



# ALLIED MACHINE & ENGINEERING

Holemaking Solutions for Today's Manufacturing



COMPLETE METALWORKING SOLUTIONS

(800) 991-4225

[www.ahbinc.com](http://www.ahbinc.com)

ISO Certified

[customerservice@ahbinc.com](mailto:customerservice@ahbinc.com)



Drilling



Reaming



Burnishing



Threading



Specials



## Criterion®

▶ BORING

Modular Boring Systems

**CRITERION®**

## North America

**Allied Machine**  
120 Deeds Drive  
Dover, OH 44622  
United States

**Allied Machine**  
485 West 3rd Street  
Dover, OH 44622  
United States

### **ThreadMills USA™**

4185 Crosstowne Ct #B  
Evans, GA 30809  
United States

### **Superior®**

1285 S Patton St.  
Xenia, OH 45385  
United States

## Europe

**Allied Machine Europe**  
93 Vantage Point  
Pensnett Estate  
Kingswinford  
West Midlands  
DY6 7FR, United Kingdom

### **Wohlhaupter™ GmbH**

Maybachstrasse 4  
Postfach 1264  
72636 Frickenhausen  
Germany

## Asia

**Wohlhaupter™ India**  
B-23, 2nd Floor  
B Block Community Centre  
Janakpuri, New Delhi - 110058  
India



Allied Machine & Engineering is a worldwide leader in holemaking and finishing solutions. We are committed to providing practical and dependable solutions to our customers through innovative designs and superior customer and technical support.

We continue to expand our product offering in order to provide new and different solutions. With Field Sales Engineers located around the world, we position ourselves to provide technical support on site, right at your spindle.



[www.alliedmachine.com](http://www.alliedmachine.com)

## The Foundation

Since 1941, Allied Machine & Engineering has provided dependable and practical holemaking solutions to the world. What was once a small job shop in Ohio is now a worldwide leader in cutting tool technology. With three manufacturing facilities in Ohio, one in Georgia, another in Germany, and headquarters in both the United States and Europe, Allied Machine is positioned to bring innovative solutions and technical expertise directly to the customers' hands.



## The Beginning

Harold E. Stokey founded Allied Machine & Engineering to aid the war effort, manufacturing taper bearing lock nuts for the production of M1 tanks. Years later, after a sales meeting gone wrong, Stokey possessed a warehouse stocked with spade drill inserts. He set forth into the industry that would become Allied Machine's thriving identity: holemaking.



## The T-A®

When Harold's son, William H. Stokey, became the president and CEO, he developed the Throw Away, or T-A, spade drill insert system. The T-A revolutionized the holemaking industry, launching Allied Machine ahead of the competition. Since then, numerous innovations and advancements have been created from the T-A's inspiration.



## The Innovation

Since the development of the T-A, Allied Machine has expanded its product offering to support a vast range of customer applications, including large diameter and deep hole drilling, boring, reaming, burnishing, porting, and threading.

## The People

Allied Machine understands that high quality products are only one facet of success. Our customer support is crucial to what we do, and that's why we make sure the best engineers and customer service associates are in place to assist our customers around the world.

## The Future

With over 75 years of experience, Allied Machine has encountered the challenges of growth and success. By investing in cutting edge technology and the brightest and sharpest minds, our knowledge and capabilities continue to expand and grow every day.



**Steve Stokey**  
Executive Vice President

**William H. Stokey**  
President and CEO

**Mike Stokey**  
Executive Vice President





## Replaceable Insert Drills

- Reduce costs by decreasing set-up time and utilizing a single holder for the lives of multiple inserts
- Provide flexibility to quickly switch between inserts with different geometries
- Products:
  - GEN3SYS® XT | GEN3SYS® XT Pro
  - Original T-A® | GEN2 T-A®
  - High Performance | Universal



## Indexable Insert Drills

- Protect your investment and reduce your inventory with replaceable cartridges that allow the same holder to be used repeatedly
- Indexable inserts increase productivity and tool life while reducing costs
- Products:
  - 4TEX® Drill
  - Revolution Drill®
  - Opening Drill®



## Replaceable / Indexable Insert Drills

- Allow for higher spindle speeds and take advantage of the power curve on modern CNC machines
- Achieve maximum penetration rates in deep hole drilling applications
- Holders cover a range of sizes with the replaceable heads determining the cutting diameter
- Products:
  - APX™ Drill



## Solid Carbide Drills

- Offer greater strength and stability when drilling tougher materials
- Available in diameters from 3mm - 20mm
- Can be made-to-order specifically for your application (Superion™ quoted specials)
  - ASC 320®
  - Superion®





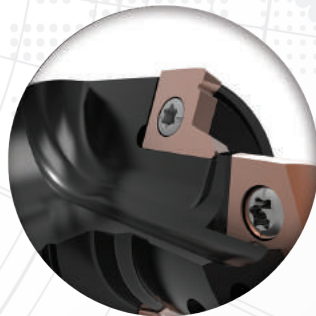


## Structural Steel Solutions

- Deliver outstanding performance and durability in structural steel applications
- Designed to produce optimal results in difficult-to-machine materials
- Available in multiple lengths and diameters
- T-A® style drills have different insert geometry options to improve performance depending on material
- Products:
  - Original T-A® | GEN2 T-A®
  - GEN3SYS® XT Pro

## BTA (STS) Machining Solutions

- The internal ejection system flushes chips and debris from the hole with no interference to the cutting process
- Utilizes the advantages of the T-A® drill insert
- Designed to significantly increase penetration rates over brazed heads and traditional gun drills
- Products:
  - BT-A Drill



## Hydraulic Port Contour Cutters

- Save significant time and money by performing four processes in one step
- Replaceable insert design reduces costs, inventory, and set-up times
- Available in 4 industry specifications:
  - Imperial: SAE J-1926
  - Metric: ISO 6149-1:2006
  - Military: SAE AS5202
  - John Deere: JDS-G173.1
- Products:
  - AccuPort 432®



## Enhanced Special Drilling Capabilities

- Allied Machine Engineers are available to meet with you to evaluate your application and recommend the best solution for you
- Special drilling solutions can incorporate advanced features such as adjustable diameter locations, multiple steps, additional coolant designs, special lengths and diameters, and more
- Special drills can drastically reduce your cost-per-hole and increase your overall productivity by eliminating multiple processes and increasing tool life



## WOHLHAUPTER®

### High Precision Boring Systems

- Designs available for high volume applications that increase rigidity to improve performance
- Versatile boring heads that are flexible with changing applications while maintaining excellent performance
- Provides high precision with absolute repeatability to ensure every part is held to tolerance
- Offers an industry leading modular shank connection that maintains rigidity and reduces inventory on your boring system
- Available with both digital and analog settings
- Products:
  - Wohlhaupter™ Boring Tools



3E TECH



## CRITERION®

### Modular Boring Systems

- The modular capabilities are ideal for use across multiple different projects
- Offers versatile boring heads suitable for job shops and tooling rooms
- Provides an economical solution for low volume and/or short-term production applications
- Offers finish boring solutions
- Products:
  - Criterion® Boring Tools

## S.C.A.M.I.®

### Expandable Reaming Solutions

- Expandable cutting diameters accommodate for wear, which extends tool life
- Replaceable cutting heads and rings reduce waste and improve production time versus solid high speed steel and carbide reamers
- Hold tight tolerances to ensure processes are performed to accurate specifications
- Reduce tooling costs because many items are available for recondition
- Products:
  - ALVAN® Reamers



## S.C.A.M.I.®

### Roller Burnishing Solutions

- Produce excellent surface finishes
- Provide accurate size control
- Increase surface hardness
- Solutions for both through hole and blind hole applications
- Products:
  - S.C.A.M.I.® Roller Burnishing Tools







## Solid Carbide Thread Mills

- Available with coolant through options
- Cover a wide range of thread forms
- Provide optimal solutions for both high production projects and short-run applications
- Products
  - AccuThread™ 856
  - AccuThread™ T3
  - ThreadMills USA™



## Replaceable Insert Thread Mills

- 3 insert lengths are available that cover a wide range of thread forms
- Holders can utilize inserts with different pitches and thread forms
- Repeatability is achieved by both the bolt-in style and the pin style locking systems
- Increase tool life by 25 - 50% with Allied Machine's AM210® coating
- Products
  - AccuThread™ 856: Bolt-in Style
  - AccuThread™ 856: Pin Style



## SPECIAL CAPABILITIES


When it comes to designing and developing special solutions for customers, Allied Machine is the top choice. If your application requires special tooling, give us a call. Our engineered specials are developed by the brightest engineers in the industry. Most of our standard tooling can be altered as specials, or we can create entirely new concepts for particularly unique applications.

One special tooling solution is Insta-Quote®, the online system that allows you to design your own special tooling 24/7. Receive a quote and drawings within minutes just by following the steps.

And with the addition of Superior® technology and capabilities, we can customize made-to-order solid carbide tools to achieve optimal results for your applications.

Whatever your application, Allied Machine has the answer.



Insta-Quote® 



 SUPERION®





# ToolMD™



**Increase the production and success of your applications today.**

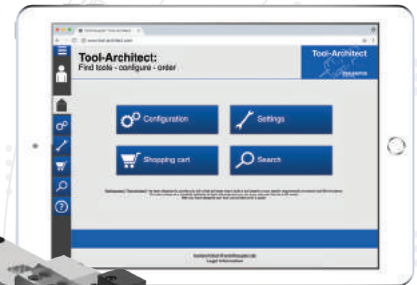
- Offers direct access to 2D drawings and 3D models
- Assemble and view tool images in your browser
- Download drawings for use in most machining software programs
- Browse products, search item numbers, and save assemblies for future use

[toolmd.com](http://toolmd.com)

## WOHLHAUPTER® Tool-Architect

**Find the right Wohlhaupter™ solution for your application.**

- Configure your complete tool assembly
- Compile an order list to be quoted
- Search and quickly find components using various criteria
- Adjust your language and measurement preferences



[tool-architect.com](http://tool-architect.com)

## 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
- Easily order by adding the item to your cart



[www.alliedmachine.com/bis](http://www.alliedmachine.com/bis)

## Product Selector

**Use the product selector to find the right tool for your application.**

- Guides you through steps to generate the right tool for your application
- Learn about your recommended tool and how to maximize its performance



[www.alliedmachine.com/productselector](http://www.alliedmachine.com/productselector)

# Insta-Code®

Eliminate the wait. Get your program now.

- Choose the best thread mill for your application
- Create program code for your machine
- Available as a PC download app (that can be used offline)
- Website app available 24/7



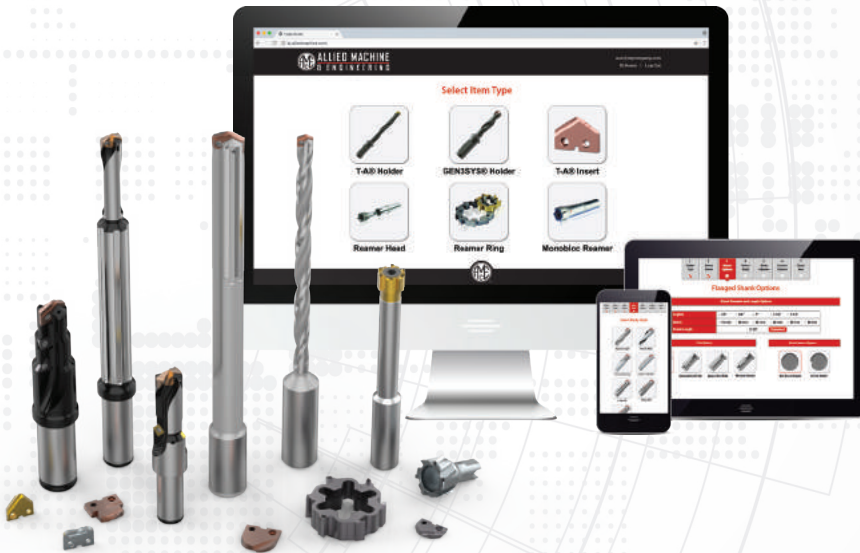
Insta-Code also has a  
**Cycle Time Calculator**

[alliedmachine.com/InstaCode](http://alliedmachine.com/InstaCode)

# Insta-Quote®

Design your custom tooling and receive a drawing and quote...all within minutes.

- Design and quote your own tooling
- Guides you through steps to generate the solution you need
- Features the following products
  - T-A® Inserts
  - T-A® Holders
  - GEN3SYS® XT Holders
  - ALVAN® Reamers



[iq.alliedmachine.com](http://iq.alliedmachine.com)

## Solution Hub App

All Allied all the time.

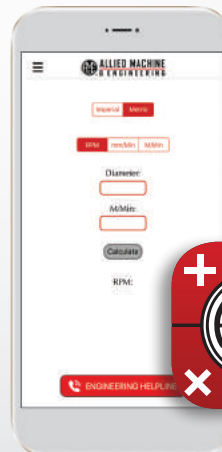
- Quickly look up product information
- Links to our free online tools
- Distributor locator
- Stay up to date on news and events



## Machinist Tool App

Quickly convert cutting tool parameters for the machine inputs you need.

- Input data to calculate the RPM and speed and feed rates
- Also features the Boring Insert Selector
- Access product literature right at your fingertips

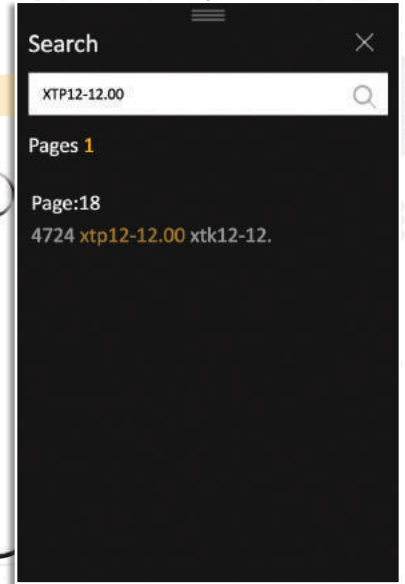
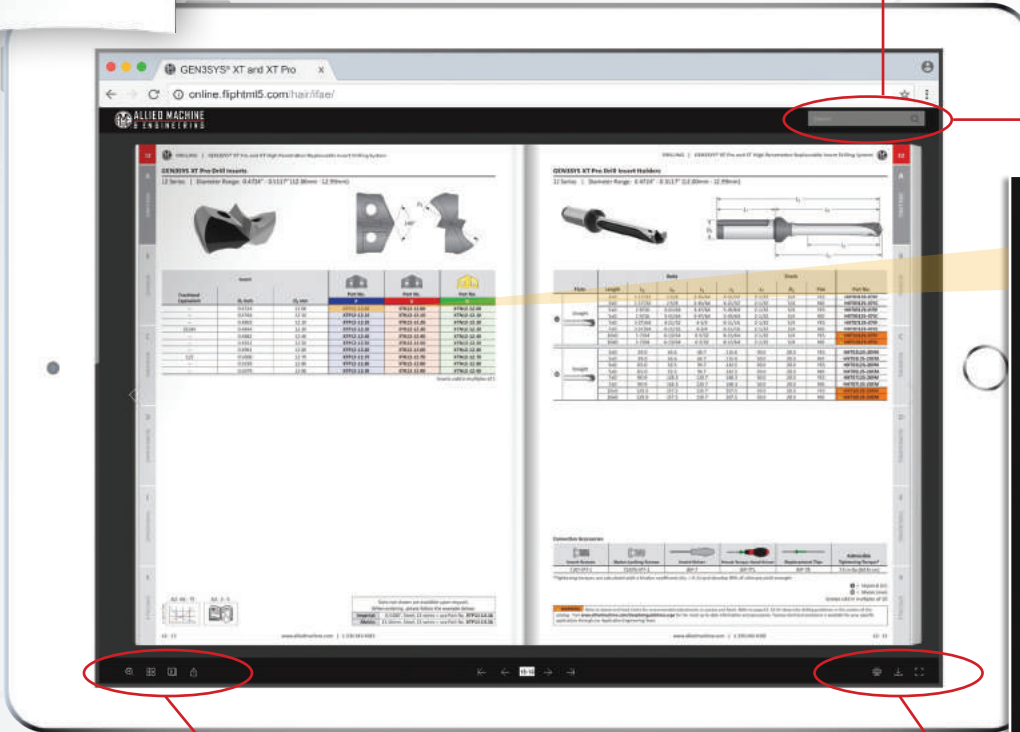






# Find what you're looking for. Now.

Flipbook gives you the ability to search for a specific item number and find the page(s) where it's located. Save time searching the catalog by hand if you already know what item number you need. Visit the Flipbooks now.



Zoom in for a closer look

Set the catalog to auto flip

Scroll through the pages in thumbnail view

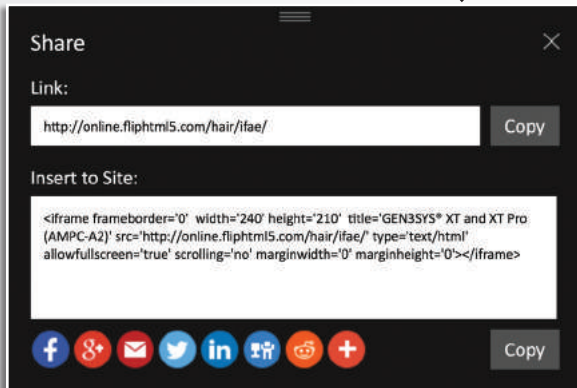
Share the Flipbook with others



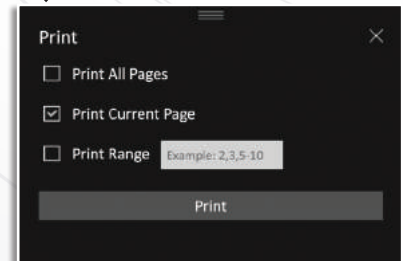
Print the full catalog or specific pages

View in full screen mode

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Share the link to each Flipbook via email and social media

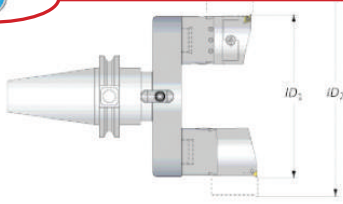




# Icon Reference Guide

## Large Cri-Bore® Finish Boring / OD Turning System

Bore ID Range: 5.000" - 12.125" (127.0mm - 307.9mm) |



Large Cri-Bore Extender Bars

Extender Bar		
ID <sub>1</sub>	ID <sub>2</sub>	OD <sub>1</sub>
5.000	6.125	0.710
6.000	7.125	1.710
7.000	8.125	2.710
8.000	9.125	3.710
9.000	10.125	4.710
10.000	11.125	5.710
11.000	12.125	6.710
<hr/>		
127.0	155.5	18.1
152.4	180.9	43.5
177.8	206.3	68.9
203.2	231.7	94.3
228.6	257.1	119.7
254.0	282.5	145.1
279.4	307.9	170.5

## Navigate with ease.

The following icons will appear throughout the catalog to help you navigate between products and find the best solution quickly.

### Coating Options



AM200 Coating



AM300 Coating



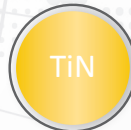
AM210 Coating



AM420 Coating



TiCN Coating



TiN Coating

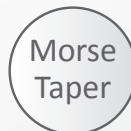


TiAlN Coating

### Tool Options



Straight Shank



Morse Taper Shank



Coolant Through

# Criterion® Modular Boring Systems

MBS | CBS | MDS | Cri-Bore® | Large Cri-Bore® | CB Style



## CRITERION®

### Boring holes doesn't have to be boring.

Criterion modular boring systems bring you speed, tolerance, toughness, and versatility to your boring applications.

The MBS finish boring tool is ideal for small diameter bores and high spindle speeds to quickly and efficiently bore.

The Cri-Bore boring system is designed for finish boring applications and can be used for extremely tight tolerances. When the tolerance is tight, the Cri-Bore can be adjusted in 0.00005" (fifty-millionths).

The versatile CB style boring heads are available in both micro adjusting and standard. Made for maximum toughness, a wide range of diameters can be produced with this single boring head.

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](http://www.alliedmachine.com) for the most up-to-date information and procedures.



Aerospace



Agriculture



Automotive



Firearms

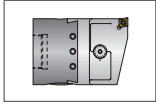


Renewable  
Energy

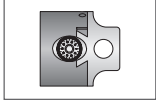
# Criterion® Modular Boring Systems Contents

## Reference Icons

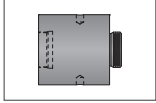
The following icons will appear throughout the catalog to help you navigate between products.



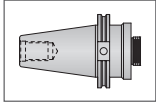
**Boring Heads - Insert Holders**  
Micro adjusting boring heads that use inserts for cutting



**Boring Heads - Boring Bar Holders**  
Standard and micro adjusting boring heads that use boring bars for cutting



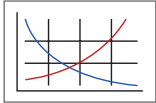
**Head-to-Shank Adapters**  
Extensions and reducers that attach the boring head to the shank



**Shanks**  
A variety of shanks for different machines



**Setup / Assembly Information**  
Detailed instructions and information regarding the corresponding part(s)



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

**MBS Finish Boring Tools** . . . . . 2 - 6

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**Cri-Bore® Micro Adjusting Finish Boring Head** . . . . . 16 - 18

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Series	Bore Diameter Range	
	Imperial (inch)	Metric (mm)
<b>MBS Finish Boring Tools</b>	0.050" - 0.750"	–
<b>CBS Finish Boring Tools</b>	0.050" - 0.750"	–
<b>MDS Finish Boring Tools</b>	0.710" - 1.280"	18mm - 33mm
<b>Cri-Bore® Micro Adjusting Finish Boring Heads</b>	1.050" - 5.065"	27mm - 128mm
<b>Large Cri-Bore® Finish Boring / OD Turning System</b>	5.000" - 12.125"	127mm - 308mm
<b>CB Style Versatile Finish Boring Heads</b>	0.250" - 21.500"	–





# WE KNOW

SPEED MATTERS

## MBS Finish Boring Tool

Ideal for small diameter bores and high spindle speeds

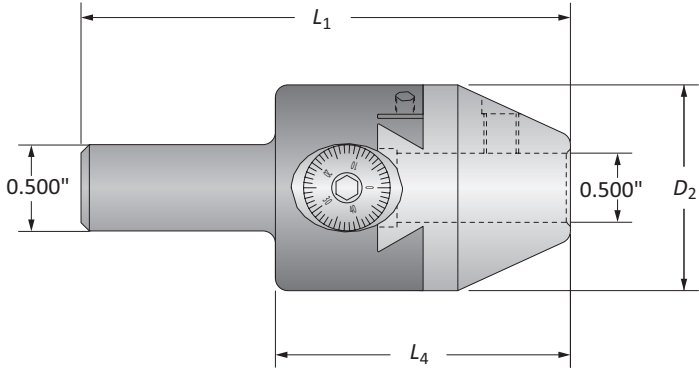
Compact design great for live tooling

Cylindrical shank can be dropped into existing tool holders



**MBS Finish Boring Tool**

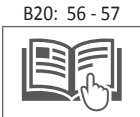
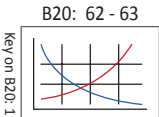
Bore Diameter Range: 0.050" - 0.750"



Boring Range	Boring Head			Weight	Part No.
	$L_1$	$L_4$	$D_2$		
<b>i</b> 0.050 - 0.750	3.500	2.125	1.500	0.900 (lbs)	<b>MBS0500B</b>

Imperial (in) = 0.001" adjustment on diameter  
**NOTE:** Max spindle speed: 7,000 RPM at 0 radial offset

A DRILLING  
 B BORING  
 C REAMING  
 D BURNISHING  
 E THREADING  
 X SPECIALS

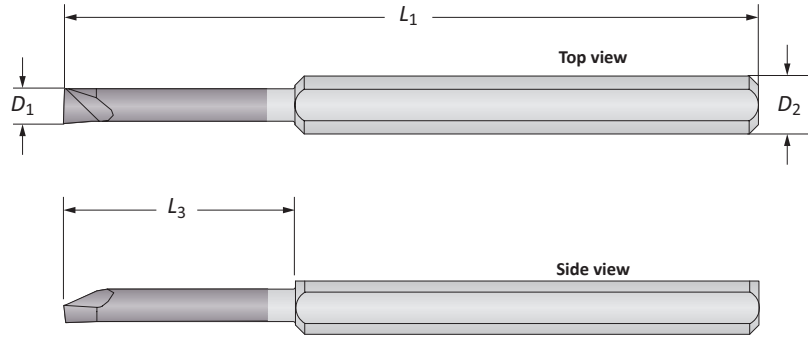


**i** = Imperial (in)  
**m** = Metric (mm)

**IMPORTANT:** Max spindle speed refers to maximum possible speed for individual boring head and is not a recommended parameter. Refer to page B20: 62 for recommended application specific parameters. Factory technical assistance is available for your specific applications through our Application Engineering department.

