



# ALLIED MACHINE & ENGINEERING

Holemaking Solutions for Today's Manufacturing



Drilling



Reaming



Burnishing



Threading



Specials



## Wohlhaupter™

► *BORING*

MultiBore® System Tools

**WOHLHAUPTER®**

It's so much easier when you make  
**BETTER CHIPS**

Allied Machine specializes in developing innovative solutions designed to *pulverize* material. Our tools achieve the chip formation and chip evacuation you need to increase your production.



Allied Machine & Engineering  
Registered to ISO 9001  
10001329





## Our Commitment to **YOU**



Manufacturing is the DNA of success everywhere in the world. When you're manufacturing, you're building, creating, and developing something that physically didn't exist before.

At Allied Machine, our core purpose is to provide practical and dependable solutions to improve your manufacturing processes. We know you face challenges and difficulties every day, so we're here to simplify your holmaking processes and improve your production.

However, many factors must be incorporated to truly improve production.

Some of those factors include increasing penetration rates while also improving chip formation and evacuation, reducing scrap rates by producing better parts, reducing setup times, and increasing tool life to get the most from your investment.

Not only does our tooling achieve these results, but our customer service is also an extension of our tooling advantages. Our Application Engineers and Field Sales Engineers are available to assist with any problems you encounter. Don't hesitate to put their skills and knowledge to the test. They won't disappoint.

This is our commitment to manufacturing, and it's our promise to you.



**ALLIED MACHINE**  
**& ENGINEERING**

## 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)





**Wohlhaupter™ Product**  
**CATALOG**

# Flipbooks and Digital PDF Downloads

## Every Section Available Online



**AMPC\***  
Allied Master Product Catalog



**Section A10**  
ASC 320®



**Section A20 (AMPC-A2\*)**  
GEN3SYS® XT and XT Pro



**Section A30**  
Original T-A® and GEN2 T-A®



**Section A40 (AMPC-A4\*)**  
High Performance / Universal



**Section A50**  
APX™ Drill



**Section A55\***  
4TEX® Drill



**Section A60**  
Revolution Drill®



**Section A70**  
Opening Drill®



**Section A91**  
Structural Steel Solutions



**Section A92**  
AccuPort 432®



**Section A93**  
BT-A Drill



**Section B10**  
Wohlhauper™ Product Overview



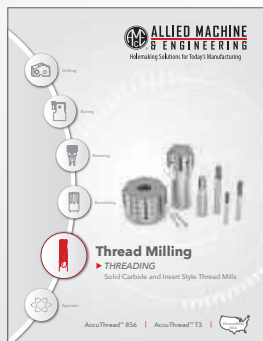
**Section B20\***  
Criterion® Modular Boring



**Section C**  
Reaming



**Section D (AMPC-D\*)**  
Burnishing



**Section E**  
Threading



**Section X**  
Special Tooling Solutions



**EcoCut (EC\*)**  
Multifunction Tooling



**AccuThread™ T3 (E-AT3\*)**  
3-Tooth Style Thread Mills

View, download, and share individual product line sections at  
[www.alliedmachine.com/Support/Literature](http://www.alliedmachine.com/Support/Literature)

