3 lb-ft	277002
	ER 25	1.654	1.122	0.079 - 0.630	73.8 lb-ft	277006
	ER 32	1.969	1.240	0.079 - 0.787	103.3 lb-ft	277008
	ER 40	2.480	1.378	0.118 - 1.024	132.8 lb-ft	278002
m	ER 16	28.00	25.00	1.00 - 10.00	60 Nm	277002
	ER 25	42.00	28.50	2.00 - 16.00	100 Nm	277006
	ER 32	50.00	31.50	2.00 - 20.00	140 Nm	277008
	ER 40	63.00	35.00	3.00 - 26.00	180 Nm	278002



B10-M: 12-19

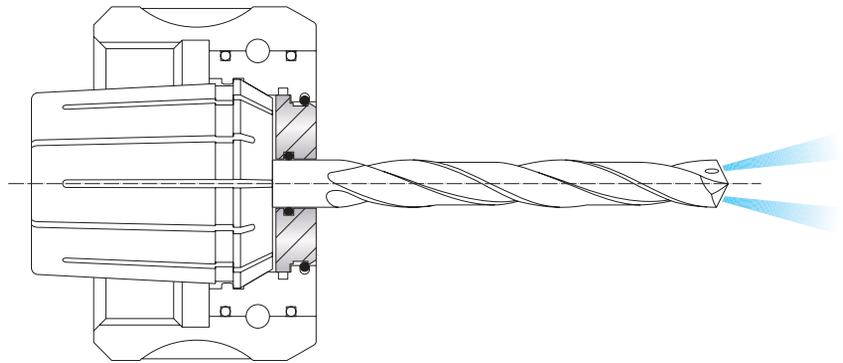
B10: vi-vii



i = Imperial (in)
m = Metric (mm)

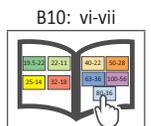
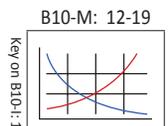
Sealing Disks for Collet Chucks: ISO 10897 (DIN 6388)

Imperial



Nominal Size	Sealing Disk		Sealing Disk		Sealing Disk		Sealing Disk	
	Diameter	Part No.						
16	0.098 - 0.118	275010	0.236 - 0.256	275017	0.374 - 0.394	275024	0.512 - 0.531	275031
16	0.118 - 0.138	275011	0.256 - 0.276	275018	0.394 - 0.413	275025	0.531 - 0.551	275032
16	0.138 - 0.157	275012	0.276 - 0.295	275019	0.413 - 0.433	275026	0.551 - 0.571	275033
16	0.157 - 0.177	275013	0.295 - 0.315	275020	0.433 - 0.453	275027	0.571 - 0.591	275034
16	0.177 - 0.197	275014	0.315 - 0.335	275021	0.453 - 0.472	275028	0.591 - 0.610	275035
16	0.197 - 0.217	275015	0.335 - 0.354	275022	0.472 - 0.492	275029	0.610 - 0.630	275036
16	0.217 - 0.236	275016	0.354 - 0.374	275023	0.492 - 0.512	275030	-	-
25	0.098 - 0.118	275040	0.335 - 0.354	275052	0.571 - 0.591	275064	0.807 - 0.827	275076
25	0.118 - 0.138	275041	0.354 - 0.374	275053	0.591 - 0.610	275065	0.807 - 0.846	275077
25	0.138 - 0.157	275042	0.374 - 0.394	275054	0.610 - 0.630	275066	0.846 - 0.866	275078
25	0.157 - 0.177	275043	0.394 - 0.413	275055	0.630 - 0.650	275067	0.866 - 0.886	275079
25	0.177 - 0.197	275044	0.413 - 0.433	275056	0.650 - 0.669	275068	0.886 - 0.906	275080
25	0.197 - 0.217	275045	0.433 - 0.453	275057	0.669 - 0.689	275069	0.906 - 0.925	275081
25	0.217 - 0.236	275046	0.453 - 0.472	275058	0.689 - 0.709	275070	0.925 - 0.945	275082
25	0.236 - 0.256	275047	0.472 - 0.492	275059	0.709 - 0.728	275071	0.945 - 0.965	275083
25	0.256 - 0.276	275048	0.492 - 0.512	275060	0.728 - 0.748	275072	0.965 - 0.984	275084
25	0.276 - 0.295	275049	0.512 - 0.531	275061	0.748 - 0.768	275073	-	-
25	0.295 - 0.315	275050	0.531 - 0.551	275062	0.768 - 0.787	275074	-	-
25	0.315 - 0.335	275051	0.551 - 0.571	275063	0.787 - 0.807	275075	-	-
32	0.138 - 0.157	276005	0.433 - 0.453	276020	0.728 - 0.748	276035	1.024 - 1.043	276050
32	0.157 - 0.177	276006	0.453 - 0.472	276021	0.748 - 0.768	276036	1.043 - 1.063	276051
32	0.177 - 0.197	276007	0.472 - 0.492	276022	0.768 - 0.787	276037	1.063 - 1.102	276052
32	0.197 - 0.217	276008	0.492 - 0.512	276023	0.787 - 0.807	276038	1.063 - 1.102	276053
32	0.217 - 0.236	276009	0.512 - 0.531	276024	0.807 - 0.827	276039	1.102 - 1.102	276054
32	0.236 - 0.256	276010	0.531 - 0.551	276025	0.827 - 0.846	276040	1.122 - 1.142	276055
32	0.256 - 0.276	276011	0.551 - 0.571	276026	0.846 - 0.866	276041	1.142 - 1.161	276056
32	0.276 - 0.295	276012	0.571 - 0.591	276027	0.866 - 0.886	276042	1.161 - 1.181	276057
32	0.295 - 0.315	276013	0.591 - 0.610	276028	0.886 - 0.906	276043	1.181 - 1.201	276058
32	0.315 - 0.335	276014	0.610 - 0.630	276029	0.906 - 0.925	276044	1.201 - 1.220	276059
32	0.335 - 0.354	276015	0.630 - 0.650	276030	0.925 - 0.945	276045	1.220 - 1.240	276060
32	0.354 - 0.374	276016	0.650 - 0.669	276031	0.945 - 0.965	276046	1.240 - 1.260	276061
32	0.374 - 0.394	276017	0.669 - 0.689	276032	0.965 - 0.984	276047	-	-
32	0.394 - 0.413	276018	0.669 - 0.709	276033	0.984 - 1.004	276048	-	-
32	0.413 - 0.433	276019	0.709 - 0.728	276034	1.004 - 1.024	276049	-	-

i

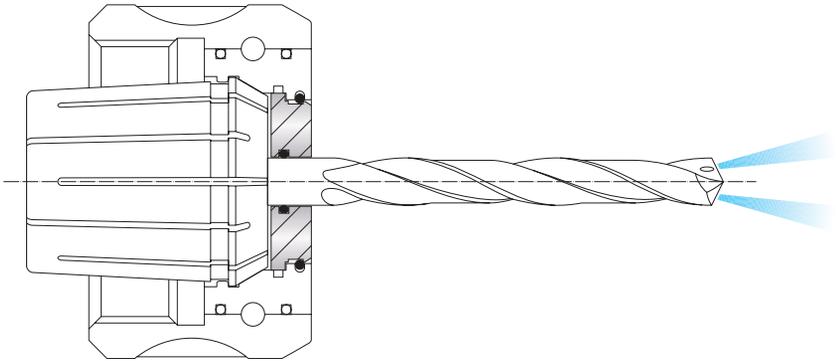


i = Imperial (in)
m = Metric (mm)

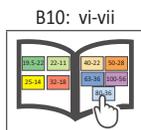
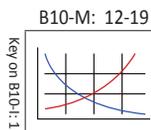
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Sealing Disks for Collet Chucks: ISO 10897 (DIN 6388)

Metric



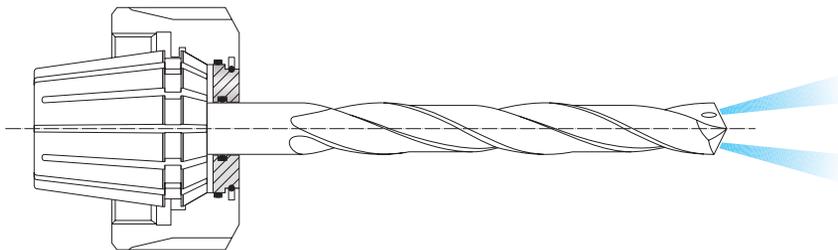
Nominal Size	Sealing Disk		Sealing Disk		Sealing Disk		Sealing Disk	
	Diameter	Part No.						
16	2.50 - 3.00	275010	6.00 - 6.50	275017	9.50 - 10.00	275024	13.00 - 13.50	275031
16	3.00 - 3.50	275011	6.50 - 7.00	275018	10.00 - 10.50	275025	13.50 - 14.00	275032
16	3.50 - 4.00	275012	7.00 - 7.50	275019	10.50 - 11.00	275026	14.00 - 14.50	275033
16	4.00 - 4.50	275013	7.50 - 8.00	275020	11.00 - 11.50	275027	14.50 - 15.00	275034
16	4.50 - 5.00	275014	8.00 - 8.50	275021	11.50 - 12.00	275028	15.00 - 15.50	275035
16	5.00 - 5.50	275015	8.50 - 9.00	275022	12.00 - 12.50	275029	15.50 - 16.00	275036
16	5.50 - 6.00	275016	9.00 - 9.50	275023	12.50 - 13.00	275030	-	-
25	2.50 - 3.00	275040	8.50 - 9.00	275052	14.50 - 15.00	275064	20.50 - 21.00	275076
25	3.00 - 3.50	275041	9.00 - 9.50	275053	15.00 - 15.50	275065	21.00 - 21.50	275077
25	3.50 - 4.00	275042	9.50 - 10.00	275054	15.50 - 16.00	275066	21.50 - 22.00	275078
25	4.00 - 4.50	275043	10.00 - 10.50	275055	16.00 - 16.50	275067	22.00 - 22.50	275079
25	4.50 - 5.00	275044	10.50 - 11.00	275056	16.50 - 17.00	275068	22.50 - 23.00	275080
25	5.00 - 5.50	275045	11.00 - 11.50	275057	17.00 - 17.50	275069	23.00 - 23.50	275081
25	5.50 - 6.00	275046	11.50 - 12.00	275058	17.50 - 18.00	275070	23.50 - 24.00	275082
25	6.00 - 6.50	275047	12.00 - 12.50	275059	18.00 - 18.50	275071	24.00 - 24.50	275083
25	6.50 - 7.00	275048	12.50 - 13.00	275060	18.50 - 19.00	275072	24.50 - 25.00	275084
25	7.00 - 7.50	275049	13.00 - 13.50	275061	19.00 - 19.50	275073	-	-
25	7.50 - 8.00	275050	13.50 - 14.00	275062	19.50 - 20.00	275074	-	-
25	8.00 - 8.50	275051	14.00 - 14.50	275063	20.00 - 20.50	275075	-	-
32	3.50 - 4.00	276005	11.00 - 11.50	276020	18.50 - 19.00	276035	26.00 - 26.50	276050
32	4.00 - 4.50	276006	11.50 - 12.00	276021	19.00 - 19.50	276036	26.50 - 27.00	276051
32	4.50 - 5.00	276007	12.00 - 12.50	276022	19.50 - 20.00	276037	27.50 - 28.00	276052
32	5.00 - 5.50	276008	12.50 - 13.00	276023	20.00 - 20.50	276038	27.50 - 28.00	276053
32	5.50 - 6.00	276009	13.00 - 13.50	276024	20.50 - 21.00	276039	28.00 - 28.50	276054
32	6.00 - 6.50	276010	13.50 - 14.00	276025	21.00 - 21.50	276040	28.50 - 29.00	276055
32	6.50 - 7.00	276011	14.00 - 14.50	276026	21.50 - 22.00	276041	29.00 - 29.50	276056
32	7.00 - 7.50	276012	14.50 - 15.00	276027	22.00 - 22.50	276042	29.50 - 30.00	276057
32	7.50 - 8.00	276013	15.00 - 15.50	276028	22.50 - 23.00	276043	30.00 - 30.50	276058
32	8.00 - 8.50	276014	15.50 - 16.00	276029	23.00 - 23.50	276044	30.50 - 31.00	276059
32	8.50 - 9.00	276015	16.00 - 16.50	276030	23.50 - 24.00	276045	31.00 - 31.50	276060
32	9.00 - 9.50	276016	16.50 - 17.00	276031	24.00 - 24.50	276046	31.50 - 32.00	276061
32	9.50 - 10.00	276017	17.00 - 17.50	276032	24.50 - 25.00	276047	-	-
32	10.00 - 10.50	276018	17.50 - 18.00	276033	25.00 - 25.50	276048	-	-
32	10.50 - 11.00	276019	18.00 - 18.50	276034	25.50 - 26.00	276049	-	-



i = Imperial (in)
m = Metric (mm)

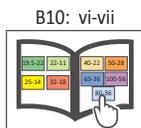
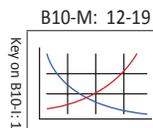
Sealing Disks Collet Chucks: ISO 15488 (DIN 6499)

Imperial



Nominal Size	Sealing Disk		Sealing Disk		Sealing Disk		Sealing Disk	
	Diameter	Part No.						
ER 16	0.098 - 0.118	277010	0.177 - 0.197	277014	0.256 - 0.276	277018	0.335 - 0.354	277022
ER 16	0.117 - 0.138	277011	0.197 - 0.217	277015	0.276 - 0.295	277019	0.354 - 0.374	277023
ER 16	0.138 - 0.157	277012	0.217 - 0.236	277016	0.295 - 0.315	277020	0.374 - 0.394	277024
ER 16	0.157 - 0.177	277013	0.236 - 0.256	277017	0.315 - 0.335	277021	–	–
ER 25	0.098 - 0.118	277025	0.236 - 0.256	277032	0.374 - 0.394	277039	0.512 - 0.531	277046
ER 25	0.118 - 0.138	277026	0.256 - 0.276	277033	0.394 - 0.413	277040	0.531 - 0.551	277047
ER 25	0.138 - 0.157	277027	0.276 - 0.295	277034	0.413 - 0.433	277041	0.551 - 0.571	277048
ER 25	0.157 - 0.177	277028	0.295 - 0.315	277035	0.433 - 0.453	277042	0.571 - 0.591	277049
ER 25	0.177 - 0.197	277029	0.315 - 0.335	277036	0.453 - 0.472	277043	0.591 - 0.610	277050
ER 25	0.197 - 0.217	277030	0.335 - 0.354	277037	0.472 - 0.492	277044	0.610 - 0.630	277051
ER 25	0.217 - 0.236	277031	0.354 - 0.374	277038	0.492 - 0.512	277045	–	–
ER 32	0.098 - 0.118	277055	0.276 - 0.295	277064	0.453 - 0.472	277073	0.630 - 0.650	277082
ER 32	0.118 - 0.138	277056	0.295 - 0.315	277065	0.472 - 0.492	277074	0.650 - 0.669	277083
ER 32	0.138 - 0.157	277057	0.315 - 0.335	277066	0.492 - 0.512	277075	0.669 - 0.689	277084
ER 32	0.157 - 0.177	277058	0.335 - 0.354	277067	0.512 - 0.531	277076	0.689 - 0.709	277085
ER 32	0.177 - 0.197	277059	0.354 - 0.374	277068	0.531 - 0.551	277077	0.709 - 0.728	277086
ER 32	0.197 - 0.217	277060	0.374 - 0.394	277069	0.551 - 0.571	277078	0.728 - 0.748	277087
ER 32	0.217 - 0.236	277061	0.394 - 0.413	277070	0.571 - 0.591	277079	0.748 - 0.768	277088
ER 32	0.236 - 0.256	277062	0.413 - 0.433	277071	0.591 - 0.610	277080	0.768 - 0.787	277089
ER 32	0.256 - 0.276	277063	0.433 - 0.453	277072	0.610 - 0.630	277081	–	–
ER 40	0.098 - 0.118	278005	0.335 - 0.354	278017	0.571 - 0.591	278029	0.807 - 0.827	278041
ER 40	0.118 - 0.138	278006	0.354 - 0.374	278018	0.591 - 0.610	278030	0.827 - 0.846	278042
ER 40	0.138 - 0.157	278007	0.374 - 0.394	278019	0.610 - 0.630	278031	0.846 - 0.866	278043
ER 40	0.157 - 0.177	278008	0.394 - 0.413	278020	0.630 - 0.650	278032	0.866 - 0.886	278044
ER 40	0.177 - 0.197	278009	0.413 - 0.433	278021	0.650 - 0.669	278033	0.866 - 0.906	278045
ER 40	0.197 - 0.217	278010	0.433 - 0.453	278022	0.669 - 0.689	278034	0.906 - 0.925	278046
ER 40	0.217 - 0.236	278011	0.453 - 0.472	278023	0.689 - 0.709	278035	0.925 - 0.945	278047
ER 40	0.236 - 0.256	278012	0.472 - 0.492	278024	0.709 - 0.728	278036	0.945 - 0.965	278048
ER 40	0.256 - 0.276	278013	0.492 - 0.512	278025	0.728 - 0.748	278037	0.965 - 0.984	278049
ER 40	0.276 - 0.295	278014	0.512 - 0.531	278026	0.748 - 0.768	278038	0.984 - 1.004	278050
ER 40	0.295 - 0.315	278015	0.531 - 0.551	278027	0.768 - 0.787	278039	1.004 - 1.024	278051
ER 40	0.315 - 0.335	278016	0.551 - 0.571	278028	0.787 - 0.807	278040	–	–

i

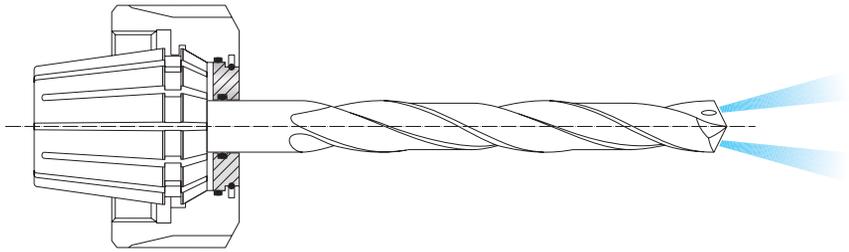


i = Imperial (in)
m = Metric (mm)

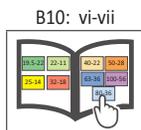
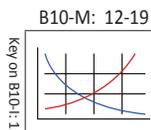
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Sealing Disks Collet Chucks: ISO 15488 (DIN 6499)

Metric



Nominal Size	Sealing Disk		Sealing Disk		Sealing Disk		Sealing Disk	
	Diameter	Part No.	Diameter	Part No.	Diameter	Part No.	Diameter	Part No.
ER 16	2.50 - 3.00	277010	4.50 - 5.00	277014	6.50 - 7.00	277018	8.50 - 9.00	277022
ER 16	3.00 - 3.50	277011	5.00 - 5.50	277015	7.00 - 7.50	277019	9.00 - 9.50	277023
ER 16	3.50 - 4.00	277012	5.50 - 6.00	277016	7.50 - 8.00	277020	9.50 - 10.00	277024
ER 16	4.00 - 4.50	277013	6.00 - 6.50	277017	8.00 - 8.50	277021	-	-
ER 25	2.50 - 3.00	277025	6.00 - 6.50	277032	9.50 - 10.00	277039	13.00 - 13.50	277046
ER 25	3.00 - 3.50	277026	6.50 - 7.00	277033	10.00 - 10.50	277040	13.50 - 14.00	277047
ER 25	3.50 - 4.00	277027	7.00 - 7.50	277034	10.50 - 11.00	277041	14.00 - 14.50	277048
ER 25	4.00 - 4.50	277028	7.50 - 8.00	277035	11.00 - 11.50	277042	14.50 - 15.00	277049
ER 25	4.50 - 5.00	277029	8.00 - 8.50	277036	11.50 - 12.00	277043	15.00 - 15.50	277050
ER 25	5.00 - 5.50	277030	8.50 - 9.00	277037	12.00 - 12.50	277044	15.50 - 16.00	277051
ER 25	5.50 - 6.00	277031	9.00 - 9.50	277038	12.50 - 13.00	277045	-	-
ER 32	2.50 - 3.00	277055	7.00 - 7.50	277064	11.50 - 12.00	277073	16.00 - 16.50	277082
ER 32	3.00 - 3.50	277056	7.50 - 8.00	277065	12.00 - 12.50	277074	16.50 - 17.00	277083
ER 32	3.50 - 4.00	277057	8.00 - 8.50	277066	12.50 - 13.00	277075	17.00 - 17.50	277084
ER 32	4.00 - 4.50	277058	8.50 - 9.00	277067	13.00 - 13.50	277076	17.50 - 18.00	277085
ER 32	4.50 - 5.00	277059	9.00 - 9.50	277068	13.50 - 14.00	277077	18.00 - 18.50	277086
ER 32	5.00 - 5.50	277060	9.50 - 10.00	277069	14.00 - 14.50	277078	18.50 - 19.00	277087
ER 32	5.50 - 6.00	277061	10.00 - 10.50	277070	14.50 - 15.00	277079	19.00 - 19.50	277088
ER 32	6.00 - 6.50	277062	10.50 - 11.00	277071	15.00 - 15.50	277080	19.50 - 20.00	277089
ER 32	6.50 - 7.00	277063	11.00 - 11.50	277072	15.50 - 16.00	277081	-	-
ER 40	2.50 - 3.00	278005	8.50 - 9.00	278017	14.50 - 15.00	278029	20.50 - 21.00	278041
ER 40	3.00 - 3.50	278006	9.00 - 9.50	278018	15.00 - 15.50	278030	21.00 - 21.50	278042
ER 40	3.50 - 4.00	278007	9.50 - 10.00	278019	15.50 - 16.00	278031	21.50 - 22.00	278043
ER 40	4.00 - 4.50	278008	10.00 - 10.50	278020	16.00 - 16.50	278032	22.00 - 22.50	278044
ER 40	4.50 - 5.00	278009	10.50 - 11.00	278021	16.50 - 17.00	278033	22.50 - 23.00	278045
ER 40	5.00 - 5.50	278010	11.00 - 11.50	278022	17.00 - 17.50	278034	23.00 - 23.50	278046
ER 40	5.50 - 6.00	278011	11.50 - 12.00	278023	17.50 - 18.00	278035	23.50 - 24.00	278047
ER 40	6.00 - 6.50	278012	12.00 - 12.50	278024	18.00 - 18.50	278036	24.00 - 24.50	278048
ER 40	6.50 - 7.00	278013	12.50 - 13.00	278025	18.50 - 19.00	278037	24.50 - 25.00	278049
ER 40	7.00 - 7.50	278014	13.00 - 13.50	278026	19.00 - 19.50	278038	25.00 - 25.50	278050
ER 40	7.50 - 8.00	278015	13.50 - 14.00	278027	19.50 - 20.00	278039	25.50 - 26.00	278051
ER 40	8.00 - 8.50	278016	14.00 - 14.50	278028	20.00 - 20.50	278040	-	-

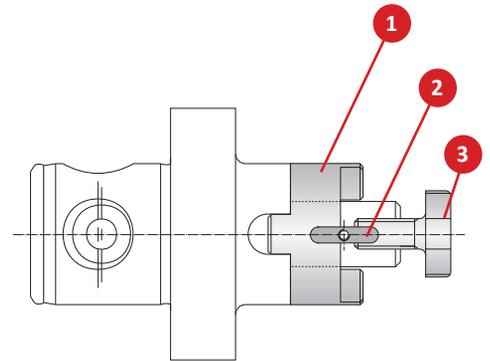


i = Imperial (in)
m = Metric (mm)

Accessories for Milling Machine Arbors

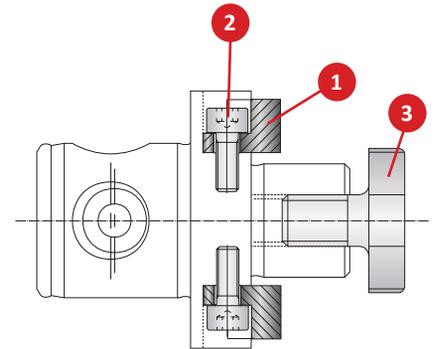
Accessories for Milling Machine Arbors

Shell-Mill Adapter	Part No.		
	1 Clutch Drive Ring	2 Axial Drive Key	3 Retaining Screw
13	115708	115709	115707
16	115696	215608	115697
22	115341	215609	115345
27	115342	215610	115346
32	115343	215611	115347
40	115344	215612	115348



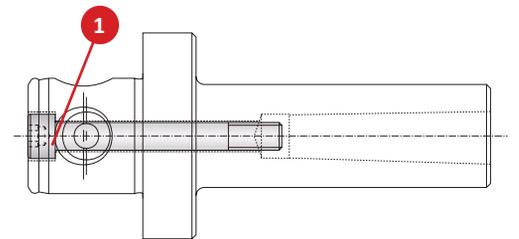
Accessories for Milling Machine Arbors

Shell-Mill Adapter	Part No.		
	1 Drive Key	2 Cap Screw	3 Retaining Screw
16	215701	115566	115697
22	215702	108109	115345
27	215703	108109	115346
32	215704	115147	115347
40	215705	116152	115348
60	115643	115237	-



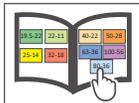
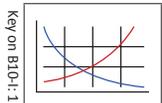
Accessories for Holding Arbors

Adapter Sleeves	Part No.	
	1 Cap Screw	Service Key
209022	115929	s5
209023	115930	s7
209024	115932	s8
209025	115933	s5
209026	115169	s8
209027	115934	s10
209028	115936	s12



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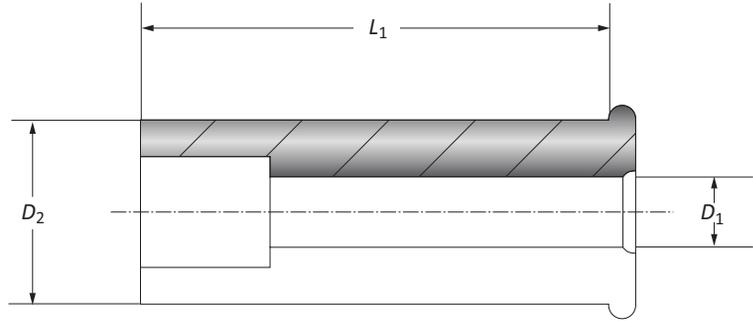
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i = Imperial (in)
m = Metric (mm)

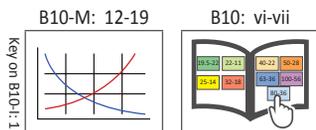
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Reducing Sleeves for Hydraulic Clamping Chucks



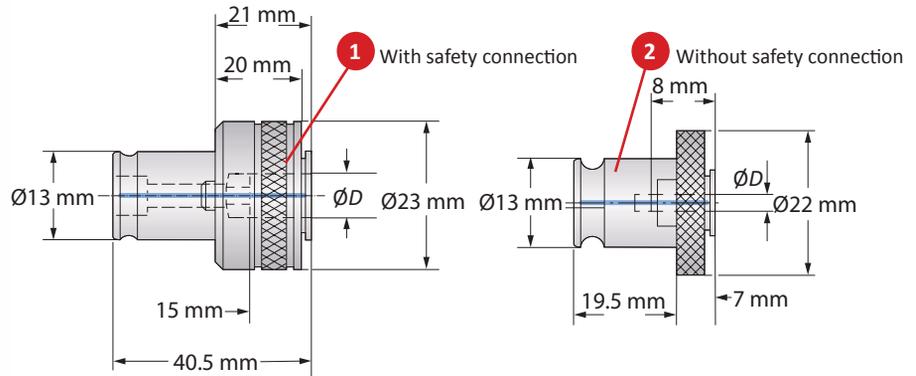
	Nominal Size	Reducing Sleeve		Part No.
	D_2	D_1	L_1	
	0.787	0.118	1.988	271045
	0.787	0.157	1.988	271046
	0.787	0.197	1.988	271047
	0.787	0.236	1.988	271070
	0.787	0.276	1.988	271049
	0.787	0.315	1.988	271004
	0.787	0.354	1.988	271050
	0.787	0.394	1.988	271005
	0.787	0.433	1.988	271051
	0.787	0.472	1.988	271073
	0.787	0.512	1.988	271052
	0.787	0.551	1.988	271074
	0.787	0.591	1.988	271018
	0.787	0.630	1.988	271008
<hr/>				
	20.00	3.00	50.50	271045
	20.00	4.00	50.50	271046
	20.00	5.00	50.50	271047
	20.00	6.00	50.50	271070
	20.00	7.00	50.50	271049
	20.00	8.00	50.50	271004
	20.00	9.00	50.50	271050
	20.00	10.00	50.50	271005
	20.00	11.00	50.50	271051
	20.00	12.00	50.50	271073
	20.00	13.00	50.50	271052
	20.00	14.00	50.50	271074
	20.00	15.00	50.50	271018
	20.00	16.00	50.50	271008

NOTE: For cylindrical shanks with shank tolerance h6 for clamping diameter 3 mm and 8 mm and with shank tolerance h7 for clamping diameter 10 mm - 32 mm.
NOTE: Reduction sleeve with adjustable stop.