## Mini Coated Boring Tools

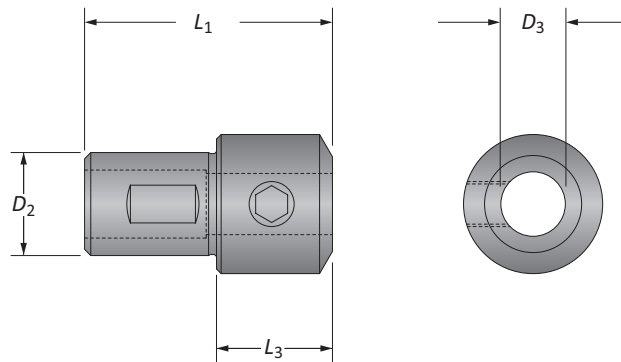
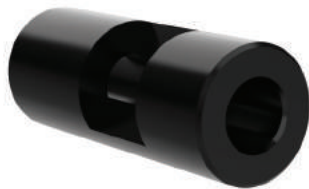
Bore Diameter Range: 0.050" - 0.275"



### Mini Coated Boring Bars

Min. Boring Diameter	Boring Bar				Weight	Part No.
$D_1$	$L_3$	$L_1$	$D_2$			
0.050	0.300	1.500	0.125*	0.010 (lbs)	<b>0050GA</b>	
0.060	0.300	1.500	0.125*	0.010 (lbs)	<b>0060GA</b>	
0.080	0.500	1.500	0.125*	0.010 (lbs)	<b>0080GA</b>	
0.100	0.600	1.500	0.125*	0.010 (lbs)	<b>0100GA</b>	
0.110	0.700	1.500	0.125*	0.010 (lbs)	<b>0110GA</b>	
0.120	0.750	2.500	0.250*	0.020 (lbs)	<b>0120HA</b>	
0.140	0.750	2.500	0.250*	0.020 (lbs)	<b>0140HA</b>	
0.160	0.875	2.500	0.250*	0.020 (lbs)	<b>0160HA</b>	
0.180	1.125	2.500	0.250*	0.020 (lbs)	<b>0180HA</b>	
0.200	1.250	2.500	0.250*	0.020 (lbs)	<b>0200HA</b>	

\*Reducing sleeve required

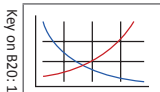


### Reducing Sleeves

Reducing Sleeve					
$D_3$	$D_2$	$L_1$	$L_3$	Weight	Part No.
0.125	0.500	2.000	0.220	0.100 (lbs)	<b>BTH-01250500</b>
0.250	0.500	1.312	-	0.050 (lbs)	<b>BTH-02500500</b>

B20: 62 - 63

B20: 56 - 57

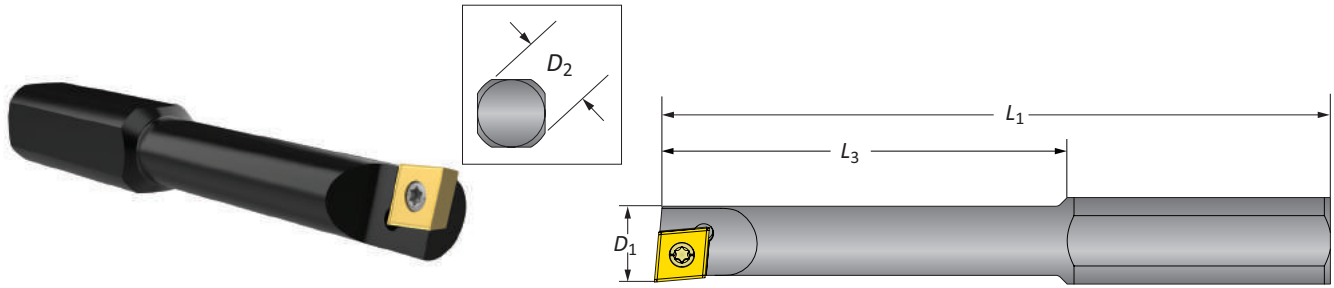


**i** = Imperial (in)  
**m** = Metric (mm)



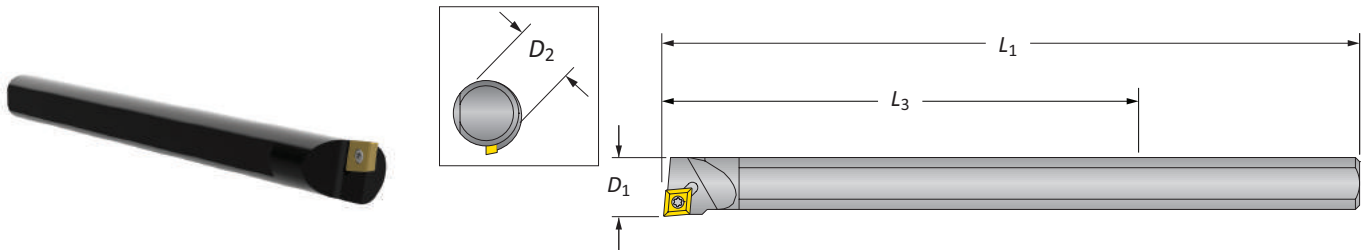
## Boring Bars

Bore Diameter Range: 0.250" - 0.750"



### Steel Boring Bars | Bore Diameter Range: 0.250" - 0.750"

Min. Boring Diameter	Boring Bar			Weight	Insert Form	Part No.
	$D_1$	$L_3$	$L_1$			
<b>i</b> 0.250	1.062	2.500	0.500	0.080 (lbs)	WBGX0301...	<b>0250B</b>
0.312	1.437	2.750	0.500	0.080 (lbs)	WBGX0301...	<b>0312B</b>
0.375	1.750	3.062	0.500	0.100 (lbs)	WBGX0301...	<b>0375B</b>
0.437	2.062	3.375	0.500	0.110 (lbs)	CC..215...	<b>0437B</b>
0.500	2.187	3.500	0.500	0.140 (lbs)	CC..215...	<b>0500B</b>



### Heavy Metal Boring Bars | Bore Diameter Range: 0.365" - 0.750"

Min. Boring Diameter	Boring Bar			Weight	Insert Form	Part No.
	$D_1$	$L_3$	$L_1$			
<b>i</b> 0.365	2.250	4.000	0.312*	0.080 (lbs)	CC..215..	<b>0365HM</b>
0.550	3.250	6.000	0.500	0.300 (lbs)	CC..215..	<b>0550BHM</b>

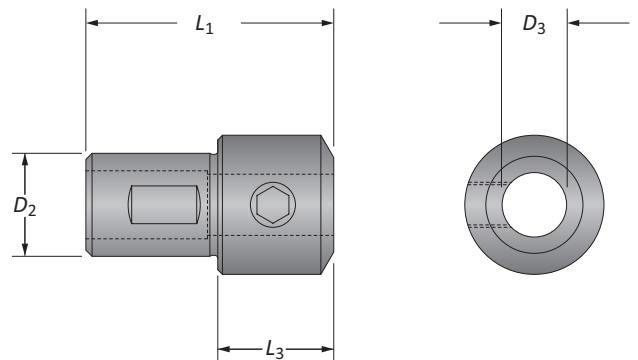
\*Reducing sleeve required

### Carbide Boring Bars | Bore Diameter Range: 0.625" - 0.750"

Min. Boring Diameter	Boring Bar			Weight	Insert Form	Part No.
	$D_1$	$L_3$	$L_1$			
<b>i</b> 0.625	4.500	8.000	0.500	0.410 (lbs)	CC..215..	<b>0625BCS</b>

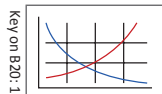
### Reducing Sleeves

Reducing Sleeve	Reducing Sleeve			Weight	Part No.
	$D_3$	$D_2$	$L_1$		
<b>i</b> 0.312	0.500	1.312	-	0.040 (lbs)	<b>BTH-03120500</b>
0.375	0.500	1.312	-	0.030 (lbs)	<b>BTH-03750500</b>



B20: 62 - 63

B20: 56 - 57

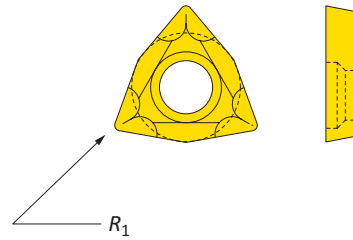


**i** = Imperial (in)  
**m** = Metric (mm)  
 Inserts sold separately

A DRILLING  
 B BORING  
 C REAMING  
 D BURNISHING  
 E THREADING  
 X SPECIALS

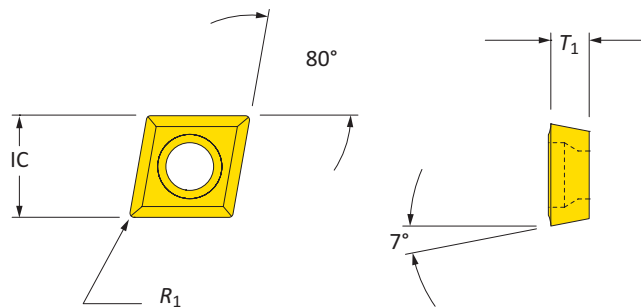
## Boring Inserts

Trigon | 80° Diamond



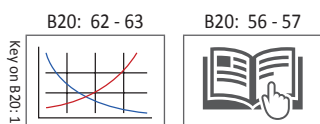
### Coated Trigon Insert

		Insert		Part No.
Insert Form		$R_1$		
<b>i</b>	WBGX0301...	0.004	<b>WBGX030101</b>	



### Coated 80° Diamond Insert

		Insert			Part No.
Insert Form		$IC$	$T_1$	$R_1$	
<b>i</b>	CC...215..	0.250	0.094	0.008	<b>CCMT060202</b>



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

Notes

Large grid area for notes, consisting of 20 columns and 25 rows.

A DRILLING  
B BORING  
C REAMING  
D BURNISHING  
E THREADING  
X SPECIALS





# WE KNOW REACH MATTERS

## CBS Finish Boring Tool



Ease the stress of reaching past fixturing

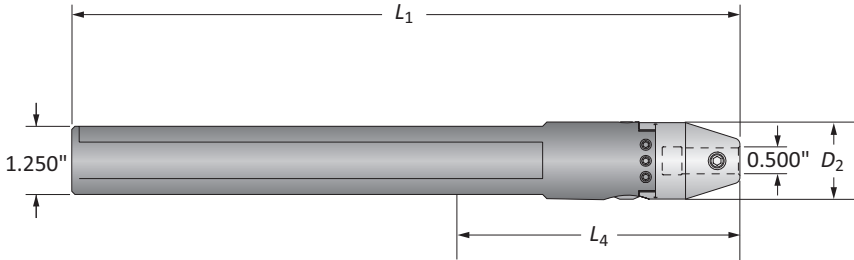
Ideal for small diameter bores with long overhangs

Cylindrical shank can be dropped into existing endmill  
(side-lock) holders



**CBS Finish Boring Tool**

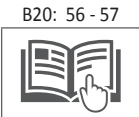
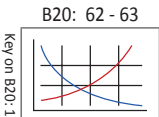
Bore Diameter Range: 0.050" - 0.750"



Boring Range	Boring Head			Weight	Part No.
	$L_1$	$L_4$	$D_2$		
<b>i</b> 0.050 - 0.750	10.600	8.320	1.250	3.100 (lbs)	<b>CBS1250B</b>

Imperial (in)= 0.001" adjustment on diameter  
**NOTE:** Max spindle speed: 3,500 RPM at 0 radial offset

A  
DRILLING  
B  
BORING  
C  
REAMING  
D  
BURNISHING  
E  
THREADING  
X  
SPECIALS

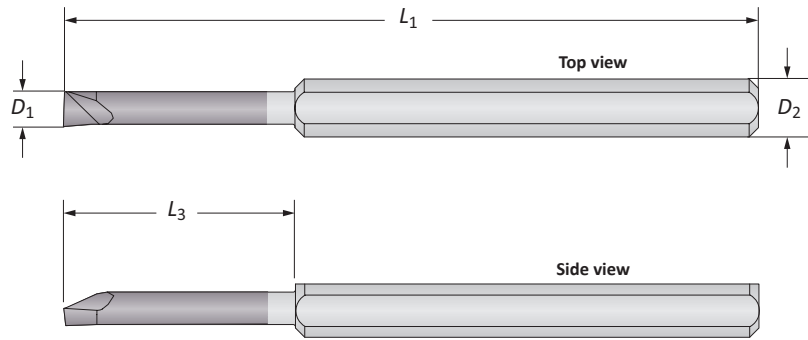


**i** = Imperial (in)  
**m** = Metric (mm)

**IMPORTANT:** Max spindle speed refers to maximum possible speed for individual boring head and is not a recommended parameter. Refer to page B20: 62 for recommended application specific parameters. Factory technical assistance is available for your specific applications through our Application Engineering department.

## Mini Coated Boring Tools

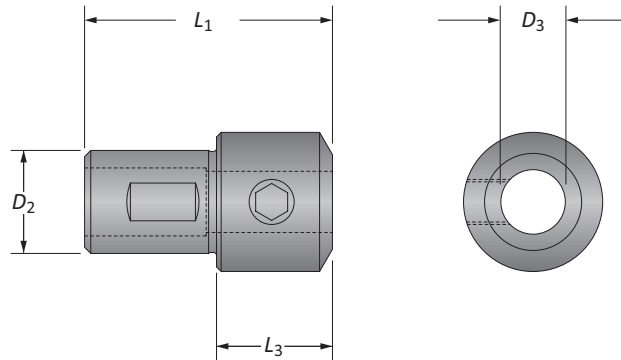
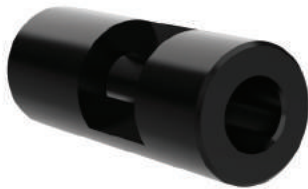
Bore Diameter Range: 0.050" - 0.275"



### Mini Coated Boring Tools

Min. Boring Diameter	Boring Bar				Weight	Coated Part No.
	$D_1$	$L_3$	$L_1$	$D_2$		
0.050	0.300	1.500	0.125*	0.010 (lbs)	0050GA	
0.060	0.300	1.500	0.125*	0.010 (lbs)	0060GA	
0.080	0.500	1.500	0.125*	0.010 (lbs)	0080GA	
0.100	0.600	1.500	0.125*	0.010 (lbs)	0100GA	
0.110	0.700	1.500	0.125*	0.010 (lbs)	0110GA	
0.120	0.750	2.500	0.250*	0.020 (lbs)	0120HA	
0.140	0.750	2.500	0.250*	0.020 (lbs)	0140HA	
0.160	0.875	2.500	0.250*	0.020 (lbs)	0160HA	
0.180	1.125	2.500	0.250*	0.020 (lbs)	0180HA	
0.200	1.250	2.500	0.250*	0.020 (lbs)	0200HA	

\*Reducing sleeve required

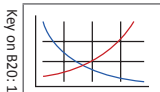


### Reducing Sleeves

	Reducing Sleeve				Weight	Part No.
	$D_3$	$D_2$	$L_1$	$L_3$		
0.125	0.500	2.000	0.220	0.100 (lbs)	BTH-01250500	
0.250	0.500	1.312	-	0.050 (lbs)	BTH-02500500	
0.375	0.500	1.312	-	0.030 (lbs)	BTH-03750500	

B20: 62 - 63

B20: 56 - 57

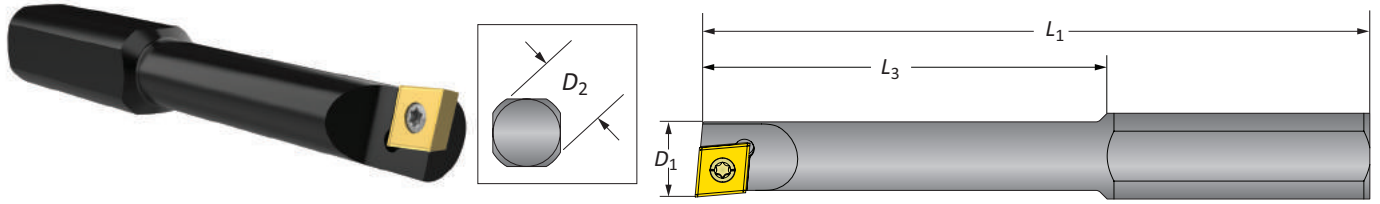


**i** = Imperial (in)  
**m** = Metric (mm)



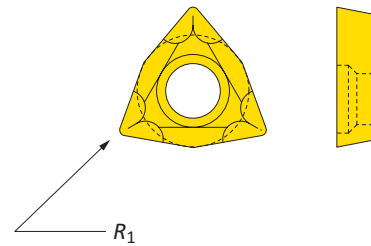
## Steel Boring Bars | Boring Inserts

Bore Diameter Range: 0.250" - 0.750"



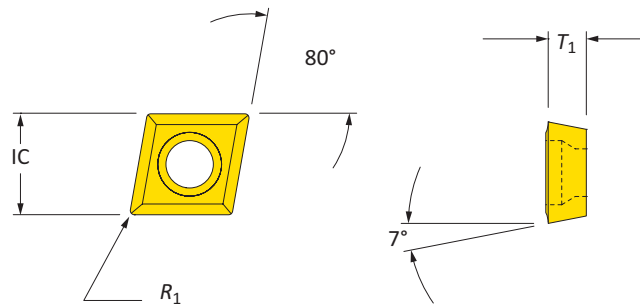
### Steel Boring Bars

Min. Boring Diameter	Boring Bar				Weight	Insert Form	Part No.
	$D_1$	$L_3$	$L_1$	$D_2$			
0.250	1.062	2.500	0.500	0.080 (lbs)	WBGX0301...	<b>0250B</b>	
0.312	1.437	2.750	0.500	0.080 (lbs)	WBGX0301...	<b>0312B</b>	
0.375	1.750	3.062	0.500	0.100 (lbs)	WBGX0301...	<b>0375B</b>	
0.437	2.062	3.375	0.500	0.110 (lbs)	CC..215...	<b>0437B</b>	
0.500	2.187	3.500	0.500	0.140 (lbs)	CC..215...	<b>0500B</b>	



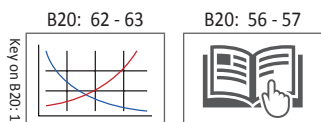
### Coated Trigon Insert

Insert Form	Insert		Part No.
	$R_1$		
WBGX0301...	0.004		<b>WBGX030101</b>



### Coated 80° Diamond Insert

Insert Form	Insert			Part No.
	$IC$	$T_1$	$R_1$	
CC...215..	0.250	0.094	0.008	<b>CCMT060202</b>



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

A DRILLING  
 B BORING  
 C REAMING  
 D BURNISHING  
 E THREADING  
 X SPECIALS



# WE KNOW CONVENIENCE MATTERS

## MDS Finish Boring Tool

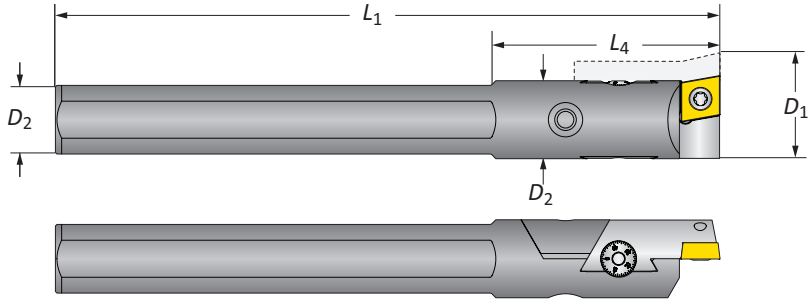
Compact design and rugged insert holder make it one of the toughest boring tools under 1.000" (25.4mm) diameter

Cylindrical shank can be dropped into existing endmill (side-lock) holders

Available in both Imperial (in) and Metric (mm) versions

**MDS Finish Boring Tools**

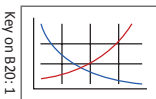
Bore Diameter Range: 0.710" - 1.280" (18.00mm - 33.00mm)




	Boring Range		Shank Diameter		Boring Head		Weight	Insert Form	Part No.
	$D_1$	$D_2$	$L_1$	Max $L_4$					
i	0.710 - 0.960	0.625	5.250	3.386	0.400 (lbs)	CC..215...	<b>MDS0625</b>		
	0.890 - 1.280	0.750	6.310	4.435	0.700 (lbs)	CC..325...	<b>MDS0750</b>		
m	18.00 - 27.00	16.00	133.00	85.37	0.18 (kg)	CC..0602...	<b>MDS16M</b>		
	22.00 - 33.00	20.00	160.00	112.37	0.32 (kg)	CC..09T3...	<b>MDS20M</b>		

Imperial (in) = 0.001" adjustment on diameter  
 Metric (mm) = 0.020mm adjustment on diameter  
**NOTE:** Max spindle speed: 1,000 SFM (305 M/Min) at 0 radial offset

A DRILLING  
 B BORING  
 C REAMING  
 D BURNISHING  
 E THREADING  
 X SPECIALS

B20: 62 - 63  Key on B20: 1

B20: 56 - 57 

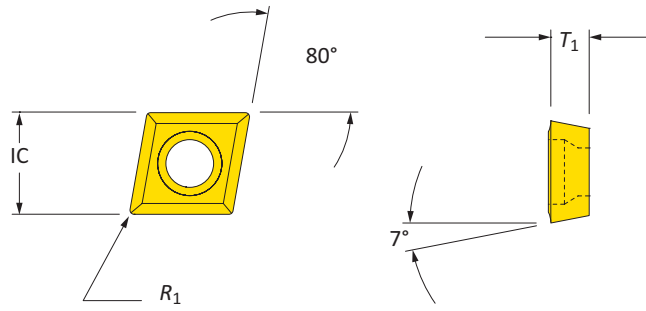
i = Imperial (in)  
 m = Metric (mm)  
 Inserts sold separately

**IMPORTANT:** Max spindle speed refers to maximum possible speed for individual boring head and is not a recommended parameter. Refer to page B20: 62 for recommended application specific parameters. Factory technical assistance is available for your specific applications through our Application Engineering department.