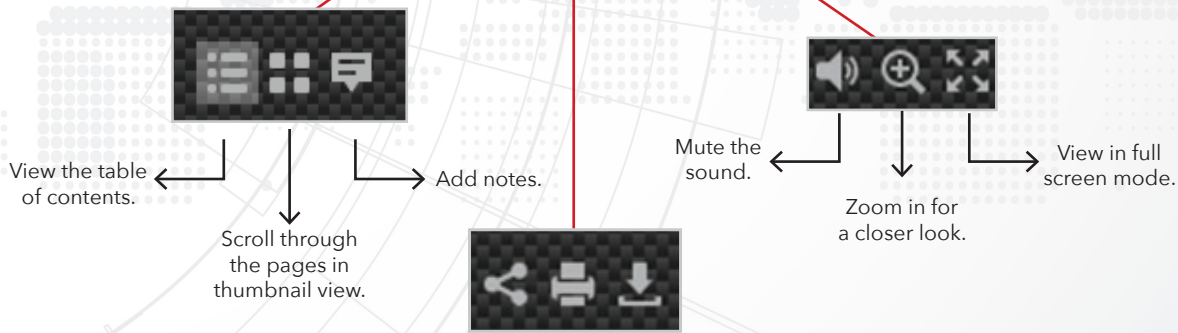
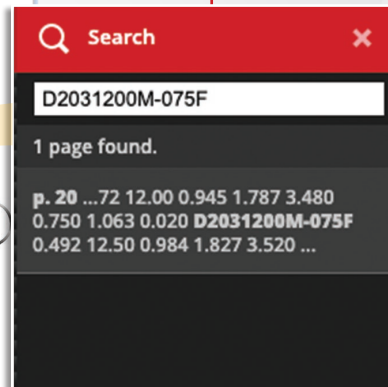
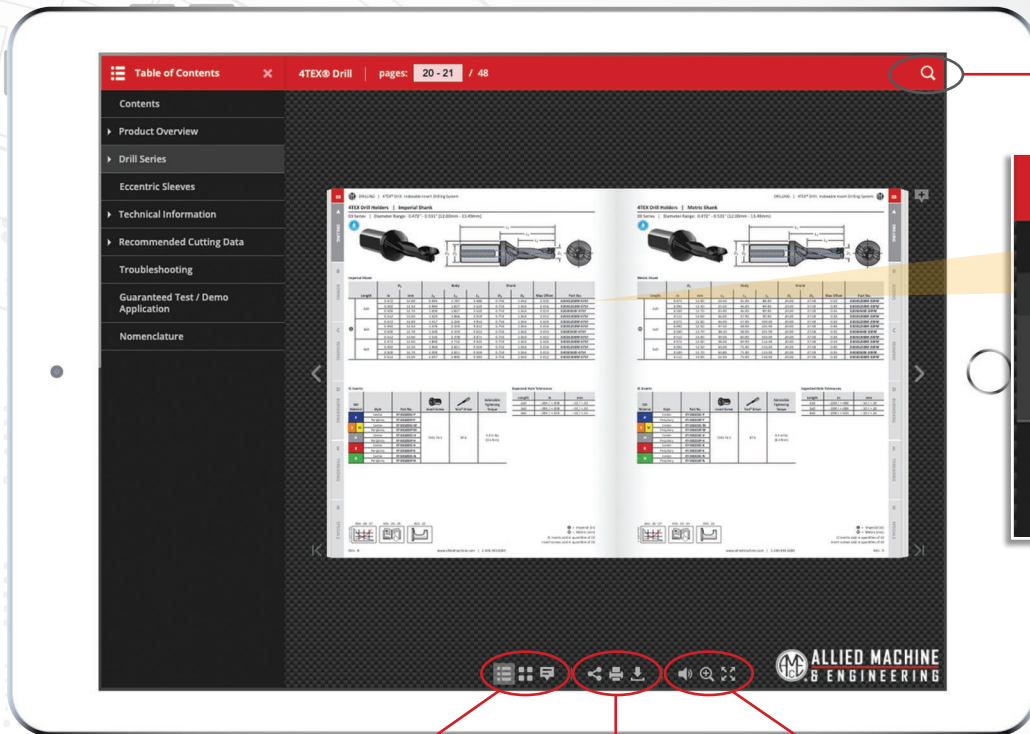
\*Also available in print