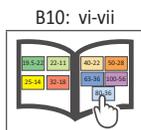
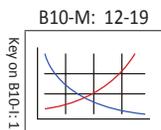


i = Imperial (in)
m = Metric (mm)

Quick Change Adapters



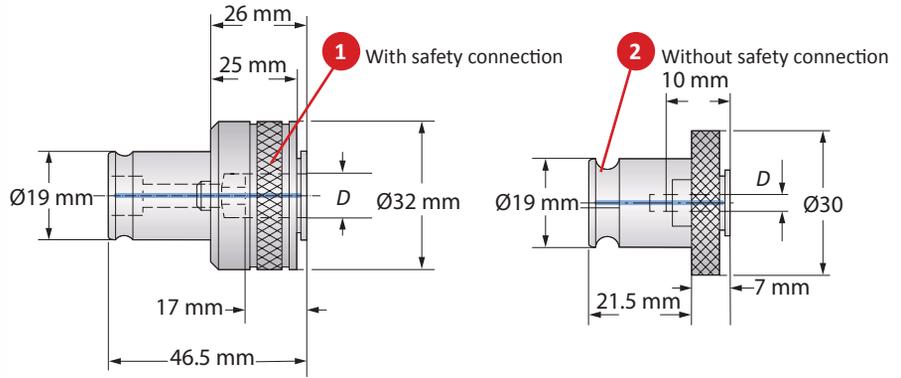
Shank Dimensions		Quick Change Adapter								Part No.		
Nominal Size	D x Square Shank	DIN 352	DIN 353	DIN 371	DIN 374	DIN 376	DIN 2182	DIN 2183	Torque Setting	1	2	
i	0	0.098 x 0.083	M 1	-	M 1	-	M 3.5	1/16"	-	1.5 - 2	233070	K24358
	0	0.110 x 0.083	M 2	-	M 2	M 4	M 4	3/32"	5/32"	2 - 3	233071	K24276
	0	0.138 x 0.106	M 3	-	M 3	M 5	M 5	1/8"	-	4 - 6	233072	K24277
	0	0.157 x 0.118	M 3.5	-	M 3.5	-	-	-	-	1.5 - 2	233073	K24278
	0	0.177 x 0.138	M 4	-	M 4	M 6	M 6	5/32"	1/4"	6 - 9	233074	K24279
	0	0.236 x 0.193	M 8	-	-	M 8	M 8	-	-	16 - 21	233075	K24280
	0	0.276 x 0.217	M 10	G 1/8"	-	M 10	M 10	1/4"	3/8"	27 - 32	233076	K24281
	0	0.315 x 0.244	-	-	M 8	-	-	5/16"	7/16"	16 - 21	233077	K24391
m	0	2.50 x 2.10	M 1	-	M 1	-	M 3.5	1/16"	-	1.5 - 2	233070	K24358
	0	2.80 x 2.10	M 2	-	M 2	M 4	M 4	3/32"	5/32"	2 - 3	233071	K24276
	0	3.50 x 2.70	M 3	-	M 3	M 5	M 5	1/8"	-	4 - 6	233072	K24277
	0	4.00 x 3.00	M 3.5	-	M 3.5	-	-	-	-	1.5 - 2	233073	K24278
	0	4.50 x 3.40	M 4	-	M 4	M 6	M 6	5/32"	1/4"	6 - 9	233074	K24279
	0	6.00 x 4.90	M 8	-	-	M 8	M 8	-	-	16 - 21	233075	K24280
	0	7.00 x 5.50	M 10	G 1/8"	-	M 10	M 10	1/4"	3/8"	27 - 32	233076	K24281
	0	8.00 x 6.20	-	-	M 8	-	-	5/16"	7/16"	16 - 21	233077	K24391



i = Imperial (in)
m = Metric (mm)

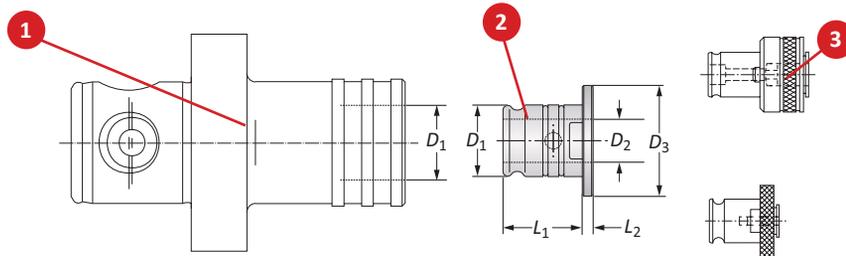
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Quick Change Adapters



Quick Change Adapters

Shank Dimensions		Quick Change Adapter								Part No.	
Nominal Size	D x Square Shank	DIN 352	DIN 353	DIN 371	DIN 374	DIN 376	DIN 2182	DIN 2183	Torque Setting	1	2
1	0.110 x 0.083	M 2	-	M 2.8	M 4	M 4	3/32"	5/32"	2 - 3	K17847	K23259
1	0.138 x 0.106	M 3	-	M 3.5	M 5	M 5	1/8"	-	4 - 6	233001	K18455
1	0.157 x 0.118	M 3.5	-	M 3.5	-	-	-	-	1.5 - 2	233002	K22439
1	0.177 x 0.134	M 4	-	M 4	M 6	M 6	5/32"	1/4"	6 - 9	233003	K16414
1	0.236 x 0.193	M 8	-	-	M 8	M 8	-	-	16 - 21	233004	K16415
1	0.276 x 0.217	M 10	-	-	M 10	M 10	1/4"	3/8"	27 - 32	233005	K16418
1	0.315 x 0.244	-	G 7/8"	M 8	-	-	5/16"	7/16"	16 - 21	233006	K16416
1	0.354 x 0.276	M 12	-	-	M 12	M 12	3/8"	1/2"	37 - 44	233007	K18454
1	0.394 x 0.315	-	-	M 10	-	-	-	-	27 - 32	233008	K16417
1	0.433 x 0.354	M 14	G 1/4"	-	M 14	M 14	-	9/16"	50 - 53	233009	K22440
1	2.80 x 2.10	M 2	-	M 2.8	M 4	M 4	3/32"	5/32"	2 - 3	K17847	K23259
1	3.50 x 2.70	M 3	-	M 3.5	M 5	M 5	1/8"	-	4 - 6	233001	K18455
1	4.00 x 3.00	M 3.5	-	M 3.5	-	-	-	-	1.5 - 2	233002	K22439
1	4.50 x 3.40	M 4	-	M 4	M 6	M 6	5/32"	1/4"	6 - 9	233003	K16414
1	6.00 x 4.90	M 8	-	-	M 8	M 8	-	-	16 - 21	233004	K16415
1	7.00 x 5.50	M 10	-	-	M 10	M 10	1/4"	3/8"	27 - 32	233005	K16418
1	8.00 x 6.20	-	G 7/8"	M 8	-	-	5/16"	7/16"	16 - 21	233006	K16416
1	9.00 x 7.00	M 12	-	-	M 12	M 12	3/8"	1/2"	37 - 44	233007	K18454
1	10.00 x 8.00	-	-	M 10	-	-	-	-	27 - 32	233008	K16417
1	11.00 x 9.00	M 14	G 1/4"	-	M 14	M 14	-	9/16"	50 - 53	233009	K22440

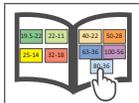
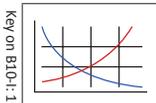


Reducers for Quick Change Adapters

1 Tapping Chuck		2 Quick Change Adapter		3. Reducer						Weight	Part No.
Nominal Size	D ₁	Nominal Size	D ₁	D ₁	D ₂	D ₃	L ₁	L ₂			
1	0.748	0	0.512	0.748	0.512	1.181	0.846	0.157	0.264 (lbs)	161038	
2	1.220	1	0.748	1.220	0.748	1.890	1.378	0.197	1.058 (lbs)	162094	
1	19.00	0	13.00	19.00	13.00	30.00	21.50	4.00	0.12 (kg)	161038	
2	31.00	1	19.00	31.00	19.00	48.00	35.00	5.00	0.48 (kg)	162094	

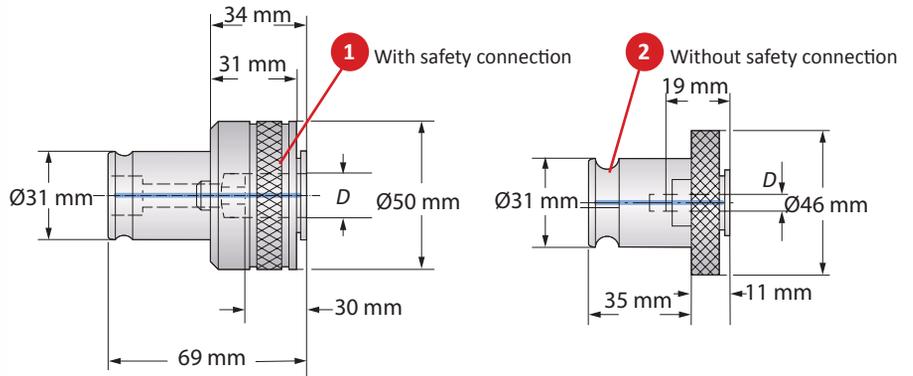
B10-M: 12-19

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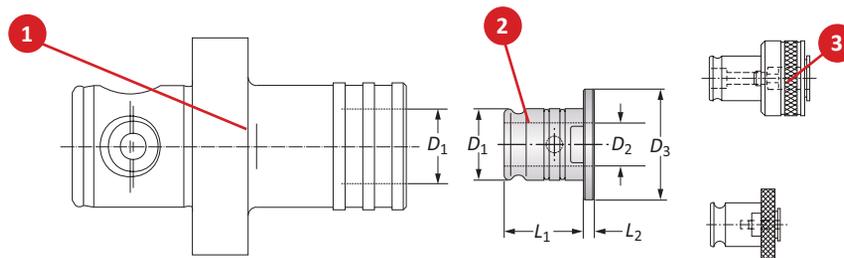
i = Imperial (in)
m = Metric (mm)

Quick Change Adapters



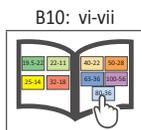
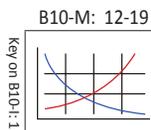
Quick Change Adapters

Shank Dimensions		Quick Change Adapter									Part No.	
Nominal Size	D x Square Shank	DIN 352	DIN 353	DIN 371	DIN 374	DIN 376	DIN 2182	DIN 2183	Torque Setting	1	2	
i	2	0.276 x 0.217	M 10	G 1/8"	-	M 10	M 10	1/4"	3/8"	24 - 32	233020	K15282
	2	0.315 x 0.244	-	-	M 8	-	-	5/16"	7/16"	16 - 21	233021	K15283
	2	0.354 x 0.276	M 12	-	-	M 12	M 12	3/8"	1/2"	37 - 44	233022	K15284
	2	0.394 x 0.315	-	-	M 10	-	-	-	-	27 - 32	233023	K18456
	2	0.433 x 0.354	M 14	G 1/4"	-	M 14	M 14	-	9/16"	50 - 53	233024	K16419
	2	0.472 x 0.354	M 16	G 3/8"	-	M 16	M 16	-	5/8"	55 - 58	233025	K15285
	2	0.551 x 0.433	M 18	-	-	M 18	M 18	-	1 1/16"	85 - 90	233026	K16420
	2	0.630 x 0.472	M 20	G 1/2"	-	M 20	M 20	-	1 3/16"	110 - 115	233027	K15286
2	0.709 x 0.571	M 24	-	-	M 24	M 24	-	1 5/16"	110 - 115	233028	K18457	
m	2	7.00 x 5.50	M 10	G 1/8"	-	M 10	M 10	1/4"	3/8"	24 - 32	233020	K15282
	2	8.00 x 6.20	-	-	M 8	-	-	5/16"	7/16"	16 - 21	233021	K15283
	2	9.00 x 7.00	M 12	-	-	M 12	M 12	3/8"	1/2"	37 - 44	233022	K15284
	2	10.00 x 8.00	-	-	M 10	-	-	-	-	27 - 32	233023	K18456
	2	11.00 x 9.00	M 14	G 1/4"	-	M 14	M 14	-	9/16"	50 - 53	233024	K16419
	2	12.00 x 9.00	M 16	G 3/8"	-	M 16	M 16	-	5/8"	55 - 58	233025	K15285
	2	14.00 x 11.00	M 18	-	-	M 18	M 18	-	1 1/16"	85 - 90	233026	K16420
	2	16.00 x 12.00	M 20	G 1/2"	-	M 20	M 20	-	1 3/16"	110 - 115	233027	K15286
2	18.00 x 14.50	M 24	-	-	M 24	M 24	-	1 5/16"	110 - 115	233028	K18457	



Reducers for Quick Change Adapters

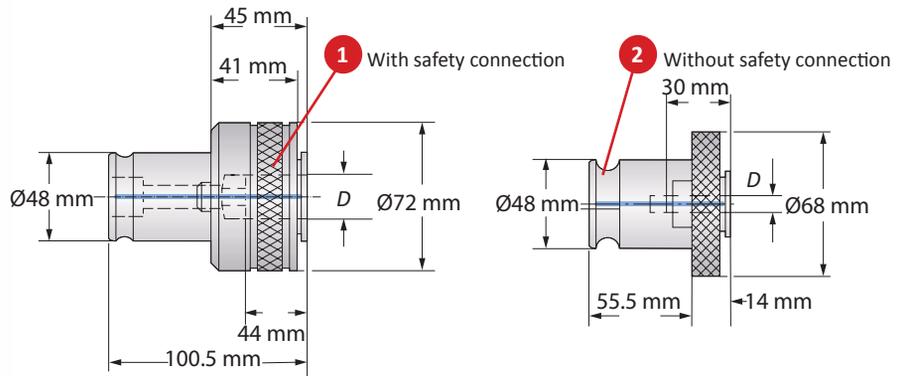
	1 Tapping Chuck		2 Quick Change Adapter		3 Reducer					Weight	Part No.
	Nominal Size	D ₁	Nominal Size	D ₁	D ₁	D ₂	D ₃	L ₁	L ₂		
i	1	0.748	0	0.512	0.748	0.512	1.181	0.846	0.157	0.264 (lbs)	161038
	2	1.220	1	0.748	1.220	0.748	1.890	1.378	0.197	1.058 (lbs)	162094
m	1	19.00	0	13.00	19.00	13.00	30.00	21.50	4.00	0.12 (kg)	161038
	2	31.00	1	19.00	31.00	19.00	48.00	35.00	5.00	0.48 (kg)	162094



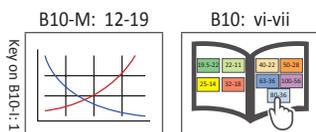
i = Imperial (in)
m = Metric (mm)

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Quick Change Adapters



Shank Dimensions		Quick Change Adapters									Part No.	
Nominal Size	D x Square Shank	DIN 352	DIN 353	DIN 371	DIN 374	DIN 376	DIN 2182	DIN 2183	Torque Setting	1	2	
i	3	0.433 x 0.354	M 14	G 1/4"	-	M 14	M 14	-	9/18"	50 - 53	233040	K22434
	3	0.472 x 0.354	M 16	G 3/8"	-	M 16	M 16	-	5/8"	55 - 58	233041	K22435
	3	0.551 x 0.433	M 18	-	-	M 18	M 18	-	11/16"	85 - 90	233042	K22436
	3	0.630 x 0.472	M 20	G 1/2"	-	M 20	M 20	-	13/18"	100 - 106	233043	K22437
	3	0.709 x 0.571	M 24	-	-	M 24	M 24	-	15/16"	140 - 150	233044	K16421
	3	0.787 x 0.650	M 27	G 3/4"	-	M 27	M 27	-	1"	150 - 160	233045	K16422
	3	0.866 x 0.709	M 30	G 7/8"	-	M 30	M 30	-	1 1/8"	240 - 250	233046	K16423
	3	0.984 x 0.866	M 33	G 1"	-	M 33	M 33	-	1 1/4"	260 - 270	233047	K16424
m	3	1.102 x 0.866	M 36	G 1 1/8"	-	M 36	M 36	-	1 3/8"	260 - 270	233048	K22438
	3	11.00 x 9.00	M 14	G 1/4"	-	M 14	M 14	-	9/18"	50 - 53	233040	K22434
	3	12.00 x 9.00	M 16	G 3/8"	-	M 16	M 16	-	5/8"	55 - 58	233041	K22435
	3	14.00 x 11.00	M 18	-	-	M 18	M 18	-	11/16"	85 - 90	233042	K22436
	3	16.00 x 12.00	M 20	G 1/2"	-	M 20	M 20	-	13/18"	100 - 106	233043	K22437
	3	18.00 x 14.50	M 24	-	-	M 24	M 24	-	15/16"	140 - 150	233044	K16421
	3	20.00 x 16.50	M 27	G 3/4"	-	M 27	M 27	-	1"	150 - 160	233045	K16422
	3	22.00 x 18.00	M 30	G 7/8"	-	M 30	M 30	-	1 1/8"	240 - 250	233046	K16423
3	25.00 x 22.00	M 33	G 1"	-	M 33	M 33	-	1 1/4"	260 - 270	233047	K16424	
3	28.00 x 22.00	M 36	G 1 1/8"	-	M 36	M 36	-	1 3/8"	260 - 270	233048	K22438	

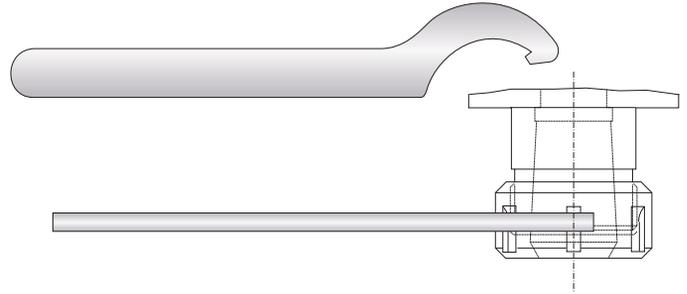


i = Imperial (in)
m = Metric (mm)

Service Keys for Collet Systems

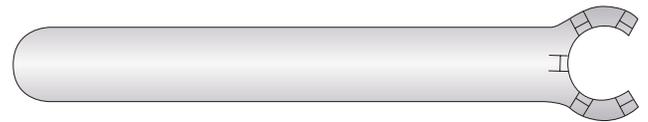
Service Keys for ISO 10897 (DIN 6388) Collet Chuck Systems

Service Key			
Nominal Size	Size	Type	Part No.
16	40 - 43	S	068179
25	58 - 62	S	068182
32	68 - 75	S	115867



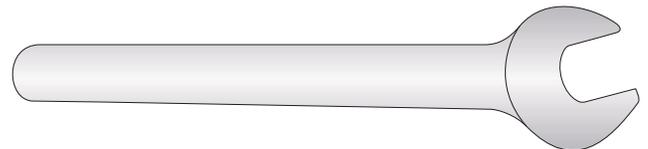
Service Keys for ISO 15488 (DIN 6499) Collet Chuck Systems

Service Key				
Nominal Size	Size	Service Key	Type	Part No.
ER 08 Mini	9.0	-	X	415373
ER 11 Mini	12.0	-	X	415374
ER 16 Mini	17.5	-	X	415375
ER 16	-	25	P	215927
ER 25	42.0	-	T	215929
ER 32	50.0	-	T	215930
ER 40	63.0	-	T	215931

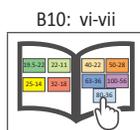
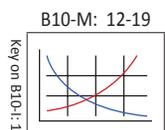
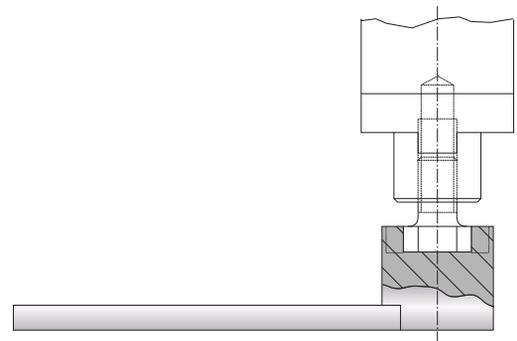


Service Keys for Erickson Collet Chuck Systems

Service Key		
Service Key	Type	Part No.
13	P	315689
19	P	315691



Service Keys	
Service Key	Part No.
13	115785
16	115699
22	115660
27	115661
32	115662
40	115663
60	315637



i = Imperial (in)
m = Metric (mm)

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SECTION

B10-J

UPA Versatile Boring Heads

Wohlhaupter® UPA Versatile Boring Heads

UPA 3 | UPA 4 | UPA 5-S 6

▶ Diameter Range: 0.000" - 24.409" (0.00 mm - 620.00 mm)



Operation Facing and Boring

In 1936, the first model of the Wohlhaupter Universal facing and boring head was developed to launch the start of Wohlhaupter boring products. It became a staple to the boring industry.

Universal Facing and Boring heads are used on universal milling and boring machines, boring mills, and jig boring machines for machining stationary workpieces in individual and batch productions.

Your safety and the safety of others is very important. This catalog contains important safety messages. Always read and follow all safety precautions.



This triangle is a safety hazard symbol. It alerts you to potential safety hazards that can cause tool failure and serious injury.

When you see this symbol in the catalog, look for a related safety message that may be near this triangle or referred to in the nearby text.

There are safety signal words also used in the catalog. Safety messages follow these words.

WARNING

WARNING (shown above) means that failure to follow the precautions in this message could result in tool failure and serious injury.

NOTICE means that failure to follow the precautions in this message could result in damage to the tool or machine but not result in personal injury.

NOTE and **IMPORTANT** are also used. These are important that you read and follow but are not safety-related.

Visit www.alliedmachine.com for the most up-to-date information and procedures.