## Boring Inserts

### Coated 80° Diamond Insert

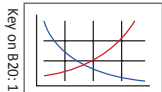


	Insert Form	Insert			Part No.
		IC	T <sub>1</sub>	R <sub>1</sub>	
<b>i</b>	CC..215...	0.250	0.094	0.008	CCMT060202
	CC..325...	0.375	0.156	0.008	CCMT09T302
	CC..325...	0.375	0.156	0.016	CCMT09T304
<b>m</b>	CC..0602...	6.35	2.38	0.20	CCMT060202
	CC..09T3...	9.53	3.97	0.20	CCMT09T302
	CC..09T3...	9.53	3.97	0.40	CCMT09T304

A  
DRILLING  
  
B  
BORING  
  
C  
REAMING  
  
D  
BURNISHING  
  
E  
THREADING  
  
X  
SPECIALS

B20: 62 - 63

B20: 56 - 57



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

Inserts sold separately





# WE KNOW

TOLERANCE MATTERS

## Cri-Bore<sup>®</sup> Micro Adjusting

Allows for 0.00005" (0.001mm) on diameter bore increments

Modular system can be used on virtually any machine

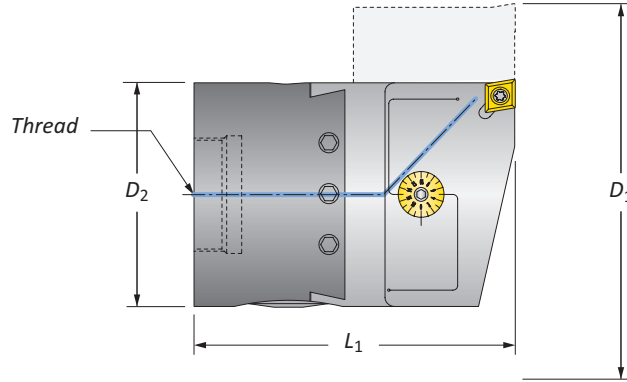
Available in both Imperial (in) and Metric (mm) versions





### Cri-Bore® Micro Adjusting Finish Boring Heads

Bore Diameter Range: 1.050" - 5.065" (27.00mm - 128.00mm)



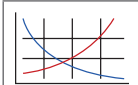
	Boring Range		Boring Head		Weight	Insert Form	Part. No
	$D_1$	Thread Connection	$L_1$	$D_2$			
i	1.050 - 1.320	¾ - 20	2.690	1.000	0.500 (lbs)	CC..215...	CB1000CC
	1.050 - 1.320	¾ - 20	2.690	1.000	0.500 (lbs)	TC..215...	CB1000TC
	1.300 - 1.600	¾ - 20	2.900	1.250	0.800 (lbs)	CC..215...	CB1250CC
	1.300 - 1.600	¾ - 20	2.900	1.250	0.800 (lbs)	TC..215...	CB1250TC
	1.585 - 2.700	¾ - 20	3.200	1.500	1.300 (lbs)	CC..325...	CB1500CC
	1.585 - 2.700	¾ - 20	3.200	1.500	1.300 (lbs)	TC..325...	CB1500TC
	2.060 - 3.320	¾ - 20	3.590	2.000	2.400 (lbs)	CC..325...	CB2000CC
	2.060 - 3.320	¾ - 20	3.590	2.000	2.400 (lbs)	TC..325...	CB2000TC
m	3.065 - 5.065	1½ - 18	4.100	3.000	5.800 (lbs)	CC..325...	CB3000CC
	3.065 - 5.065	1½ - 18	4.100	3.000	5.800 (lbs)	TC..325...	CB3000TC
	27.00 - 33.00	¾ - 20	68.35	25.00	0.23 (kg)	CC..0602...	CB025MCC
	27.00 - 33.00	¾ - 20	68.35	25.00	0.23 (kg)	TC..1102...	CB025MTC
	33.00 - 41.00	¾ - 20	73.65	32.00	0.36 (kg)	CC..0602...	CB032MCC
	33.00 - 41.00	¾ - 20	73.65	32.00	0.36 (kg)	TC..1102...	CB032MTC
	41.00 - 68.00	¾ - 20	81.25	38.00	0.59 (kg)	CC..09T3...	CB038MCC
	41.00 - 68.00	¾ - 20	81.25	38.00	0.59 (kg)	TC..16T3...	CB038MTC
	53.00 - 84.00	¾ - 20	91.30	50.00	1.09 (kg)	CC..09T3...	CB050MCC
	53.00 - 84.00	¾ - 20	91.30	50.00	1.09 (kg)	TC..16T3...	CB050MTC
78.00 - 128.00	1½ - 18	104.25	76.00	2.36 (kg)	CC..09T3...	CB076MCC	
78.00 - 128.00	1½ - 18	104.25	76.00	2.36 (kg)	TC..16T3...	CB076MTC	

Imperial (in) = 0.00005" adjustment on diameter

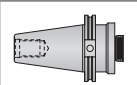
Metric (mm) = 0.001mm adjustment on diameter

**NOTE:** Max spindle speed: 1,000 SFM (305 M/Min) at 0 radial offset

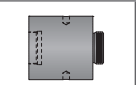
B20: 62 - 63




B20: 50 - 53



B20: 48 - 49



B20: 56 - 57



Key on B20:1

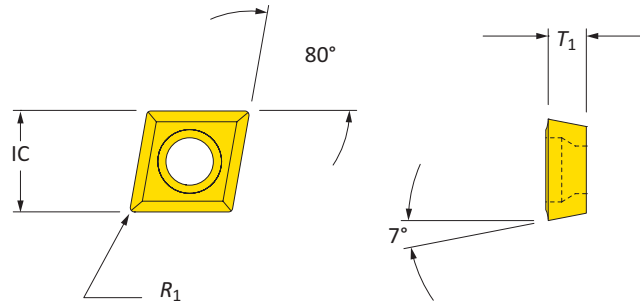
i = Imperial (in)  
m = Metric (mm)  
Inserts sold separately

**IMPORTANT:** Max spindle speed refers to maximum possible speed for individual boring head and is not a recommended parameter. Refer to page B20: 62 for recommended application specific parameters. Factory technical assistance is available for your specific applications through our Application Engineering department.

A DRILLING  
B BORING  
C REAMING  
D BURNISHING  
E THREADING  
X SPECIALS

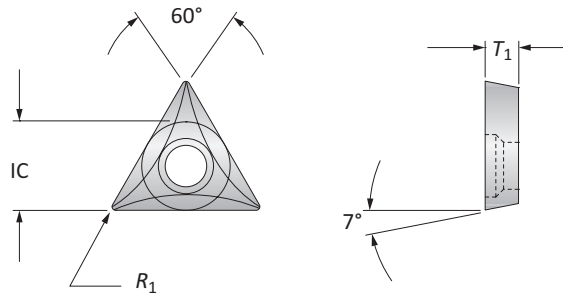
## Boring Inserts

80° Diamond Insert | 60° Triangle Insert



### Coated 80° Rhombic Inserts

	Insert Form	Insert			Part No.
		IC	T <sub>1</sub>	R <sub>1</sub>	
<b>i</b>	CC...215...	0.250	0.094	0.008	CCMT060202
	CC...215...	0.250	0.094	0.016	CCMT060204
	CC...325...	0.375	0.156	0.008	CCMT09T302
	CC...325...	0.375	0.156	0.016	CCMT09T304
<b>m</b>	CC...0602...	6.35	2.38	0.20	CCMT060202
	CC...0602...	6.35	2.38	0.40	CCMT060204
	CC...09T3...	9.53	3.97	0.20	CCMT09T302
	CC...09T3...	9.53	3.97	0.40	CCMT09T304

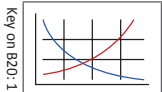


### Coated 60° Triangle Inserts

	Insert Form	Insert			Part No.
		IC	T <sub>1</sub>	R <sub>1</sub>	
<b>i</b>	TC...215...	0.250	0.094	0.008	TCGT110202
	TC...215...	0.250	0.094	0.016	TCGT110204
	TC...325...	0.375	0.156	0.016	TCGT16T304
<b>m</b>	TC...1102...	6.35	2.38	0.20	TCGT110202
	TC...1102...	6.35	2.38	0.40	TCGT110204
	TC...16T3...	9.53	3.97	0.40	TCGT16T304

B20: 62 - 63

B20: 56 - 57



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

Inserts sold separately

A DRILLING  
B BORING  
C REAMING  
D BURNISHING  
E THREADING  
X SPECIALS







# EXTEND YOUR BORING RANGE

## Large Cri-Bore<sup>®</sup> Finish Boring / OD Turning System

Extend the diameter range for internal and external boring

Modular tooling system allows for CAT, BT, or HSK shanks

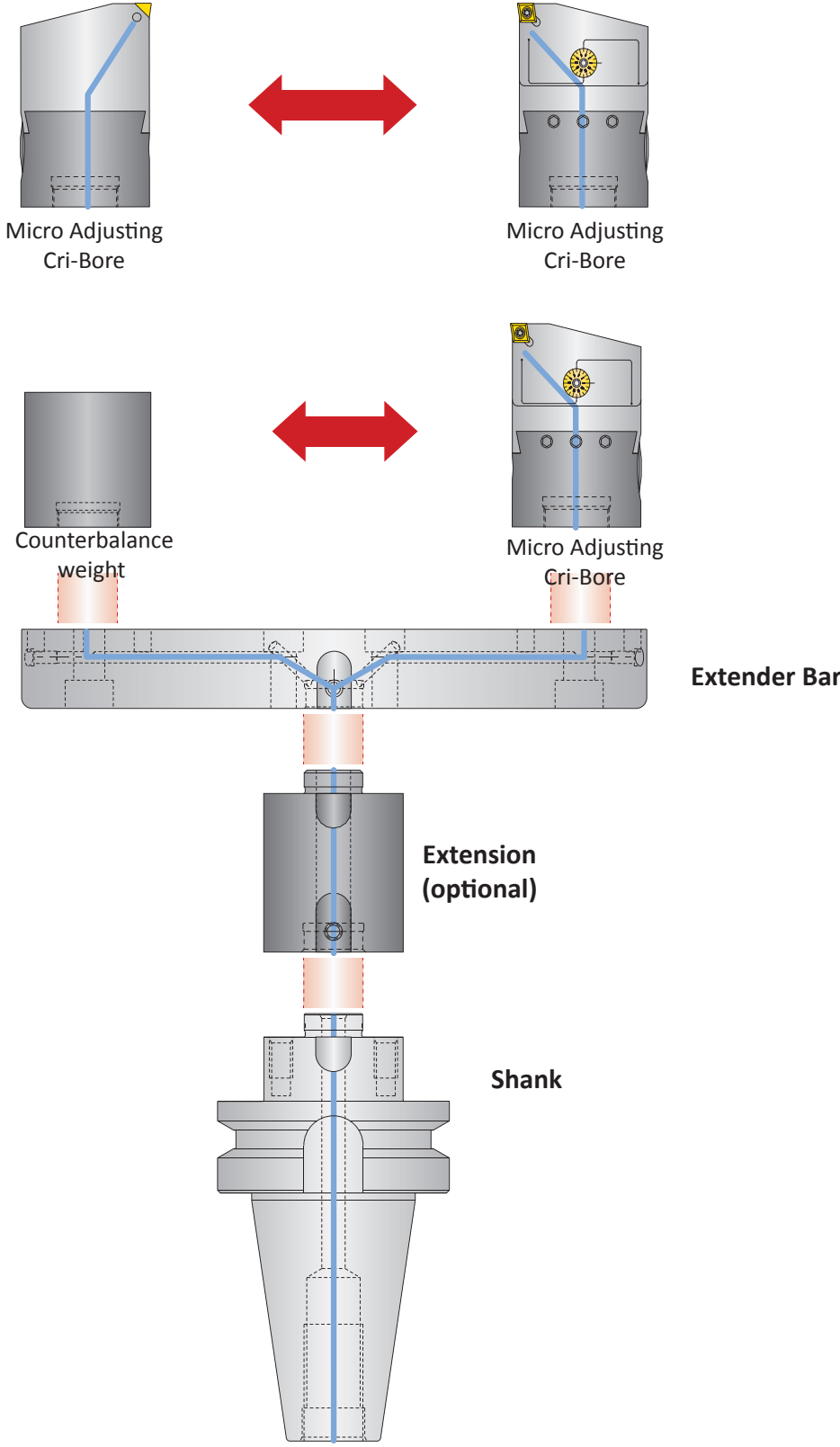
Allows for 0.00005" (0.001mm) on diameter bore increments



# Large Cri-Bore® Finish Boring / OD Turning System



## Cri-Bore Boring Head / Optional Component Combinations



**⚠ WARNING** Exceeding weight capacity for machine tool spindle and tool changer can cause machine damage, and/or serious injury. To prevent:

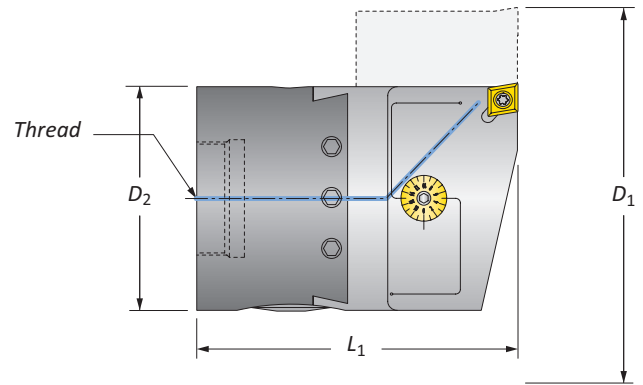
- Refer to page B20: 61 to see formula for calculating weight of tool assembly.
- Consult machine tool builder for machine's weight limitations.

Factory technical assistance is also available for specific applications through our Application Engineering department.

- A DRILLING
- B BORING
- C REAMING
- D BURNISHING
- E THREADING
- X SPECIALS

## Cri-Bore Micro Adjusting Finish Boring Heads | Counter Weights

Bore ID Range: 5.000" - 12.125" (127.00mm - 307.90mm) | Bore OD Range: 0.710" - 7.830" (18.10mm - 198.80mm)



### Cri-Bore Micro Adjusting Boring Heads

	Connection Thread	Boring Head		Weight	Insert Form	Part No.
		$L_1$	$D_2$			
i	$\frac{7}{8}$ - 20	3.200	1.500	1.300 (lbs)	CC..325..	CB1500CC
	$\frac{7}{8}$ - 20	3.200	1.500	1.300 (lbs)	TC..325..	CB1500TC
m	$\frac{7}{8}$ - 20	81.25	38.00	0.59 (kg)	CC..09T3...	CB038MCC
	$\frac{7}{8}$ - 20	81.25	38.00	0.59 (kg)	TC..16T3...	CB038MTC

Imperial (in) = 0.00005" adjustment on diameter

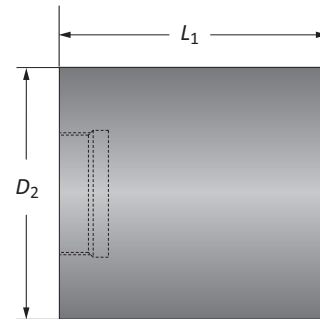
Metric (mm) = 0.001mm adjustment on diameter

**NOTE:** Max spindle speed ID boring: 1,000 SFM (305 M/Min) at 0 radial offset and used with counter weight or additional boring head

**NOTE:** Max spindle speed OD boring: Contact our Application Engineering department.

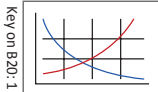
### Large Cri-Bore Counter Weights

	Counter Weight		Weight	Part No.
	$D_1$	$L_1$		
i	1.500	2.580	1.250 (lbs)	LCB1500-CBWTA
m	38.10	65.53	0.57 (kg)	LCB1500-CBWTA



B20: 62 - 63

B20: 56 - 57



i = Imperial (in)

m = Metric (mm)

Inserts sold separately

**IMPORTANT:** Max spindle speed refers to maximum possible speed for individual boring head and is not a recommended parameter. Refer to page B20: 62 for recommended application specific parameters. Factory technical assistance is available for your specific applications through our Application Engineering department.

**WARNING** Exceeding weight capacity for machine tool spindle and tool changer can cause machine damage, and/or serious injury. To prevent:

-Refer to page B20: 61 to see formula for calculating weight of tool assembly.

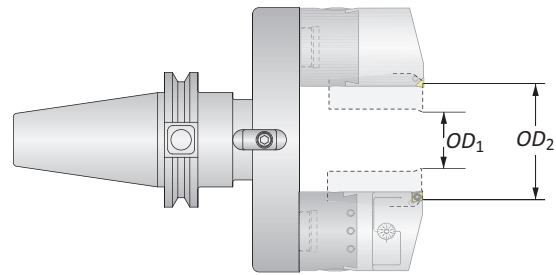
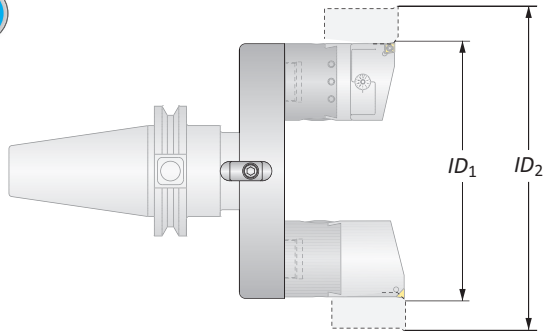
-Consult machine tool builder for machine's weight limitations.

Factory technical assistance is also available for specific applications through our Application Engineering department.



## Large Cri-Bore® Finish Boring / OD Turning System

Bore ID Range: 5.000" - 12.125" (127.00mm - 307.90mm) | Bore OD Range: 0.710" - 7.830" (18.10mm - 198.80mm)



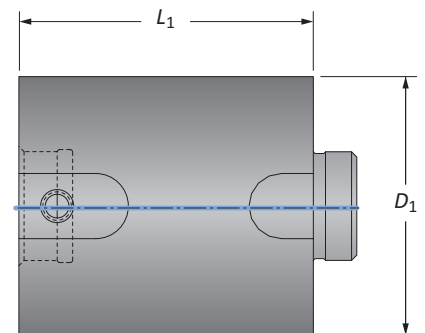
### Large Cri-Bore Extender Bars

Extender Bar						
	$ID_1$	$ID_2$	$OD_1$	$OD_2$	Weight	Part No.
i	5.000	6.125	0.710	1.830	1.560 (lbs)	LCB1500-56EBK
	6.000	7.125	1.710	2.830	1.920 (lbs)	LCB1500-67EBK
	7.000	8.125	2.710	3.830	2.290 (lbs)	LCB1500-78EBK
	8.000	9.125	3.710	4.830	2.650 (lbs)	LCB1500-89EBK
	9.000	10.125	4.710	5.830	3.010 (lbs)	LCB1500-910EBK
	10.000	11.125	5.710	6.830	3.370 (lbs)	LCB1500-1011EBK
	11.000	12.125	6.710	7.830	3.730 (lbs)	LCB1500-1112EBK
m	127.00	155.50	18.10	46.40	0.71 (kg)	LCB1500-56EBK
	152.40	180.90	43.50	71.80	0.87 (kg)	LCB1500-67EBK
	177.80	206.30	68.90	97.20	1.04 (kg)	LCB1500-78EBK
	203.20	231.70	94.30	122.60	1.20 (kg)	LCB1500-89EBK
	228.60	257.10	119.70	148.00	1.37 (kg)	LCB1500-910EBK
	254.00	282.50	145.10	173.40	1.53 (kg)	LCB1500-1011EBK
	279.40	307.90	170.50	198.80	1.69 (kg)	LCB1500-1112EBK

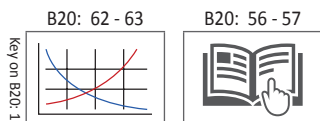


### Large Cri-Bore Extensions

Extension				
	$D_1$	$L_1$	Weight	Part No.
i	1.500	1.500	0.660 (lbs)	LCB1500-IA1500
	1.500	3.000	1.330 (lbs)	LCB1500-IA3000
	1.500	4.500	1.980 (lbs)	LCB1500-IA4500
m	38.10	38.10	0.30 (kg)	LCB1500-IA1500
	38.10	76.20	0.60 (kg)	LCB1500-IA3000
	38.10	114.30	0.90 (kg)	LCB1500-IA4500



**NOTE:** Only one extension can be used per boring assembly. Extensions cannot be combined.



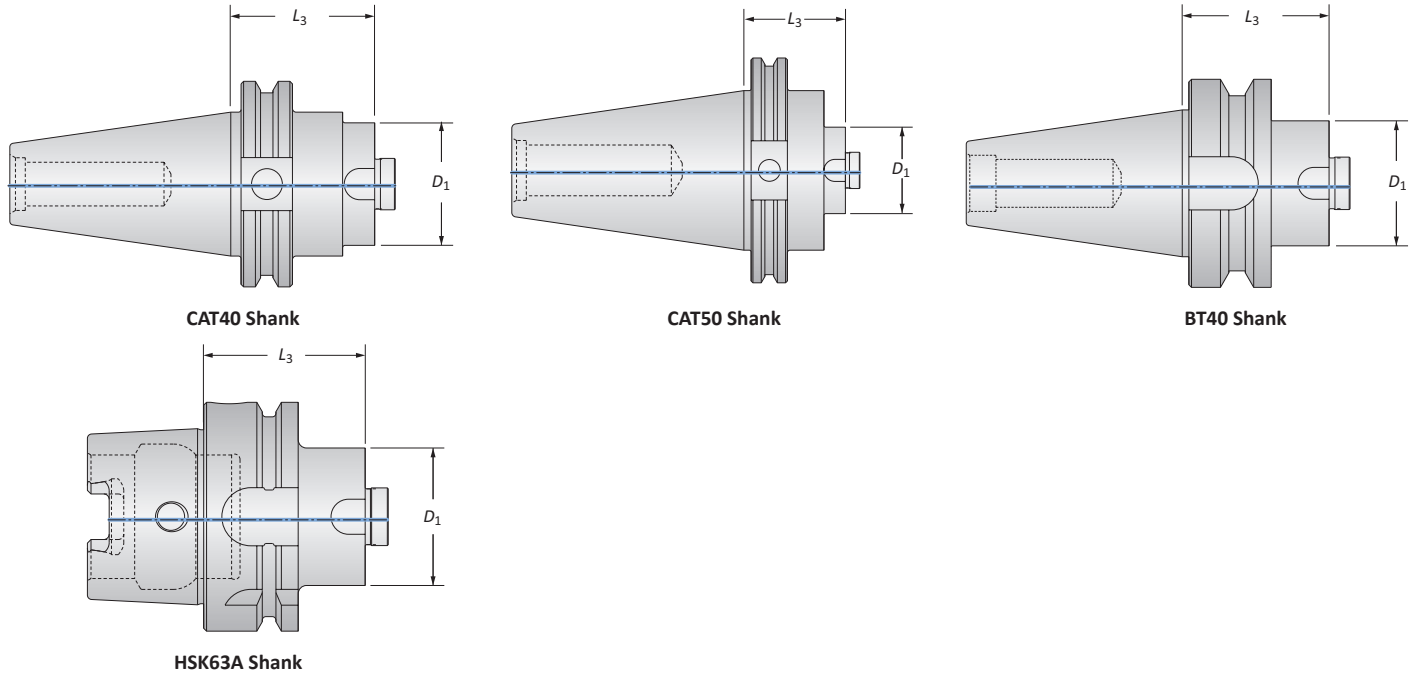
i = Imperial (in)  
m = Metric (mm)  
Inserts sold separately

**WARNING** Exceeding weight capacity for machine tool spindle and tool changer can cause machine damage, and/or serious injury. To prevent:  
-Refer to page B20: 61 to see formula for calculating weight of tool assembly.  
-Consult machine tool builder for machine's weight limitations.  
Factory technical assistance is also available for specific applications through our Application Engineering department.