# Find what you need. Now.

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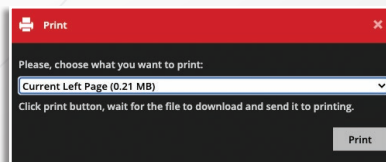
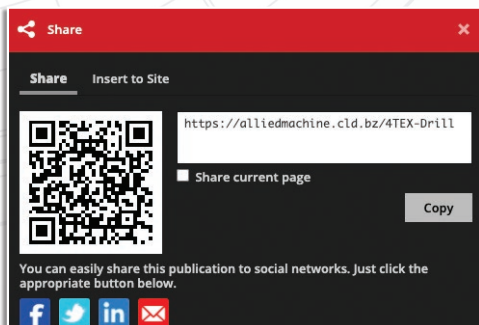


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# Allied Machine & Engineering

## The Foundation

Since 1941, Allied Machine & Engineering has provided dependable and practical holmaking 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: holmaking.

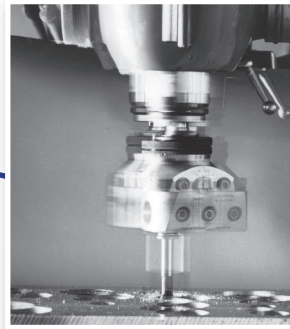


## The T-A®

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 holmaking industry, launching Allied Machine ahead of the competition. Since then, numerous innovations and advancements have been created from the T-A's inspiration.



# Wohlhaupter™



## The Foundation

On October 1, 1929, Emil Wohlhaupter founded a small mechanical workshop in Stuttgart-Feuerbach, Germany, reconditioning cutting and stamping tools by hand. A few years later, the company was subcontracted to carry out small-scale batch productions.

## The UPA Beginning

In 1936, the first model of the Universal Facing and Boring head was developed. One year later, it was shown at the Leipzig Trade Fair. The UPA became known around the world along with Wohlhaupter's name. The Universal Facing and Boring head can be used on different machines for individual and batch productions. Since then, numerous boring innovations and advancements have been created.

## The MultiBore® System

Wohlhaupter developed the world's first modular boring system in 1973 called MultiBore. MultiBore was created with a system of modular components that is compatible with every machine spindle.



## The Innovation

Since the development of the T-A<sup>®</sup>, 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.



## Today

In 2016, Allied Machine & Engineering joined forces with Wohlhaupter to create a globally sought after specialist for the entire holemaking process. 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.



**Steve Stokey**  
Executive Vice President  
Allied Machine & Engineering

**Frank-M. Wohlhaupter**  
Managing Director  
Wohlhaupter GmbH

**Paul Crawford**  
Managing Director  
Allied Machine & Engineering  
(Europe) Ltd.

**William H. Stokey**  
President and CEO

**Mike Stokey**  
Executive Vice President  
Allied Machine & Engineering



**ALLIED MACHINE  
& ENGINEERING**

Holemaking Solutions for Today's Manufacturing

**WOHLHAUPTER**



**SUPERION**

**CRITERION**

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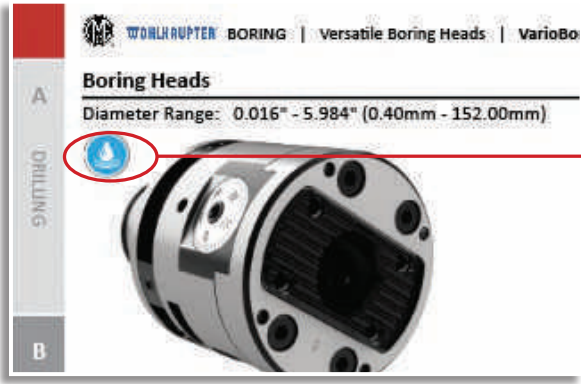
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Visit [www.alliedmachine.com/Support/Literature](http://www.alliedmachine.com/Support/Literature) to access the complete Allied Machine & Engineering product catalogs.