Applicable Industries



Aerospace



Agriculture



Automotive



Firearms



General
Machining



Oil & Gas



Renewable
Energy

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UPA Boring System Diagrams 16 - 17

Series	Diameter Range	
	Imperial (inch)	Metric (mm)
UPA 3	0.000 - 10.236	0.00 - 260.00
UPA 4	0.000 - 15.748	0.00 - 400.00
UPA 5-S 6	0.000 - 24.409	0.00 - 620.00

UPA Product Overview



UPA Boring Head FACING AND BORING

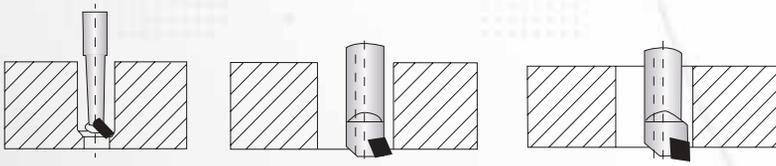
Universal Facing and Boring Heads

The versatile Wohlhaupter UPA boring heads can be used for facing, boring, and taper turning. They are available in right- or left-handed types.

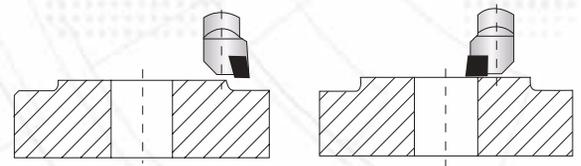
Precise and *versatile* boring heads.

- Diameter range: 0.000" - 24.409" (0.00 mm - 620.00 mm).
- Slide adjustment up to 4.410" (112.00 mm).
- Can be used in a variety of operations.

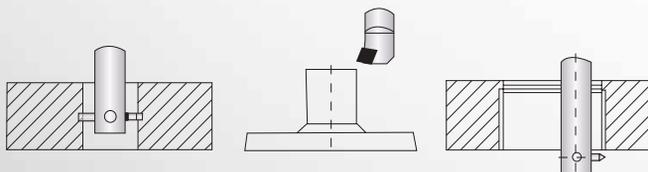
UNIVERSAL FACING and BORING Applications



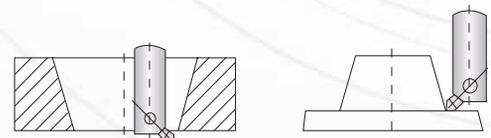
Boring with different tools



Facing
From inside outward From outside inward



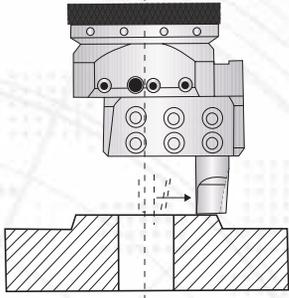
Recessing Outside Turning Thread Cutting



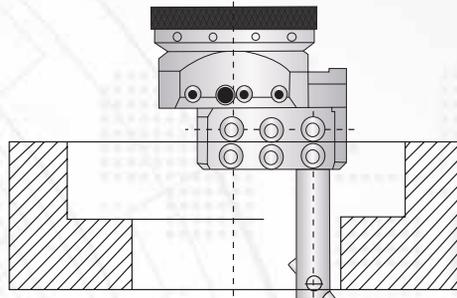
Taper Turning

UNIVERSAL

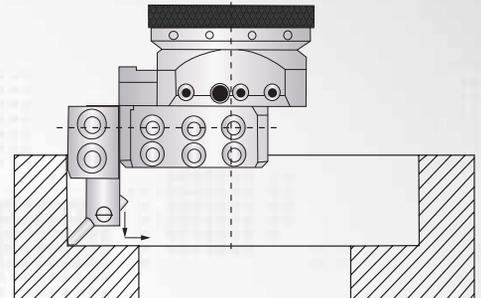
FACING and BORING Application Examples



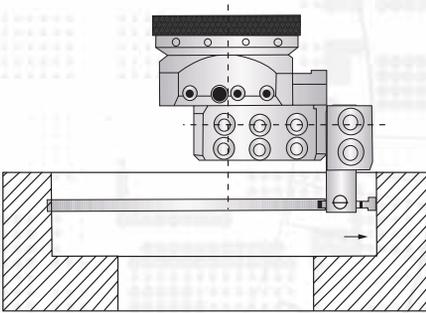
Facing with boring bar directly in slide



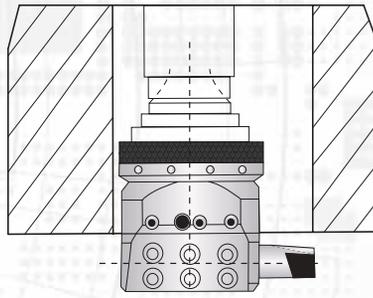
Boring with long boring bar



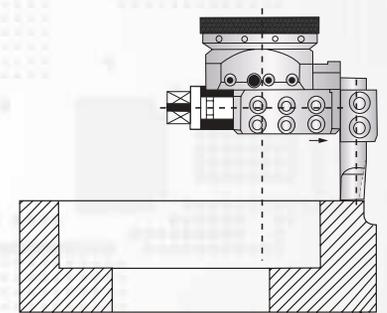
Boring and facing with short boring bar holder and a boring bar



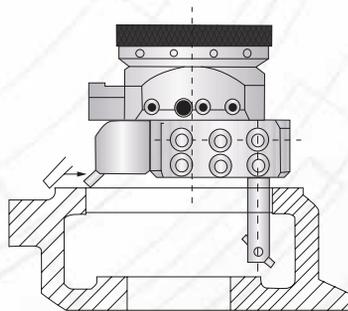
Recessing with short boring bar holder and a boring bar



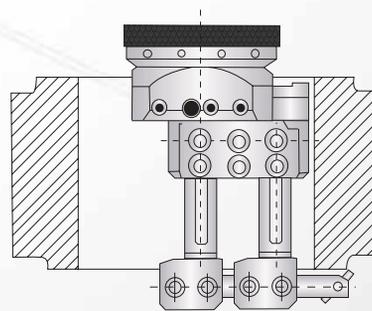
Deep hole boring with boring bar directly in slide



Large diameter facing with a long boring bar holder



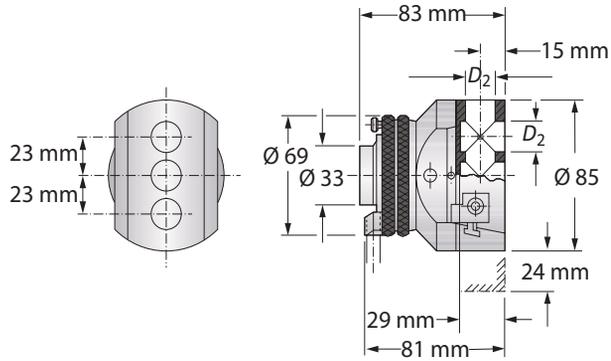
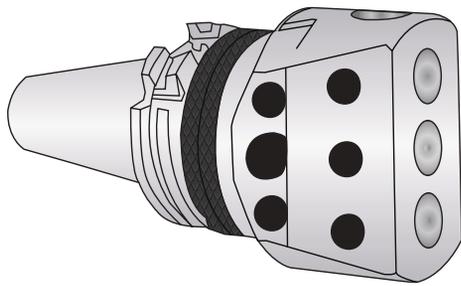
Facing in two areas with one boring bar and a boring bar holder



Facing the reverse side by using boring bar holders contained in attachment

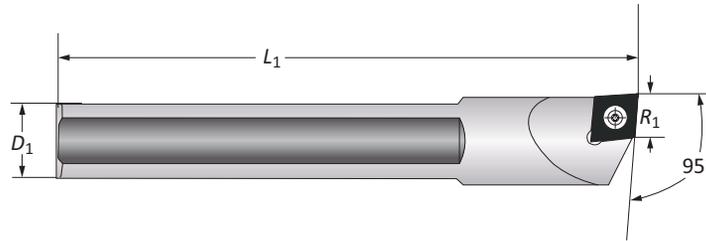
UPA 3 Boring Heads and Accessories

Diameter Range: 0.000" - 10.236" (0.00 mm - 260.00 mm)



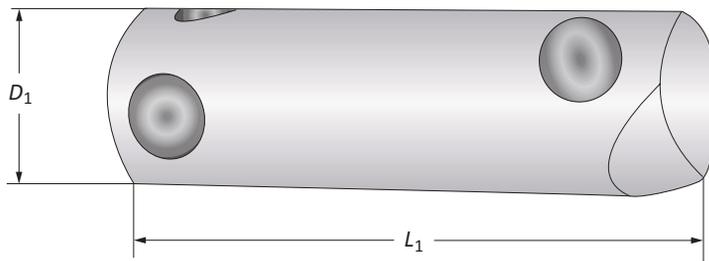
UPA 3 Boring Heads

		Boring Head		
	Boring Range	D ₂	Weight	Part No.
i	0.000 - 10.234	0.750	4.629 (lbs)	006020
m	0.00 - 260.00	18.00	2.10 (kg)	005020



UPA 3 Boring Bars

		Boring Bar					
	D ₁	L ₁	R ₁	Weight	Type	Insert Form	Part No.
i	0.750	3.149	0.531	0.220 (lbs)	Right	103	0750BFBR
	0.750	3.149	0.531	0.220 (lbs)	Left	103	0750BFBL
m	18.00	80.00	13.50	0.10 (kg)	Right	103	081087
	18.00	80.00	13.50	0.10 (kg)	Left	103	218088



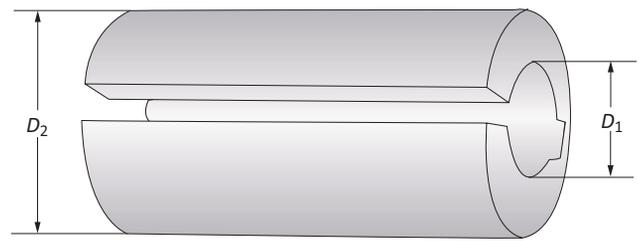
UPA 3 Boring Bars

		Boring Bar				
	D ₁	L ₁	Boring Depth	Designation	Part No.	
i	0.750	2.362	1.181	B 306	074003	
	0.750	3.543	2.362	B 309	074004	
	0.750	4.724	3.543	B 312	074005	
m	18.00	60.00	30.00	B 306	073003	
	18.00	90.00	60.00	B 309	073004	
	18.00	120.00	90.00	B 312	073005	

i = Imperial (in)
m = Metric (mm)

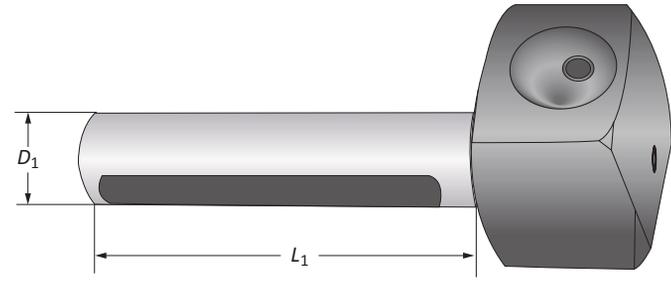
UPA 3 Accessories

Reducing Sleeves | Boring Bar Holders



UPA 3 Reducing Sleeves

Reducing Sleeve				
	D_2	D_1	Weight	Part No.
i	0.750	0.313	0.220 (lbs)	072104
	0.750	0.375	0.220 (lbs)	072105
	0.750	0.500	0.220 (lbs)	072106
	0.750	0.625	0.220 (lbs)	072107
m	18.00	8.00	0.10 (kg)	071103
	18.00	10.00	0.10 (kg)	071104
	18.00	12.00	0.10 (kg)	071105
	18.00	14.00	0.10 (kg)	071106

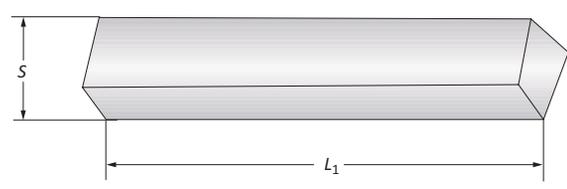


UPA 3 Boring Bar Holders

Boring Bar Holder					
	D_1	L_1	Working Diameter Range	Designation	Part No.
i	0.750	3.228	3.346 - 7.480	BH 308	076001
	0.750	4.724	6.299 - 10.236	BH 312	076002
m	18.00	82.00	85.00 - 190.00	BH 308	075001
	18.00	120.00	160.00 - 260.00	BH 312	075002

UPA 3 Square Turning Bit

Square Turning Bit				
	S	L_1	Weight	Part No.
i	0.236	1.574	0.035 (oz)	089001
m	6.00	40.00	11 (g)	089001



i = Imperial (in)
m = Metric (mm)

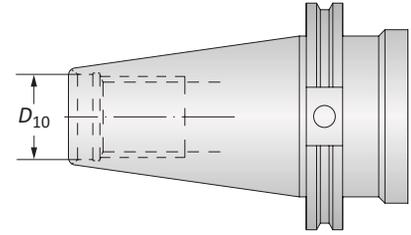
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UPA 3 Master Shanks

CAT | SK (DIN 69871) | DIN 2080

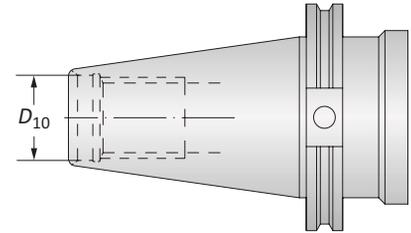
CAT Shanks

Shank				
	Style	D_{10}	Weight	Part No.
i	CAT 40	$\frac{5}{8}$ - 11	2.336 (lbs)	130001T013939
	CAT 50	1 - 8	7.054 (lbs)	130001T011624



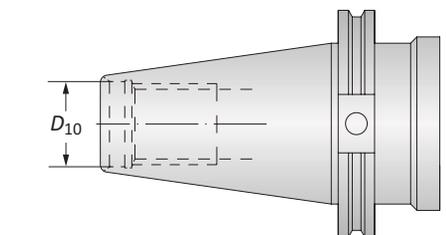
SK (DIN 69871)

Shank				
	Style	D_{10}	Weight	Part No.
m	ISO 40	M16	1.00 (kg)	130001T013815



DIN 2080

Shank				
	Style	D_{10}	Weight	Part No.
m	ISO 30	M12	0.40 (kg)	130001T003673
	ISO 40	M16 (chucking groove)	0.80 (kg)	130001T010229
	ISO 40	M16 (cap screw clamping)	1.00 (kg)	130001T003703
	ISO 50	M24	2.80 (kg)	130001T003704
	ISO 50	M24 (chucking groove)	2.80 (kg)	130001T010048



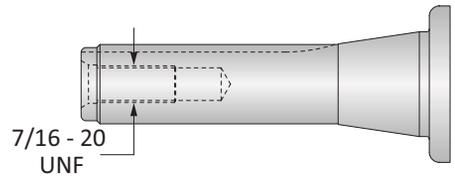
i = Imperial (in)
m = Metric (mm)

UPA 3 Master Shanks

R-8 | NMTB | Morse Taper | Norm Taper

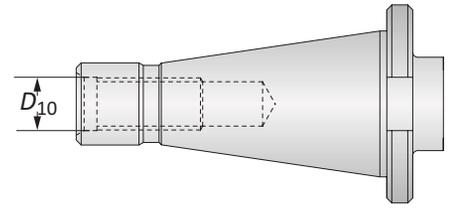
R-8 Shanks

Shank		Part No.
Weight		
i	1.058 (lbs)	130001T007166
m	0.48 (kg)	130001T007166



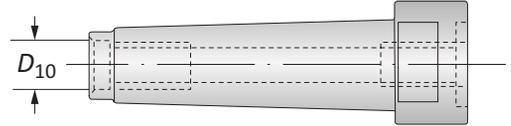
NMTB Shanks

Shank		Weight	Part No.
Style	D_{10}		
i	NMTB 40	1.984 (lbs)	130001T004498
	NMTB 50	5.798 (lbs)	130001T004480



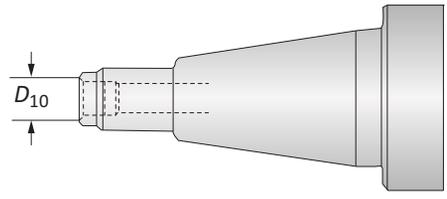
Morse Taper Shanks

Shank		Weight	Part No.
Style	Type		
i	MT 3	0.661 (lbs)	130001T004509
	MT 4	1.212 (lbs)	130001T003590
	MT 5	2.976 (lbs)	130001T003920
m	MT 3	0.30 (kg)	130001T004509
	MT 4	0.70 (kg)	130001T004256
	MT 4	1.00 (kg)	130001T004255



Norm Taper

Shank		Weight	Part No.
Style	D_{10}		
m	40 x S 20 x 2 with bolts DECKEL	1.00 (kg)	130001T005070



Differential Screw

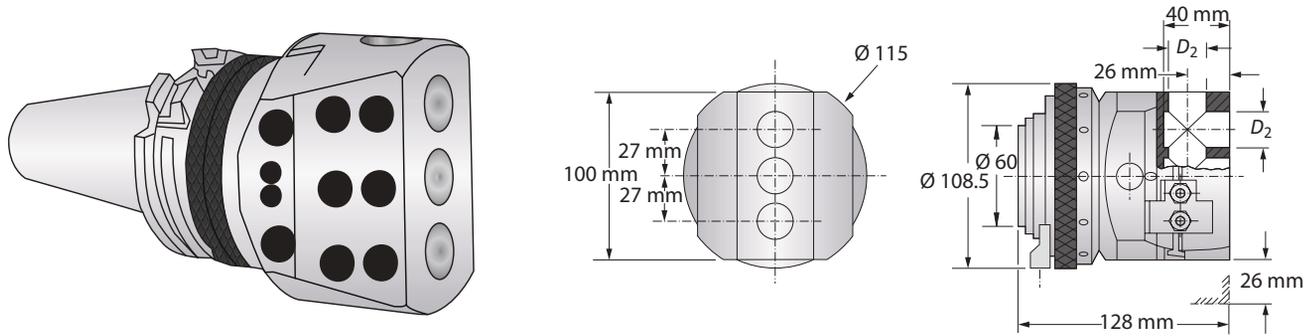
Thread	Weight	Part No.
i	M16 x 2	KW9208
m	M16 x 2	KW9208

i = Imperial (in)
m = Metric (mm)

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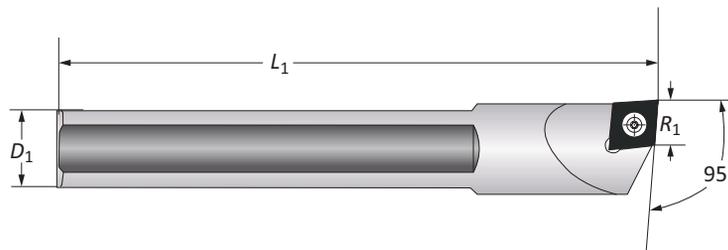
UPA 4 Boring Heads and Accessories

Diameter Range: 0.000" - 15.748" (0.00 mm - 400.00 mm)



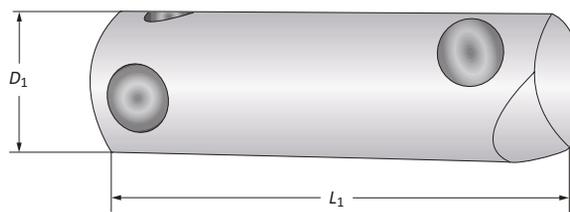
UPA 4 Boring Heads

		Boring Head		
	Boring Range	D ₂	Weight	Part No.
i	0.000 - 15.748	0.875	14.330 (lbs)	008020
m	0.00 - 400.00	22.00	6.50 (kg)	007020



UPA 4 Boring Bars

		Boring Bar					
	D ₁	L ₁	R ₁	Weight	Type	Insert Form	Part No.
i	0.875	3.937	0.531	0.220 (lbs)	Right	103	0875BFBR
	0.875	3.937	0.531	0.220 (lbs)	Right	103	0875BFBL
m	22.00	100.00	13.50	0.10 (kg)	Right	103	081092
	22.00	100.00	13.50	0.10 (kg)	Left	103	218089



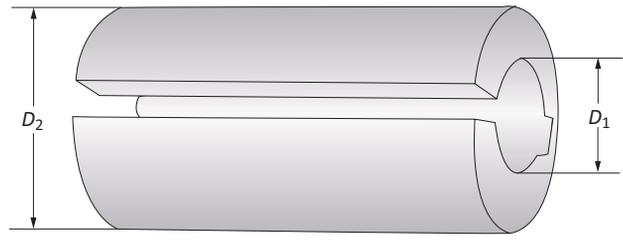
UPA 4 Boring Bars

		Boring Bar				
	D ₁	L ₁	Boring Depth	Designation	Part No.	
i	0.875	3.346	1.771	B 408	074006	
	0.875	4.921	3.346	B 412	074007	
	0.875	6.496	4.921	B 416	074008	
m	22.00	85.00	45.00	B 408	073006	
	22.00	125.00	85.00	B 412	073007	
	22.00	165.00	125.00	B 416	073008	

i = Imperial (in)
m = Metric (mm)

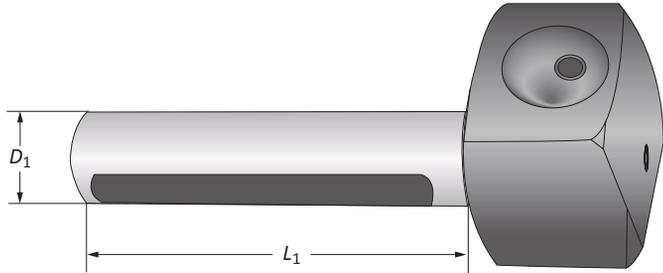
UPA 4 Accessories

Reducing Sleeves | Boring Bar Holders



UPA 4 Reducing Sleeves

		Reducing Sleeve		
	D_2	D_1	Weight	Part No.
i	0.875	0.312	0.220 (lbs)	072108
	0.875	0.375	0.220 (lbs)	072109
	0.875	0.500	0.220 (lbs)	072110
	0.875	0.625	0.176 (lbs)	072111
	0.875	0.750	0.176 (lbs)	072112
m	22.00	8.00	0.10 (kg)	071107
	22.00	10.00	0.10 (kg)	071108
	22.00	12.00	0.10 (kg)	071109
	22.00	14.00	0.08 (kg)	071110
	22.00	18.00	0.08 (kg)	071111

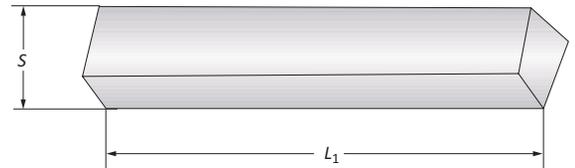


UPA 4 Boring Bar Holders

		Boring Bar Holder			
	D_1	L_1	Designation	Working Diameter Range	Part No.
i	0.875	3.858	BH 410	4.527 - 9.448	076003
	0.875	7.086	BH 418	8.661 - 15.748	076004
m	22.00	98.00	BH 410	115.00 - 240.00	075003
	22.00	180.00	BH 418	220.00 - 400.00	075004

UPA 4 Square Turning Bit

		Square Turning Bit		
	S	L_1	Weight	Part No.
i	0.236	1.574	0.035 (oz)	089001
m	6.00	40.00	11 (g)	089001

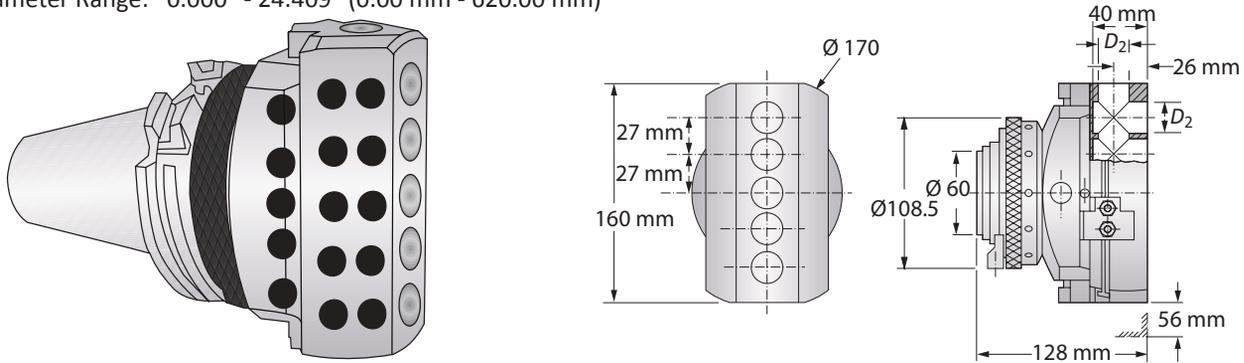


i = Imperial (in)
m = Metric (mm)

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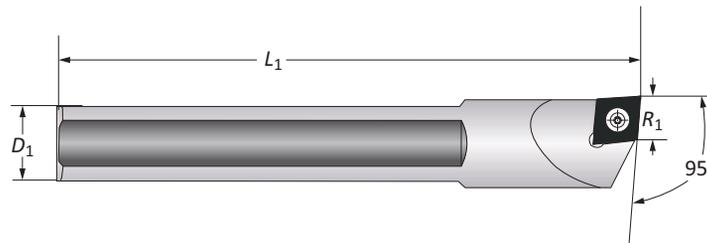
UPA 5-S 6 Boring Heads and Accessories

Diameter Range: 0.000" - 24.409" (0.00 mm - 620.00 mm)



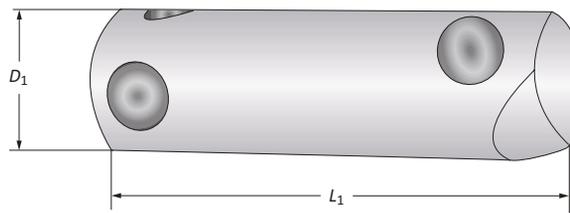
UPA 5-S 6 Boring Heads

		Boring Head		
	Boring Range	D ₂	Weight	Part No.
i	0.000 - 24.409	0.875	17.416 (lbs)	014020
m	0.00 - 620.00	22.00	7.90 (kg)	013020