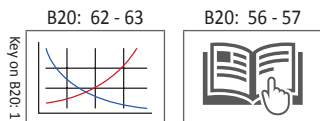
A DRILLING  
B BORING  
C REAMING  
D BURNISHING  
E THREADING  
X SPECIALS

## Large Cri-Bore® Finish / Turning Boring System Shanks

Bore ID Range: 5.000" - 12.125" (127.00mm - 307.90mm) | Bore OD Range: 0.710" - 7.830" (18.10mm - 198.80mm)



		Shank				
		$L_3$	$D_1$	Taper	Weight	Part No.
<b>i</b>		1.750	1.500	CAT40	2.410 (lbs)	<b>LCB1500-CV40</b>
		1.750	1.500	CAT50	6.960 (lbs)	<b>LCB1500-CV50</b>
		1.750	1.500	BT40	2.460 (lbs)	<b>LCB1500-BT40</b>
		1.750	1.500	HSK63A	1.750 (lbs)	<b>LCB1500-HSK63A</b>
		44.45	38.10	CAT40	1.09 (kg)	<b>LCB1500-CV40</b>
		44.45	38.10	CAT50	3.16 (kg)	<b>LCB1500-CV50</b>
		44.45	38.10	BT40	1.12 (kg)	<b>LCB1500-BT40</b>
		44.45	38.10	HSK63A	0.79 (kg)	<b>LCB1500-HSK63A</b>



key on B20: 1

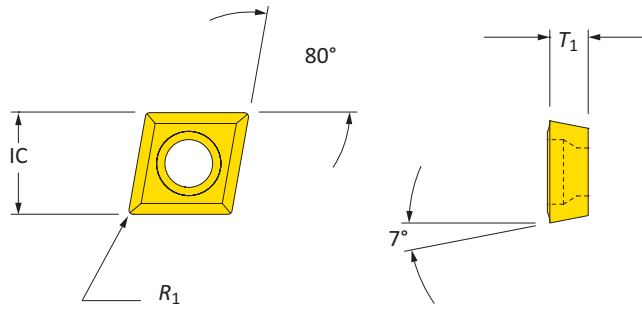
**i** = Imperial (in)  
**m** = Metric (mm)

Inserts sold separately

**! WARNING** Exceeding weight capacity for machine tool spindle and tool changer can cause machine damage, and/or serious injury. To prevent:  
-Refer to page B20: 61 to see formula for calculating weight of tool assembly.  
-Consult machine tool builder for machine's weight limitations.  
Factory technical assistance is also available for specific applications through our Application Engineering department.

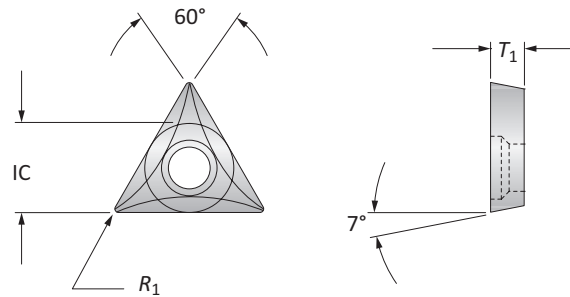
## Boring Inserts

80° Rhombic Insert | 60° Triangle Insert



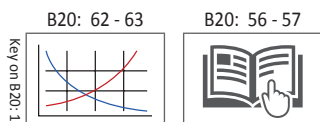
### Coated 80° Rhombic Inserts

	Insert Form	Insert			Part No.
		IC	T <sub>1</sub>	R <sub>1</sub>	
<b>i</b>	CC...325..	0.375	0.156	0.008	CCMT09T302
	CC...325..	0.375	0.156	0.016	CCMT09T304
	CC...325..	0.375	0.156	0.031	CCMT09T308
<b>m</b>	CC...09T3...	9.53	3.97	0.20	CCMT09T302
	CC...09T3...	9.53	3.97	0.40	CCMT09T304
	CC...09T3...	9.53	3.97	0.80	CCMT09T308



### Coated 60° Triangle Inserts

	Insert Form	Insert			Part No.
		IC	T <sub>1</sub>	R <sub>1</sub>	
<b>i</b>	TC..325...	0.375	0.156	0.016	TCGT16T304
<b>m</b>	TC..16T3...	9.53	3.97	0.40	TCGT16T304



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





# NEED VERSATILITY? NO PROBLEM.

## CB Style Versatile Boring

Wide range of diameters produced with  
a single boring head

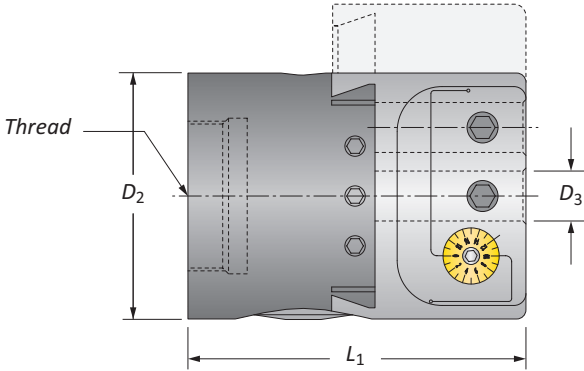
Allows for 0.001" adjustment on bore diameter and  
0.000050" with CB2500BMA

Maximum toughness and maximum versatility



**CB2500BMA Micro Adjusting Versatile Boring Head**

Bore Diameter Range: 0.250" - 3.125"



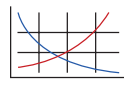
		Boring Head				
Boring Range	Thread Connection	$L_1$	$D_2$	$D_3$	Weight	Part No.
<b>i</b> 0.250 - 3.125	1½ - 18	3.375	2.500	0.500	3.400 (lbs)	<b>CB2500BMA</b>

Imperial (in) = 0.00005" adjustment on diameter  
**NOTE:** Max spindle speed: 2,000 RPM at 0 radial offset

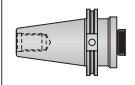
A  
DRILLING  
B  
BORING  
C  
REAMING  
D  
BURNISHING  
E  
THREADING  
X  
SPECIALS

key on B20:1

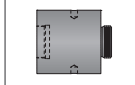
B20: 62 - 63




B20: 50 - 53



B20: 48 - 49



B20: 56 - 57

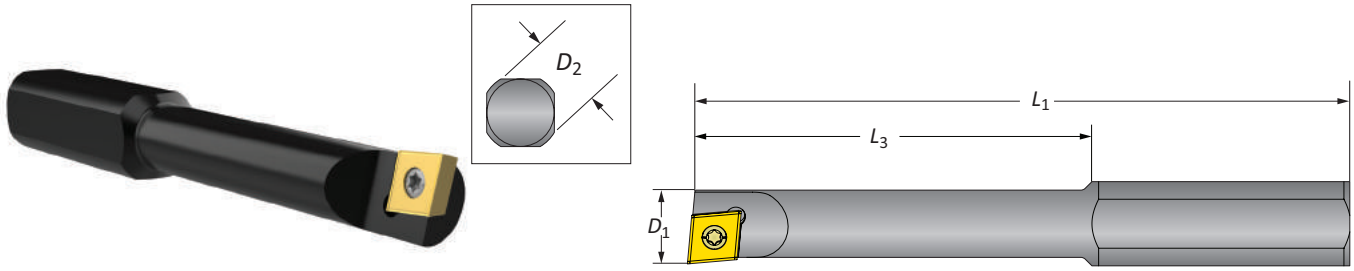


**i** = Imperial (in)  
**m** = Metric (mm)  
 Inserts sold separately

**IMPORTANT:** Max spindle speed refers to maximum possible speed for individual boring head and is not a recommended parameter. Refer to page B20: 62 for recommended application specific parameters. Factory technical assistance is available for your specific applications through our Application Engineering department.

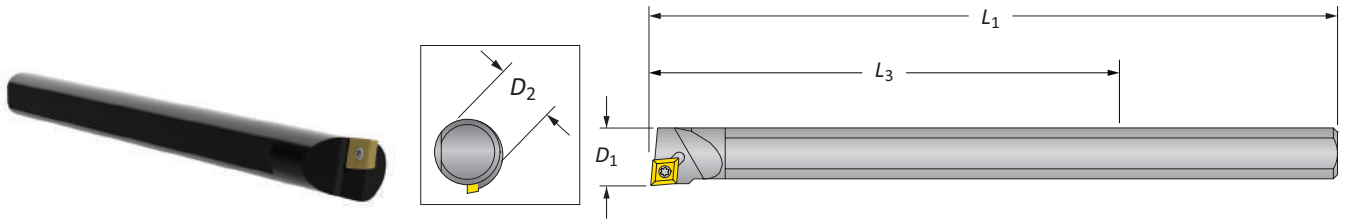
## Boring Bars

Bore Diameter Range: 0.250" - 3.125"



### Steel Boring Bars | Bore Diameter Range: 0.250" - 3.125"

Min. Boring Diameter	Boring Bar				Weight	Insert Form	Part No.
	$D_1$	$L_3$	$L_1$	$D_2$			
	0.250	1.062	2.500	0.500	0.080 (lbs)	WBGX0301...	0250B
	0.312	1.437	2.750	0.500	0.080 (lbs)	WBGX0301...	0312B
<b>i</b>	0.375	1.750	3.062	0.500	0.100 (lbs)	WBGX0301...	0375B
	0.437	2.062	3.375	0.500	0.110 (lbs)	CC..215...	0437B
	0.500	2.187	3.500	0.500	0.140 (lbs)	CC..215...	0500B



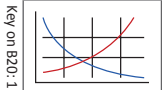
### Heavy Metal Boring Bars | Bore Diameter Range: 0.365" - 3.125"

Min. Boring Diameter	Boring Bar				Weight	Insert Form	Part No.
	$D_1$	$L_3$	$L_1$	$D_2$			
<b>i</b>	0.365	2.250	4.000	0.312*	0.080 (lbs)	CC..215..	0365HM
	0.550	3.250	6.000	0.500	0.300 (lbs)	CC..215..	0550BHM

\*Reducing sleeve required

B20: 62 - 63

B20: 56 - 57

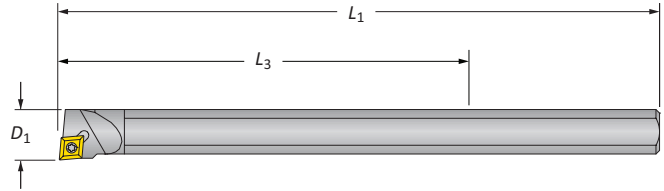
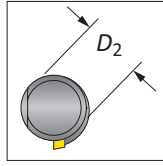


**i** = Imperial (in)  
**m** = Metric (mm)

A DRILLING  
B BORING  
C REAMING  
D BURNISHING  
E THREADING  
X SPECIALS

## Boring Bar | Boring Inserts

Bore Diameter Range: 0.625" - 3.125"

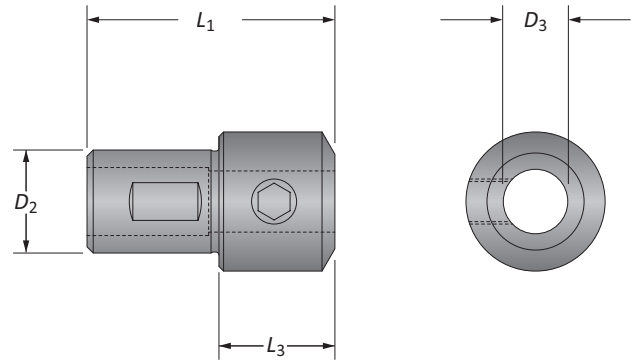


### Carbide Boring Bar

Min. Boring Diameter	Boring Bar			Weight	Insert Form	Part No.
	$D_1$	$L_3$	$L_1$			
<b>i</b> 0.625	4.500	8.000	0.500	0.410 (lbs)	CC..215..	<b>0625BCS</b>

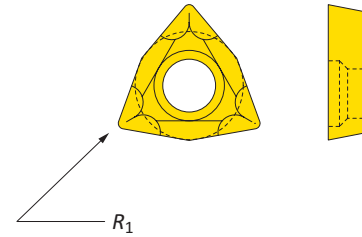
### Reducing Sleeves

	Reducing Sleeve				Weight	Part No.
	$D_3$	$D_2$	$L_1$	$L_3$		
<b>i</b> 0.312	0.500	1.312	-	0.040 (lbs)	<b>BTH-03120500</b>	
0.375	0.500	1.312	-	0.030 (lbs)	<b>BTH-03750500</b>	



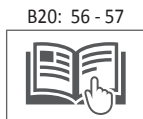
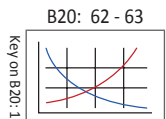
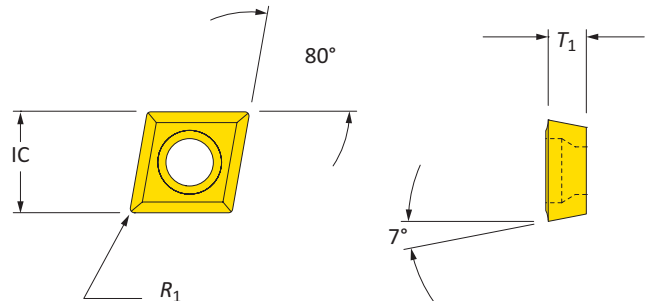
### Coated Trigon Insert

Insert Form	Insert	Part No.
<b>i</b> WBGX0301...	0.004	<b>WBGX030101</b>



### Coated 80° Diamond Inserts

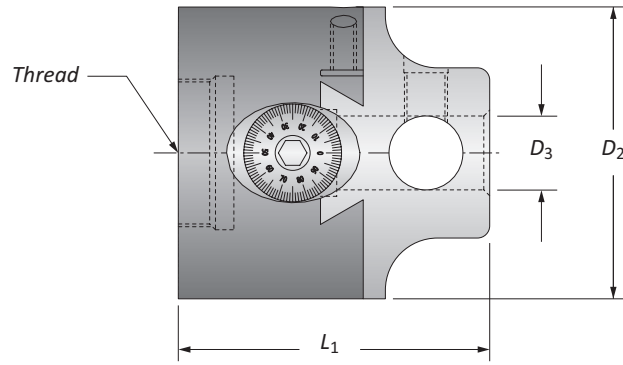
Insert Form	Insert			Part No.
	IC	$T_1$	$R_1$	
<b>i</b> CC...215...	0.250	0.094	0.008	<b>CCMT060202</b>
CC...215...	0.250	0.094	0.016	<b>CCMT060204</b>
CC...215...	0.250	0.094	0.031	<b>CCMT060208</b>



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

## CB202B Versatile Boring Head

Bore Diameter Range: 0.250" - 6.687"



	Boring Range	Thread Connection	Boring Head			Weight	Part No.
			$L_1$	$D_2$	$D_3$		
<b>i</b>	0.250 - 6.687	$\frac{7}{8}$ - 20	2.435	2.000	0.500	1.600 (lbs)	<b>CB202B</b>

**NOTICE:** Cross hole bars should always be secured in the bar holder with at least two set screws

Imperial (in) = 0.001" adjustment on diameter

**NOTE:** Max spindle speed: 2,500 RPM at 0 radial offset

A DRILLING  
B BORING  
C REAMING  
D BURNISHING  
E THREADING  
X SPECIALS

Key on B20:1

B20: 62 - 63

B20: 50 - 53

B20: 48 - 49

B20: 56 - 57

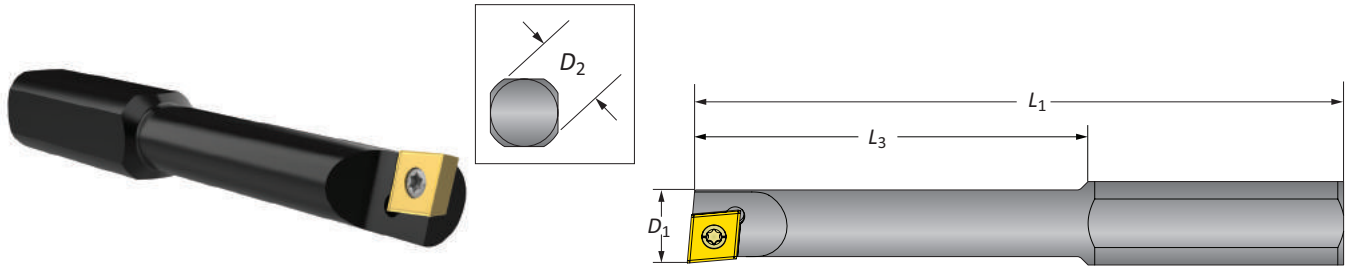
**i** = Imperial (in)  
**m** = Metric (mm)

**IMPORTANT:** Max spindle speed refers to maximum possible speed for individual boring head and is not a recommended parameter. Refer to page B20: 62 for recommended application specific parameters. Factory technical assistance is available for your specific applications through our Application Engineering department.



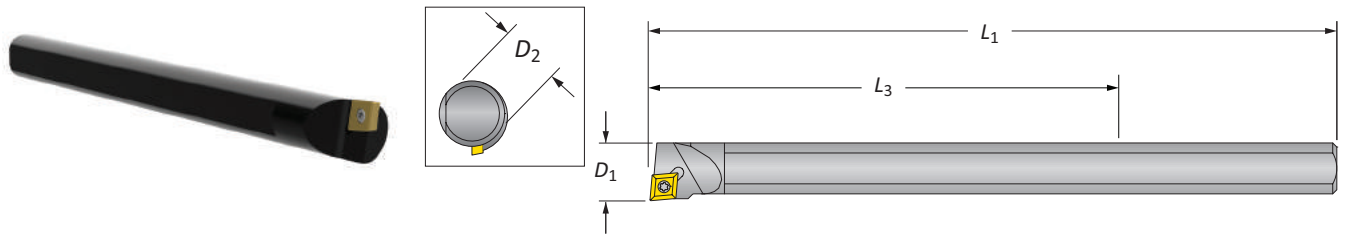
## Boring Bars

Bore Diameter Range: 0.250" - 3.000"



### Steel Boring Bars | Bore Diameter Range: 0.250" - 3.000"

Min. Boring Diameter	Boring Bar				Weight	Insert Form	Part No.
	$D_1$	$L_3$	$L_1$	$D_2$			
<b>i</b> 0.250	1.062	2.500	0.500	0.080 (lbs)	WBGX0301...	0250B	
0.312	1.437	2.750	0.500	0.080 (lbs)	WBGX0301...	0312B	
0.375	1.750	3.062	0.500	0.100 (lbs)	WBGX0301...	0375B	
0.437	2.062	3.375	0.500	0.110 (lbs)	CC..215...	0437B	
0.500	2.187	3.500	0.500	0.140 (lbs)	CC..215...	0500B	



### Heavy Metal Boring Bars | Bore Diameter Range: 0.365" - 3.000"

Min. Boring Diameter	Boring Bar				Weight	Insert Form	Part No.
	$D_1$	$L_3$	$L_1$	$D_2$			
<b>i</b> 0.365	2.250	4.000	0.312*	0.080 (lbs)	CC..215..	0365HM	
0.550	3.250	6.000	0.500	0.300 (lbs)	CC..215..	0550BHM	

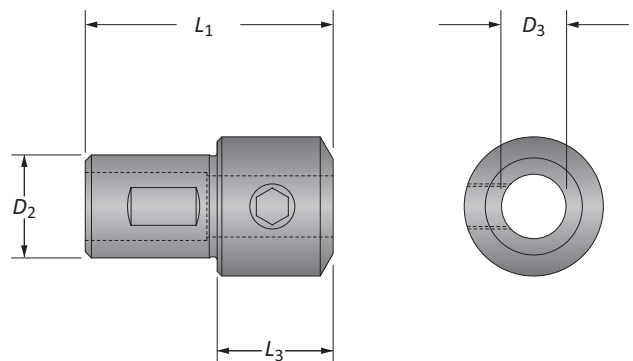
\*Reducing sleeve required

### Carbide Boring Bar | Bore Diameter Range: 0.625" - 3.000"

Min. Boring Diameter	Boring Bar				Weight	Insert Form	Part No.
	$D_1$	$L_3$	$L_1$	$D_2$			
<b>i</b> 0.625	4.500	8.000	0.500	0.410 (lbs)	CC..215..	0625BCS	

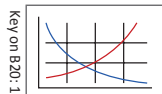
### Reducing Sleeves

Min. Boring Diameter	Reducing Sleeve				Weight	Part No.
	$D_3$	$D_2$	$L_1$	$L_3$		
<b>i</b> 0.312	0.500	1.312	-	0.040 (lbs)	BTH-03120500	
0.375	0.500	1.312	-	0.030 (lbs)	BTH-03750500	



B20: 62 - 63

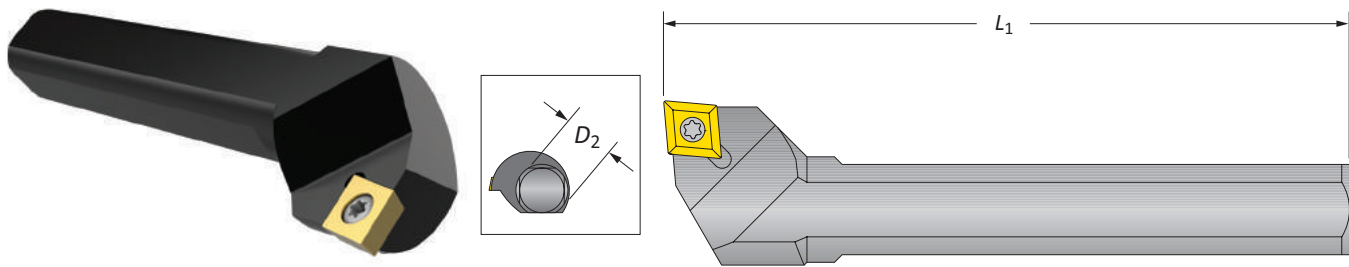
B20: 56 - 57



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

## Boring Bar

Bore Diameter Range: 0.625" - 3.000"



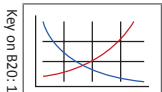
	Boring Bar*		Weight	Insert Form	Part No.
	Min. Boring Diameter	$L_1$			
<b>i</b>	2.875	2.750	0.140 (lbs)	CC..215...	0500BCH

\*NOTICE: Cross hole bars should always be secured in the bar holder with at least two set screws

A DRILLING  
B BORING  
C REAMING  
D BURNISHING  
E THREADING  
X SPECIALS

B20: 62 - 63

B20: 56 - 57

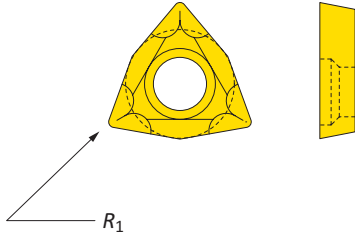


**i** = Imperial (in)  
**m** = Metric (mm)

Inserts sold separately

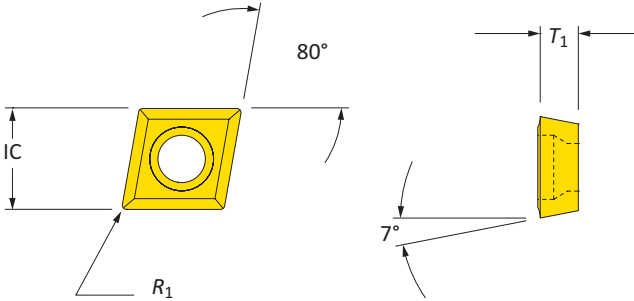
**Boring Inserts**

80° Diamond Insert | 60° Triangle Insert



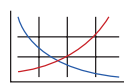
**Coated Trigon Insert**


		Insert		
Insert Form		$R_1$	Part No.	
<b>i</b>	WBGX0301...	0.004	WBGX030101	



**Coated 80° Diamond Inserts**

		Insert			
Insert Form		$IC$	$T_1$	$R_1$	Part No.
<b>i</b>	CC...215...	0.250	0.094	0.008	CCMT060202
	CC..215...	0.250	0.094	0.016	CCMT060204
	CC..215...	0.250	0.094	0.031	CCMT060208

B20: 62 - 63  **Key on B20-1**

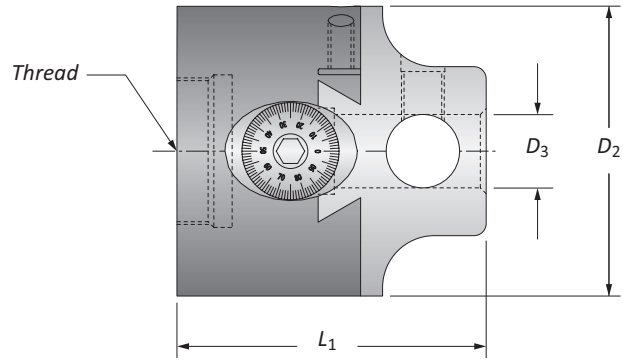
B20: 56 - 57 

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

A  
 DRILLING  
 B  
 BORING  
 C  
 REAMING  
 D  
 BURNISHING  
 E  
 THREADING  
 X  
 SPECIALS

## CB203D Versatile Boring Head

Bore Diameter Range: 0.250" - 11.000"



	Boring Range	Connection	Boring Head			Weight	Part No.
			$L_1$	$D_2$	$D_3$		
<b>i</b>	0.250 - 11.000	1½ - 18	5.165	3.000	0.750	4.700 (lbs)	<b>CB203D</b>

**NOTICE:** Cross hole bars should always be secured in the bar holder with at least two set screws

Imperial (in) = 0.001" adjustment on diameter

**NOTE:** Max spindle speed: 1,750 RPM at 0 radial offset

A DRILLING  
B BORING  
C REAMING  
D BURNISHING  
E THREADING  
X SPECIALS

B20: 62 - 63

Key on B20: 1

B20: 50 - 53

B20: 48 - 49

B20: 56 - 57

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

Inserts sold separately

**IMPORTANT:** Max spindle speed refers to maximum possible speed for individual boring head and is not a recommended parameter. Refer to page B20: 62 for recommended application specific parameters. Factory technical assistance is available for your specific applications through our Application Engineering department.