**For a Guaranteed Test/Demo Application, see the last page of this book.**



## Icon Reference Guide



### Navigate with ease.

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

#### Tool Options



Coolant Through

### Safety Information

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



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

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

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

 **WARNING**

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

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

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

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

### Patent Information

Allied Machine & Engineering and Wohlhaupter patent information can be found at [www.alliedmachine.com/patents](http://www.alliedmachine.com/patents)



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## Product Offering Overview

### Replaceable Insert Drills

- Reduce costs by decreasing setup 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
  - T-A® | T-A® GEN2
  - 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

- Drill large diameter holes and maximize penetration rates even on low horsepower machines
- Delivers strength and versatility needed for any deep hole drilling application
- 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:
  - T-A® | T-A® GEN2
  - 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 setup times
- Available in four 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

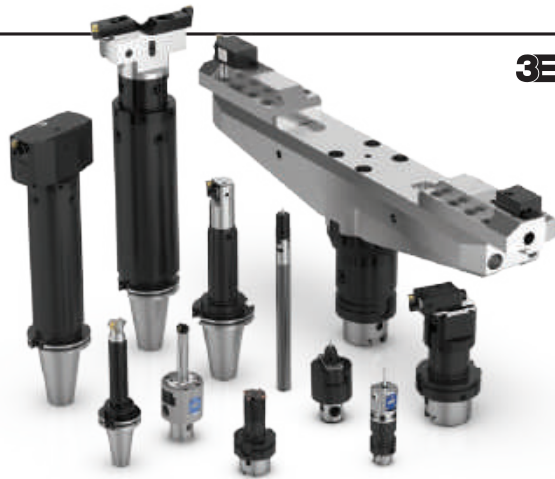


Product Offering Overview

**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



**3ETECH**



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



**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 reconditioning
- 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







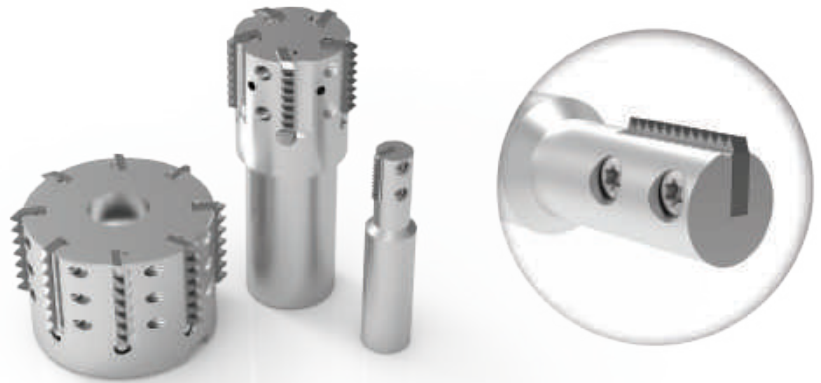
### Solid Carbide Thread Mills

- 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™



### Indexable Insert Thread Mills

- Three 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®



## Customer Support

### Support You Can Count On

Allied Machine has many lines of support to ensure we're available to assist you at all times. It's important to establish relationships with new customers, but we also know it's equally important to strengthen and support relationships with existing customers. Whether you need help with an order or you need someone to come assist you at the spindle, we have the right people to get you what you need.

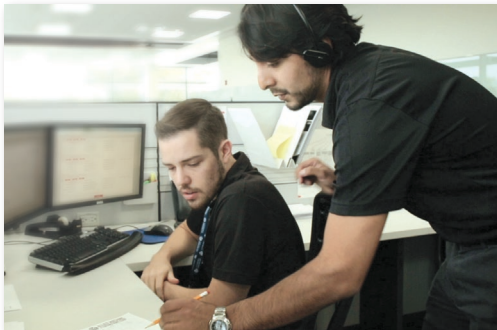


1

#### Inside Sales Support

Our inside sales team is trained to handle your account information and general inquiries. We are happy to assist you and find the answers to your questions.