UPA 5-S 6 Boring Bars

		Boring Bar					
	D ₁	L ₁	R ₁	Weight	Type	Insert Form	Part No.
i	0.875	3.937	0.531	0.220 (lbs)	Right	103	0875BFBR
	0.875	3.937	0.531	0.220 (lbs)	Left	103	0875BFBL
m	22.00	100.00	13.50	0.10 (kg)	Right	103	081092
	22.00	100.00	13.50	0.10 (kg)	Left	103	218089



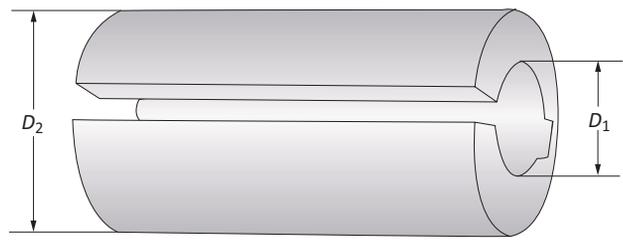
UPA 5-S 6 Boring Bars

		Boring Bar				
	D ₁	L ₁	Boring Depth	Designation	Part No.	
i	0.875	3.346	1.771	B 408	074006	
	0.875	4.921	3.346	B 412	074007	
	0.875	6.496	4.921	B 416	074008	
m	22.00	85.00	45.00	B 408	073006	
	22.00	125.00	85.00	B 412	073007	
	22.00	165.00	125.00	B 416	073008	

i = Imperial (in)
m = Metric (mm)

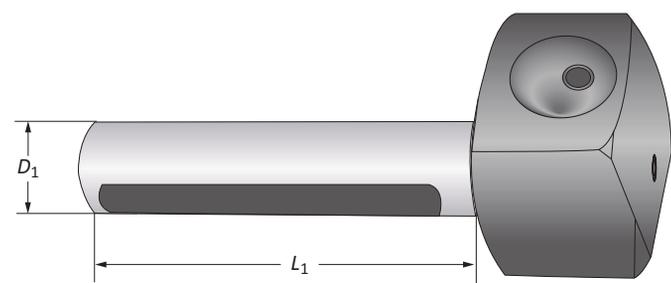
UPA 5-S 6 Accessories

Reducing Sleeves | Boring Bar Holders



UPA 5-S 6 Reducing Sleeves

		Reducing Sleeve			
		D_2	D_1	Weight	Part No.
i		0.875	0.312	0.220 (lbs)	072108
		0.875	0.375	0.220 (lbs)	072109
		0.875	0.500	0.220 (lbs)	072110
		0.875	0.625	0.176 (lbs)	072111
		0.875	0.750	0.176 (lbs)	072112
m		22.00	8.00	0.10 (kg)	071107
		22.00	10.00	0.10 (kg)	071108
		22.00	12.00	0.10 (kg)	071109
		22.00	14.00	0.08 (kg)	071110
		22.00	18.00	0.08 (kg)	071111

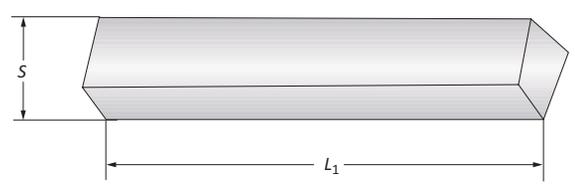


UPA 5-S 6 Boring Bar Holders

		Boring Bar Holder				
		D_1	L_1	Designation	Working Diameter Range	Part No.
i		0.875	5.039	BH 513	4.724 - 15.748	076003
		0.875	9.055	BH 523	10.630 - 24.408	076004
m		22.00	228.00	BH 513	120.00 - 400.00	075003
		22.00	230.00	BH 523	270.00 - 620.00	075004

UPA 5-S 6 Square Turning Bit

		Square Turning Bit			
		S	L_1	Weight	Part No.
i		0.236	1.574	0.035 (oz)	089001
m		6.00	40.00	11 (g)	089001



i = Imperial (in)
m = Metric (mm)

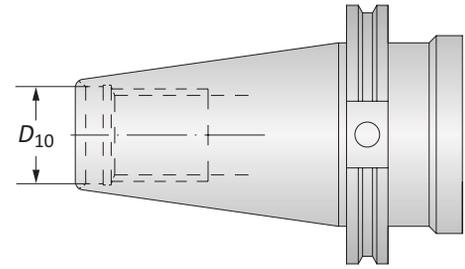
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UPA 4 and 5-S 6 Master Shanks

CAT | SK (DIN 69871) | DIN 2080

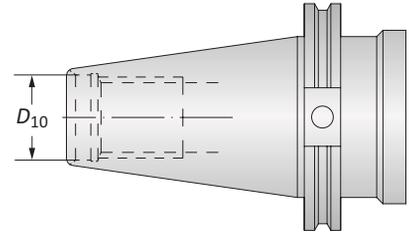
CAT Shanks

Shank				
	Style	D_{10}	Weight	Part No.
i	CAT 40	5/8 - 11	3.196 (lbs)	130005T013939
	CAT 50	1 - 8	7.054 (lbs)	130005T011624



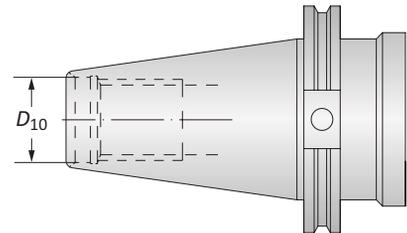
SK (DIN 69871)

Shank				
	Style	D_{10}	Weight	Part No.
m	ISO 40	M16	1.60 (kg)	130005T013815
	ISO 40	M24	3.00 (kg)	130005T013960



DIN 2080

Shank				
	Style	D_{10}	Weight	Part No.
m	ISO 40	M16 (cap nut clamps)	1.20 (kg)	130005T003703
	ISO 50	M24	2.90 (kg)	130005T003704
	ISO 40	M16 (chucking groove)	1.20 (kg)	130005T010229
	ISO 50	M24 (chucking groove)	3.00 (kg)	130005T010048



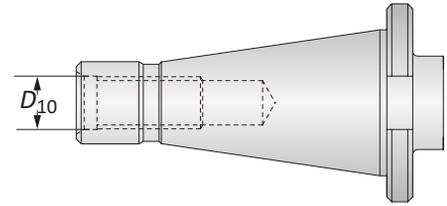
i = Imperial (in)
m = Metric (mm)

UPA 4 and 5-S 6 Master Shanks

NMTB | Morse Taper | Norm Taper

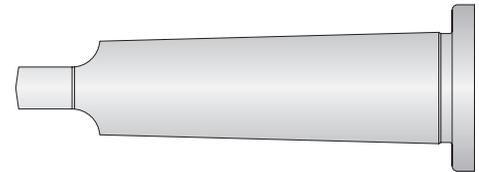
NMTB Shanks

Shank				
	Style	D_{10}	Weight	Part No.
i	NMTB 40	5/8 - 11	2.866 (lbs)	130005T004498
	NMTB 40	5/8 - 11	2.866 (lbs)	130005T010327
	NMTB 50	1 - 8	6.393 (lbs)	130005T004480



Morse Taper Shanks (DIN 1806)

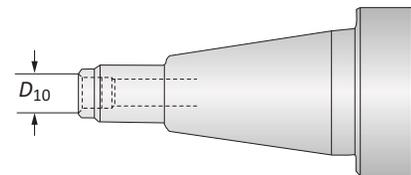
Shank			
	Style	Weight	Part No.
i	MT 4	1.895 (lbs)	130005T003590*
	MT 5	3.639 (lbs)	130005T003920
m	MT 4	0.86 (kg)	130005T003590*
	MT 5	1.65 (kg)	130005T003920



*Shank can only be used with UPA 4 boring heads.

Norm Taper

Shank				
	Style	D_{10}	Weight	Part No.
m	40 x S 20 x 2 with bolts DECKEL	M12 x 1	1.20 (kg)	130005T005070



Differential Screw

	Thread	Weight	Part No.
i	M20 x 2.5	0.154 (lbs)	KW9209
m	M20 x 2.5	0.07 (lbs)	KW9209

i = Imperial (in)
m = Metric (mm)

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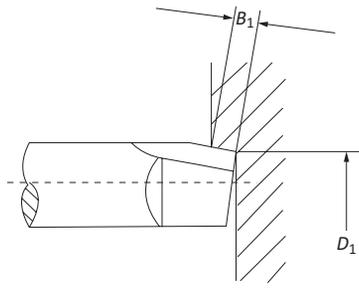
Technical Information

Technical Data

Type	UPA 3	UPA 4	UPA 5-S 6
Working accuracy	±0.005	±0.005	±0.005
Diameter range	25.00	35.00	45.00
MT shank	3.00	4.00	5.00
ISO shank	30.00	40.00	40.00
Facing and boring range	0.00 - 260.00	0.00 - 400.00	0.00 - 620.00
Adjustment of slide (max)	48.00	52.00	112.00
Self-activated feed of slide per revolution	0.05	0.02, 0.04, 0.06, 0.08, 0.10, 0.12, 0.14, 0.16, 0.18, 0.20, 0.22, 0.24	0.02, 0.04, 0.06, 0.08, 0.10, 0.12, 0.14, 0.16, 0.18, 0.20, 0.22, 0.24
^m Fine adjustment of one division	0.01	0.01	0.01
Fine adjustment of one revolution	1.00	0.40	0.40
Rapid return per revolution	1.00	–	–
Rapid return setting per revolution	–	6.00	6.00
Largest diameter of slide	85.00	115.00	170.00
Height of boring head without shank	81.00	128.00	128.00
Tool locations in slide	18.00	22.00	22.00
Max permissible revolutions	1000	600	600
End cut off accuracy	±0.05	±0.05	±0.05

ⁱ = Imperial (in)
^m = Metric (mm)

Chip Production Values



Chip Production Values

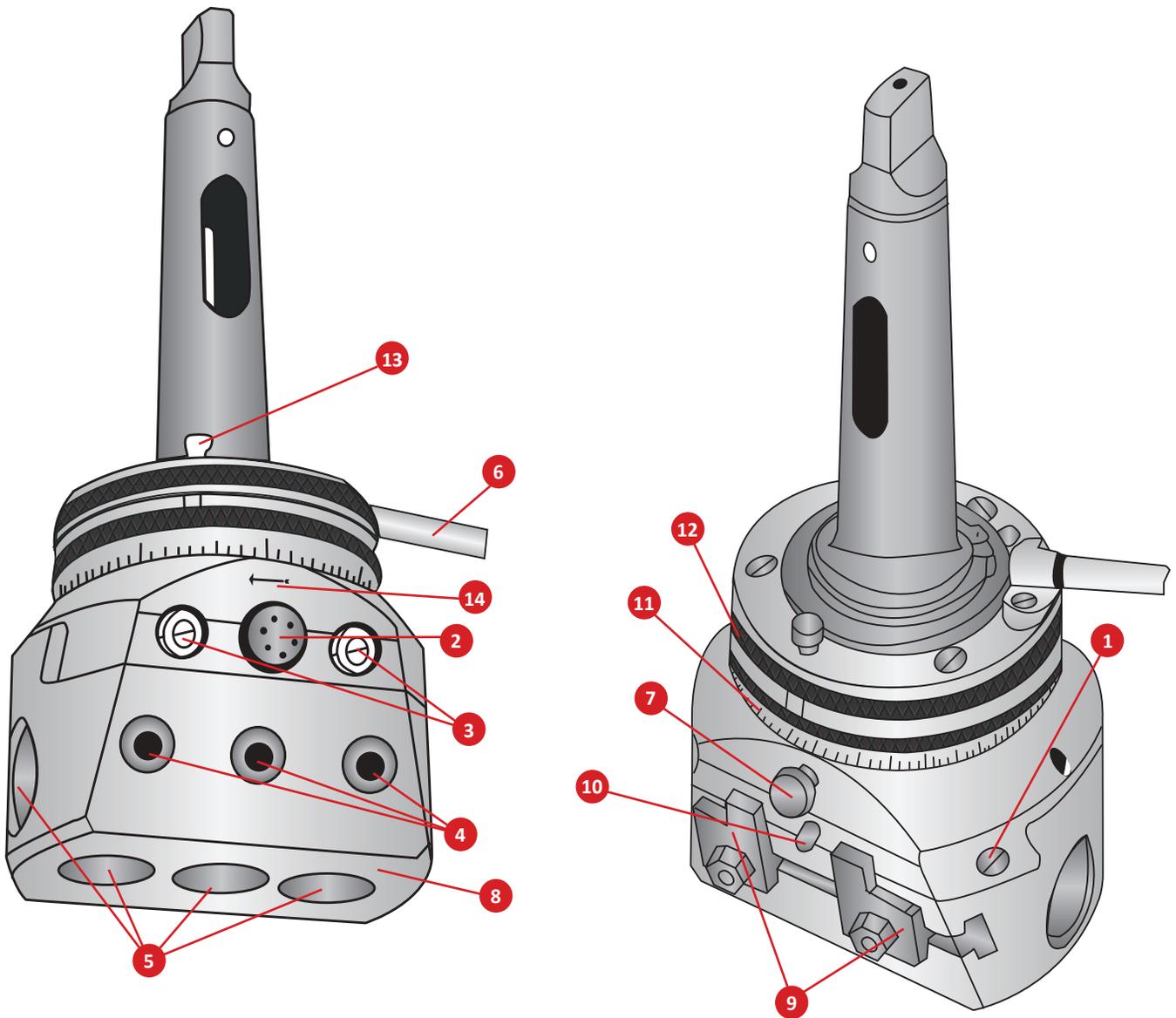
Chip Cutting Guide	Type	UPA 3	UPA 4	UPA 5-S 6
Max load	KW	2.50	7.00	9.50
With slide feed	mm/rev.	0.05	0.08, 0.12, 0.24	0.08, 0.12, 0.24
For smaller working \varnothing	D_1	60.00	150.00	200.00
m Maximum width of chip	B_1	4.00	7.00, 6.00, 4.00	8.00, 7.00, 5.00
Maximum working \varnothing	D_1	260.00	400.00	500.00 / 620.00
Max width of chip without reinforcement rings	B_1	2.00	2.20, 2.00, 1.50	2.50, 2.00, 1.50
Max width of chip with reinforcement rings*	B_1	-	4.50, 4.00, 3.00	5.00, 4.00, 3.00

*By using the reinforcement rings contained in the normal attachment, chip cutting capacity is increased by 100%.

i = Imperial (in)
m = Metric (mm)

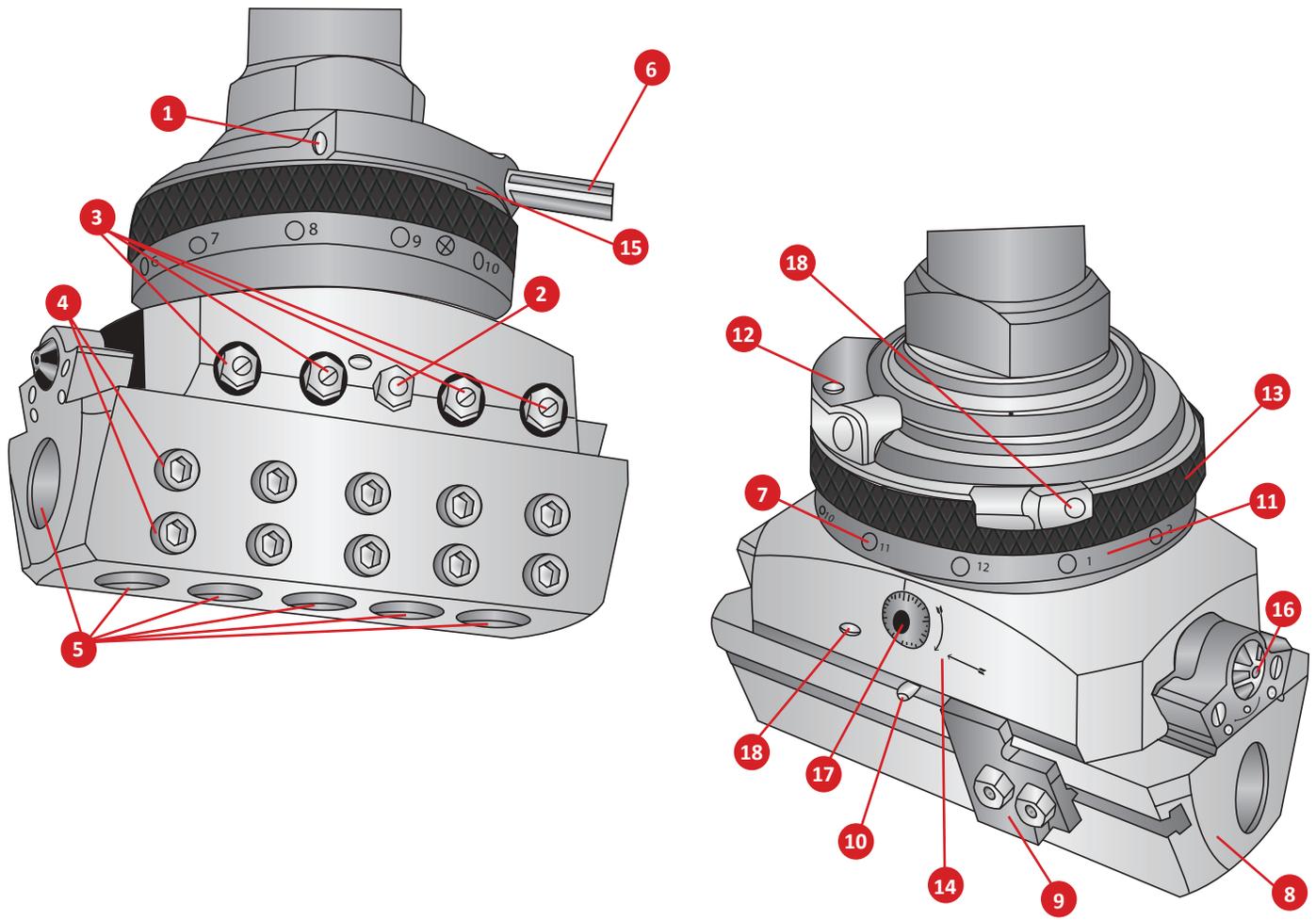
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UPA 3 Boring Head Diagram



No.	Part	No.	Part
1	Regulating screw	8	Slide
2	Locking screw	9	Stop
3	Setting screws	10	Fixed pin
4	Fastening screw	11	Scale ring
5	Tool post holes	12	Holding ring
6	Holding rod	13	Button for return movement
7	Feed button	14	Arrow

UPA 4 / 5-S 6 Boring Heads Diagram



No.	Part	No.	Part
1	Regulating screw	10	Fixed pin
2	Locking screw	11	Scale ring
3	Setting screws	12	Retaining pin
4	Fastening screws	13	Feed ring
5	Tool post holes	14	Arrow
6	Holding rod	15	Recess
7	Feed buttons	16	Quick setting dial
8	Slide with rotation bores	17	Fine setting dial
9	Stop	18	Release ring

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SECTION

B10-K

Special Boring Solutions

Wohlhaupter® Special Boring Solutions



Special Design Tooling

When it comes to special solutions for customers, Wohlhaupter has unique capabilities to effectively design and develop special boring tools. Our special boring tools are designed for specific machines, processes, and materials to help save you time and money.

If you have a particularly unique or difficult application, give our Application Engineering team a call.

phone: 330.343.4283 ext: 7611 | email: appeng@alliedmachine.com

Your safety and the safety of others is very important. This catalog contains important safety messages. Always read and follow all safety precautions.



This triangle is a safety hazard symbol. It alerts you to potential safety hazards that can cause tool failure and serious injury.

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WARNING

WARNING (shown above) means that failure to follow the precautions in this message could result in tool failure and serious injury.

NOTICE means that failure to follow the precautions in this message could result in damage to the tool or machine but not result in personal injury.

NOTE and **IMPORTANT** are also used. These are important that you read and follow but are not safety-related.

Visit www.alliedmachine.com for the most up-to-date information and procedures.

Applicable Industries



Aerospace



Agriculture



Automotive



Firearms



General
Machining



Oil & Gas



Renewable
Energy

Wohlhaupter® Special Boring Solutions Table of Contents

Special Tooling Solutions

- ES-Bore Fine Boring Lay Down Cartridge 2
- EK Groover | Lay Down Cartridge 3
- Anti-Vibration | Multistep Boring Tool 4
- OD Turning Tool | Padded Line Boring Tool 5
- 3E^{TECH+} Special Tools 6
- DigiBore Special Boring Tools 7
- Combi-Line Special Boring Tool 8

Online Tools 9

ES-Bore Fine Boring Lay Down Cartridge

DIGITAL ES-BORE WITH ADAPTER PLATE



NOTE: ES-Bore digital fine boring cartridges must be used with the new 3E^{TECH+} and adapter plate. The ES-Bore cannot be used with 3E^{TECH}.

NOTE: 3E^{TECH+} adjustment accuracy of 0.00005" or 0.001 mm on diameter.

ANALOG ES-BORE



LAYDOWN CARTRIDGES

ES-BORE

- ▶ Mounts to custom designed boring tools.
- ▶ Available with digital 3E^{TECH+} or analog adjustment.
- ▶ Accurate adjustments with easy-to-use settings.
- ▶ Versatility in many different application types over 1.102" (28.00 mm) on diameter.



GROOVING TOOLS

EK GROOVER

- ▶ Create complex grooves faster and deeper than ever before.
- ▶ Eliminate chatter in hard-to-reach internal forms.
- ▶ The electronically-controlled insert release can be adapted to most machine tools.
- ▶ Single or double grooving in one operation.

ROUGH BORING TOOLS

LAY DOWN CARTRIDGE

- ▶ Increase the productivity of your roughing tool while protecting your investment.
- ▶ If the tool is ever damaged, simply replace a cartridge and resume making chips.



SPECIAL BORING TOOLS

ANTI-VIBRATION

- ▶ Vibration dampening rings.
- ▶ Optimized tool weight.
- ▶ Used to reduce harmonic vibration in deeper boring applications.

SPECIAL BORING TOOLS

MULTISTEP BORING TOOL

- ▶ Fine adjustment tool for reverse machining.
- ▶ Combined with multidiameter fine adjustable cartridges for finish machining.



SPECIAL BORING TOOLS

OD TURNING TOOLS

- ▶ Multistep OD turning.
- ▶ Drastically reduce cycle time.
- ▶ Improve surface finish and feature concentricity.

SPECIAL BORING TOOLS

PADDED TOOLING

- ▶ Aids in stable part processing.
- ▶ Expands length-to-diameter capabilities.
- ▶ Improves surface finish.
- ▶ Pads are replaceable to extend tool life.



NOTE: 3E^{TECH+} adjustment accuracy of 0.00005" or 0.001 mm on diameter.

3E^{TECH+} BORING TOOL

MULTISTEP BORING TOOL

- ▶ Easy diameter adjustments with 3E^{TECH+}.
- ▶ One digital readout module to use on all steps.



NOTE: 3E^{TECH+} adjustment accuracy of 0.00005" or 0.001 mm on diameter.

3E^{TECH+} BORING TOOL

LINE BORING TOOL

- ▶ One digital readout module used on all steps.
- ▶ Easy diameter adjustment at the machine spindle.

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DigiBore Special Boring Tools



NOTE: Imperial item pictured.
NOTE: Digital adjustment accuracy of 0.0001" or 0.002 mm on diameter.



NOTE: Imperial item pictured.
NOTE: Digital adjustment accuracy of 0.0001" or 0.002 mm on diameter.

FINISH BORING TOOLS

DIGIBORE WITH 249 (248)

- ▶ Standard DigiBore head, standard 249 (248) head, and special slide for precise two-step bore.
- ▶ MVS connection.

FINISH BORING TOOLS

DIGIBORE SPECIAL

- ▶ Standard DigiBore boring head with OD turn and OD chamfer insert holder.
- ▶ MVS connection.

Combi-Line Special Boring Tool



ROUGH, FINISH, and CHAMFER BORING TOOLS

COMBI-LINE

- ▶ Standard Combi-Line tooling with added chamfer cartridge.
- ▶ MVS connection.

Online Tools

ToolMD® | Wohlhaupter® Boring Insert Selector



Design Your Own Solutions

ToolMD is a configurator for Wohlhaupter modular tooling systems that allows customers to virtually build their own solution. This online-based simulator puts the entire Wohlhaupter product line at your fingertips. It provides a digital bank of every individual part that Wohlhaupter manufactures in either inch or metric.

Once you select a component, you will be guided by a series of user-friendly prompts to select the next components until you have built your tooling system. Throughout the process, you can monitor the size of your custom tool and ensure what you're building matches your real-life specifications. Once a complete system is virtually assembled, the program will render the tool in either a 2D or 3D drawing to view on your device.

Designing your tools with ToolMD saves you time and allows you to instantly obtain the right tool for the job.



Design anytime from anywhere.
Available online 24/7.

WOHLHAUPTER® | Boring Insert Selector

www.alliedmachine.com/bis



- Generate the correct boring insert for your application in just six easy steps.



- Search for your new insert item number by entering your old item number.



- Choose type, shape, substrate, insert form, nose radius, and workpiece material.
- Order easily by adding the item to your cart.

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SECTION

B10-L

Lay Down Cartridges

Wohlhaupter® Lay Down Cartridges

ES-Bore Fine Boring Holders | Holders for Pre-Machining | Holders for Compact Boring Bars | Short Clamp Holders



Robust. Powerful. Versatile. Engineered Solutions.

ES-Bore lay down cartridges can be easily mounted onto the body of a custom tool, while the dimensions allow the cartridge to fit onto existing bodies. Wohlhaupter's fine boring ES-Bore cartridges are available in both digital 3E^{TECH+} and analog versions to make quick and accurate adjustments while at the machine.