**WARNING** Exceeding weight capacity for machine tool spindle and tool changer can cause machine damage, and/or serious injury. To prevent:

-Refer to page B20: 61 to see formula for calculating weight of tool assembly.

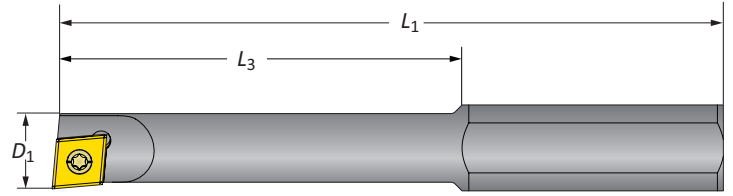
-Consult machine tool builder for machine's weight limitations.

Factory technical assistance is also available for specific applications through our Application Engineering department.



## Boring Bars

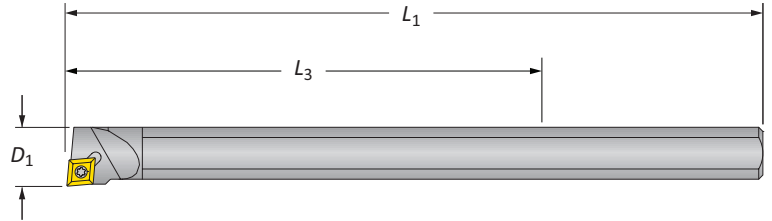
Bore Diameter Range: 0.250" - 5.125"



### Steel Boring Bars | Bore Diameter Range: 0.250" - 5.125"

Min. Boring Diameter	Boring Bar				Weight	Insert Form	Part No.
	$D_1$	$L_3$	$L_1$	$D_2$			
i	0.250	1.062	2.500	0.500*	0.080 (lbs)	WBGX0301...	<b>0250B</b>
	0.312	1.437	2.570	0.500*	0.080 (lbs)	WBGX0301...	<b>0312B</b>
	0.375	1.750	3.062	0.500*	0.100 (lbs)	WBGX0301...	<b>0375B</b>
	0.437	2.062	3.375	0.500*	0.110 (lbs)	CC...215...	<b>0437B</b>
	0.500	2.500	4.250	0.750	0.280 (lbs)	CC...215...	<b>0500D</b>
	0.750	3.000	4.687	0.750	0.430 (lbs)	CC...325...	<b>0750D</b>
	1.000	3.500	5.125	0.750	0.570 (lbs)	CC...325...	<b>1000D</b>
	1.250	4.000	5.562	0.750	0.570 (lbs)	CC...325...	<b>1250D</b>

\*Reducing sleeve required



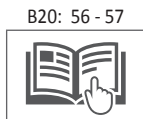
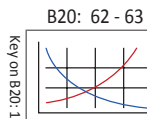
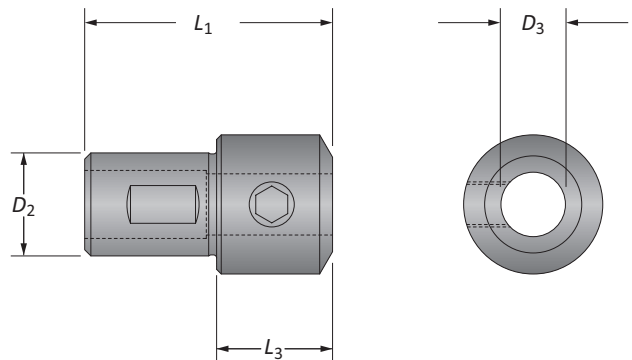
### Heavy Metal Boring Bars | Bore Diameter Range: 0.425" - 4.250"

Min. Boring Diameter	Boring Bar				Weight	Insert Form	Part No.
	$D_1$	$L_3$	$L_1$	$D_2$			
i	0.425	2.250	4.000	0.375*	0.110 (lbs)	CC...215...	<b>0425BHM</b>
	0.550	3.250	6.000	0.500*	0.300 (lbs)	CC...215...	<b>0550BHM</b>
	0.688	4.250	8.000	0.625*	0.630 (lbs)	CC...325...	<b>0688CHM</b>
	0.832	4.750	10.000	0.750	1.150 (lbs)	CC...325...	<b>0832DHM</b>

\*Reducing sleeve required

### Reducing Sleeves

Reducing Sleeve					Weight	Part No.
	$D_3$	$D_2$	$L_1$	$L_3$		
i	0.375	0.750	2.406	-	0.190 (lbs)	<b>BTH-03750750</b>
	0.500	0.750	2.406	0.910	0.040 (lbs)	<b>BTH-05000750</b>
	0.625	0.750	1.500	-	0.060 (lbs)	<b>BTH-06250750</b>

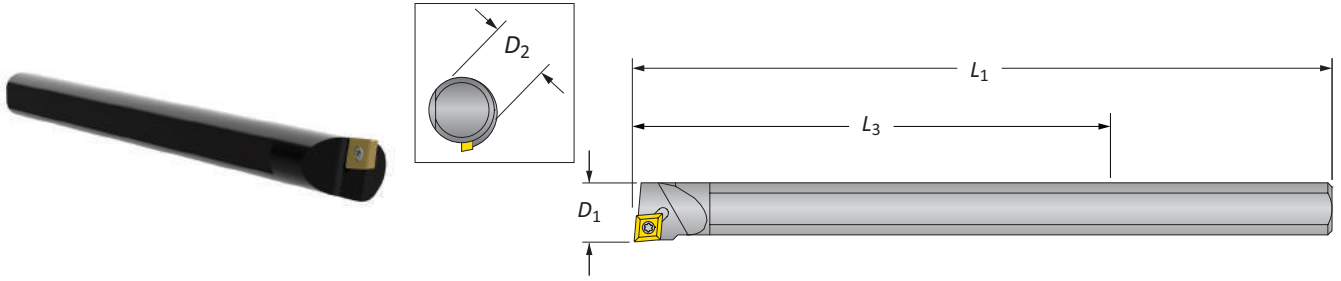


i = Imperial (in)  
m = Metric (mm)  
Inserts sold separately

A DRILLING  
B BORING  
C REAMING  
D BURNISHING  
E THREADING  
X SPECIALS

## Carbide Boring Bars

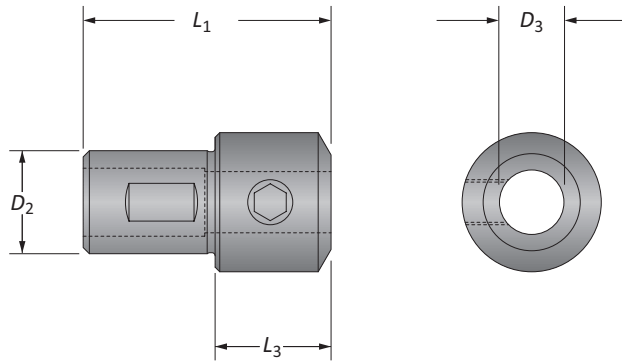
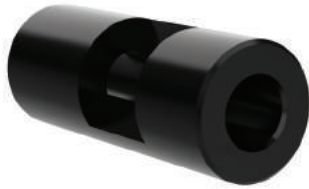
Bore Diameter Range: 0.625" - 4.250"



### Carbide Boring Bars

Min. Boring Diameter	Boring Bar				Weight	Insert Form	Part No.
	$D_1$	$L_3$	$L_1$	$D_2$			
<b>i</b> 0.625	4.500	8.000	0.500*	0.410 (lbs)	CC..215..	<b>0625BCS</b>	
0.875	6.000	10.000	0.750	1.130 (lbs)	CC..325...	<b>0875DCS</b>	

\*Reducing sleeve required

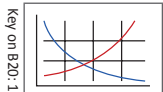


### Reducing Sleeve

Reducing Sleeve				Weight	Part No.
$D_3$	$D_2$	$L_1$	$L_3$		
<b>i</b> 0.500	0.750	2.406	0.910	0.040 (lbs)	<b>BTH-05000750</b>

B20: 62 - 63

B20: 56 - 57



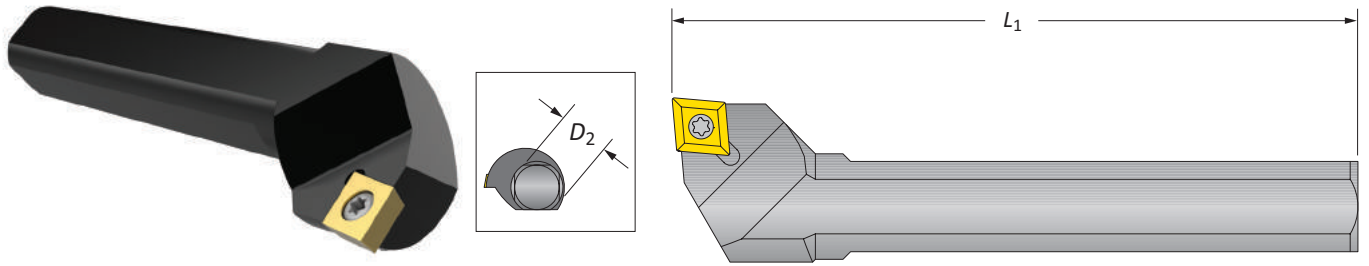
**i** = Imperial (in)  
**m** = Metric (mm)

Inserts sold separately

A DRILLING  
B BORING  
C REAMING  
D BURNISHING  
E THREADING  
X SPECIALS

## Boring Bar | Boring Inserts

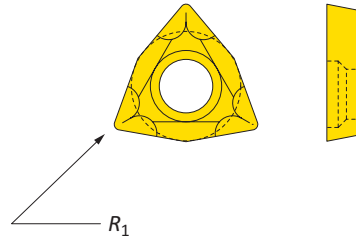
Bore Diameter Range: 4.937" - 11.000"



### Cross Hole Boring Bar

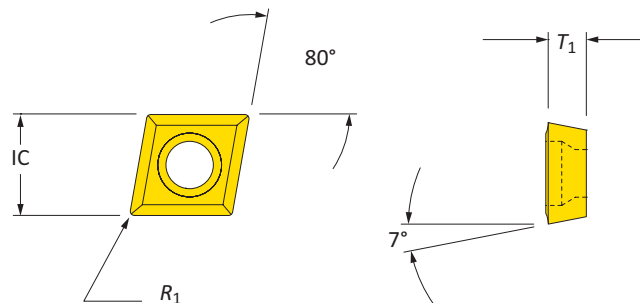
Min. Bore Diameter	Boring Bar*		Weight	Insert Form	Part No.
	$L_1$	$D_2$			
<b>i</b> 4.937	4.750	0.750	0.550 (lbs)	CC..325...	<b>0750DCH</b>

\*NOTICE: Cross hole bars should always be secured in the bar holder with at least two set screws



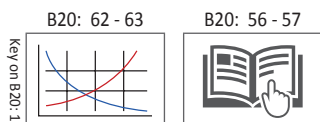
### Coated Trigon Insert

Insert Form	Insert $R_1$	Part No.
<b>i</b> WBGX0301...	0.004	<b>WBGX030101</b>



### Coated 80° Diamond Inserts

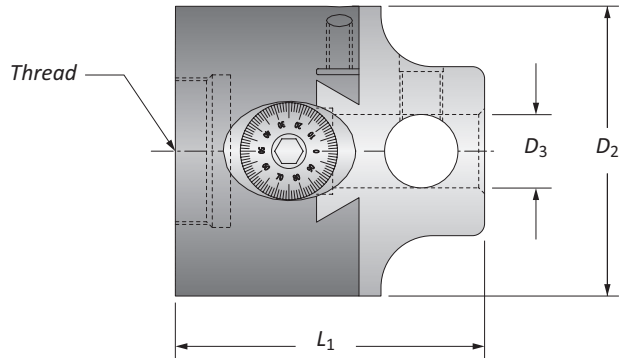
Insert Form	Insert			Part No.
	$IC$	$T_1$	$R_1$	
<b>i</b> CC..215...	0.250	0.094	0.008	<b>CCMT060202</b>
CC..215...	0.250	0.094	0.016	<b>CCMT060204</b>
CC..215...	0.250	0.094	0.031	<b>CCMT060208</b>
CC..325...	0.375	0.156	0.008	<b>CCMT09T302</b>
CC..325...	0.375	0.156	0.016	<b>CCMT09T304</b>
CC..325...	0.375	0.156	0.031	<b>CCMT09T308</b>



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

## CB204E Versatile Boring Head

Bore Diameter Range: 0.500" - 13.437"



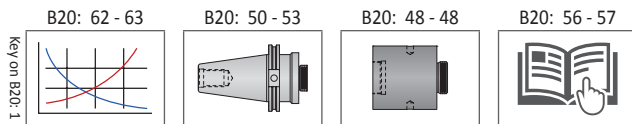
	Boring Range	Connection	Boring Head			Weight	Part No.
			$L_1$	$D_2$	$D_3$		
<b>i</b>	0.500 - 13.437	1½ - 18	3.715	4.000	1.000	9,300 (lbs)	CB204E

**NOTICE:** Cross hole bars should always be secured in the bar holder with at least two set screws

Imperial (in) = 0.001" adjustment on diameter

**NOTE:** Max spindle speed: 800 RPM at 0 radial offset

A DRILLING  
B BORING  
C REAMING  
D BURNISHING  
E THREADING  
X SPECIALS



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

**IMPORTANT:** Max spindle speed refers to maximum possible speed for individual boring head and is not a recommended parameter. Refer to page B20: 62 for recommended application specific parameters. Factory technical assistance is available for your specific applications through our Application Engineering department.

**WARNING** Exceeding weight capacity for machine tool spindle and tool changer can cause machine damage, and/or serious injury. To prevent:

-Refer to page B20: 61 to see formula for calculating weight of tool assembly.

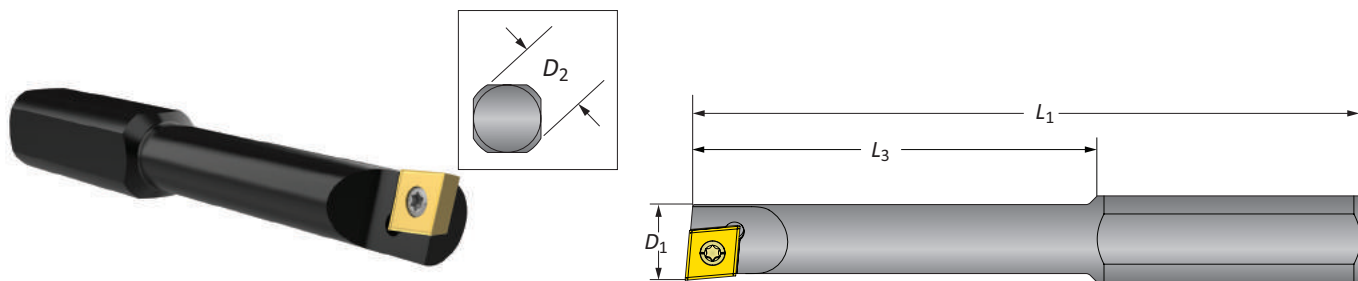
-Consult machine tool builder for machine's weight limitations.

Factory technical assistance is also available for specific applications through our Application Engineering department.



## Boring Bars

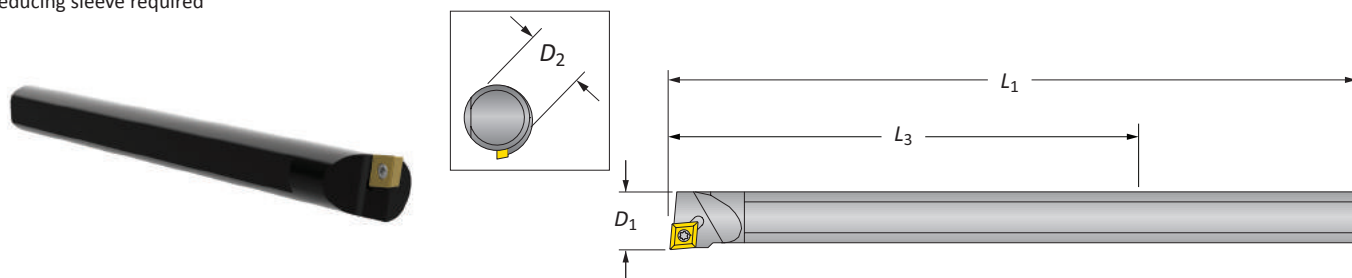
Bore Diameter Range: 0.500" - 5.750"



Steel Boring Bars | Bore Diameter Range: 0.500" - 5.750"

Min. Boring Diameter	Boring Bar				Weight	Insert Form	Part No.
	$D_1$	$L_3$	$L_1$	$D_2$			
<b>i</b> 0.500	2.500	4.250	0.750*	0.280 (lbs)	CC...215...	<b>0500D</b>	
0.750	3.000	4.687	0.750*	0.430 (lbs)	CC...325...	<b>0750D</b>	
1.000	3.500	5.125	0.750*	0.510 (lbs)	CC...325...	<b>1000D</b>	
1.250	4.000	5.562	0.750*	0.570 (lbs)	CC...325...	<b>1250D</b>	

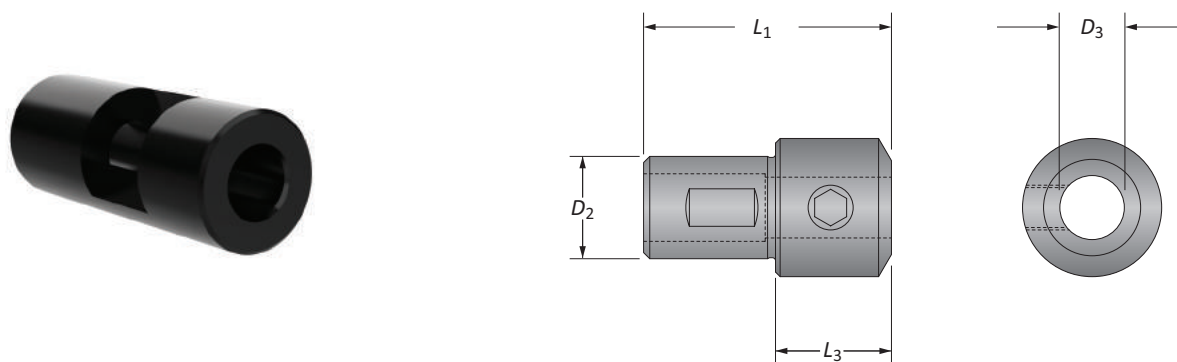
\*Reducing sleeve required



Heavy Metal Boring Bar | Bore Diameter Range: 0.832" - 5.125"

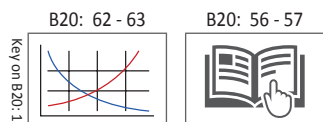
Min. Boring Diameter	Boring Bar				Weight	Insert Form	Part No.
	$D_1$	$L_3$	$L_1$	$D_2$			
<b>i</b> 0.832	4.750	10.000	0.750*	1.150 (lbs)	CC...325...	<b>0832DHM</b>	

\*Reducing sleeve required



## Reducing Sleeve

Min. Boring Diameter	Reducing Sleeve				Weight	Part No.
	$D_3$	$D_2$	$L_1$	$L_3$		
<b>i</b> 0.750	1.000	2.405	1.125	0.400 (lbs)	<b>BTH-07501000</b>	

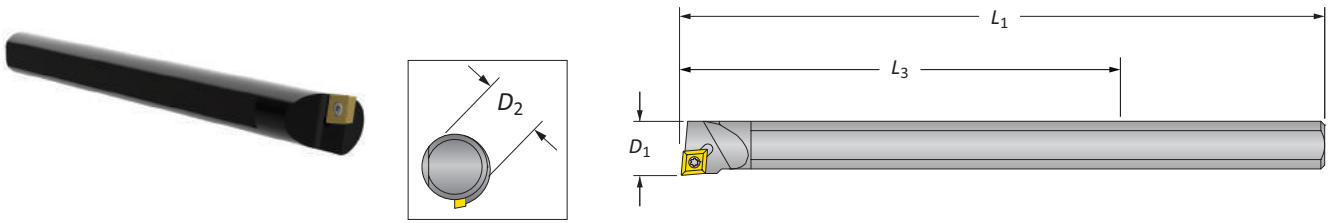


**i** = Imperial (in)  
**m** = Metric (mm)  
 Inserts sold separately

A DRILLING  
 B BORING  
 C REAMING  
 D BURNISHING  
 E THREADING  
 X SPECIALS

## Boring Bars

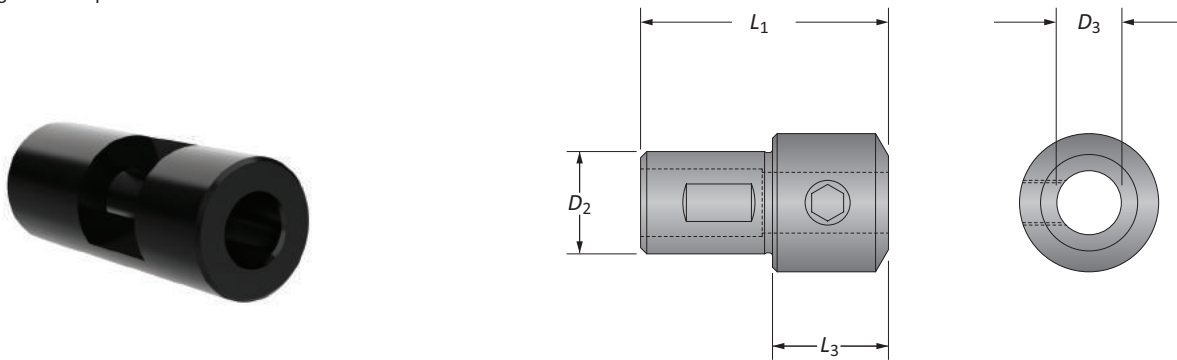
Bore Diameter Range: 0.875" - 5.125"



### Carbide Boring Bar

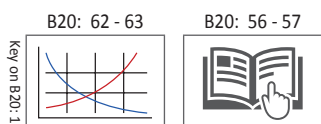
Min. Boring Diameter	Boring Bar				Weight	Insert Form	Part No.
	$D_1$	$L_3$	$L_1$	$D_2$			
<b>i</b> 0.875	6.000	10.000	0.750*	1.130 (lbs)	CC..325...	<b>0875DCS</b>	

\*Reducing sleeve required



### Reducing Sleeve

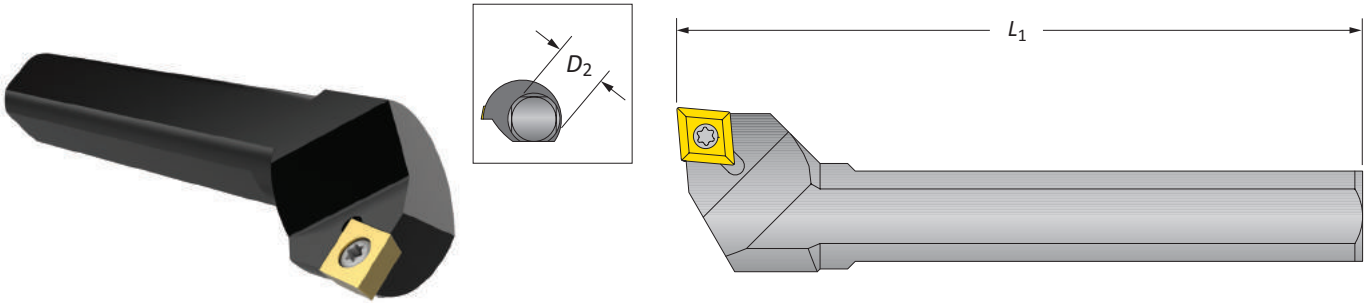
Min. Boring Diameter	Reducing Sleeve				Weight	Part No.
	$D_3$	$D_2$	$L_1$	$L_3$		
<b>i</b> 0.750	1.000	2.405	1.125	0.400 (lbs)	<b>BTH-07501000</b>	



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

**Cross Hole Boring Bar | Boring Inserts**

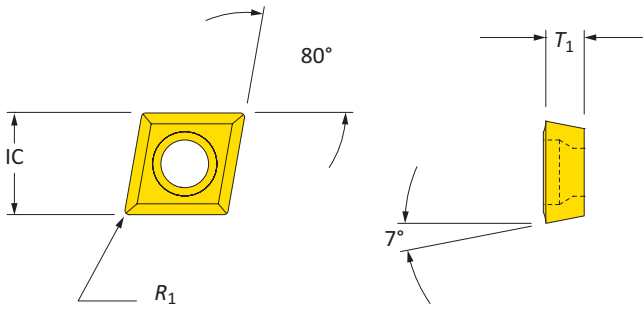
Bore Diameter Range: 5.625" - 13.437"



**Cross Hole Boring Bar**

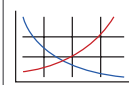
Min Boring Diameter	Boring Bar*		Weight	Insert Form	Part No.
	L <sub>1</sub>	D <sub>2</sub>			
<b>i</b> 5.625	5.310	1.000	1.020 (lbs)	CC..325...	<b>1000ECH</b>


\*NOTICE: Cross hole bars should always be secured in the bar holder with at least two set screws



**Coated 80° Diamond Inserts**

Insert Form	Insert			Part No.
	IC	T <sub>1</sub>	R <sub>1</sub>	
<b>i</b> CC..215..	0.250	0.094	0.008	<b>CCMT060202</b>
CC..215..	0.250	0.094	0.016	<b>CCMT060204</b>
CC..215..	0.250	0.094	0.031	<b>CCMT060208</b>
CC..325..	0.375	0.156	0.008	<b>CCMT09T302</b>
CC..325..	0.375	0.156	0.016	<b>CCMT09T304</b>
CC..325..	0.375	0.156	0.031	<b>CCMT09T308</b>

B20: 62 - 63  **Key on B20-1**

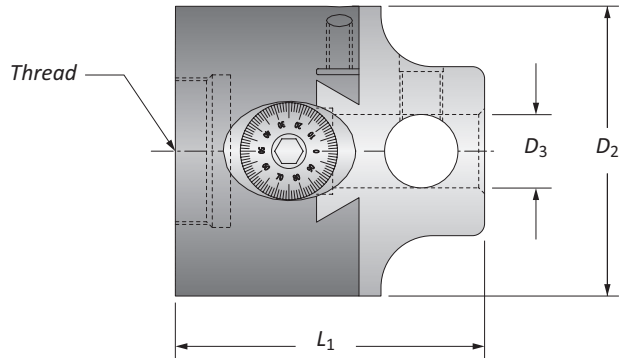
B20: 56 - 57 

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

A DRILLING  
 B BORING  
 C REAMING  
 D BURNISHING  
 E THREADING  
 X SPECIALS

## CB206F Versatile Boring Head

Bore Diameter Range: 0.500" - 21.500"



	Boring Range	Connection	Boring Head			Weight	Part No.
			$L_1$	$D_2$	$D_3$		
<b>i</b>	0.500 - 21.500	2 ¼ - 10	5.475	6.000	1.500	26.400 (lbs)	<b>CB206F</b>

**NOTICE:** Cross hole bars should always be secured in the bar holder with at least two set screws  
Imperial (in) = 0.001" adjustment on diameter

**NOTE:** Max spindle speed: 500 RPM at 0 radial offset

A DRILLING  
B BORING  
C REAMING  
D BURNISHING  
E THREADING  
X SPECIALS

Key on B20: 1

B20: 62 - 63

B20: 50 - 53

B20: 48 - 49

B20: 56 - 57

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

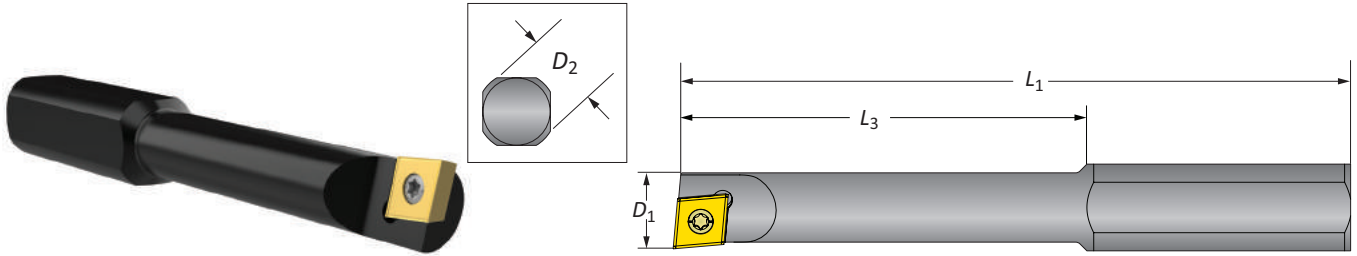
**IMPORTANT:** Max spindle speed refers to maximum possible speed for individual boring head and is not a recommended parameter. Refer to page B20: 62 for recommended application specific parameters. Factory technical assistance is available for your specific applications through our Application Engineering department.

**WARNING** Exceeding weight capacity for machine tool spindle and tool changer can cause machine damage, and/or serious injury. To prevent:  
-Refer to page B20: 61 to see formula for calculating weight of tool assembly.  
-Consult machine tool builder for machine's weight limitations.  
Factory technical assistance is also available for specific applications through our Application Engineering department.



## Boring Bars

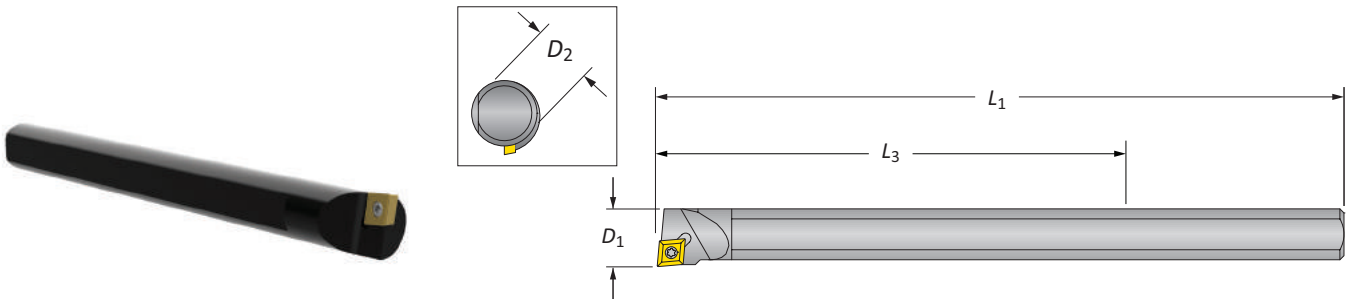
Bore Diameter Range: 0.500" - 9.125"



### Steel Boring Bars | Bore Diameter Range: 0.500" - 9.125"

Min. Boring Diameter	Boring Bar				Weight	Insert Form	Part No.
	$D_1$	$L_3$	$L_1$	$D_2$			
<b>i</b> 0.500	2.500	4.250	0.750*	0.280 (lbs)	CC...215...	<b>0500D</b>	
0.750	3.000	4.687	0.750*	0.430 (lbs)	CC...325...	<b>0750D</b>	
1.000	3.500	5.125	0.750*	0.510 (lbs)	CC...325...	<b>1000D</b>	
1.250	4.000	5.562	0.750*	0.570 (lbs)	CC...325...	<b>1250D</b>	

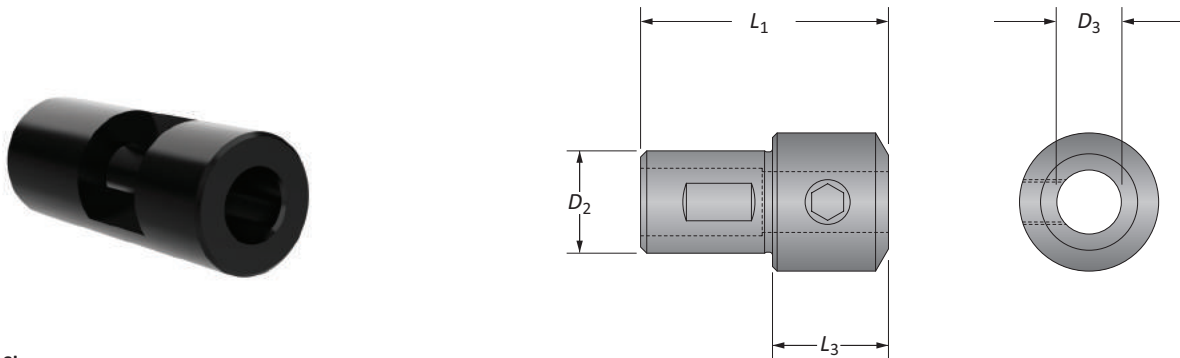
\*Reducing sleeve required



### Heavy Metal Boring Bar | Bore Diameter Range: 0.832" - 7.125"

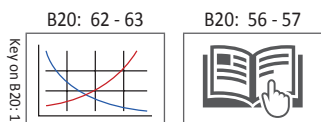
Min. Boring Diameter	Boring Bar				Weight	Insert Form	Part No.
	$D_1$	$L_3$	$L_1$	$D_2$			
<b>i</b> 0.832	4.750	10.000	0.750*	1.150 (lbs)	CC...325...	<b>0832DHM</b>	

\*Reducing sleeve required



### Reducing Sleeve

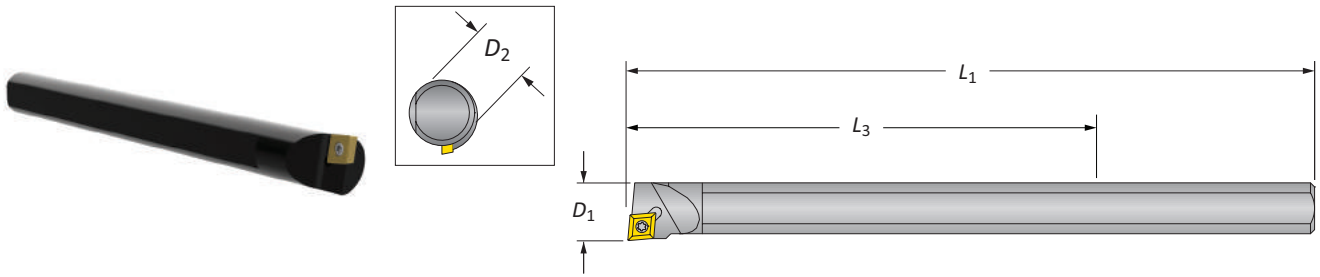
Min. Boring Diameter	Reducing Sleeve				Weight	Part No.
	$D_3$	$D_2$	$L_1$	$L_3$		
<b>i</b> 0.750	1.500	3.000	1.000	1.400 (lbs)	<b>BTH-07501500</b>	



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

## Carbide Boring Bar

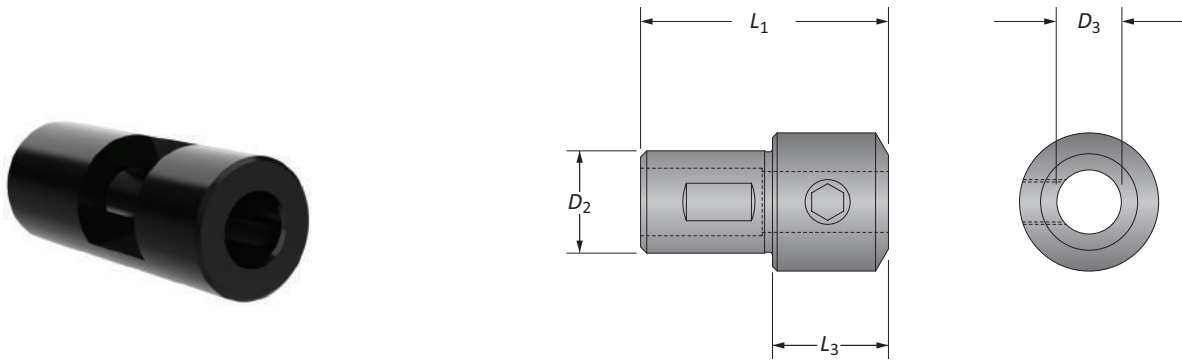
Bore Diameter Range: 0.875" - 7.125"



### Carbide Boring Bar

Min. Boring Diameter	Boring Bar			Weight	Insert Form	Part No.
	$D_1$	$L_3$	$L_1$			
<b>i</b> 0.875	6.000	10.000	0.750*	1.130 (lbs)	CC..325...	<b>0875DCS</b>

\*Reducing sleeve required

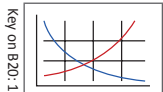


### Reducing Sleeve

Reducing Sleeve				Weight	Part No.
$D_3$	$D_2$	$L_1$	$L_3$		
<b>i</b> 0.750	1.500	3.000	1.000	1.400 (lbs)	<b>BTH-07501500</b>

B20: 62 - 63

B20: 56 - 57

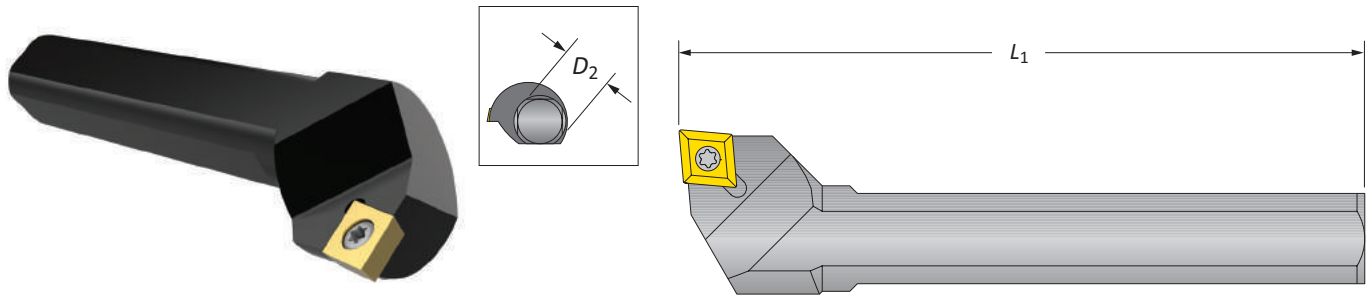


**i** = Imperial (in)  
**m** = Metric (mm)

Inserts sold separately

## Cross Hole Boring Bar | Boring Inserts

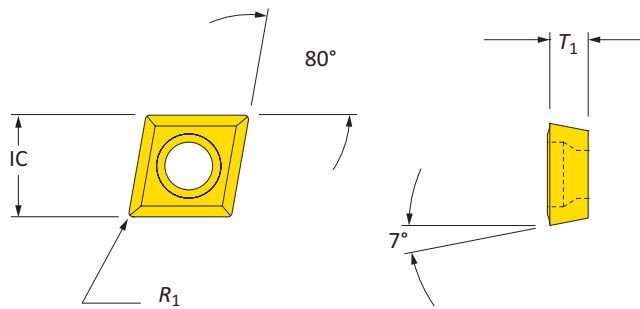
Bore Diameter Range: 9.093" - 21.500"



### Cross Hole Boring Bar

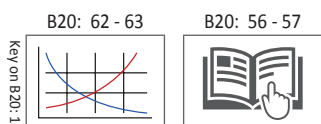
Min. Boring Diameter	Boring Bar*		Weight	Insert Form	Part No.
	$L_1$	$D_2$			
<b>i</b> 9.093	9.125	1.500	4.130 (lbs)	CC..43...	1500FCH

\*NOTICE: Cross hole bars should always be secured in the bar holder with at least two set screws



### Coated 80° Diamond Inserts

Insert Form	Insert			Part No.
	IC	$T_1$	$R_1$	
<b>i</b> CC..215...	0.250	0.094	0.008	CCMT060202
CC..215...	0.250	0.091	0.016	CCMT060204
CC..215...	0.250	0.094	0.031	CCMT060208
CC..325...	0.375	0.156	0.008	CCMT09T302
CC..325...	0.375	0.156	0.016	CCMT09T304
CC..325...	0.375	0.156	0.031	CCMT08T308
CC..43...	0.500	0.188	0.031	CCMT120408



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

A DRILLING  
 B BORING  
 C REAMING  
 D BURNISHING  
 E THREADING  
 X SPECIALS

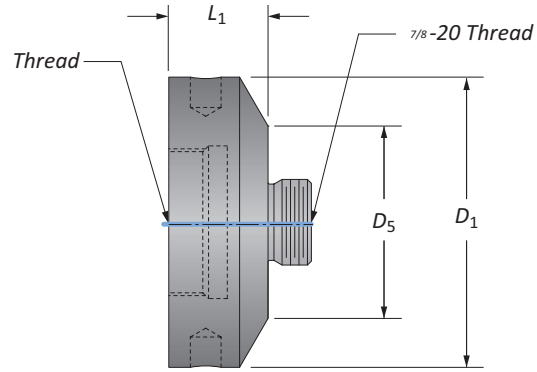






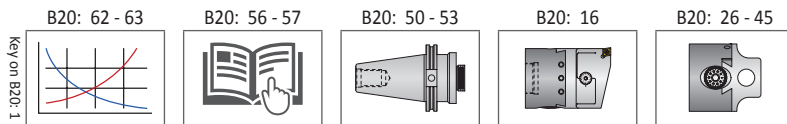
## Intermediate Modules

### Reducers



Dimensions					
$D_1$	$D_5$	$L_1$	Weight	Thread	Part No.
1.500	1.000	1.000	0.440 (lbs)	$7/8 - 20$	CB1500-IRCB1000
1.500	1.250	1.000	0.450 (lbs)	$7/8 - 20$	CB1500-IRCB1250
2.000	1.000	1.000	0.720 (lbs)	$7/8 - 20$	CB2000-IRCB1000
2.000	1.250	1.000	0.760 (lbs)	$7/8 - 20$	CB2000-IRCB1250
<b>i</b> 2.000	1.500	1.000	0.800 (lbs)	$7/8 - 20$	CB2000-IRCB1500
3.000	1.000	1.250	1.610 (lbs)	$1\frac{1}{2} - 18$	CB3000-IRCB1000
3.000	1.250	1.250	1.750 (lbs)	$1\frac{1}{2} - 18$	CB3000-IRCB1250
3.000	1.500	1.250	1.840 (lbs)	$1\frac{1}{2} - 18$	CB3000-IRCB1500
3.000	2.000	1.250	2.020 (lbs)	$1\frac{1}{2} - 18$	CB3000-IRCB2000

A  
DRILLING  
B  
BORING  
C  
REAMING  
D  
BURNISHING  
E  
THREADING  
X  
SPECIALS



**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:

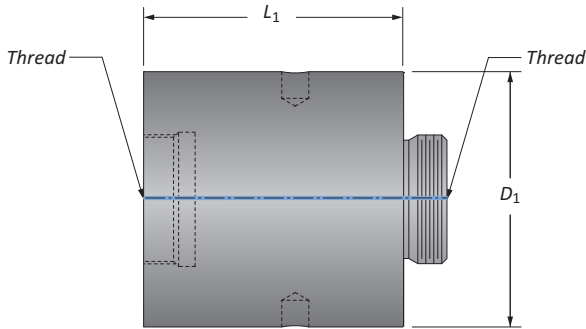
- Refer to page B20: 61 to see formula for calculating weight of tool assembly.
- Consult machine tool builder for machine's weight limitations.
- Factory technical assistance is also available for specific applications through our Application Engineering department.

**⚠ WARNING** Tool failure can cause serious injury. To prevent:

- Do not exceed recommended 9xD length to diameter ratio or exceed 4 total components (including shank)
- Refer to example on page B20: 60 for calculating length to diameter ratio
- Factory technical assistance is available for your specific applications through our Application Engineering department.

Intermediate Modules

Extensions



Dimensions				
$D_1$	$L_1$	Weight	Thread	Part No.
1.000	1.000	0.190 (lbs)	$\frac{7}{8}$ - 20	CB1000-IA1000
1.000	2.000	0.390 (lbs)	$\frac{7}{8}$ - 20	CB1000-IA2000
1.250	1.250	0.390 (lbs)	$\frac{7}{8}$ - 20	CB1250-IA1250
1.250	2.500	0.800 (lbs)	$\frac{7}{8}$ - 20	CB1250-IA2500
1.500	1.500	0.700 (lbs)	$\frac{7}{8}$ - 20	CB1500-IA1500
1.500	3.000	1.410 (lbs)	$\frac{7}{8}$ - 20	CB1500-IA3000
2.000	2.000	1.660 (lbs)	$\frac{7}{8}$ - 20	CB2000-IA2000
2.000	4.000	3.350 (lbs)	$\frac{7}{8}$ - 20	CB2000-IA4000
3.000	3.000	5.730 (lbs)	1½ - 18	CB3000-IA3000
3.000	6.000	11.500 (lbs)	1½ - 18	CB3000-IA6000

i

Key on B20: 1

B20: 62 - 63

B20: 56 - 57

B20: 50 - 53

B20: 16

B20: 26 - 45

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

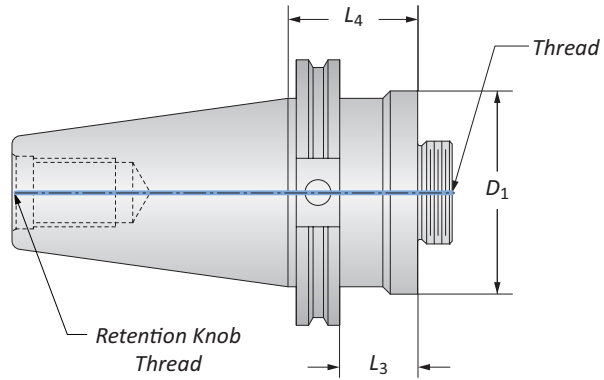
**⚠ WARNING** Exceeding weight capacity for machine tool spindle and tool changer can cause machine damage, and/or serious injury. To prevent:  
 -Refer to page B20: 61 to see formula for calculating weight of tool assembly.  
 -Consult machine tool builder for machine's weight limitations.  
 Factory technical assistance is also available for specific applications through our Application Engineering department.