From pre-machining holes with heavy stock removal to finish machining with tight tolerances and excellent surface finish, Wohlhaupter's extensive range of lay down cartridges can help you achieve specific boring solutions. Wohlhaupter's lay down cartridges bring innovative concepts designed to improve productivity, reduce scrap, and reduce the cost per part.

Applicable Industries



Aerospace



Agriculture



Automotive



Firearms



General
Machining



Oil & Gas



Renewable
Energy

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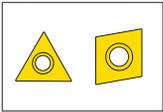
NOTICE means that failure to follow the precautions in this message could result in damage to the tool or machine but not result in personal injury.

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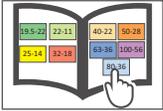
Reference Icons

The following icons will appear throughout the catalog to help you navigate between products.



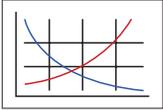
Inserts

For use with insert holder boring heads and boring bars using indexable inserts



MVS Connection Color Guide

Detailed instructions and information regarding the MVS connection(s)



Recommended Cutting Data

Speed and feed recommendations for optimum and safe boring

Lay Down Cartridges Table of Contents

ES-Bore Lay Down Cartridges

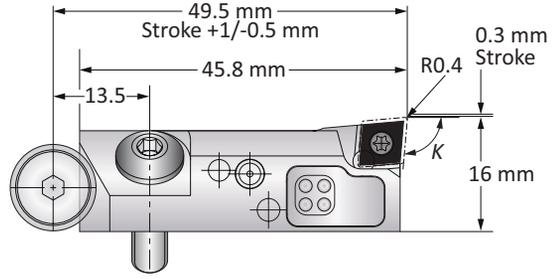
Digital 3E ^{TECH+} Insert Forms 101 and 20.	2
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Compact Lay Down Cartridges

Insert Forms 101, 103, 104 and 105.	6
Insert Form 112.	7
Insert Forms 04 and 05.	8
Mounting Dimensions.	9
Accessories.	10

ES-Bore Digital 3E^{TECH+} Fine Boring Cartridges | Insert Forms 101 and 20

Diameter Range: $\geq 1.102''$ (28.00 mm)



Holder Type	K	ISO	Minimum Boring Diameter	Type	Insert Form	Weight	Part No.
	90°	CC.. 0602..	1.102	Right	101	0.132 (lbs)	345032
	90°	CC.. 0602..	1.102	Left	101	0.132 (lbs)	345033
	90°	TOGX 0802..	1.102	Right	20	0.132 (lbs)	345042
	90°	TOGX 0802..	1.102	Left	20	0.132 (lbs)	345043
	95°	CC.. 0602..	1.102	Right	101	0.132 (lbs)	345030
	95°	CC.. 0602..	1.102	Left	101	0.132 (lbs)	345031
	95°	TOGX 0802..	1.102	Right	20	0.132 (lbs)	345040
	95°	TOGX 0802..	1.102	Left	20	0.132 (lbs)	345041
	90°	CC.. 0602..	28.00	Right	101	0.06 (kg)	345032
	90°	CC.. 0602..	28.00	Left	101	0.06 (kg)	345033
	90°	TOGX 0802..	28.00	Right	20	0.06 (kg)	345042
	90°	TOGX 0802..	28.00	Left	20	0.06 (kg)	345043
	95°	CC.. 0602..	28.00	Right	101	0.06 (kg)	345030
	95°	CC.. 0602..	28.00	Left	101	0.06 (kg)	345031
	95°	TOGX 0802..	28.00	Right	20	0.06 (kg)	345040
	95°	TOGX 0802..	28.00	Left	20	0.06 (kg)	345041

NOTE: ES-Bore digital fine boring cartridges must be used with the new 3E^{TECH+} and adapter plate. The ES-Bore cannot be used with 3E^{TECH}.
NOTE: 3E^{TECH+} module, adapter, and charging unit sold separately.

3E^{TECH+} Digital Readout Module

Part No.	Charging Unit*
536015	536016

NOTE: WEEE-Reg.-Nr. DE 15820388
 *Charging unit sold separately.



NOTE: 3E^{TECH+} adjustment accuracy of 0.00005" or 0.001 mm on diameter.

Adapter Plate for 3E^{TECH+}

Type	Part No.
Right	536017
Left	536018

NOTE: Adapter sold separately.

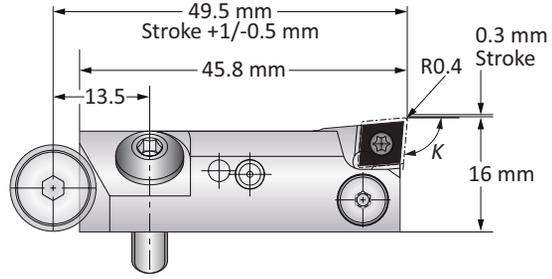


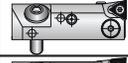
B10-M: 12-15 B10-H B10: vi-vii

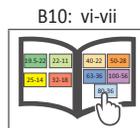
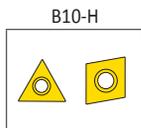
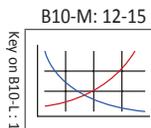
i = Imperial (in)
m = Metric (mm)
 Inserts sold separately

ES-Bore Analog Fine Boring Cartridges | Insert Forms 101 and 20

Diameter Range: $\geq 1.102''$ (28.00 mm)



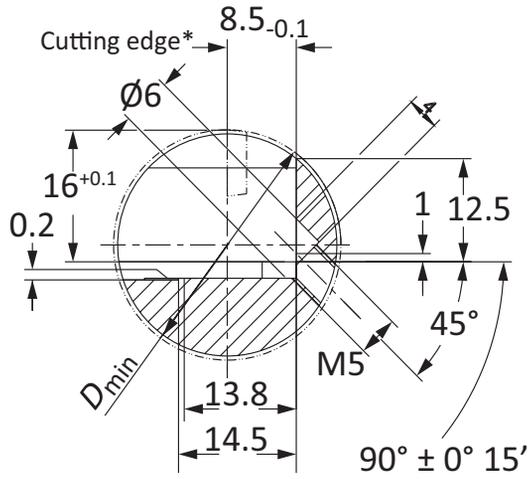
Holder Type	K	ISO	Minimum Boring Diameter	Type	Insert Form	Weight	Part No.	
		90°	CC.. 0602..	1.102	Right	101	0.132 (lbs)	346036
		90°	CC.. 0602..	1.102	Left	101	0.132 (lbs)	346037
		90°	TOGX 0802..	1.102	Right	20	0.132 (lbs)	346046
		90°	TOGX 0802..	1.102	Left	20	0.132 (lbs)	346047
		95°	CC.. 0602..	1.102	Right	101	0.132 (lbs)	346034
		95°	CC.. 0602..	1.102	Left	101	0.132 (lbs)	346035
		90°	CC.. 0602..	28.00	Right	101	0.132 (lbs)	346036
		90°	CC.. 0602..	28.00	Left	101	0.06 (kg)	345037
		90°	TOGX 0802..	28.00	Right	20	0.06 (kg)	345046
		90°	TOGX 0802..	28.00	Left	20	0.06 (kg)	345047
		95°	CC.. 0602..	28.00	Right	101	0.06 (kg)	345034
		95°	CC.. 0602..	28.00	Left	101	0.06 (kg)	345035
	95°	TOGX 0802..	28.00	Right	20	0.06 (kg)	345044	
	95°	TOGX 0802..	28.00	Left	20	0.06 (kg)	345045	



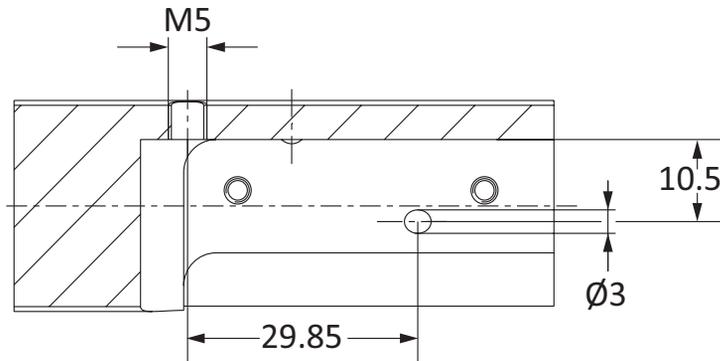
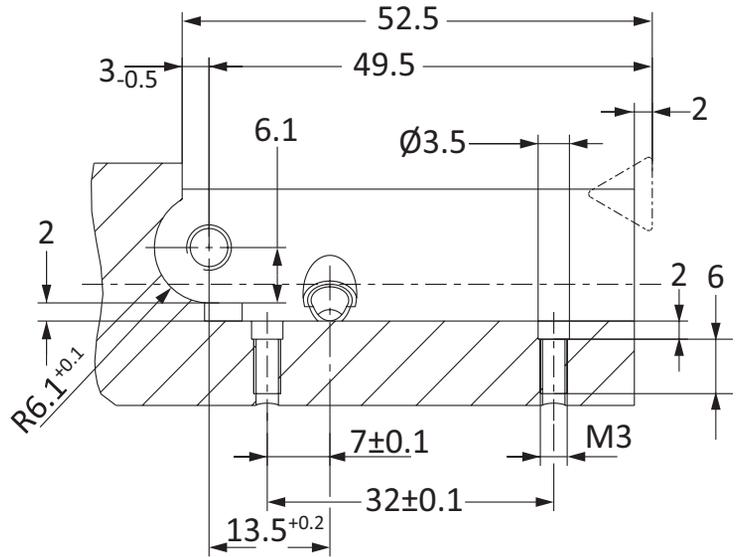
i = Imperial (in)
m = Metric (mm)
 Inserts sold separately

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ES-Bore Mounting Dimensions

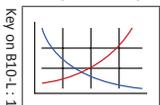


*For $D \leq 32$ mm cutting edge 1 mm before center



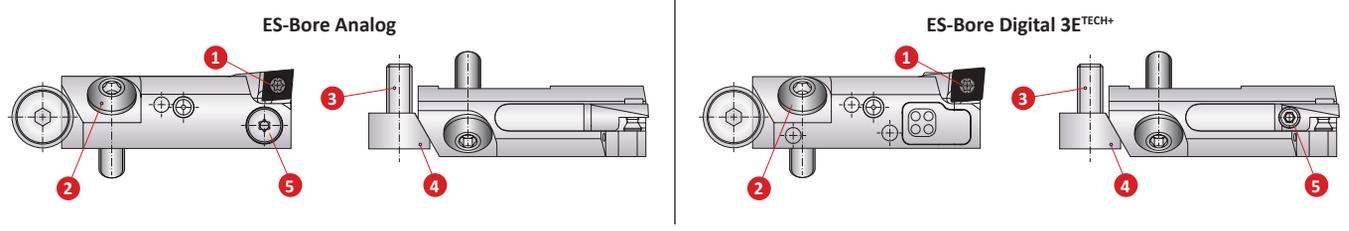
B10-M: 12-15

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ES-Bore Accessories

Screws | Service Keys | 3E^{TECH+} Accessories



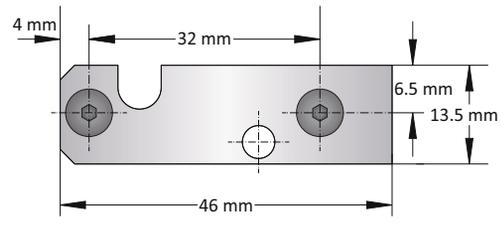
	1 Insert Screw		2	3	4	5
	Insert Form 101	Insert Form 20	Mounting Screw	Height Adjusting Screw	Height Adjusting Wedge	Diameter Adjusting Screw*
Screw	115676 (T8)	115535 (T7)	515553 (s3)	115466 (s3)	415721	-
Service Key	115590	115591	051110	051110	-	115590

*Diameter adjusting screw must not be removed from the fine boring cartridge.

ES-Bore Shim Assembly (Unfinished)

	Part No
Shim Assembly (Shim with 2 Screws)	345048
Replacement Screw	116438

NOTE: Shim can be used for both right-hand and left-hand cutting to achieve desired diameter for insert with alternative nose radius. Face grinding and screw hole countersinking will be required.



3E^{TECH+} Accessories

1 Charging Unit
Part No.
536016

NOTE: Charging unit sold separately from 3E^{TECH+}.



NOTE: 3E^{TECH+} adjustment accuracy of 0.00005" or 0.001 mm on diameter.

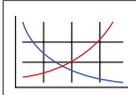
Adapter Plate for 3E^{TECH+}

Type	Part No.
Right	536017
Left	536018

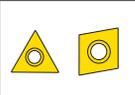
NOTE: Adapter sold separately.



B10-M: 12-15



B10-H



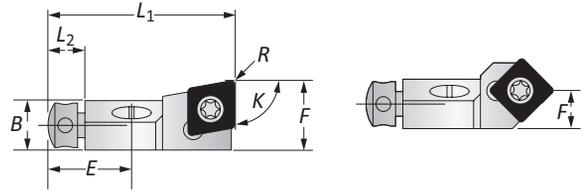
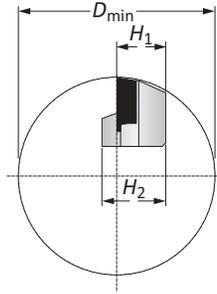
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Compact Lay Down Cartridges | Insert Forms 101, 103, 104 and 105

Diameter Range: ≥0.984" (25.00 mm)



Holder Type	K	ISO	D _{min} Boring Range	Designation	Insert Holder								Insert Form	Part No.
					L ₁	L ₂	B	H ₁	H ₂	F	R Radius	E		
	90°	CC..0602..	0.984	SCFCR08CK-06	1.102	0.236	0.255	0.314	0.393	0.393	0.015	0.511	101	345001
	90°	CC..09T3..	1.574	SCFCR10CK-09	1.496	0.295	0.393	0.393	0.511	0.551	0.031	0.669	103	345002
	90°	CC..1204..	1.968	SCFCR12CK-12	1.771	0.314	0.551	0.472	0.629	0.787	0.031	0.787	104	345003
	90°	CC..1605..	2.165	SCFCR14CK-16	2.125	0.314	0.629	0.551	0.708	0.905	0.031	0.925	105	345004
	80°	CC..0602..	0.984	SCOCR08CK-06	1.102	0.236	0.255	0.314	0.393	0.354	0.015	0.511	101	345014
	80°	CC..09T3..	1.574	SCOCR10CK-09	1.496	0.295	0.393	0.393	0.511	0.492	0.031	0.669	103	345009
	75°	CC..0602..	0.984	SCRCR08CK-06	1.102	0.236	0.255	0.314	0.393	0.334	0.015	0.511	101	345013
	75°	CC..09T3..	1.574	SCRCR10CK-09	1.496	0.295	0.393	0.393	0.511	0.460	0.031	0.669	103	345008
	70°	CC..0602..	0.984	SCPCR08CK-06	1.102	0.236	0.255	0.314	0.393	0.314	0.015	0.511	101	345012
	70°	CC..09T3..	1.574	SCPCR10CK-09	1.496	0.295	0.393	0.393	0.511	0.433	0.031	0.669	103	345007
	60°	CC..0602..	0.984	SCTCR08CK-06	1.102	0.236	0.255	0.314	0.393	0.275	0.015	0.511	101	345011
	60°	CC..09T3..	1.574	SCTCR10CK-09	1.496	0.295	0.393	0.393	0.511	0.381	0.031	0.669	103	345006
	45°	CC..0602..	0.984	SCSCR08CK-06	0.944	0.236	0.255	0.314	0.393	0.393	0.015	0.511	101	345010
	45°	CC..09T3..	1.574	SCSCR10CK-09	1.259	0.295	0.393	0.393	0.511	0.570	0.031	0.669	103	345005
	90°	CC..0602..	25.00	SCFCR08CK-06	28.00	6.00	6.50	8.00	10.00	10.00	0.40	13.00	101	345001
	90°	CC..09T3..	40.00	SCFCR10CK-09	38.00	7.50	10.00	10.00	13.00	14.00	0.80	17.00	103	345002
	90°	CC..1204..	50.00	SCFCR12CK-12	45.00	8.00	14.00	12.00	16.00	20.00	0.80	20.00	104	345003
	90°	CC..1605..	55.00	SCFCR14CK-16	54.00	8.00	16.00	14.00	18.00	23.00	0.80	23.50	105	345004
	80°	CC..0602..	25.00	SCOCR08CK-06	28.00	6.00	6.50	8.00	10.00	9.00	0.40	13.00	101	345014
	80°	CC..09T3..	40.00	SCOCR10CK-09	38.00	7.50	10.00	10.00	13.00	12.50	0.80	17.00	103	345009
	75°	CC..0602..	25.00	SCRCR08CK-06	28.00	6.00	6.50	8.00	10.00	8.50	0.40	13.00	101	345013
	75°	CC..09T3..	40.00	SCRCR10CK-09	38.00	7.50	10.00	10.00	13.00	11.70	0.80	17.00	103	345008
	70°	CC..0602..	25.00	SCPCR08CK-06	28.00	6.00	6.50	8.00	10.00	8.00	0.40	13.00	101	345012
	70°	CC..09T3..	40.00	SCPCR10CK-09	38.00	7.50	10.00	10.00	13.00	11.00	0.80	17.00	103	345007
	60°	CC..0602..	25.00	SCTCR08CK-06	28.00	6.00	6.50	8.00	10.00	7.00	0.40	13.00	101	345011
	60°	CC..09T3..	40.00	SCTCR10CK-09	38.00	7.50	10.00	10.00	13.00	9.70	0.80	17.00	103	345006
	45°	CC..0602..	25.00	SCSCR08CK-06	24.00	6.00	6.50	8.00	10.00	10.00	0.40	13.00	101	345010
	45°	CC..09T3..	40.00	SCSCR10CK-09	32.00	7.50	10.00	10.00	13.00	14.50	0.80	17.00	103	345005

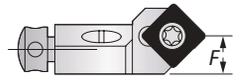
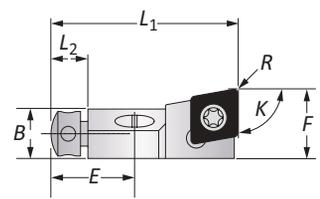
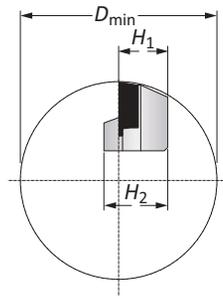
B10-M: 12-15 B10-H B10: vi-vii

Key on B10-L: 1

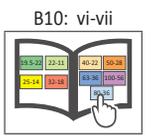
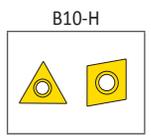
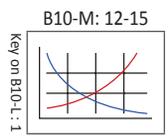
i = Imperial (in)
m = Metric (mm)
Inserts sold separately

Compact Lay Down Cartridges | Insert Form 112

Diameter Range: ≥1.574" (40.00 mm)



Holder Type	K	ISO	D _{min} Boring Range	Designation	Insert Holder								Insert Form	Part No.
					L ₁	L ₂	B	H ₁	H ₂	F	R Radius	E		
		SC..09T3..	1.574	SSOCR10CK-09	1.496	0.295	0.393	0.393	0.511	0.472	0.031	0.669	112	345019
		SC..09T3..	1.574	SSRCR10CK-09	1.496	0.295	0.393	0.393	0.511	0.460	0.031	0.669	112	345018
		SC..09T3..	1.574	SSPCR10CK-09	1.496	0.295	0.393	0.393	0.511	0.433	0.031	0.669	112	345017
		SC..09T3..	1.574	SSTCR10CK-09	1.496	0.295	0.393	0.393	0.511	0.381	0.031	0.669	112	345016
		SC..09T3..	1.574	SSSCR10CK-09	1.260	0.295	0.393	0.393	0.511	0.551	0.031	0.669	112	345015
		SC..09T3..	40.00	SSOCR10CK-09	38.00	7.50	10.00	10.00	13.00	12.50	0.80	17.00	112	345019
		SC..09T3..	40.00	SSRCR10CK-09	38.00	7.50	10.00	10.00	13.00	11.70	0.80	17.00	112	345018
		SC..09T3..	40.00	SSPCR10CK-09	38.00	7.50	10.00	10.00	13.00	11.00	0.80	17.00	112	345017
		SC..09T3..	40.00	SSTCR10CK-09	38.00	7.50	10.00	10.00	13.00	9.70	0.80	17.00	112	345016
		SC..09T3..	40.00	SSSCR10CK-09	32.00	7.50	10.00	10.00	13.00	14.00	0.80	17.00	112	345015

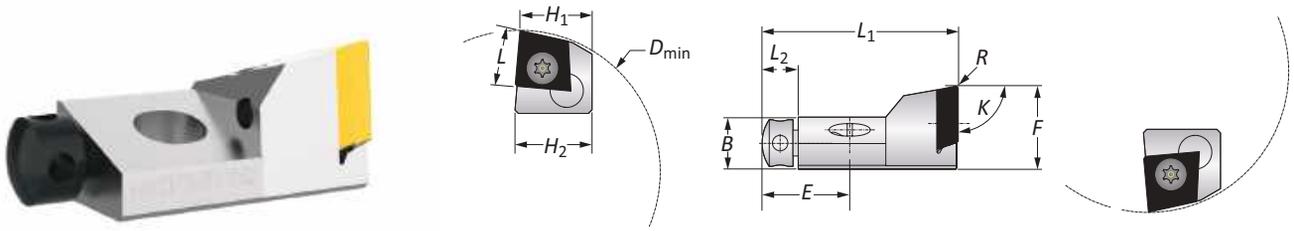


 = Imperial (in)
 = Metric (mm)
 Inserts sold separately

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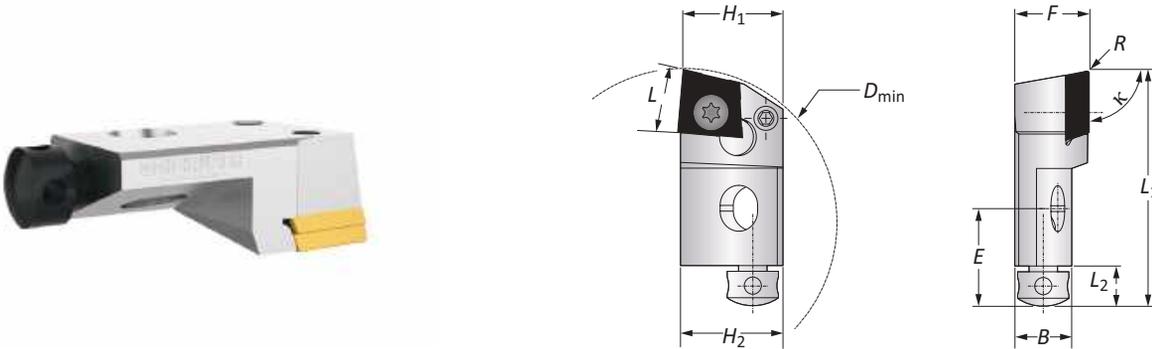
Tangential Compact Lay Down Cartridges | Insert Forms 04 and 05

Diameter Range: ≥ 2.125 " (54.00 mm)



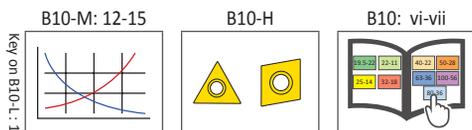
Insert Form 04, 05 Insert Holders

Holder Type	K	D _{min} Boring Range	Insert Holder								Type	L	Insert Form	Part No.
			L ₁	L ₂	B	H ₁	H ₂	F	R Radius	E				
	90°	2.125	1.496	0.295	0.393	0.551	0.590	0.629	0.019	0.669	Right	0.413	04	345023
	90°	2.125	1.496	0.295	0.393	0.551	0.590	0.629	0.019	0.669	Left	0.413	04	345025
	90°	2.755	2.755	0.314	0.551	0.748	0.787	0.866	0.019	0.787	Right	0.570	05	345020
	90°	2.755	2.755	0.314	0.551	0.748	0.787	0.866	0.019	0.787	Left	0.570	05	345022
	90°	54.00	38.00	7.50	10.00	14.00	15.00	16.00	0.50	17.00	Right	10.50	04	345023
	90°	54.00	38.00	7.50	10.00	14.00	15.00	16.00	0.50	17.00	Left	10.50	04	345025
	90°	70.00	45.00	8.00	14.00	19.00	20.00	22.00	0.50	20.00	Right	14.50	05	345020
	90°	70.00	45.00	8.00	14.00	19.00	20.00	22.00	0.50	20.00	Left	14.50	05	345022