**⚠ WARNING** Tool failure can cause serious injury. To prevent:  
 -Do not exceed recommended 9xD length to diameter ratio or exceed 4 total components (including shank)  
 -Refer to example on page B20: 60 for calculating length to diameter ratio  
 Factory technical assistance is available for your specific applications through our Application Engineering department.

A  
DRILLING  
B  
BORING  
C  
REAMING  
D  
BURNISHING  
E  
THREADING  
X  
SPECIALS

## Criterion Master Shanks

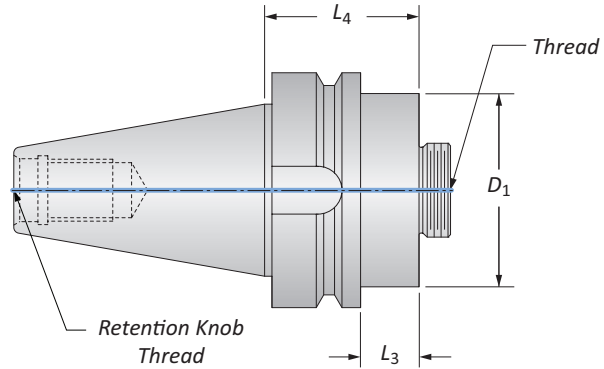
CAT 40/50 | BT Flange



### CAT 40/50 Shanks

Style	D <sub>1</sub>	L <sub>3</sub>	Shank				Retention Knob Thread	Part No.
			L <sub>4</sub>	Weight	Thread			
CAT40	1.500	0.370	1.770	2.490 (lbs)	7/8 - 20	7/8 - 11	CB1500-CV40	
CAT40	2.000	1.130	1.880	2.700 (lbs)	7/8 - 20	7/8 - 11	CB2000-CV40	
CAT40	2.500	1.130	1.880	3.120 (lbs)	1-1/2 - 18	7/8 - 11	CB2500-CV40	
CAT40	3.000	1.180	1.880	3.410 (lbs)	1-1/2 - 18	7/8 - 11	CB3000-CV40	
<b>i</b> CAT50	1.500	0.370	1.770	7.120 (lbs)	7/8 - 20	1 - 8	CB1500-CV50	
CAT50	2.000	1.130	1.880	7.330 (lbs)	7/8 - 20	1 - 8	CB2000-CV50	
CAT50	2.500	1.130	1.880	7.740 (lbs)	1-1/2 - 18	1 - 8	CB2500-CV50	
CAT50	3.000	1.130	1.880	8.030 (lbs)	1-1/2 - 18	1 - 8	CB3000-CV50	
CAT50	3.380	1.380	2.130	9.440 (lbs)	2-1/4 - 10	1 - 8	CB6000-CV50	

**NOTE:** Taper ground to AT3 tolerance



### BT Flange Shanks

Style	D <sub>1</sub>	L <sub>3</sub>	Shank				Retention Knob Thread	Part No.
			L <sub>4</sub>	Weight	Thread			
BT30	1.500	0.900	1.770	1.360 (lbs)	7/8 - 20	M12 x 1.75	CB1500-BT30	
BT40	1.500	0.710	1.770	2.540 (lbs)	7/8 - 20	M16 x 2	CB1500-BT40	
BT40	2.000	0.500	1.560	2.620 (lbs)	7/8 - 20	M16 x 2	CB2000-BT40	
BT40	2.500	0.870	2.060	3.690 (lbs)	1-1/2 - 18	M16 x 2	CB2500-BT40	
<b>i</b> BT40	3.000	1.000	2.060	3.980 (lbs)	1-1/2 - 18	M16 x 2	CB3000-BT40	
BT50	1.500	0.270	1.770	8.220 (lbs)	7/8 - 20	M24 x 3	CB1500-BT50	
BT50	2.000	0.060	1.560	8.250 (lbs)	7/8 - 20	M24 x 3	CB2000-BT50	
BT50	3.000	0.500	2.060	9.410 (lbs)	1-1/2 - 18	M24 x 3	CB3000-BT50	
BT50	3.380	0.630	2.130	10.500 (lbs)	2-1/4 - 10	M24 x 3	CB6000-BT50	

**NOTE:** Taper ground to AT3 tolerance

**X** SPECIALS

Key on B20: 1

B20: 62 - 63

B20: 56 - 57

B20: 48 - 49

B20: 16

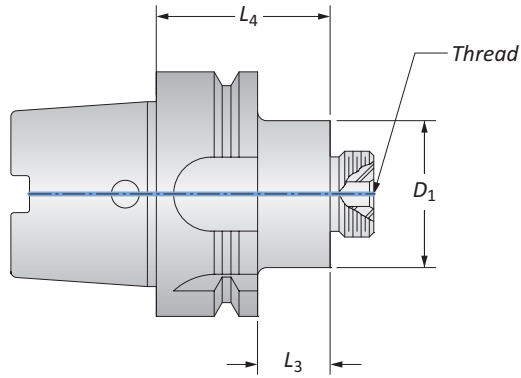
B20: 26 - 45

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



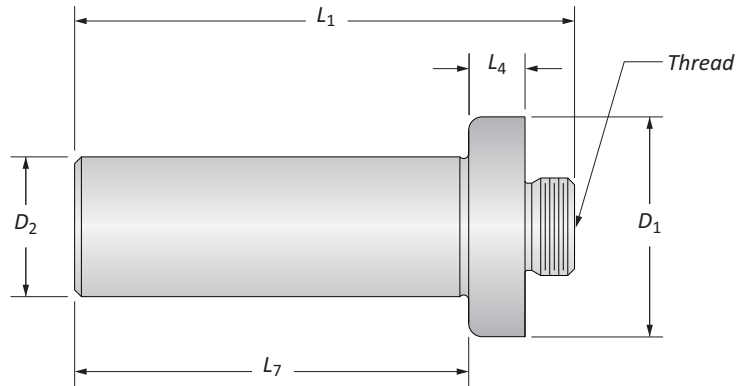
## Criterion Master Shanks

HSK | Straight Shank



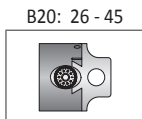
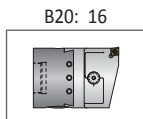
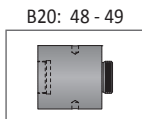
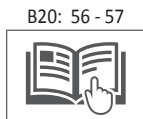
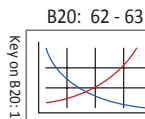
### HSK Shanks

Style	D <sub>1</sub>	Shank			Weight	Thread	Part No.
		L <sub>3</sub>	L <sub>4</sub>				
i	HSK63	1.500	0.730	1.750	1.820 (lbs)	7/8 - 20	CB1500-HSK63A
	HSK63	2.000	0.730	1.750	2.090 (lbs)	7/8 - 20	CB2000-HSK63A
	HSK63	3.000	0.500	2.150	3.200 (lbs)	1-1/2 - 18	CB3000-HSK63A
i	HSK100	1.500	0.500	2.270	6.300 (lbs)	7/8 - 20	CB1500-HSK100A
	HSK100	2.000	0.500	2.270	6.470 (lbs)	7/8 - 20	CB2000-HSK100A
	HSK100	3.000	0.500	2.270	7.180 (lbs)	1-1/2 - 18	CB3000-HSK100A



### Straight Shanks

D <sub>1</sub>	D <sub>2</sub>	Shank			Weight	Thread	Part No.	
		L <sub>4</sub>	L <sub>7</sub>	L <sub>1</sub>				
i	1.110	0.500	0.250	2.000	2.690	0.240 (lbs)	7/8 - 20	SS0500-087520
	1.110	0.625	0.250	2.370	3.060	0.340 (lbs)	7/8 - 20	SS0625-087520
	1.110	0.750	0.250	2.750	3.440	0.480 (lbs)	7/8 - 20	SS0750-087520
	1.110	1.000	0.250	3.120	3.810	0.820 (lbs)	7/8 - 20	SS1000-087520
	1.860	0.750	0.250	3.120	3.870	0.810 (lbs)	1-1/2 - 18	SS0750-150018
	1.860	1.000	0.250	3.120	3.870	1.110 (lbs)	1-1/2 - 18	SS1000-150018
	1.860	1.250	0.250	3.880	4.630	1.760 (lbs)	1-1/2 - 18	SS1250-150018
	1.860	1.500	0.250	4.630	5.380	2.720 (lbs)	1-1/2 - 18	SS1500-150018
2.000	2.000	-	6.380	6.880	5.850 (lbs)	1-1/2 - 18	SS2000-150018	

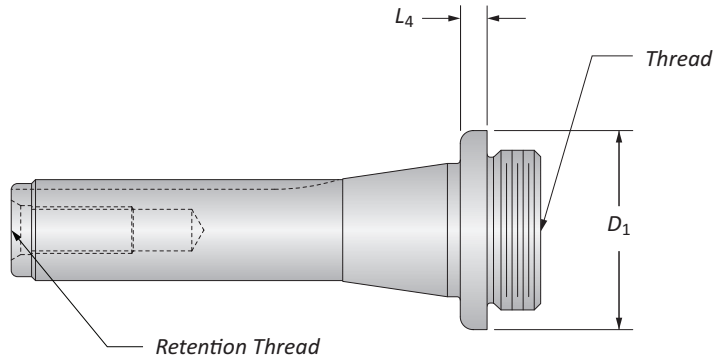


i = Imperial (in)  
m = Metric (mm)

A DRILLING  
B BORING  
C REAMING  
D BURNISHING  
E THREADING  
X SPECIALS

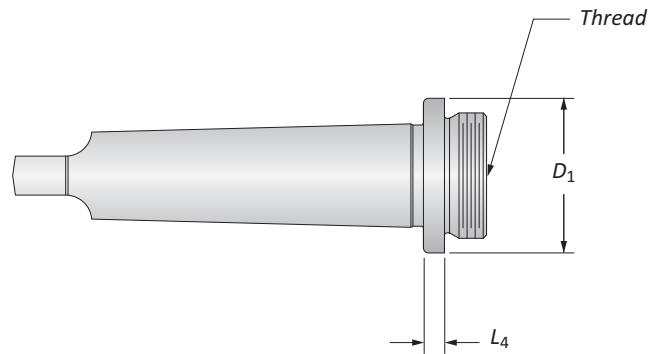
## Criterion Shanks

R-8 | Morse Taper



### R-8 Shanks

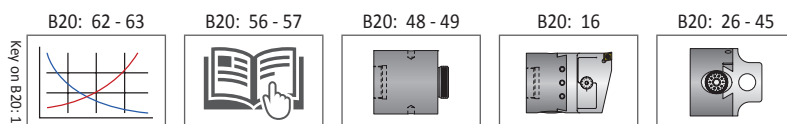
		Shank					
		$D_1$	$L_4$	Weight	Thread	Retention Thread	Part No.
i		1.110	0.470	0.990 (lbs)	$\frac{7}{8}$ - 20	$\frac{7}{16}$ - 20	<b>R8-087520</b>
		1.860	0.370	1.270 (lbs)	1- $\frac{1}{2}$ - 18	$\frac{7}{16}$ - 20	<b>R8-150018</b>



### Morse Taper Shanks

		Shank					
		Style	$D_1$	$L_4$	Weight	Thread	Part No.
i		2 Taper	1.110	0.250	0.380 (lbs)	$\frac{7}{8}$ - 20	<b>MT2-375THD87520*</b>
		2 Taper	1.110	0.250	0.390 (lbs)	$\frac{7}{8}$ - 20	<b>MT2-087520</b>
		3 Taper	1.110	0.250	0.710 (lbs)	$\frac{7}{8}$ - 20	<b>MT3-087520</b>
		3 Taper	1.860	0.250	1.000 (lbs)	1- $\frac{1}{2}$ - 18	<b>MT3-150018</b>
		4 Taper	1.230	0.250	1.350 (lbs)	$\frac{7}{8}$ - 20	<b>MT4-087520</b>
		4 Taper	1.860	0.250	1.700 (lbs)	1- $\frac{1}{2}$ - 18	<b>MT4-150018</b>
		5 Taper	1.860	0.250	3.770 (lbs)	1- $\frac{1}{2}$ - 18	<b>MT5-150018</b>

\*Item features a  $\frac{3}{8}$  - 16 thread instead of tang

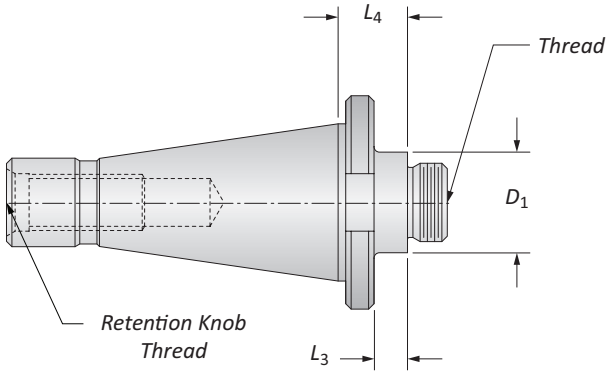


i = Imperial (in)  
m = Metric (mm)

A DRILLING  
B BORING  
C REAMING  
D BURNISHING  
E THREADING  
X SPECIALS

**Criterion Master Shanks**

NMTB Taper



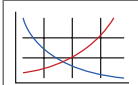
Style	$D_1$	$L_3$	$L_4$	Shank			Part No.
				Weight	Thread	Retention Knob Thread	
NMTB 30	1.120	0.370	0.790	0.810 (lbs)	$\frac{7}{8}$ - 20	$\frac{1}{2}$ - 13	NMTB30-087520
NMTB 30	1.850	0.630	1.050	1.190 (lbs)	1- $\frac{1}{2}$ - 18	$\frac{1}{2}$ - 13	NMTB30-150018
NMTB 40	1.120	0.370	0.770	1.780 (lbs)	$\frac{7}{8}$ - 20	$\frac{5}{8}$ - 11	NMTB40-087520
NMTB 40	1.850	0.630	1.020	2.310 (lbs)	1- $\frac{1}{2}$ - 18	$\frac{5}{8}$ - 11	NMTB40-150018
NMTB 50	1.970	0.510	1.250	6.750 (lbs)	$\frac{7}{8}$ - 20	1 - 8	NMTB50-087520
NMTB 50	1.870	0.400	1.210	6.870 (lbs)	1- $\frac{1}{2}$ - 18	1 - 8	NMTB50-150018
NMTB 50	3.380	0.500	1.250	8.320 (lbs)	2- $\frac{1}{4}$ - 10	1 - 8	NMTB50-225010

**i**


A DRILLING  
B BORING  
C REAMING  
D BURNISHING  
E THREADING  
X SPECIALS

Key on B20-1

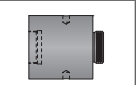
B20: 62 - 63



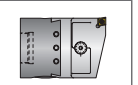
B20: 56 - 57



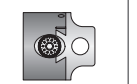
B20: 48 - 49



B20: 16



B20: 26 - 45







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



## Criterion Accessories

Insert Screws | Drivers | Pin Spanner Wrenches

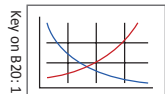
### Insert Screws & Drivers

 <b>Insert Form</b>	 <b>Part No.</b>	 <b>Thread</b>	 <b>Part No.</b>	<b>Technical Information</b>	
				<b>Torque Specs</b>	<b>Key Size</b>
WBGX0301..	<b>215377</b>	M2x4	<b>115537</b>	0.6 (Nm)	T6
CC..215.. CC..0602..	<b>115676</b>	M2.5x5	<b>115590</b>	1.2 (Nm)	T8
CC..32500 CC..09T3 (<Ø37mm)	<b>115672</b>	M3.5x7.5	<b>115664</b>	3.0 (Nm)	T15
CC..32500 CC..09T3 (<Ø36mm)	<b>115673</b>	M3.5x9	<b>115664</b>	3.0 (Nm)	T15
CC..43.. CC..1204..	<b>215149</b>	M4.5x11.5	<b>215150</b>	5.0 (Nm)	T20
TC..215.. TC..1102..	<b>115676</b>	M2.5x5	<b>115590</b>	1.2 (Nm)	T8
TC..325.. TC..16T3	<b>115673</b>	M3.5x9	<b>115664</b>	3.0 (Nm)	T15

### Pin Spanner Wrenches

 <b>Body Diameter</b>	<b>Pin Spanner Wrench</b>  <b>Part No.</b>
1.000" (25.00mm)	<b>CB1000-PSW</b>
1.250" (32.00mm)	<b>CB1250-PSW</b>
1.500" (38.00mm)	<b>CB1500-PSW</b>
2.000" (38.00mm)	<b>CB2000-PSW</b>
2.500" (63.50mm)	<b>CB2500-PSW</b>
3.000" (76.00mm)	<b>CB3000-PSW</b>
4.000" (101.00mm)	<b>CB4000-PSW</b>

B20: 62 - 63



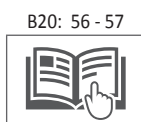
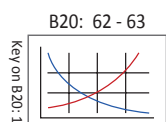
B20: 56 - 57



A DRILLING  
B BORING  
C REAMING  
D BURNISHING  
E THREADING  
X SPECIALS

## Criterion Hardware Kits

Corresponding Boring Head Item Number	Hardware Kit Part No.
CBR-0625CP, CBR-0628TP, CBR-0625SG, CBS-0625CP, CBS-0625TP, CBS-0625SG, CBER16S-SG, CBR16-SG, CBER20S-SG, CBER20-SG, CBER16MS-CP, CBR16M-CP, CBER16MS-TP, CBR16M-TP, CBER20MS-CP, CBER20M-CP, CBER20MS-TP, CBER20M-TP, CBER16S-CP, CBR16-CP, CBER16S-TP, CBR16-TP, CBER20S-CP, CBER20-CP, CBER20S-TP, CBER20-TP	<b>CB0625-HDW</b>
CBS-0750CP, CBS-0750TP, CBS-0750SH, CBR-0750CP, CBR-0750TP, CBR-0750SH, CBER25S-SH, CBER25-SH, CBER25S-CP, CBER25-CP, CBER25S-TP, CBER25-TP, CBER25-TP, CBER25MS-CP, CBER25M-CP, CBER25MS-TP	<b>CB0750-HDW</b>
TMT-0750H, TMT-1000H	<b>TMT0750-HDW</b>
CB1000CC, CB1000TC CBS-1000CP, CBS-1000TP, CBS-1000CPMA, CBS-1000TPMA, CBS-1000SA, CBR-1000CP, CBR-1000TP, CBR-1000CPMA, CBR-1000TPMA, CBR-1000SA, CBER32S-CPMA, CBER32-CPMA, CBER32S-TPMA, CBER32-TPMA, CBER32MS-CPMA, CBER32M-CPMA, CBER32MS-TPMA, CBER32M-TPMA, CBER32S-SA, CBER32-SA, CBER32S-CP, CBER32-CP, CBER32S-TP, CBER32-TP, CBER32MS-CP, CBER32M-CP, CBER32MS-TP, CBER32M-TP, CB1000-TPMA, CB1000-CPMA, CB1000-TP, CB1000-CP	<b>CB1000-HDW</b>
CT1000-0, CT1000-1, CT1000-2	<b>CT1000-HDW</b>
CB025MCC, CB025MTC, CB025M-TPMA, CB025M-CPMA, CB025M-TP, CB025M-CP	<b>CB025M-HDW</b>
CT025M-0, CT025M-1, CT025M-2	<b>CT025M-HDW</b>
CBS1250B, CB1250CC, CB1250TC, CBS-1250CP, CBS-1250TP, CBS-1250CPMA, CBS-1250TPMA, CBS-1250SB, CBR-1250CP, CBR-1250TP, CBR-1250CPMA, CBR-1250TPMA, CBR-1250SB, CBER40S-CPMA, CBER40-CPMA, CBER40S-TPMA, CBER40-TPMA, CBER40S-CPMA, CBER40M-CPMA, CBER40MS-TPMA, CBER40M-TPMA, CBER40S-SB, CBER40-SB, CBER40S-CP, CBER40-CP, CBER40S-TP, CBER40-TP, CBER40MS-CP, CBER40M-CP, CBER40MS-TP, CBER40M-TP, CB1250-TPMA, CB1250-CPMA, CB1250-TP, CB1250-CP	<b>CB1250-HDW</b>
CT1250-0, CT1250-1, CT1250-2	<b>CT1250-HDW</b>
CB032MCC, CB032MTC, CB032M-TPMA, CB032M-CPMA, CB032M-TP, CBO32M-CP	<b>CB032M-HDW</b>
CT032M-0, CT032M-1, CT032M-2	<b>CT032M-HDW</b>
MBS0500B, CB1500CC, CB1500TC, MB002-500, MB002-625, MB002-750, MB152-500, MB152-625, MB152-750, CB-2375A, CB-1500B, CB-1500AMA, CB1500-TPMA, CB1500-CPMA, CB1500-TP, CB1500-CP	<b>CB1500-HDW</b>
CT1500-0, CT1500-1, CT1500-2	<b>CT1500-HDW</b>
SQ-1500B	<b>S1500-HDW</b>
CB038MCC, CB038MTC, CB-038MA, CB-038MB, CB038M-TPMA, CB038M-CPMA, CB038M-TP, CB038M-CP	<b>CB038-HDW</b>
CT038M-0, CT038M-1, CT038-2	<b>CT038M-HDW</b>
SQ-2000B	<b>S2000-HDW</b>
CB2000CC, CB2000TC, CB202B, CB2500BMA CSL-202, CB-202A, CB-202B, CB-2500BMA, CB2000-TPMA, CB2000-CPMA, CB050M-TP, CB050M-CP	<b>CB2000-HDW</b>
CT2000-0, CT2000-1, CT2000-2	<b>CT2000-HDW</b>
CB050MCC, CB050MTC, CB-050MA, CB-050MB, CB-064MBMA, CB050M-TPMA, CB050M-TPMA, CB050M-TPMA, CB050M-CPMA, CB050M-TP, CP050M-CP	<b>CB050M-HDW</b>
CT050M-0, CT050M-1, CT050M-2	<b>CT050M-HDW</b>
SQ-3000D, SQ-3000E	<b>S3000-HDW</b>
CB3000CC, CB3000TC, CB203D, CSL-203, CB-203D, CB-3000DMA, CB3000-TPMA, CB3000-CPMA, CB3000-TP, CB3000-CP	<b>CB3000-HDW</b>
CT3000-0, CT3000-1, CT3000-2	<b>CT3000-HDW</b>
CB076MCC, CB076MTC, CB-076MD, CB-076MDMA, CB076M-TPMA, CB076M-CPMA, CBO76M-TP, CB076M-CP	<b>CB076M-HDW</b>
CT076M-0, CT076M-1, CT076M-2	<b>CT076M-HDW</b>
CB204E, CSL-204, CB-204E, CB4000-TP, CB4000-TP, CB4000-TP, CB4000-CP	<b>CB4000-HDW</b>
CB-101ME, CB101M-TP, CB101-CP	<b>CB101M-HDW</b>
CB206F, CB-206F	<b>CB6000-HDW</b>





## Set-up Instructions | Standard Adjusting Boring Heads

### Adjusting Standard Adjusting Boring Heads (see figure B1)

1. Loosen locking screw (6).
2. Turn dial screw (3) to desired graduation.
3. Tighten locking screw (6) to proper torque spec (laser marked on tool).