Insert Form 04, 05 Radial Cutting Insert Holders

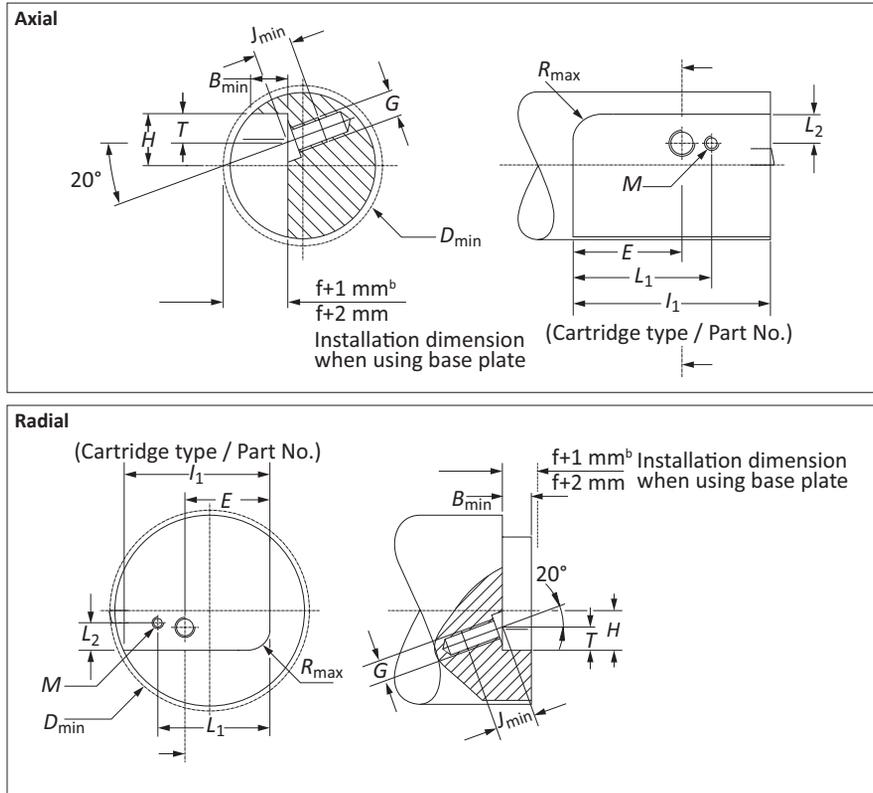
Holder Type	K	D _{min} Boring Range	Insert Holder								Type	L	Insert Form	Part No.
			L ₁	L ₂	B	H ₁	H ₂	F	R Radius	E				
	90°	2.125	1.614	0.295	0.393	0.669	0.708	0.511	0.019	0.669	Right	0.413	04	345024
	90°	2.755	1.968	0.314	0.551	0.826	0.866	0.669	0.019	0.787	Right	0.570	05	345021
	90°	54.00	41.00	7.50	10.00	17.00	18.00	13.00	0.50	17.00	Right	10.50	04	345024
	90°	70.00	50.00	8.00	14.00	21.00	22.00	17.00	0.50	20.00	Right	14.50	05	345021



i = Imperial (in)
m = Metric (mm)
Inserts sold separately



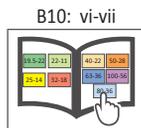
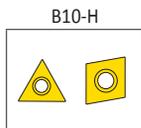
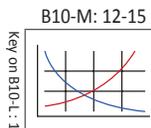
Compact Lay Down Cartridge Mounting Dimensions



	Installation Dimensions				Mounting Thread and Base Plate							Cartridge Type
	D_{min}	H	R_{max}	B_{min}	E	L_1	T	L_2	G	M	J_{min}	
i	0.984	0.315	0.079	0.256	0.512	0.728	0.177	0.165	M4	M2	0.315	XXXXX 08CK ^{1,2}
	1.575	0.394	0.098	0.394	0.669	0.965	0.197	0.185	M6	M3	0.433	XXXXX 10CK
	1.969	0.472	0.217	0.551	0.787	1.102	0.236	0.224	M6	M3	0.472	XXXXX 12CK
	2.165	0.551	0.217	0.630	0.925	1.299	0.236	0.276	M8	M3	0.512	XXXXX 14CK
	2.756	0.787	0.256	0.551	0.787	1.083	0.236	0.441	M8	M3	0.591	345020
	2.756	0.866	0.256	0.551	0.787	1.102	0.236	0.441	M8	M3	0.591	345021*
	2.756	0.787	0.256	0.551	0.787	1.083	0.236	0.441	M8	M3	0.591	345022
	2.126	0.591	0.118	0.394	0.669	0.925	0.197	0.382	M6	M3	0.433	345023
	2.126	0.709	0.118	0.394	0.669	0.945	0.197	0.362	M6	M3	0.433	345024*
	2.126	0.591	0.118	0.394	0.669	0.925	0.197	0.382	M6	M3	0.433	345025
m	25.00	8.00	2.00	6.50	13.00	18.50	4.50	4.20	M4	M2	8.00	XXXXX 08CK ^{1,2}
	40.00	10.00	2.50	10.00	17.00	24.50	5.00	4.70	M6	M3	11.00	XXXXX 10CK
	50.00	12.00	5.50	14.00	20.00	28.00	6.00	5.70	M6	M3	12.00	XXXXX 12CK
	55.00	14.00	5.50	16.00	23.50	33.00	6.00	7.20	M8	M3	13.00	XXXXX 14CK
	70.00	20.00	6.50	14.00	20.00	27.50	6.00	11.20	M8	M3	15.00	345020
	70.00	22.00	6.50	14.00	20.00	28.00	6.00	11.20	M8	M3	15.00	345021*
	70.00	20.00	6.50	14.00	20.00	27.50	6.00	11.20	M8	M3	15.00	345022
	54.00	15.00	3.00	10.00	17.00	23.50	5.00	9.70	M6	M3	11.00	345023
	54.00	18.00	3.00	10.00	17.00	24.00	5.00	9.20	M6	M3	11.00	345024*
	54.00	15.00	3.00	10.00	17.00	23.50	5.00	9.70	M6	M3	11.00	345025

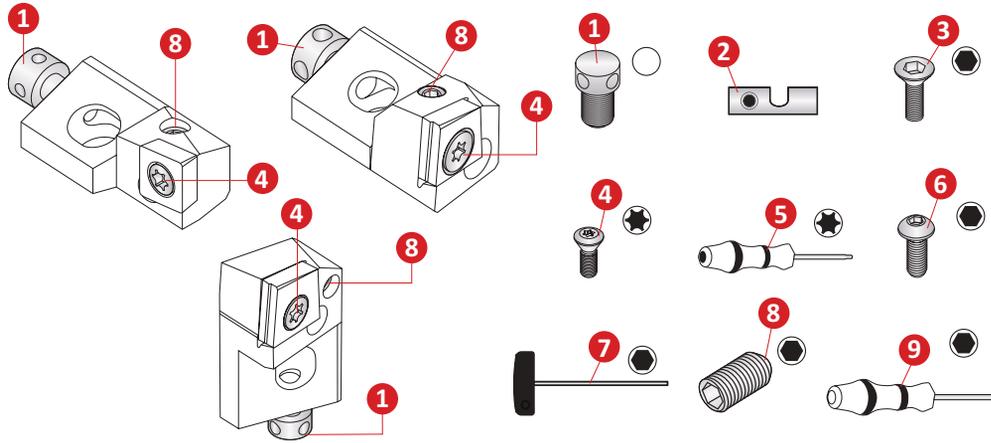
*Radial

- From D_{min} 25 mm - 32 mm, the short clamp holder is 0.5 mm from the middle.
- Installation with base plate.

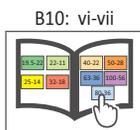
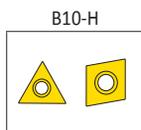
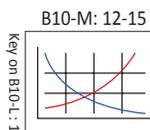


i = Imperial (in)
m = Metric (mm)
Inserts sold separately

Compact Lay Down Cartridges Accessories



Insert Holder Part No.	1 Axial Barrel Screw	2 Shim	3 Insert Screw	4 Insert Screw	5 Torx Driver	6 Holder Fixing Screw	7 Hex Driver	8 Radial Set Screw	9 Hex Driver
345001	215742	345201	215461	115676	115590	215343	415577	114224	215472
345002	415299	345202	116433	115673	115664	215634	415164	070161	215473
345003	215250	345203	116433	415298	215150	215431	415164	215467	115575
345004	215265	345204	116433	215149	215150	315476	415165	215467	115575
345005	415299	345216	116433	115673	115664	215634	415164	070161	215473
345006	415299	345218	116433	115673	115664	215634	415164	070161	215473
345007	415299	345208	116433	115673	115664	215634	415164	070161	215473
345008	415299	345208	116433	115673	115664	215634	415164	070161	215473
345009	415299	345202	116433	115673	115664	215634	415164	070161	215473
345010	215742	345211	215461	115676	115590	215343	415577	114224	215472
345011	215742	345211	215461	115676	115590	215343	415577	114224	215472
345012	215742	345213	215461	115676	115590	215343	415577	114224	215472
345013	215742	345213	215461	115676	115590	215343	415577	114224	215472
345014	215742	345201	215461	115676	115590	215343	415577	114224	215472
345015	415299	345215	116433	115673	115664	215634	415164	070161	215473
345016	415299	345216	116433	115673	115664	215634	415164	070161	215473
345017	415299	345218	116433	115673	115664	215634	415164	070161	215473
345018	415299	345218	116433	115673	115664	215634	415164	070161	215473
345019	415299	345208	116433	115673	115664	215634	415164	070161	215473
345020	215250	345220	116433	415949	215150	315476	415165	215467	115575
345021	215250	345221	116433	415949	215150	315476	415165	215104	115575
345022	215250	345222	116433	415949	215150	315476	415165	215467	115575
345023	415299	345223	116433	415977	115664	215634	415164	415280	215473
345024	415299	345224	116433	415977	115664	215634	415164	070161	215473
345025	415299	345225	116433	415977	115664	215634	415164	415280	215473



i = Imperial (in)
m = Metric (mm)
Inserts sold separately

SECTION

B10-M

Accessories / Technical Information

Wohlhaupter® Accessories / Technical Information



Your safety and the safety of others is very important. This catalog contains important safety messages. Always read and follow all safety precautions.



This triangle is a safety hazard symbol. It alerts you to potential safety hazards that can cause tool failure and serious injury.

When you see this symbol in the catalog, look for a related safety message that may be near this triangle or referred to in the nearby text.

There are safety signal words also used in the catalog. Safety messages follow these words.

WARNING

WARNING (shown above) means that failure to follow the precautions in this message could result in tool failure and serious injury.

NOTICE means that failure to follow the precautions in this message could result in damage to the tool or machine but not result in personal injury.

NOTE and **IMPORTANT** are also used. These are important that you read and follow but are not safety-related.

Visit www.alliedmachine.com for the most up-to-date information and procedures.

Applicable Industries



Aerospace



Agriculture



Automotive



Firearms



General
Machining



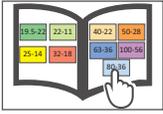
Oil & Gas



Renewable
Energy

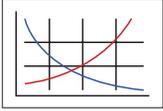
Reference Icons

The following icons will appear throughout the catalog to help you navigate between products.



MVS Connection Color Guide

Detailed instructions and information regarding the MVS connection(s)



Recommended Cutting Data

Speed and feed recommendations for optimum and safe boring

Accessories and Technical Information Table of Contents

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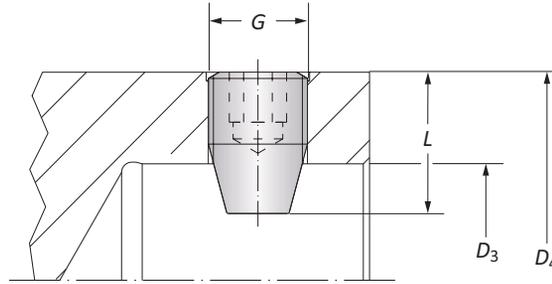
Recommended Cutting Data

Imperial 12 - 15

Metric 16 - 19

Accessories

Threaded Taper Pins for MVS Connections



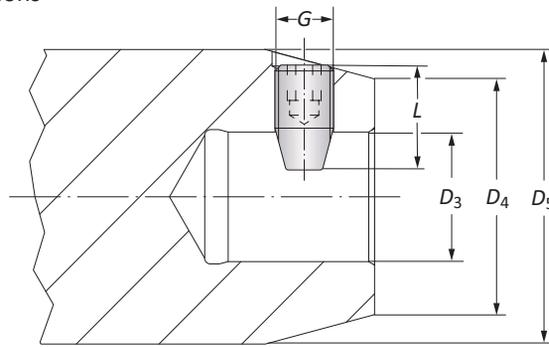
Connection	Taper Pin		Service Key	Torque	Steel	Titanium	
	$D_4 D_3$	G			L	Part No.	Part No.
i	19.5 - 11	M5 x 0.5	0.256	s2.5 / A	3.5 Nm	115949	-
	22 - 11	M5 x 0.5	0.327	s2.5 / A	3.5 Nm	215375	-
	25 - 14	M8 x 1.0	0.327	s4 / B	12.0 Nm	132174	-
	32 - 18	M8 x 1.0	0.409	s4 / B	12.0 Nm	132142	-
	40 - 22	M10 x 1.0	0.571	s5 / B	22.0 Nm	133113	-
	50 - 28	M12 x 1.0	0.657	s6 / B	25.0 Nm	132145	415334
	63 - 36	M16 x 1.5	0.780	s8 / B	30.0 Nm	132146	415336
	80 - 36	M16 x 1.5	1.134	s8 / B	30.0 Nm	132191	415335
	100 - 56	M24 x 2.0	1.339	s12 / B	45.0 Nm	215470	415337
	m	19.5 - 11	M5 x 0.5	6.50	s2.5 / A	3.5 Nm	115949
22 - 11		M5 x 0.5	8.30	s2.5 / A	3.5 Nm	215375	-
25 - 14		M8 x 1.0	8.30	s4 / B	12.0 Nm	132174	-
32 - 18		M8 x 1.0	10.40	s4 / B	12.0 Nm	132142	-
40 - 22		M10 x 1.0	14.50	s5 / B	22.0 Nm	133113	-
50 - 28		M12 x 1.0	16.70	s6 / B	25.0 Nm	132145	415334
63 - 36		M16 x 1.5	19.80	s8 / B	30.0 Nm	132146	415336
80 - 36		M16 x 1.5	28.80	s8 / B	30.0 Nm	132191	415335
100 - 56		M24 x 2.0	34.00	s12 / B	45.0 Nm	215470	415337

NOTE: Steel or titanium taper pins are used in balancing the Alu-Line tooling.

i = Imperial (in)
m = Metric (mm)

Accessories

Threaded Taper Pins for MVS Connections



Connection	Taper Pin			Service Key	Steel	Titanium	
	$D_4 D_3$	G	L		D_5	Part No.	Part No.
	22 - 11	M5 x 0.5	0.327	1.260	s2.5 / A	215375	-
	22 - 11	M5 x 0.5	0.630	1.575	s2.5 / A	215376	-
	22 - 11	M5 x 0.5	0.630	1.969	s2.5 / A	215376	-
	22 - 11	M5 x 0.5	0.630	2.480	s2.5 / A	215376	-
	25 - 14	M8 x 1.0	0.409	1.260	s4 / B	132142	-
	25 - 14	M8 x 1.0	0.409	1.417	s4 / B	132142	-
	32 - 18	M8 x 1.0	0.409	1.378	s4 / B	132142	-
i	32 - 18	M8 x 1.0	0.571	1.457	s4 / B	132143	-
	32 - 18	M8 x 1.0	0.571	1.575	s4 / B	132143	-
	32 - 18	M8 x 1.0	0.571	1.811	s4 / B	132143	-
	40 - 22	M10 x 1.0	0.571	1.575	s5 / B	133113	-
	40 - 22	M10 x 1.0	0.701	1.850	s5 / B	132144	-
	40 - 22	M10 x 1.0	0.701	1.969	s5 / B	132144	-
	50 - 28	M12 x 1.0	0.657	2.480	s6 / B	132145	415334
	63 - 36	M16 x 1.5	0.780	3.150	s8 / B	132146	415336
	22 - 11	M5 x 0.5	8.30	32.00	s2.5 / A	215375	-
	22 - 11	M5 x 0.5	16.00	40.00	s2.5 / A	215376	-
	22 - 11	M5 x 0.5	16.00	50.00	s2.5 / A	215376	-
	22 - 11	M5 x 0.5	16.00	63.00	s2.5 / A	215376	-
	25 - 14	M8 x 1.0	10.40	32.00	s4 / B	132142	-
	25 - 14	M8 x 1.0	10.40	36.00	s4 / B	132142	-
	32 - 18	M8 x 1.0	10.40	35.00	s4 / B	132142	-
m	32 - 18	M8 x 1.0	14.50	37.00	s4 / B	132143	-
	32 - 18	M8 x 1.0	14.50	40.00	s4 / B	132143	-
	32 - 18	M8 x 1.0	14.50	46.00	s4 / B	132143	-
	40 - 22	M10 x 1.0	14.50	40.00	s5 / B	133113	-
	40 - 22	M10 x 1.0	17.80	47.00	s5 / B	132144	-
	40 - 22	M10 x 1.0	17.80	50.00	s5 / B	132144	-
	50 - 28	M12 x 1.0	16.70	63.00	s6 / B	132145	415334
	63 - 36	M16 x 1.5	19.80	80.00	s8 / B	132146	415336

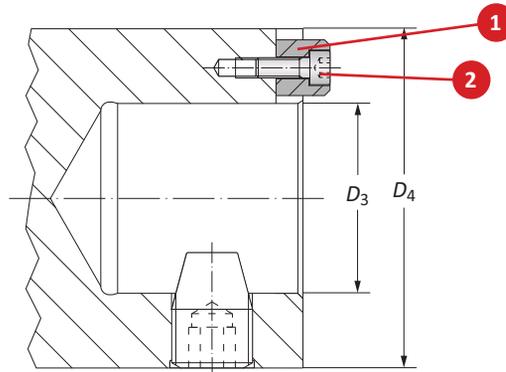
NOTE: Steel or titanium taper pins are used in balancing the Alu-Line tooling.

i = Imperial (in)
m = Metric (mm)

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Accessories

Clamping Pieces for MVS Connection 100 - 56 | D 60 / D 40 Connections



Clamping Pieces for MVS 100 - 56

Connection	Service Key	1 Torque		Service Key	2 Cap Screw	
		D x L	Part No.		D x L	Part No.
100 - 56	-	-	115641	S5 / B	M6 x 1 x 16	115147

Clamping Pieces for D 60 / D 40

Connection	1 Torque	
	Part No.	
D 60	115643 (125 mm)	
D 60	KW31562 (110 mm)	
D 40	117143	

Clamping Pieces for D 60 / D 40

Connection	Service Key	2 Cap Screw	
		D x L	Part No.
D 60	s10 / B	M12 x 1.75 x 25	115237
D 40	s5 / B	M6 x 1 x 16	115147

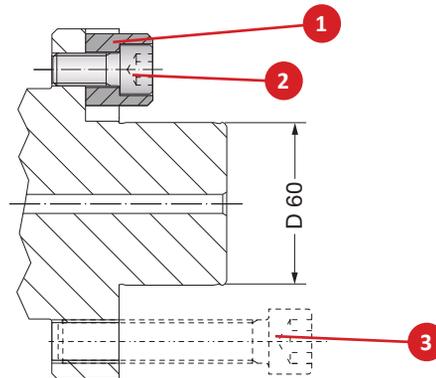
Clamping Pieces for D 60 / D 40

Connection	Service Key	3 Cap Screw	
		D x L	Part No.
D 60	s14 / C	M16 x 2 x 80	115170 ⁽¹⁾
D 60	s14 / C	M16 x 2 x 55	215189 ⁽²⁾
D 40	s10 / B	M12 x 1.75 x 75	315186 ⁽³⁾
D 40	s10 / B	M12 x 1.75 x 50	077104 ⁽²⁾

⁽¹⁾ To mount boring tools above $\varnothing 7.874''$ (200.00 mm), see section B10-G.

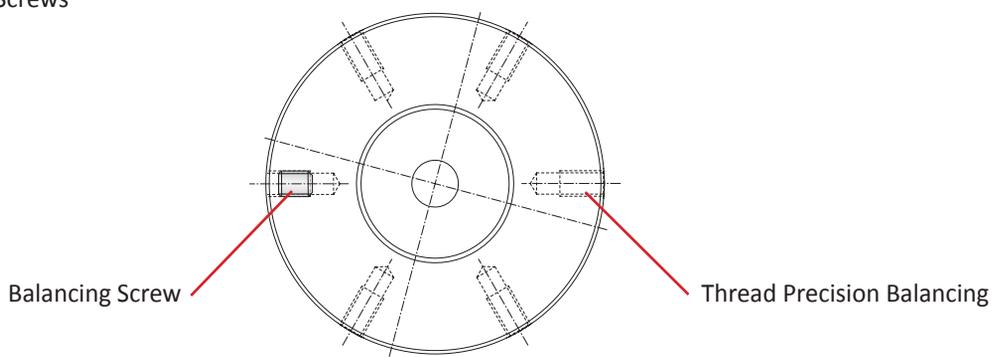
⁽²⁾ Cap screws used for mounting cutter heads to DIN 1830.

⁽³⁾ $\varnothing 7.874''$ - 20.472'' (200.00 mm - 520.00 mm).



Accessories

Heavy Metal Balancing Screws



Balancing Screw		
Nominal Size	Service Key	Part No.
M5 x 0.8 x 6	0.8 x 4 / K	415573
M6 x 1 x 6	0.8 x 4 / K	415284
M6 x 1 x 8	0.8 x 4 / K	415341
M6 x 1 x 10	0.8 x 4 / K	415283
M8 x 1.25 x 8	1.2 x 6.5 / K	415285
M8 x 1.25 x 10	1.2 x 6.5 / K	415286
M8 x 1.25 x 12	1.2 x 6.5 / K	415287

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Accessories

Torque Drivers | Wrenches

Service Keys for Insert Holders and Fixing Screws (Type A, B, C, F)

Service Key	Part No.
S1.5 / A	215472
s2 / A	215473
s2 / B	415761
s2.5 / A	115575
s2.5 / B	415577
s3 / A	115630
s3 / B	415578
s4 / B	115576
s4 / F	315265
s4 / B	415164
s5 / B	115577
s5 / B	415165
s6 / B	115578
s8 / B	115579
s8 / C	415611
s10 / B	115580
s12 / B	215638
s14 / C	215639

Fixed Torque Driver (Type B, H)

Service Key	Part No.
T6 / H	115537
T7 / H	115591
T8 / H	115590
T15 / H	115664
T20 / H	215150
T25 / B	415121

Torque Driver (Type H)

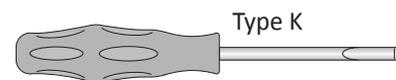
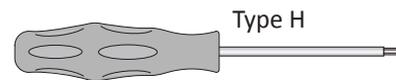
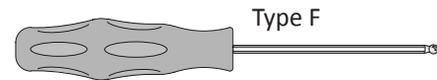
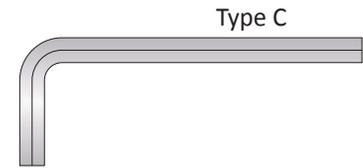
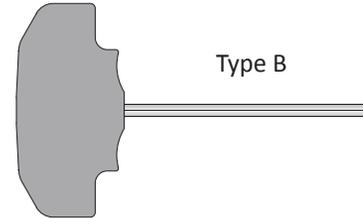
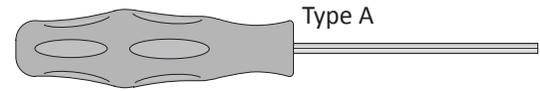
Service Key	Part No.
T6 / H	415507
T7 / H	415508
T8 / H	415514
T15 / H	415510
T20 / H	415543

Torque Driver (Type K)

Service Key	Part No.
0.5 x 3 / K	315322
0.8 x 4 / K	415579
1.2 x 6.5 / K	415580

Wrench (Type P)

Service Key	Part No.
13 / P	315689
15 / P	315690
19 / P	315691



Accessories

Torque Driver Set | 25 Piece Wrench Set



NOTE: Torque driver set pictured.

Torque Driver Set: Torx® Bits, Hexagon Bits, Flat Blade Bits

Type	Pieces	Size	Set Part No.
Flat Blade Bit	1	0.3 - 1.2 (Nm)	103086
Flat Blade Bit	1	1.2 - 3.0 (Nm)	
Flat Blade Bit	1	4.0 - 8.0 (Nm)	
Torque Driver	3	T6	
Torque Driver	3	T7	
Torque Driver	3	T8	
Torque Driver	1	T16	
Torque Driver	1	T20	
Torque Driver	1	T25	
Hexagon Bit	3	s2	
Hexagon Bit	3	s2.5	
Hexagon Bit	2	s3	
Hexagon Bit	2	s4	
Hexagon Bit	1	s5	
Flat Blade Bit	1	0.5 x 3.0	

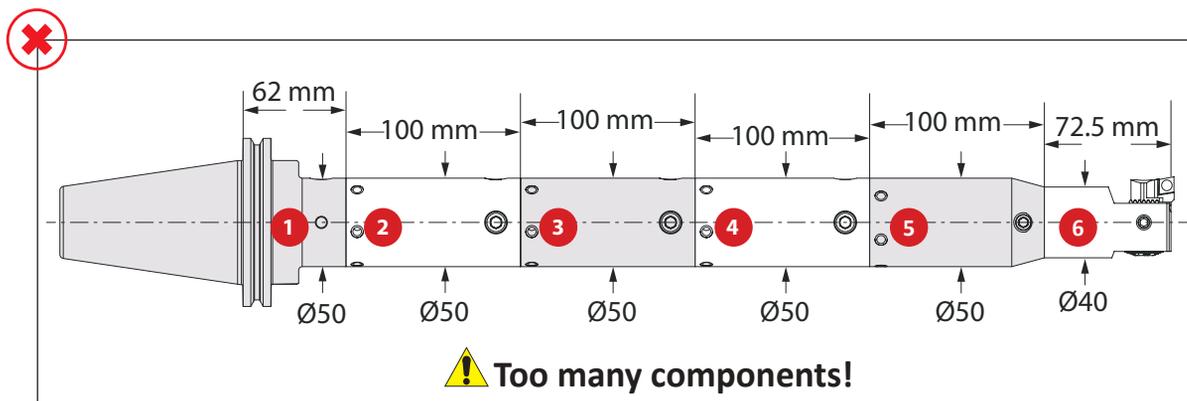
25 Piece Wrench Set

Type	Size	Set Part No.
A	s1.5 / s2 / s2.5 / s3 / s4	103025
B	s4 / s5 / s6 / s8 / s10 / s12 / s14	
C	s7	
F	s4	
H	T6 / T7 / T8 / T15 / T20 / T25	
K	0.5 x 3	
P	s13 / s15 / s19	

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Guidelines for Not Exceeding Recommended Length-to-Diameter Ratio

To calculate, see graphics below:



NOTE: Length-to-diameter ratio is calculated using body diameters not cutting diameter.

NOTE: Do not exceed recommended 10xD length-to-diameter ratio or exceed four total components (including shank).

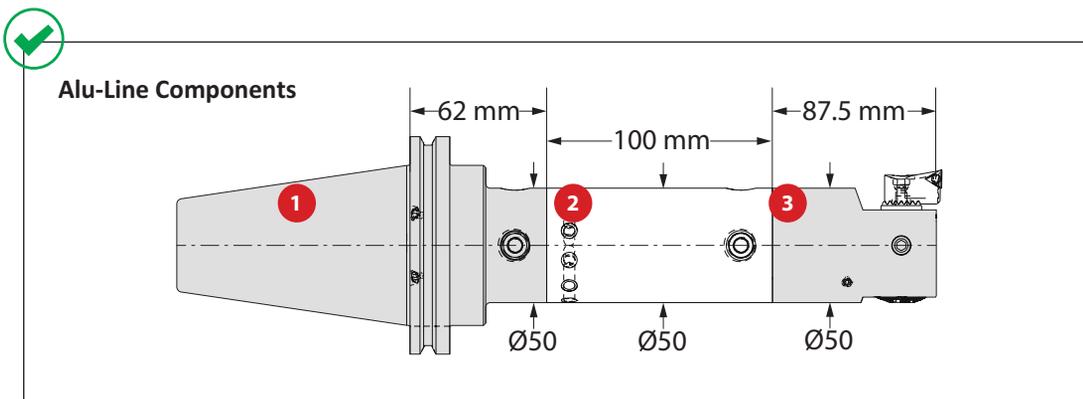
Step 1: Find L : D by component.

- 1 1.2 = 62/50
- 2 2.0 = 100/50
- 3 2.0 = 100/50
- 4 2.0 = 100/50
- 5 2.0 = 100/50
- 6 1.8 = 72.5/40

Step 2: Add each L : D average.

1.2	→	1.2
2.0	→	2.0
2.0	→	2.0
2.0	→	2.0
2.0	→	2.0
1.8	→	1.8
		+ 1.8
		11.0 = L : D ratio

Too long with too many components!



NOTE: Length-to-diameter ratio is calculated using body diameters not cutting diameter.

NOTE: Do not exceed recommended 5xD length-to-diameter ratio when using Alu-Line (Aluminum) components or exceed four total components (including shank).

Step 1: Find L : D by component.

- 1 1.2 = 62/50
- 2 2.0 = 100/50
- 3 1.8 = 87.5/50

Step 2: Add each L : D average.

1.2	→	1.2
2.0	→	2.0
1.8	→	1.8
		+ 1.8
		5.0 = L : D ratio

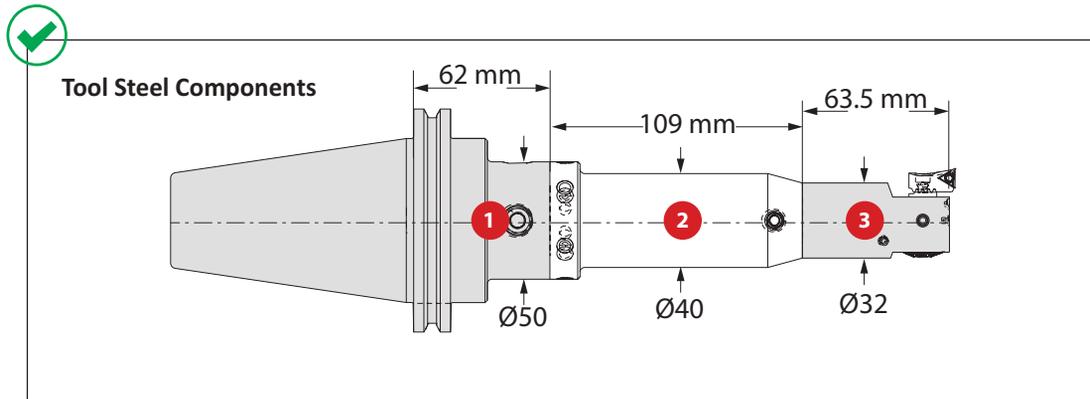
WARNING Tool failure can cause serious injury. To prevent:

- Do not exceed recommended 10xD length-to-diameter ratio or exceed four total components (including shank).
- When using Alu-Line components, do not exceed recommended 5xD length-to-diameter ratio.
- When using tool steel components, do not exceed recommended 6xD length-to-diameter ratio.
- When using heavy metal components, do not exceed recommended 8xD length-to-diameter ratio.
- When using a carbide shank, do not exceed recommended 9xD length-to-diameter ratio.
- When using a NOVI^{TECH} module, do not exceed recommended 10xD length-to-diameter ratio.

Factory technical assistance is available for your specific applications through our Application Engineering department. ext: 7611 | email: appeng@alliedmachine.com

Guidelines for Not Exceeding Recommended Length-to-Diameter Ratio

To calculate, see graphics below:



NOTE: Length-to-diameter ratio is calculated using body diameters not cutting diameter.

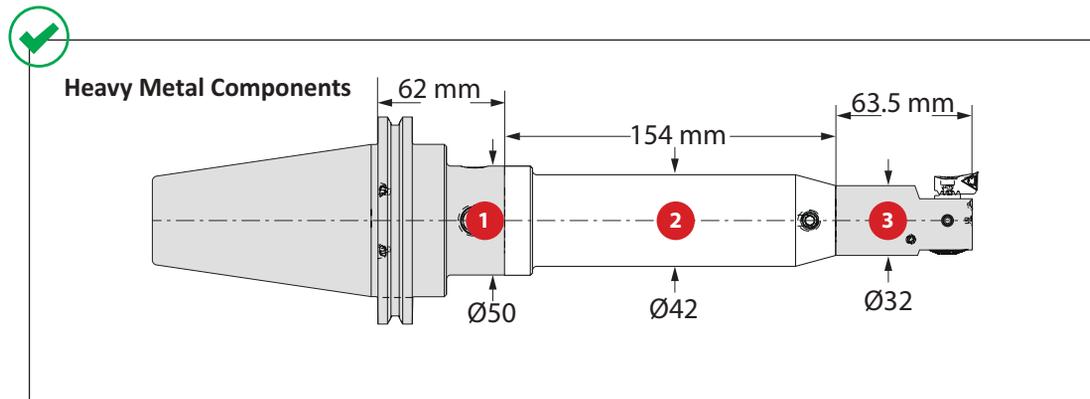
NOTE: When using steel components, do not exceed recommended 6xD length-to-diameter ratio or exceed four total components (including shank).

Step 1: Find L : D by component.

- 1 1.2 = 62/50
- 2 2.7 = 109/40
- 3 2.0 = 63.5/32

Step 2: Add each L : D average.

_____	→	1.2
_____	→	2.7
_____	→	+ 2.0
	→	<u>5.9 = L : D ratio</u>



NOTE: Length-to-diameter ratio is calculated using body diameters not cutting diameter.

NOTE: When using a heavy metal components, do not exceed recommended 8xD length-to-diameter ratio or exceed four total components (including shank).

Step 1: Find L : D by component.

- 1 1.2 = 62/50
- 2 3.6 = 154/42
- 3 2.0 = 63.5/32

Step 2: Add each L : D average.

_____	→	1.2
_____	→	3.6
_____	→	+ 2.0
	→	<u>6.8 = L : D ratio</u>

⚠ WARNING Tool failure can cause serious injury. To prevent:

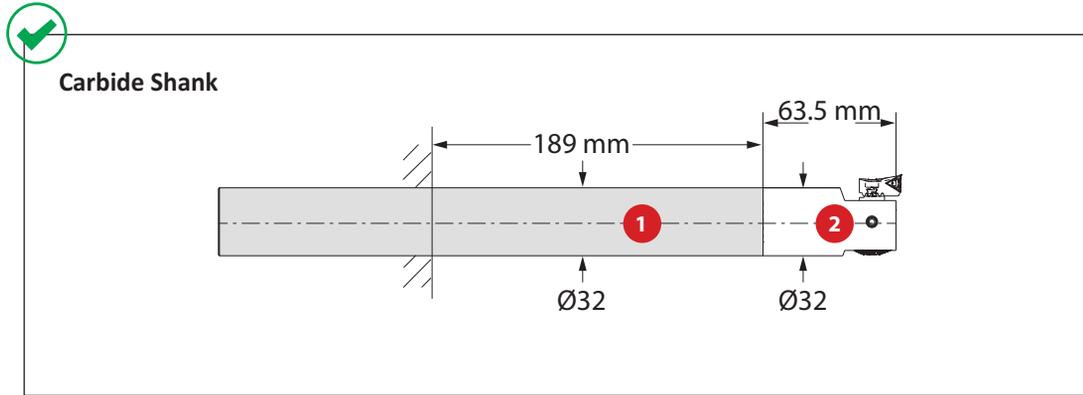
- Do not exceed recommended 10xD length-to-diameter ratio or exceed four total components (including shank).
- When using Alu-Line components, do not exceed recommended 5xD length-to-diameter ratio.
- When using tool steel components, do not exceed recommended 6xD length-to-diameter ratio.
- When using heavy metal components, do not exceed recommended 8xD length-to-diameter ratio.
- When using a carbide shank, do not exceed recommended 9xD length-to-diameter ratio.
- When using a NOVI^{TECH} module, do not exceed recommended 10xD length-to-diameter ratio.

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Guidelines for Not Exceeding Recommended Length-to-Diameter Ratio

To calculate, see graphics below:



NOTE: Length-to-diameter ratio is calculated using body diameters not cutting diameter.

NOTE: When using carbide shank components, do not exceed recommended 9xD length-to-diameter ratio or exceed four total components.

Step 1: Find L : D by component.

1 8.1 = 189/32

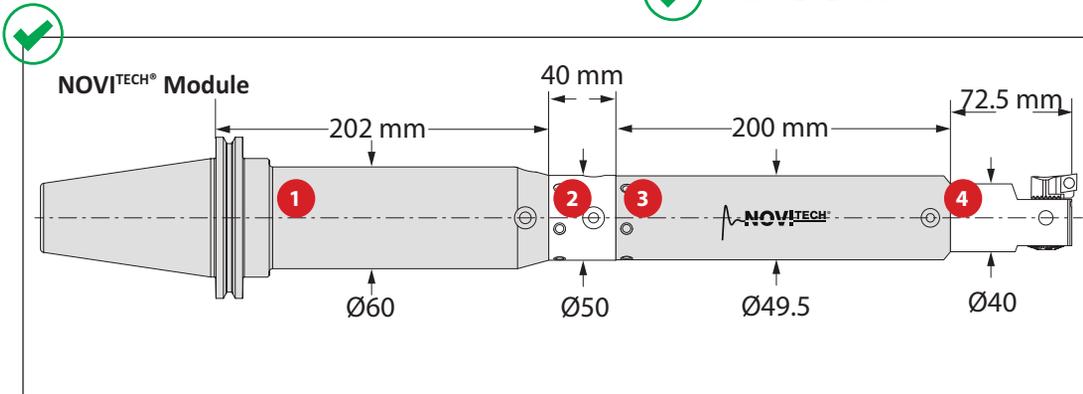
2 2.0 = 63.5/32

Step 2: Add each L : D average.

5.9

+ 2.0

7.9 = L : D ratio



NOTE: Length-to-diameter ratio is calculated using body diameters not cutting diameter.

NOTE: Do not exceed recommended 10xD length-to-diameter ratio when using NOVI^{TECH}® intermediate modules or exceed four total components (including shank).

NOTE: The NOVI^{TECH}® intermediate module should always be assembled as close as possible to the cutting edge (i.e. the next component behind the boring head).

Step 1: Find L : D by component.

1 3.3 = 202/60

2 0.8 = 40/50

3 4.0 = 200/49.5

4 1.8 = 72.5/40

Step 2: Add each L : D average.

3.3

0.8

4.0

+ 1.8

9.9 = L : D ratio

Component	Length-to -Diameter Ratio
Alu-Line	5xD
Tool Steel	6xD
Heavy Metal	8xD
Carbide	9xD
NOVI ^{TECH} ®	10xD

⚠ WARNING Tool failure can cause serious injury. To prevent:

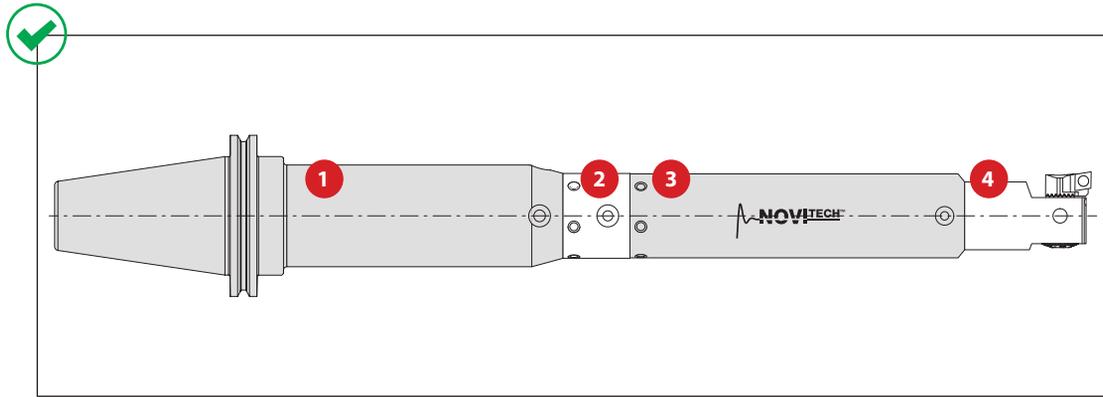
- Do not exceed recommended 10xD length-to-diameter ratio or exceed four total components (including shank).
- When using Alu-Line components, do not exceed recommended 5xD length-to-diameter ratio.
- When using tool steel components, do not exceed recommended 6xD length-to-diameter ratio.
- When using heavy metal components, do not exceed recommended 8xD length-to-diameter ratio.
- When using a carbide shank, do not exceed recommended 9xD length-to-diameter ratio.
- When using a NOVI^{TECH}® module, do not exceed recommended 10xD length-to-diameter ratio.

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Calculating Tool Assembly Weight

To calculate, see graphics below:



Step 1: Find weight for each component circled in the example table below.

Example:

	MVS Connection	Boring Range	4 Boring Head				Weight	Part No.
	D_1 D_2	A	X_1	X_2	L_2	D_5		
i	40 - 22	2.087 - 2.598	2.953	1.535	2.854	-	1.543 (lbs)	320004
m	40 - 22	53.01 - 65.98	75.00	39.00	72.50	-	0.70 (kg)	310004

Step 2: Calculate total assembly weight

$$\begin{array}{r}
 \textcircled{1} \ 6.6 \text{ kg} \\
 \textcircled{2} \ 0.6 \text{ kg} \\
 \textcircled{3} \ 3.5 \text{ kg} \\
 + \textcircled{4} \ 0.7 \text{ kg} \\
 \hline
 11.4 \text{ kg}
 \end{array}$$

Step 3: Consult machine tool builder to ensure tool assembly weight does not exceed machine capabilities.

i = Imperial (in)
m = Metric (mm)

⚠ WARNING Exceeding weight capacity for machine tool spindle and tool changer can cause machine damage and/or serious injury. To prevent:
 -Consult machine tool builder for machine's weight limitations.
 Factory technical assistance is also available for specific applications through our Application Engineering department. ext: 7611 | email: appeng@alliedmachine.com

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Rough Machining Recommended Cutting Data | Imperial (inch)

ISO	Material	(BHN) Hardness	Grade	Speed* SFM	Recommended Feed (inch / tooth)			
					Nose Radii			
					0.008"	0.016"	0.032"	0.047"
P	Free-Machining Steel 1118, 1215, 12L14, etc.	100 - 250	Carbide	490 - 750	0.004 - 0.006	0.004 - 0.012	0.008 - 0.020	0.004 - 0.031
			Cermet	490 - 820	0.004 - 0.006	0.004 - 0.012	0.008 - 0.020	0.004 - 0.031
	Low-Carbon Steel 1010, 1020, 1025, 1522, 1144, etc.	85 - 275	Carbide	460 - 820	0.004 - 0.006	0.004 - 0.012	0.008 - 0.020	0.004 - 0.031
	Medium-Carbon Steel 1030, 1040, 1050, 1527, 1140, 1151, etc.	125 - 325	Carbide	460 - 820	0.004 - 0.006	0.004 - 0.012	0.008 - 0.020	0.004 - 0.031
	Alloy Steel 4140, 5140, 8640, etc.	125 - 375	Carbide	390 - 660	0.004 - 0.006	0.004 - 0.012	0.008 - 0.020	0.004 - 0.031
	High-Strength Alloy 4340, 4330V, 300M, etc.	225 - 400	Carbide	330 - 590	0.004 - 0.006	0.004 - 0.012	0.008 - 0.020	0.004 - 0.031
Structural Steel A36, A285, A516, etc.	100 - 350	Carbide	490 - 850	0.004 - 0.006	0.004 - 0.012	0.008 - 0.020	0.004 - 0.031	
		Cermet	490 - 920	0.004 - 0.006	0.004 - 0.012	0.008 - 0.020	0.004 - 0.031	
Tool Steel H-13, H-21, A-4, O-2, S-3, etc.	150 - 250	Carbide	330 - 590	0.004 - 0.006	0.004 - 0.012	0.008 - 0.020	0.004 - 0.031	
S	High-Temp Alloy Hastelloy B, Inconel 600, etc.	140 - 310	Carbide	70 - 160	0.004 - 0.006	0.004 - 0.008	0.006 - 0.014	0.008 - 0.016
	Titanium Alloy	Carbide	130 - 260	0.004 - 0.006	0.004 - 0.008	0.006 - 0.014	0.008 - 0.016	
Aerospace Alloy S82	185 - 350	Carbide	130 - 260	0.004 - 0.006	0.004 - 0.008	0.006 - 0.014	0.008 - 0.016	
M	Stainless Steel 400 Series 416, 420, etc.	185 - 350	Carbide	160 - 330	0.004 - 0.006	0.004 - 0.010	0.004 - 0.014	0.008 - 0.024
	Stainless Steel 300 Series 304, 316, 17-4PH, etc.	135 - 275	Carbide	260 - 490	0.004 - 0.006	0.004 - 0.010	0.004 - 0.014	0.008 - 0.024
Super Duplex Stainless Steel	135 - 275	Carbide	200 - 330	0.004 - 0.006	0.004 - 0.010	0.004 - 0.014	0.008 - 0.024	

*Not to exceed max recommended RPM for boring head found in corresponding Wohlhaupter Operation Manual.

Deep Hole Boring Speed Adjustment

Recommended Speed Example

⚠ For Dynamic Boring Tool NOVI ^{TECH} ® Length			
Boring Type	8xD	9xD	10xD
Roughing	0.80	0.60	0.40
Finishing	0.90	0.70	0.50

If the recommended speed for a finish boring assembly under 5xD is 120 m/min, then the speed for a 10xD finish boring assembly in the same application would be 60 m/min (120 m/min x 0.50 = 60 m/min).

5xD = 120 m/min

10xD = 60 m/min

*Not to exceed recommended RPM printed on NOVI^{TECH}® module.
Single-edge use is recommended.

IMPORTANT: Max spindle speed refers to maximum possible speed for individual boring head and is not a recommended parameter. Factory technical assistance is available for your specific applications through our Application Engineering department. ext: 7611 | email: appeng@alliedmachine.com

⚠ WARNING Tool failure can cause serious injury. To prevent:

- Do not exceed recommended 10xD length-to-diameter ratio or exceed four total components (including shank).
- When using Alu-Line components, do not exceed recommended 5xD length-to-diameter ratio.
- When using tool steel components, do not exceed recommended 6xD length-to-diameter ratio.
- When using heavy metal components, do not exceed recommended 8xD length-to-diameter ratio.
- When using a carbide shank, do not exceed recommended 9xD length-to-diameter ratio.
- When using a NOVI^{TECH}® module, do not exceed recommended 10xD length-to-diameter ratio.

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Rough Machining Recommended Cutting Data | Imperial (inch)

ISO	Material	(BHN) Hardness	Grade	Speed* SFM	Recommended Feed (inch / tooth) Nose Radii			
					0.008"	0.016"	0.032"	0.047"
H	Wear Plate Hardox®, AR400, T-1, etc.	400 - 600	Carbide	100 - 160	0.002 - 0.006	0.004 - 0.008	0.004 - 0.008	0.004 - 0.010
			CBN	200 - 460	0.002 - 0.006	0.004 - 0.008	0.004 - 0.008	0.004 - 0.010
	Hardened Steel	300 - 500	Carbide	130 - 200	0.002 - 0.006	0.004 - 0.008	0.004 - 0.008	0.004 - 0.010
			CBN	200 - 460	0.002 - 0.006	0.004 - 0.008	0.004 - 0.008	0.004 - 0.010
K	SG / Nodular Cast Iron	120 - 320	Carbide	430 - 820	0.004 - 0.006	0.006 - 0.014	0.008 - 0.020	0.008 - 0.031
			Ceramic	660 - 1310	0.004 - 0.006	0.006 - 0.014	0.008 - 0.020	0.008 - 0.031
	Grey / White Iron	180 - 320	Carbide	490 - 920	0.004 - 0.006	0.006 - 0.014	0.008 - 0.020	0.008 - 0.031
			Ceramic	1310 - 3280	0.004 - 0.006	0.006 - 0.014	0.008 - 0.020	0.008 - 0.031
N	Cast Aluminum	30 - 180	Carbide	820 - 2620	0.004 - 0.006	0.006 - 0.014	0.008 - 0.024	0.008 - 0.031
			PCD	1310 - 3940	0.004 - 0.006	0.006 - 0.014	0.008 - 0.024	0.008 - 0.031
	Wrought Aluminum	30 - 180	Carbide	660 - 1640	0.004 - 0.006	0.006 - 0.014	0.006 - 0.020	0.008 - 0.031
	Aluminum Bronze	100 - 250	Carbide	390 - 820	0.004 - 0.006	0.006 - 0.010	0.006 - 0.016	0.008 - 0.024
Brass	100	Carbide	660 - 1640	0.004 - 0.006	0.006 - 0.010	0.006 - 0.016	0.008 - 0.031	
Copper	60	Carbide	330 - 490	0.004 - 0.006	0.006 - 0.010	0.006 - 0.014	0.008 - 0.016	

*Not to exceed max recommended RPM for boring head found in corresponding Wohlhaupter Operation Manual.

Deep Hole Boring Speed Adjustment

⚠ For Dynamic Boring Tool NOVI^{TECH} Length

Boring Type	8xD	9xD	10xD
Roughing	0.80	0.60	0.40
Finishing	0.90	0.70	0.50

*Not to exceed recommended RPM printed on NOVI^{TECH} module.
Single-edge use is recommended.

Recommended Speed Example

If the recommended speed for a finish boring assembly under 5xD is 120 m/min, then the speed for a 10xD finish boring assembly in the same application would be 60 m/min (120 m/min x 0.50 = 60 m/min).

5xD = 120 m/min

10xD = 60 m/min

IMPORTANT: Max spindle speed refers to maximum possible speed for individual boring head and is not a recommended parameter. Factory technical assistance is available for your specific applications through our Application Engineering department. ext: 7611 | email: appeng@alliedmachine.com

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- Do not exceed recommended 10xD length-to-diameter ratio or exceed four total components (including shank).
- When using Alu-Line components, do not exceed recommended 5xD length-to-diameter ratio.
- When using tool steel components, do not exceed recommended 6xD length-to-diameter ratio.
- When using heavy metal components, do not exceed recommended 8xD length-to-diameter ratio.
- When using a carbide shank, do not exceed recommended 9xD length-to-diameter ratio.
- When using a NOVI^{TECH} module, do not exceed recommended 10xD length-to-diameter ratio.