**IMPORTANT:** Do not loosen the gib screws (5). It can cause poor performance.

**NOTE:** To machine smaller bore diameters, turn dial screw (3) counterclockwise one full rotation to remove any backlash. Once backlash is mitigated, turn dial screw (3) clockwise to desired graduation.

No.	Part
1	Bar holder
2	Boring head body
3	Dial screw
4	Bar holder set screws
5	Gib screws (DO NOT ADJUST)
6	Locking screw

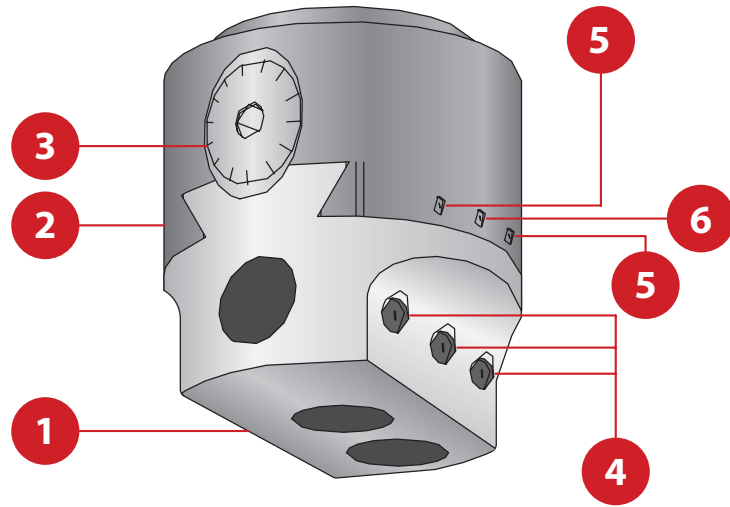
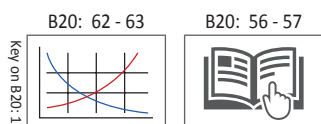


Figure B1



**Set-up Instructions | Micro Adjusting Boring Heads**

**Adjusting Micro Adjusting Setting Boring Heads (see figure B2)**

1. Loosen locking screw (6).
2. Turn dial screw (3) to desired graduation to make macro adjustment.
3. Tighten locking screw (6) to proper torque spec (laser marked on tool).
4. Turn micro adjusting dial screw (4) clockwise to desired graduation to make micro adjustment. Locking of micro adjustment dial screw (4) is not required.

**IMPORTANT:** Do not loosen the gib screws (5). It can cause poor performance.

**NOTE:** To machine smaller bore diameter, turn dial (3) counterclockwise one full rotation to remove any backlash. Once backlash is mitigated, turn dial screw (3) clockwise to desired graduation.

**NOTE:** The micro adjusting dial screws only have a total range of 0.006" (0.152mm) on diameter. To zero, turn dial (4) clockwise until dial screw bottoms out. Turn the dial (4) two complete turns counterclockwise. Turn dial (4) one half turn clockwise. Dial is now centered for 0.003" (0.076mm) positive or negative travel.

No.	Part
1	Insert holder
2	Boring head body
3	Dial screw
4	Micro adjusting dial screw
5	Gib screws (DO NOT ADJUST)
6	Locking screw

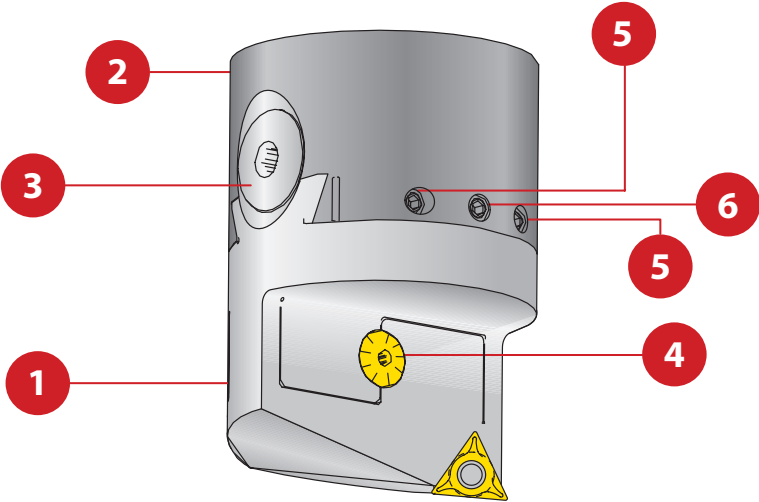
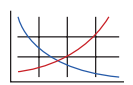



Figure B2

Key on B20-1

B20: 62 - 63



B20: 56 - 57



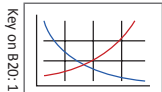
**Technical Information**

A DRILLING  
B BORING  
C REAMING  
D BURNISHING  
E THREADING  
X SPECIALS

Assembly Item Number	Lock Screw	Torque Specs				Insert Torx Screw Driver Size
		Locking Screw Allen Key Size	Dial Adjust Allen Key Size	Micro-Adjusting Dial Allen Key Size	Clamping Screw Allen Key Size	
MBS0500B	1.4 (Nm)	5/64	5/32	-	1/8	-
CBS1250B	0.6 (Nm)	1/16	5/32	-	1/8	-
MDS0625	1.4 (Nm)	9/64	7/64	-	-	T8
MDS0750	1.5 (Nm)	5/32	7/64	-	-	T15
MDS16M	1.4 (Nm)	2.5mm	2.5mm	-	-	T8
MDS20M	1.5 (Nm)	3.0mm	2.5mm	-	-	T15
CB1000CC	0.4 (Nm)	0.050	5/32	3/32	-	T8
CB1000TC	0.4 (Nm)	0.050	5/32	3/32	-	T8
CB1250CC	0.6 (Nm)	1/16	5/32	3/32	-	T8
CB1250TC	0.6 (Nm)	1/16	5/32	3/32	-	T8
CB1500CC	1.4 (Nm)	5/64	5/32	7/64	-	T15
CB1500TC	1.4 (Nm)	5/64	5/32	7/64	-	T15
CB2000CC	2.3 (Nm)	3/32	5/32	7/64	-	T15
CB2000TC	2.3 (Nm)	3/32	5/32	7/64	-	T15
CB3000CC	5.3 (Nm)	1/8	1/4	7/64	-	T15
CB3000TC	5.3 (Nm)	1/8	1/4	7/64	-	T15
CB025MCC	0.4 (Nm)	1.5mm	4.0mm	2.5mm	-	T8
CB025MTC	0.4 (Nm)	1.5mm	4.0mm	2.5mm	-	T8
CB032MCC	0.6 (Nm)	2.0mm	4.0mm	2.5mm	-	T8
CB032MTC	0.6 (Nm)	2.0mm	4.0mm	2.5mm	-	T8
CB038MCC	1.4 (Nm)	2.0mm	4.0mm	3.0mm	-	T15
CB038MTC	1.4 (Nm)	2.0mm	4.0mm	3.0mm	-	T15
CB050MCC	2.3 (Nm)	2.5mm	4.0mm	3.0mm	-	T15
CB050MTC	2.3 (Nm)	2.5mm	4.0mm	3.0mm	-	T15
CB076MCC	5.3 (Nm)	3.0mm	6.0mm	3.0mm	-	T15
CB076MTC	5.3 (Nm)	3.0mm	6.0mm	3.0mm	-	T15
CB2500BMA	2.3 (Nm)	3/32	1/4	7/64	7/32	-
CB202B	2.3 (Nm)	3/32	5/32	-	5/32	-
CB203D	5.3 (Nm)	1/8	1/4	-	7/32	-
CB204E	12.4 (Nm)	5/32	1/4	-	7/32	-
CB206F	12.4 (Nm)	5/32	5/16	-	1/4	-

B20: 62 - 63

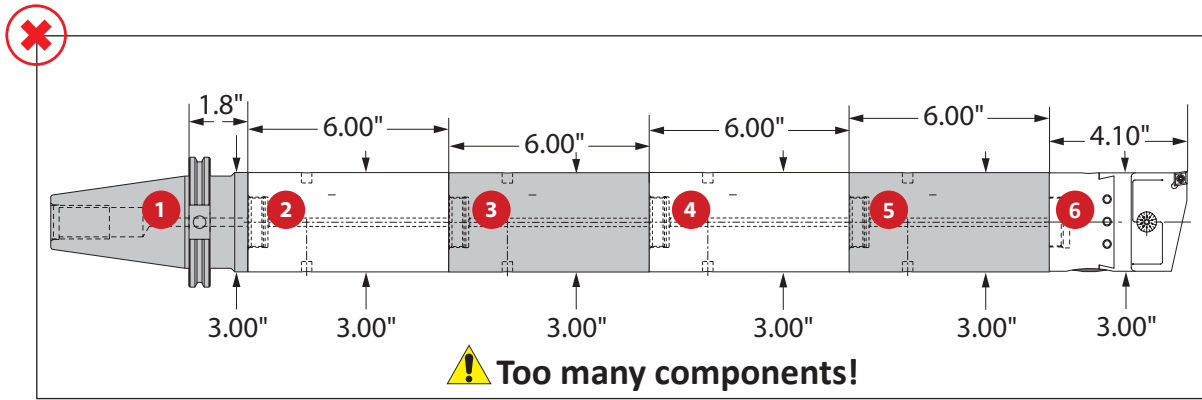
B20: 56 - 57





## Guidelines for not Exceeding Recommended Length to Diameter Ratio

To calculate, see graphics below:



\*Length to diameter ratio is calculated using body diameters, not cutting diameter.

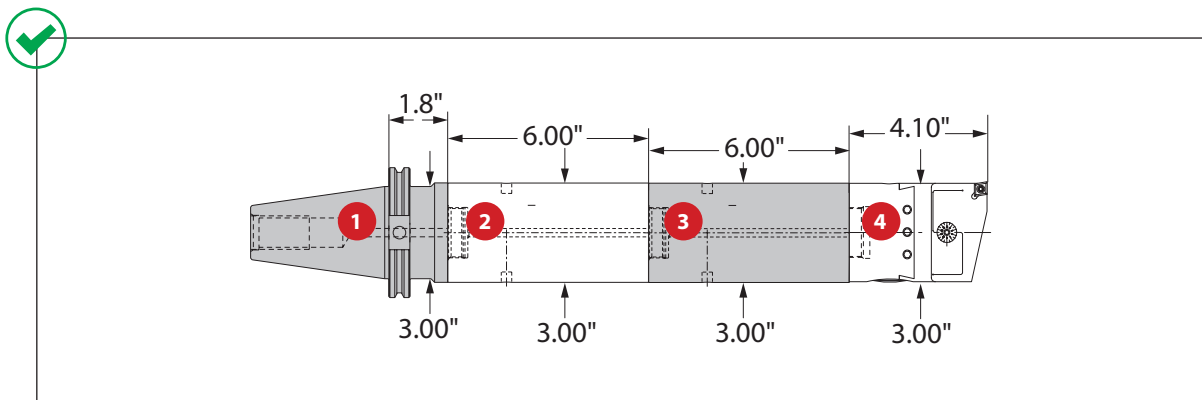
### Step 1: Find L : D by component

- 1  $0.6 = 1.88/3.00$
- 2  $2.0 = 6.00/3.00$
- 3  $2.0 = 6.00/3.00$
- 4  $2.0 = 6.00/3.00$
- 5  $2.0 = 6.00/3.00$
- 6  $1.4 = 4.10/3.00$

### Step 2: Add each L : D Average

	0.6
	2.0
	2.0
	2.0
	2.0
	+ 1.4
	<b>10.0 = L : D ratio</b>

**⚠ Too Long!**



\*Length to diameter ratio is calculated using body diameters, not cutting diameter.

### Step 1: Find L : D by component

- 1  $0.6 = 1.88/3.00$
- 2  $2.0 = 6.00/3.00$
- 3  $2.0 = 6.00/3.00$
- 4  $1.4 = 4.10/3.00$

### Step 2: Add each L : D Average

	0.6
	2.0
	2.0
	+ 1.4
	<b>6.0 = L : D ratio</b>

**✓**

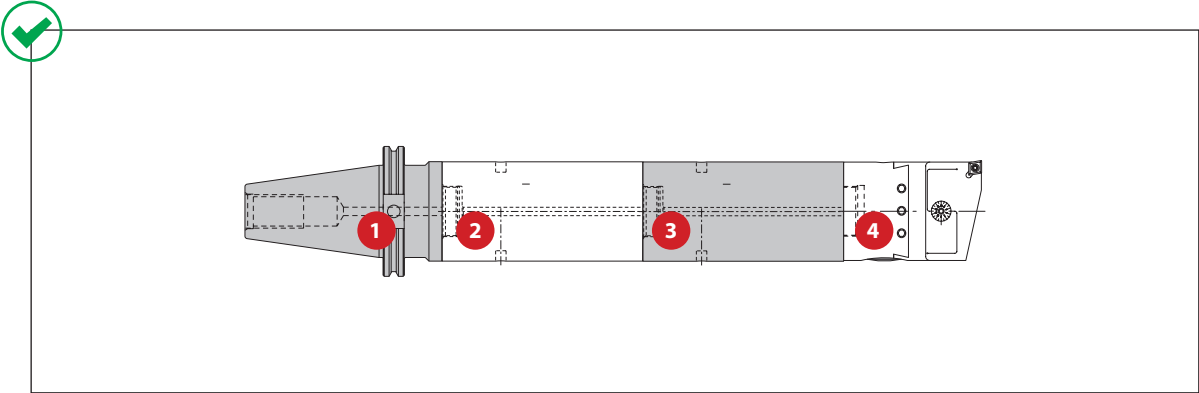
**⚠ WARNING** Tool failure can cause serious injury. To prevent:

-Do not exceed recommended 9xD length to diameter ratio or exceed 4 total components (including shank)  
 Factory technical assistance is available for your specific applications through our Application Engineering department.



### Calculating Tool Assembly Weight

To calculate, see graphics below:



**Step 1: Find weight for each component**

**Example:**

Boring Range	Thread Connection	4 Boring Head		Weight	Insert Form	Order Number
		L <sub>1</sub>	D <sub>2</sub>			
1.050 - 1.320	¾ - 20	2.690	1.000	0.50 (lbs)	CC..215...	CB1000CC
1.050 - 1.320	¾ - 20	2.690	1.000	0.50 (lbs)	TC..215...	CB1000TC
1.300 - 1.600	¾ - 20	2.900	1.250	0.80 (lbs)	CC..215...	CB1250CC
1.300 - 1.600	¾ - 20	2.900	1.250	0.80 (lbs)	TC..215...	CB1250TC
1.585 - 2.700	¾ - 20	3.200	1.500	1.30 (lbs)	CC..325...	CB1500CC
1.585 - 2.700	¾ - 20	3.200	1.500	1.30 (lbs)	TC..325...	CB1500TC
2.060 - 3.320	¾ - 20	3.590	2.000	2.40 (lbs)	CC..325...	CB2000CC
2.060 - 3.320	¾ - 20	3.590	2.000	2.40 (lbs)	TC..325...	CB2000TC
3.065 - 5.065	1½ - 18	4.100	3.000	5.80 (lbs)	CC..325...	CB3000CC
3.065 - 5.065	1½ - 18	4.100	3.000	5.80 (lbs)	TC..325...	CB3000TC
27.00 - 33.00	¾ - 20	68.35	25	0.23 (kg)	CC..0602...	CB025MCC
27.00 - 33.00	¾ - 20	68.35	25	0.23 (kg)	TC..1102...	CB025MTC
33.00 - 41.00	¾ - 20	73.65	32	0.36 (kg)	CC..0602...	CB032MCC
33.00 - 41.00	¾ - 20	73.65	32	0.36 (kg)	TC..1102...	CB032MTC
41.00 - 68.00	¾ - 20	81.25	38	0.59 (kg)	CC..09T3...	CB038MCC
41.00 - 68.00	¾ - 20	81.25	38	0.59 (kg)	TC..16T3...	CB038MTC
53.00 - 84.00	¾ - 20	91.30	50	1.09 (kg)	CC..09T3...	CB050MCC
53.00 - 84.00	¾ - 20	91.30	50	1.09 (kg)	TC..16T3...	CB050MTC
78.00 - 128.00	1½ - 18	104.25	76	2.36 (kg)	CC..09T3...	CB076MCC
78.00 - 128.00	1½ - 18	104.25	76	2.36 (kg)	TC..16T3...	CB076MTC

Imperial (in) = 0.00005" adjustment on diameter  
 Metric (mm) = 0.001mm adjustment on diameter

**Step 2: Calculate total assembly weight**

$$\begin{array}{r}
 1 \quad 8.03 \text{ lbs} \\
 2 \quad 11.5 \text{ lbs} \\
 3 \quad 11.5 \text{ lbs} \\
 + 4 \quad 5.80 \text{ lbs} \\
 \hline
 36.8 \text{ lbs}
 \end{array}$$

**Step 3: Consult machine tool builder to ensure tool assembly weight does not exceed machine capabilities.**

**⚠ 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.

## Recommended Cutting Data | Imperial (inch)

ISO	Material	(BHN) Hardness	Grade	*Speed SFM	Recommended Feed (inch / tooth) Nose Radius			
					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	300 - 525	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	300 - 525	0.001 - 0.002	0.002 - 0.004	0.003 - 0.004	0.004 - 0.006
H	Wear Plate	400 - 600	Carbide	100 - 200	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
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 - 1000	0.001 - 0.002	0.002 - 0.004	0.003 - 0.005	0.005 - 0.008
N	Cast Aluminum	30 - 180	Carbide	850 - 1000	0.001 - 0.002	0.002 - 0.004	0.003 - 0.005	0.005 - 0.008
	Wrought Aluminum	30 - 180	Carbide	675 - 1000	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 - 1000	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

### Deep Hole Boring Speed Adjustment

⚠ For Dynamic Boring Tool Length			
Boring Type	7xD	8xD	9xD
Finishing	0.70	0.50	0.30

### Recommended Speed Example

If the recommended speed for a finish boring assembly under 5xD is 400 SFM, then the speed for an 8xD finish boring assembly in the same application would be 200 SFM. (400 SFM x 0.50 = 200 SFM)

5xD = 400 SFM

8xD = 200 SFM

**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.

### ⚠ WARNING Tool failure can cause serious injury. To prevent:

- Do not exceed recommended 9xD length to diameter ratio or exceed 4 total components (including shank)
  - Refer to example on page B20: 60 for calculating length to diameter ratio
- Factory technical assistance is available for your specific applications through our Application Engineering department.

## Recommended Cutting Data | Metric (mm)

ISO	Material	(BHN) Hardness	Grade	*Speed M/min	Recommended Feed (mm / tooth)			
					Nose Radius			
					0.1mm	0.2mm	0.4mm	0.8mm
P	Free Machining Steel 1118, 1215, 12L14, etc.	100 - 250	Carbide	160 - 300	0.02 - 0.07	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	0.07 - 0.13	0.13 - 0.20
	Medium Carbon Steel 1030, 1040, 1050, 1527, 1140, 1151, etc.	125 - 325	Carbide	145 - 250	0.02 - 0.05	0.05 - 0.10	0.07 - 0.13	0.13 - 0.20
	Alloy Steel 4140, 5140, 8640, etc.	125 - 375	Carbide	120 - 210	0.02 - 0.05	0.05 - 0.10	0.07 - 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	0.07 - 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	0.07 - 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 - 0.07	0.07 - 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 - 0.07	0.07 - 0.13	0.10 - 0.15
	Titanium Alloy	140 - 310	Carbide	40 - 90	0.02 - 0.05	0.05 - 0.07	0.07 - 0.13	0.10 - 0.15
	Aerospace Alloy S82	185 - 350	Carbide	40 - 90	0.02 - 0.05	0.05 - 0.07	0.07 - 0.13	0.10 - 0.15
M	Stainless Steel 400 Series	185 - 350	Carbide	90 - 160	0.02 - 0.05	0.05 - 0.10	0.07 - 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	0.07 - 0.10	0.10 - 0.15
	Super Duplex Stainless Steel	135 - 275	Carbide	90 - 160	0.02 - 0.05	0.05 - 0.10	0.07 - 0.10	0.10 - 0.15
H	Wear Plate	400 - 600	Carbide	30 - 60	0.02 - 0.05	0.05 - 0.07	0.07 - 0.10	0.10 - 0.15
	Hardened Steel	300 - 500	Carbide	40 - 80	0.02 - 0.05	0.05 - 0.07	0.07 - 0.10	0.10 - 0.15
K	SG / Nodular Cast Iron	120 - 320	Carbide	145 - 260	0.02 - 0.05	0.05 - 0.10	0.07 - 0.13	0.13 - 0.20
	Grey / White Iron	180 - 320	Carbide	180 - 306	0.02 - 0.05	0.05 - 0.10	0.07 - 0.13	0.13 - 0.20
N	Cast Aluminum	30 - 180	Carbide	260 - 306	0.02 - 0.05	0.05 - 0.10	0.07 - 0.13	0.13 - 0.20
	Wrought Aluminum	30 - 180	Carbide	205 - 305	0.02 - 0.07	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 - 305	0.02 - 0.05	0.05 - 0.10	0.07 - 0.13	0.13 - 0.20
	Copper	60	Carbide	100 - 180	0.02 - 0.05	0.05 - 0.07	0.07 - 0.10	0.10 - 0.13

\*Not to exceed max recommended RPM for boring head

### Deep Hole Boring Speed Adjustment

⚠ For Dynamic Boring Tool Length			
Boring Type	7xD	8xD	9xD
Finishing	0.70	0.50	0.30

### Recommended Speed Example

If the recommended speed for a finish boring assembly under 5xD is 260 M/min, then the speed for an 8xD finish boring assembly in the same application would be 260 M/min. (260 M/min x 0.50 = 130 M/min)	
5xD = 260 M/min	8xD = 130 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.

### ⚠ WARNING Tool failure can cause serious injury. To prevent:

- Do not exceed recommended 9xD length to diameter ratio or exceed 4 total components (including shank)
- Refer to example on page B20: 60 for calculating length to diameter ratio

Factory technical assistance is available for your specific applications through our Application Engineering department.



## Notes

A

DRILLING

B

BORING

C

REAMING

D

BURNISHING

F

THREADING

X

SPECIALS

Large grid area for taking notes, spanning the width of the page and most of its height.



# S.C.A.M.I.<sup>®</sup>

## ROLLER BURNISHING

When your mirror finish still isn't shiny enough, follow your Criterion<sup>®</sup> boring tool with a S.C.A.M.I. roller burnisher. Contact your local Allied Machine & Engineering representative for more details.

**S.C.A.M.I.<sup>®</sup>**

**ALLIED MACHINE  
& ENGINEERING**



# Guaranteed Test / Demo Application Form

Distributor PO #	
------------------	--

The following must be filled out completely before your test will be considered

## 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

Finish Bore Diameter: _____ in/mm	Tolerance: _____	Material: _____ (4150 / A36 / Cast Iron / etc.)
Pre-existing Diameter: _____ in/mm	Depth of Bore: _____ in/mm	Hardness: _____ (BHN / Rc)
		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		
	Using Canned Boring Cycle	Thrust: _____ lbs/N
	<input type="checkbox"/> Yes	
	<input type="checkbox"/> No	

## 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



**ALLIED MACHINE & ENGINEERING**

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Complete information as to operating conditions, machine, setup, and the application of cutting fluid should accompany any product returned for inspection. This warranty shall not apply to any Allied Machine products which have been subjected to misuse, abuse, improper operating conditions, improper machine setup or improper application of cutting fluid or which have been repaired or altered if such repair or alteration, in the judgement of Allied Machine, would adversely affect the performance of the product.

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