Factory technical assistance is available for your specific applications through our Application Engineering department. ext: 7611 | email: appeng@alliedmachine.com

Finish Machining Recommended Cutting Data | Imperial (inch)

ISO	Material	(BHN) Hardness	Grade	*Speed SFM	Recommended Feed (inch / tooth) Nose Radii			
					0.004"	0.008"	0.016"	0.031"
P	Free-Machining Steel 1118, 1215, 12L14, etc.	100 - 250	Carbide	525 - 975	0.001 - 0.003	0.002 - 0.005	0.004 - 0.006	0.006 - 0.009
	Low-Carbon Steel 1010, 1020, 1025, 1522, 1144, etc.	85 - 275	Carbide	475 - 925	0.001 - 0.002	0.002 - 0.004	0.003 - 0.005	0.005 - 0.008
	Medium-Carbon Steel 1030, 1040, 1050, 1527, 1140, 1151, etc.	125 - 325	Carbide	475 - 825	0.001 - 0.002	0.002 - 0.004	0.003 - 0.005	0.005 - 0.008
	Alloy Steel 4140, 5140, 8640, etc.	125 - 375	Carbide	400 - 700	0.001 - 0.002	0.002 - 0.004	0.003 - 0.005	0.005 - 0.008
	High-Strength Alloy 4340, 4330V, 300M, etc.	225 - 400	Carbide	325 - 600	0.001 - 0.002	0.002 - 0.004	0.003 - 0.005	0.005 - 0.008
	Structural Steel A36, A285, A516, etc.	100 - 350	Carbide	475 - 925	0.001 - 0.002	0.002 - 0.004	0.003 - 0.005	0.005 - 0.008
	Tool Steel H-13, H-21, A-4, O-2, S-3, etc.	150 - 250	Carbide	325 - 600	0.001 - 0.002	0.002 - 0.003	0.003 - 0.004	0.004 - 0.006
S	High-Temp Alloy Hastelloy B, Inconel 600, etc.	140 - 310	Carbide	100 - 225	0.001 - 0.002	0.002 - 0.003	0.003 - 0.005	0.004 - 0.006
	Titanium Alloy	140 - 310	Carbide	125 - 300	0.001 - 0.002	0.002 - 0.003	0.003 - 0.005	0.004 - 0.006
	Aerospace Alloy S82	185 - 350	Carbide	125 - 300	0.001 - 0.002	0.002 - 0.003	0.003 - 0.005	0.004 - 0.006
M	Stainless Steel 400 Series 416, 420, etc.	185 - 350	Carbide	164 - 394	0.001 - 0.002	0.002 - 0.004	0.003 - 0.004	0.004 - 0.006
	Stainless Steel 300 Series 304, 316, 17-4PH, etc.	135 - 275	Carbide	300 - 525	0.001 - 0.002	0.002 - 0.004	0.003 - 0.004	0.004 - 0.006
	Super Duplex Stainless Steel	135 - 275	Carbide	197 - 525	0.001 - 0.002	0.002 - 0.004	0.003 - 0.004	0.004 - 0.006

*Not to exceed max recommended RPM for boring head found in corresponding Wohlhaupter Operation Manual.

Deep Hole Boring Speed Adjustment

Recommended Speed Example

⚠ For Dynamic Boring Tool NOVI ^{TECH} ® Length			
Boring Type	8xD	9xD	10xD
Roughing	0.80	0.60	0.40
Finishing	0.90	0.70	0.50

If the recommended speed for a finish boring assembly under 5xD is 120 m/min, then the speed for a 10xD finish boring assembly in the same application would be 60 m/min (120 m/min x 0.50 = 60 m/min).

5xD = 120 m/min

10xD = 60 m/min

*Not to exceed recommended RPM printed on NOVI^{TECH}® module.

IMPORTANT: Max spindle speed refers to maximum possible speed for individual boring head and is not a recommended parameter. Factory technical assistance is available for your specific applications through our Application Engineering department. ext: 7611 | email: appeng@alliedmachine.com

⚠ WARNING Tool failure can cause serious injury. To prevent:

- Do not exceed recommended 10xD length-to-diameter ratio or exceed four total components (including shank).
- When using Alu-Line components, do not exceed recommended 5xD length-to-diameter ratio.
- When using tool steel components, do not exceed recommended 6xD length-to-diameter ratio.
- When using heavy metal components, do not exceed recommended 8xD length-to-diameter ratio.
- When using a carbide shank, do not exceed recommended 9xD length-to-diameter ratio.
- When using a NOVI^{TECH}® module, do not exceed recommended 10xD length-to-diameter ratio.

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Finish Machining Recommended Cutting Data | Imperial (inch)

ISO	Material	(BHN) Hardness	Grade	*Speed SFM	Recommended Feed (inch / tooth) Nose Radii			
					0.004"	0.008"	0.016"	0.031"
H	Wear Plate Hardox®, AR400, T-1, etc.	400 - 600	Carbide	100 - 200	0.001 - 0.002	0.002 - 0.003	0.003 - 0.004	0.004 - 0.006
			CBN	225 - 600	0.001 - 0.002	0.002 - 0.003	0.003 - 0.004	0.004 - 0.006
	Hardened Steel	300 - 500	Carbide	125 - 275	0.001 - 0.002	0.002 - 0.003	0.003 - 0.004	0.004 - 0.006
			CBN	225 - 600	0.001 - 0.002	0.002 - 0.003	0.003 - 0.004	0.004 - 0.006
K	SG / Nodular Cast Iron	120 - 320	Carbide	475 - 850	0.001 - 0.002	0.002 - 0.004	0.003 - 0.005	0.005 - 0.008
	Grey / White Iron	180 - 320	Carbide	600 - 1050	0.001 - 0.002	0.002 - 0.004	0.003 - 0.005	0.005 - 0.008
			CBN	1325 - 3275	0.001 - 0.002	0.002 - 0.004	0.003 - 0.005	0.005 - 0.008
N	Cast Aluminum	30 - 180	Carbide	850 - 2800	0.001 - 0.002	0.002 - 0.004	0.003 - 0.005	0.005 - 0.008
			PCD	1625 - 6550	0.001 - 0.002	0.002 - 0.004	0.003 - 0.005	0.005 - 0.008
	Wrought Aluminum	30 - 180	Carbide	675 - 1975	0.001 - 0.003	0.002 - 0.005	0.004 - 0.006	0.006 - 0.009
	Aluminum Bronze	100 - 250	Carbide	475 - 925	0.001 - 0.002	0.002 - 0.004	0.004 - 0.005	0.005 - 0.008
	Brass	100	Carbide	675 - 1975	0.001 - 0.002	0.002 - 0.004	0.003 - 0.005	0.005 - 0.008
Copper	60	Carbide	325 - 600	0.001 - 0.002	0.002 - 0.003	0.003 - 0.004	0.004 - 0.005	

*Not to exceed max recommended RPM for boring head found in corresponding Wohlhaupter Operation Manual.

Deep Hole Boring Speed Adjustment

⚠ For Dynamic Boring Tool NOVI ^{TECH} Length			
Boring Type	8xD	9xD	10xD
Roughing	0.80	0.60	0.40
Finishing	0.90	0.70	0.50

*Not to exceed recommended RPM printed on NOVI^{TECH} module.

Recommended Speed Example

If the recommended speed for a finish boring assembly under 5xD is 120 m/min, then the speed for a 10xD finish boring assembly in the same application would be 60 m/min (120 m/min x 0.50 = 60 m/min).

5xD = 120 m/min

10xD = 60 m/min

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- Do not exceed recommended 10xD length-to-diameter ratio or exceed four total components (including shank).
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- When using tool steel components, do not exceed recommended 6xD length-to-diameter ratio.
- When using heavy metal components, do not exceed recommended 8xD length-to-diameter ratio.
- When using a carbide shank, do not exceed recommended 9xD length-to-diameter ratio.
- When using a NOVI^{TECH} module, do not exceed recommended 10xD length-to-diameter ratio.

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Rough Machining Recommended Cutting Data | Metric (mm)

ISO	Material	(BHN) Hardness	Grade	*Speed M / Min	Recommended Feed (mm / tooth) Nose Radii			
					0.2 mm	0.4 mm	0.8 mm	1.2 mm
P	Free-Machining Steel 1118, 1215, 12L14, etc.	100 - 250	Carbide	150 - 230	0.10 - 0.15	0.10 - 0.30	0.20 - 0.50	0.10 - 0.80
	Cermet		150 - 250	0.10 - 0.15	0.10 - 0.30	0.20 - 0.50	0.10 - 0.80	
	Low-Carbon Steel 1010, 1020, 1025, 1522, 1144, etc.	85 - 275	Carbide	140 - 250	0.10 - 0.15	0.10 - 0.30	0.20 - 0.50	0.10 - 0.80
	Medium-Carbon Steel 1030, 1040, 1050, 1527, 1140, 1151, etc.		Carbide	140 - 250	0.10 - 0.15	0.10 - 0.30	0.20 - 0.50	0.10 - 0.80
	Alloy Steel 4140, 5140, 8640, etc.	125 - 375	Carbide	120 - 200	0.10 - 0.15	0.10 - 0.30	0.20 - 0.50	0.10 - 0.80
	High-Strength Alloy 4340, 4330V, 300M, etc.		Carbide	100 - 180	0.10 - 0.15	0.10 - 0.30	0.20 - 0.50	0.10 - 0.80
	Structural Steel A36, A285, A516, etc.	100 - 350	Carbide	150 - 260	0.10 - 0.15	0.10 - 0.30	0.20 - 0.50	0.10 - 0.80
	Cermet		150 - 280	0.10 - 0.15	0.10 - 0.30	0.20 - 0.50	0.10 - 0.80	
	Tool Steel H-13, H-21, A-4, O-2, S-3, etc.	150 - 250	Carbide	100 - 180	0.10 - 0.15	0.10 - 0.30	0.20 - 0.50	0.10 - 0.80
	High-Temp Alloy Hastelloy B, Inconel 600, etc.		Carbide	20 - 50	0.10 - 0.15	0.10 - 0.2	0.15 - 0.35	0.20 - 0.40
S	Titanium Alloy	140 - 310	Carbide	40 - 80	0.10 - 0.15	0.10 - 0.2	0.15 - 0.35	0.20 - 0.40
	Aerospace Alloy S82	185 - 350	Carbide	40 - 80	0.10 - 0.15	0.10 - 0.2	0.15 - 0.35	0.20 - 0.40
	Stainless Steel 400 Series 416, 420, etc.	185 - 350	Carbide	50 - 100	0.10 - 0.15	0.10 - 0.25	0.10 - 0.35	0.20 - 0.60
M	Stainless Steel 300 Series 304, 316, 17-4PH, etc.	135 - 275	Carbide	80 - 150	0.10 - 0.15	0.10 - 0.25	0.10 - 0.35	0.20 - 0.60
	Super Duplex Stainless Steel	135 - 275	Carbide	60 - 100	0.10 - 0.15	0.10 - 0.25	0.10 - 0.35	0.20 - 0.60

*Not to exceed max recommended RPM for boring head found in corresponding Wohlhaupter Operation Manual.

Deep Hole Boring Speed Adjustment

Recommended Speed Example

⚠ For Dynamic Boring Tool NOVI ^{TECH} ® Length			
Boring Type	8xD	9xD	10xD
Roughing	0.80	0.60	0.40
Finishing	0.90	0.70	0.50

If the recommended speed for a finish boring assembly under 5xD is 120 m/min, then the speed for a 10xD finish boring assembly in the same application would be 60 m/min (120 m/min x 0.50 = 60 m/min).

5xD = 120 m/min

10xD = 60 m/min

*Not to exceed recommended RPM printed on NOVI^{TECH}® module.
Single-edge use is recommended.

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- When using Alu-Line components, do not exceed recommended 5xD length-to-diameter ratio.
- When using tool steel components, do not exceed recommended 6xD length-to-diameter ratio.
- When using heavy metal components, do not exceed recommended 8xD length-to-diameter ratio.
- When using a carbide shank, do not exceed recommended 9xD length-to-diameter ratio.
- When using a NOVI^{TECH}® module, do not exceed recommended 10xD length-to-diameter ratio.

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Rough Machining Recommended Cutting Data | Metric (mm)

ISO	Material	(BHN) Hardness	Grade	*Speed M / Min	Recommended Feed (mm / tooth) Nose Radii			
					0.2 mm	0.4 mm	0.8 mm	1.2 mm
H	Wear Plate Hardox®, AR400, T-1, etc.	400 - 600	Carbide	30 - 50	0.05 - 0.15	0.10 - 0.20	0.10 - 0.20	0.10 - 0.25
			CBN	60 - 140	0.05 - 0.15	0.10 - 0.20	0.10 - 0.20	0.10 - 0.25
	Hardened Steel	300 - 500	Carbide	40 - 60	0.05 - 0.15	0.10 - 0.20	0.10 - 0.20	0.10 - 0.25
			CBN	60 - 140	0.05 - 0.15	0.10 - 0.20	0.10 - 0.20	0.10 - 0.25
K	SG / Nodular Cast Iron	120 - 320	Carbide	130 - 250	0.10 - 0.15	0.15 - 0.35	0.20 - 0.50	0.20 - 0.80
			Ceramic	200 - 400	0.10 - 0.15	0.15 - 0.35	0.20 - 0.50	0.20 - 0.80
	Grey / White Iron	180 - 320	Carbide	150 - 280	0.10 - 0.15	0.15 - 0.35	0.20 - 0.60	0.20 - 0.80
			Ceramic	400 - 1000	0.10 - 0.15	0.15 - 0.35	0.20 - 0.60	0.20 - 0.80
N	Cast Aluminum	30 - 180	Carbide	250 - 800	0.10 - 0.15	0.15 - 0.35	0.20 - 0.60	0.20 - 0.80
			PCD	400 - 1200	0.10 - 0.15	0.15 - 0.35	0.20 - 0.60	0.20 - 0.80
	Wrought Aluminum	30 - 180	Carbide	200 - 500	0.10 - 0.15	0.15 - 0.35	0.15 - 0.50	0.20 - 0.80
	Aluminum Bronze	100 - 250	Carbide	120 - 250	0.10 - 0.15	0.15 - 0.25	0.15 - 0.40	0.20 - 0.60
Brass	100	Carbide	200 - 500	0.10 - 0.15	0.15 - 0.25	0.15 - 0.40	0.20 - 0.80	
Copper	60	Carbide	100 - 150	0.10 - 0.15	0.15 - 0.25	0.15 - 0.35	0.20 - 0.40	

*Not to exceed max recommended RPM for boring head found in corresponding Wohlhaupter Operation Manual.

Deep Hole Boring Speed Adjustment

⚠ For Dynamic Boring Tool NOVI^{TECH} Length

Boring Type	8xD	9xD	10xD
Roughing	0.80	0.60	0.40
Finishing	0.90	0.70	0.50

*Not to exceed recommended RPM printed on NOVI^{TECH} module.
Single-edge use is recommended.

Recommended Speed Example

If the recommended speed for a finish boring assembly under 5xD is 120 m/min, then the speed for a 10xD finish boring assembly in the same application would be 60 m/min (120 m/min x 0.50 = 60 m/min).

5xD = 120 m/min

10xD = 60 m/min

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- When using Alu-Line components, do not exceed recommended 5xD length-to-diameter ratio.
- When using tool steel components, do not exceed recommended 6xD length-to-diameter ratio.
- When using heavy metal components, do not exceed recommended 8xD length-to-diameter ratio.
- When using a carbide shank, do not exceed recommended 9xD length-to-diameter ratio.
- When using a NOVI^{TECH} module, do not exceed recommended 10xD length-to-diameter ratio.

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Finish Machining Recommended Cutting Data | Metric (mm)

ISO	Material	(BHN) Hardness	Grade	*Speed M / Min	Recommended Feed (mm / tooth) Nose Radii			
					0.1 mm	0.2 mm	0.4 mm	0.8 mm
P	Free-Machining Steel 1118, 1215, 12L14, etc.	100 - 250	Carbide	150 - 300	0.02 - 0.08	0.05 - 0.13	0.10 - 0.15	0.15 - 0.23
	Low-Carbon Steel 1010, 1020, 1025, 1522, 1144, etc.	85 - 275	Carbide	145 - 280	0.02 - 0.05	0.05 - 0.10	0.08 - 0.13	0.13 - 0.20
	Medium-Carbon Steel 1030, 1040, 1050, 1527, 1140, 1151, etc.	125 - 325	Carbide	145 - 280	0.02 - 0.05	0.05 - 0.10	0.08 - 0.13	0.13 - 0.20
	Alloy Steel 4140, 5140, 8640, etc.	125 - 375	Carbide	120 - 215	0.02 - 0.05	0.05 - 0.10	0.08 - 0.13	0.13 - 0.20
	High-Strength Alloy 4340, 4330V, 300M, etc.	225 - 400	Carbide	100 - 180	0.02 - 0.05	0.05 - 0.10	0.08 - 0.13	0.13 - 0.20
	Structural Steel A36, A285, A516, etc.	100 - 350	Carbide	145 - 280	0.02 - 0.05	0.05 - 0.10	0.08 - 0.13	0.13 - 0.20
	Tool Steel H-13, H-21, A-4, O-2, S-3, etc.	150 - 250	Carbide	100 - 180	0.02 - 0.05	0.05 - 0.08	0.08 - 0.10	0.10 - 0.15
S	High-Temp Alloy Hastelloy B, Inconel 600, etc.	140 - 310	Carbide	30 - 70	0.02 - 0.05	0.05 - 0.08	0.08 - 0.13	0.10 - 0.15
	Titanium Alloy	140 - 310	Carbide	40 - 90	0.02 - 0.05	0.05 - 0.08	0.08 - 0.13	0.10 - 0.15
	Aerospace Alloy S82	185 - 350	Carbide	40 - 90	0.02 - 0.05	0.05 - 0.08	0.08 - 0.13	0.10 - 0.15
M	Stainless Steel 400 Series 416, 420, etc.	185 - 350	Carbide	50 - 120	0.02 - 0.05	0.05 - 0.10	0.08 - 0.10	0.10 - 0.15
	Stainless Steel 300 Series 304, 316, 17-4PH, etc.	135 - 275	Carbide	90 - 160	0.02 - 0.05	0.05 - 0.10	0.08 - 0.10	0.10 - 0.15
	Super Duplex Stainless Steel	135 - 275	Carbide	60 - 160	0.02 - 0.05	0.05 - 0.10	0.08 - 0.10	0.10 - 0.15

*Not to exceed max recommended RPM for boring head found in corresponding Wohlhaupter Operation Manual.

Deep Hole Boring Speed Adjustment

Recommended Speed Example

⚠ For Dynamic Boring Tool NOVI ^{TECH} ® Length			
Boring Type	8xD	9xD	10xD
Roughing	0.80	0.60	0.40
Finishing	0.90	0.70	0.50

If the recommended speed for a finish boring assembly under 5xD is 120 m/min, then the speed for a 10xD finish boring assembly in the same application would be 60 m/min (120 M/Min x 0.50 = 60 m/min).	
5xD = 120 m/min	10xD = 60 m/min

*Not to exceed recommended RPM printed on NOVI^{TECH}® module.

IMPORTANT: Max spindle speed refers to maximum possible speed for individual boring head and is not a recommended parameter. Factory technical assistance is available for your specific applications through our Application Engineering department. ext: 7611 | email: appeng@alliedmachine.com

⚠ WARNING Tool failure can cause serious injury. To prevent:

- Do not exceed recommended 10xD length-to-diameter ratio or exceed four total components (including shank).
- When using Alu-Line components, do not exceed recommended 5xD length-to-diameter ratio.
- When using tool steel components, do not exceed recommended 6xD length-to-diameter ratio.
- When using heavy metal components, do not exceed recommended 8xD length-to-diameter ratio.
- When using a carbide shank, do not exceed recommended 9xD length-to-diameter ratio.
- When using a NOVI^{TECH}® module, do not exceed recommended 10xD length-to-diameter ratio.

Factory technical assistance is available for your specific applications through our Application Engineering department. ext: 7611 | email: appeng@alliedmachine.com

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Finish Machining Recommended Cutting Data | Metric (mm)

ISO	Material	(BHN) Hardness	Grade	*Speed M / Min	Recommended Feed (mm / tooth) Nose Radii			
					0.1 mm	0.2 mm	0.4 mm	0.8 mm
H	Wear Plate Hardox®, AR400, T-1, etc.	400 - 600	Carbide	30 - 60	0.02 - 0.05	0.05 - 0.08	0.08 - 0.10	0.10 - 0.15
			CBN	70 - 180	0.02 - 0.05	0.05 - 0.08	0.08 - 0.10	0.10 - 0.15
	300 - 500	Carbide	40 - 80	0.02 - 0.05	0.05 - 0.08	0.08 - 0.10	0.10 - 0.15	
		CBN	70 - 180	0.02 - 0.05	0.05 - 0.08	0.08 - 0.10	0.10 - 0.15	
K	SG / Nodular Cast Iron	120 - 320	Carbide	145 - 260	0.02 - 0.05	0.05 - 0.10	0.08 - 0.13	0.13 - 0.20
	180 - 320	Carbide	180 - 320	0.02 - 0.05	0.05 - 0.10	0.08 - 0.13	0.13 - 0.20	
		CBN	400 - 1000	0.02 - 0.05	0.05 - 0.10	0.08 - 0.13	0.13 - 0.20	
N	Cast Aluminum	30 - 180	Carbide	260 - 850	0.02 - 0.05	0.05 - 0.10	0.08 - 0.13	0.13 - 0.20
			PCD	495 - 1995	0.02 - 0.05	0.05 - 0.10	0.08 - 0.13	0.13 - 0.20
	Wrought Aluminum	30 - 180	Carbide	205 - 600	0.02 - 0.05	0.05 - 0.13	0.10 - 0.15	0.15 - 0.23
	Aluminum Bronze	100 - 250	Carbide	145 - 280	0.02 - 0.05	0.05 - 0.10	0.10 - 0.13	0.13 - 0.20
	Brass	100	Carbide	205 - 600	0.02 - 0.05	0.05 - 0.10	0.08 - 0.13	0.13 - 0.20
Copper	60	Carbide	100 - 180	0.02 - 0.05	0.05 - 0.08	0.08 - 0.10	0.10 - 0.13	

*Not to exceed max recommended RPM for boring head found in corresponding Wohlhaupter Operation Manual.

Deep Hole Boring Speed Adjustment

⚠ For Dynamic Boring Tool NOVI ^{TECH} Length			
Boring Type	8xD	9xD	10xD
Roughing	0.80	0.60	0.40
Finishing	0.90	0.70	0.50

*Not to exceed recommended RPM printed on NOVI^{TECH} module.

Recommended Speed Example

If the recommended speed for a finish boring assembly under 5xD is 120 m/min, then the speed for a 10xD finish boring assembly in the same application would be 60 m/min (120 m/min x 0.50 = 60 m/min).

5xD = 120 m/min

10xD = 60 m/min

IMPORTANT: Max spindle speed refers to maximum possible speed for individual boring head and is not a recommended parameter. Factory technical assistance is available for your specific applications through our Application Engineering department. ext: 7611 | email: appeng@alliedmachine.com

⚠ WARNING Tool failure can cause serious injury. To prevent:

- Do not exceed recommended 10xD length-to-diameter ratio or exceed four total components (including shank).
- When using Alu-Line components, do not exceed recommended 5xD length-to-diameter ratio.
- When using tool steel components, do not exceed recommended 6xD length-to-diameter ratio.
- When using heavy metal components, do not exceed recommended 8xD length-to-diameter ratio.
- When using a carbide shank, do not exceed recommended 9xD length-to-diameter ratio.
- When using a NOVI^{TECH} module, do not exceed recommended 10xD length-to-diameter ratio.

Factory technical assistance is available for your specific applications through our Application Engineering department. ext: 7611 | email: appeng@alliedmachine.com

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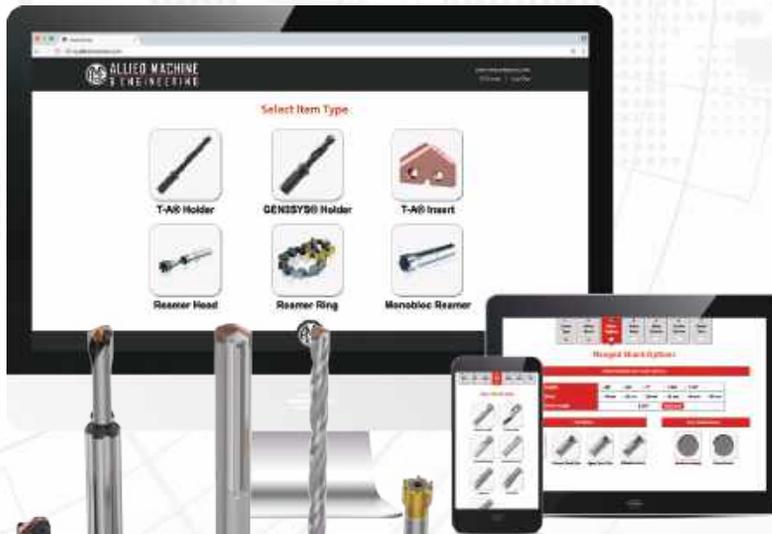


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Distributor PO # _____

The following must be filled out completely before your test will be considered.

IMPORTANT: For processing, send purchase order to your Allied Field Sales Engineer (FSE). Please clearly mark the paperwork as "Test Order."

Distributor Information

Company Name: _____
 Contact: _____
 Account Number: _____
 Phone: _____
 Email: _____

End User Information

Company Name: _____
 Contact: _____
 Industry: _____
 Phone: _____
 Email: _____

Current Process List all tooling, coatings, substrates, speeds and feeds, tool life, and any problems you are experiencing.

Test Objective List what would make this a successful test (i.e. penetration rate, finish, tool life, hole size, etc.).

Application Information

Hole Diameter: _____ in/mm	Tolerance: _____	Material: _____ (4150, A36, cast iron, etc.)
Preexisting Diameter: _____ in/mm	Depth of Cut: _____ in/mm	Hardness: _____ (BHN, Rc)
Required Finish: _____ RMS	State: _____	(Casting, hot rolled, forging)

Machine Information

Machine Type: _____ (Lathe, screw machine, machine center, etc.)	Builder: _____ (Haas, Mori Seiki, etc.)	Model #: _____
Shank Required: _____ (CAT50, Morse taper, etc.)	Power: _____ HP/KW	
Rigidity: _____	Orientation: _____	Tool Rotating: _____
<input type="checkbox"/> Excellent	<input type="checkbox"/> Vertical	<input type="checkbox"/> Yes
<input type="checkbox"/> Good	<input type="checkbox"/> Horizontal	<input type="checkbox"/> No
<input type="checkbox"/> Poor		Thrust: _____ lbs/N

Coolant Information

Coolant Delivery: _____ (Through tool, flood)	Coolant Pressure: _____ PSI / bar
Coolant Type: _____ (Air mist, oil, synthetic, water soluble, etc.)	Coolant Volume: _____ GPM / LPM

Requested Tooling

QTY	Item Number	QTY	Item Number



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 Dover, OH 44622

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 Toll Free USA & Canada: (800) 321-5537
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