- ☎ 1.330.343.4283 ext. 8610
- ☎ 1.800.321.5537 (toll free United States and Canada)
- ✉ insidesales@alliedmachine.com



2

#### Engineering Support

Our highly trained and skilled Application Engineers are here to assist you. If you are experiencing technical difficulties, our engineers will recommend the best solutions to the problem. Speeds and feeds, coolant pressure, and other machining components all affect the performance of our tooling. Our AEs are experienced in working with difficult materials in many different environments. Give us a call and put our knowledge to the test.

- ☎ 1.330.343.4283 ext. 7611
- ☎ 1.800.321.5537 (toll free United States and Canada)
- ✉ appeng@alliedmachine.com

3

#### Field Support

Allied Machine provides local engineering support all over the world. Our Field Sales Engineers (FSEs) spend months training in-house before going to the field. This support line allows us to provide assistance to our customers right at the spindle. They are available to visit your facility, run demos and tests, and work hand-in-hand with machine operators and engineers to find the best possible tooling solutions.

NOTE: If you do not know your local FSE, please contact us

- ☎ 1.330.343.4283
- ☎ 1.800.321.5537 (toll free United States and Canada)
- ✉ info@alliedmachine.com

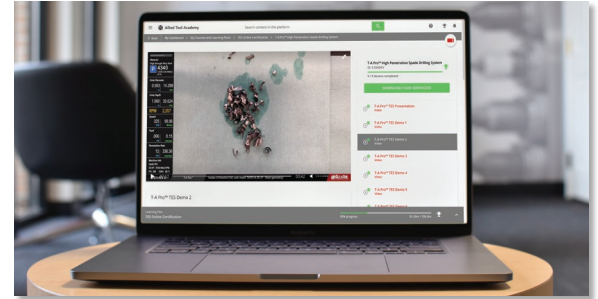




**Online Training**

Get *all* the tooling training of our 3-day in-person Technical Education Seminar (TES) through the online **Allied Tool Academy** training platform. Level up your tooling IQ through a series of product overviews, demos, and short quizzes.

- Online TES Certification as well as other training modules
- On demand
- On YOUR schedule



Register online today:  
[www.alliedtoolacademy.com](http://www.alliedtoolacademy.com)



Register online today:  
[www.alliedmachine.com/live](http://www.alliedmachine.com/live)

**Allied LIVE (Broadcasting)**

Join us for **LIVE broadcast** training events where you will have the ability to learn about our tooling, watch live demos, and ask our trainers questions.

- Online
- Quick brief presentation provides basic knowledge of our products
- Watch live demos of tools at the spindle at different speeds and feeds

**On-site Technical Education Seminar (TES)**

Allied Machine's **Technical Education Seminar (TES)** puts the attendees in front of the machines. When you attend our three day TES program, you'll gain first-hand experience in *real-life* application situations. Test and experiment with different speeds and feeds, observe the results, and discover the best solution.

- Training Lab: In-depth training at the spindle allows you to choose speeds and feeds
- Learning Lab: Quick, brief sessions provide basic knowledge of our products
- Facility Tours: Take guided tours of our two manufacturing facilities located in Dover, Ohio



 Register online today:  
[www.alliedmachine.com/TES](http://www.alliedmachine.com/TES)



**Allied Machine  
Training Facility**  
485 West 3rd Street  
Dover, OH 44622



Increase the production and success of your applications today.

- 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

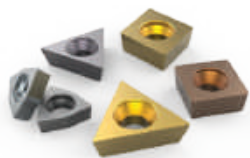
[toolmd.com](http://toolmd.com)

## WOHLHAUPTER®

### Boring Insert Selector

Find the best insert for your application.

- Generate the correct boring insert for your job in just six easy steps
- Choose type, shape, substrate, insert form, nose radius, and material
- Order easily by adding the item to your cart



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

## Product Selector

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

- Follow guided steps to generate the right tool for your application
- Learn about your recommended tool and how to maximize its performance



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

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# 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



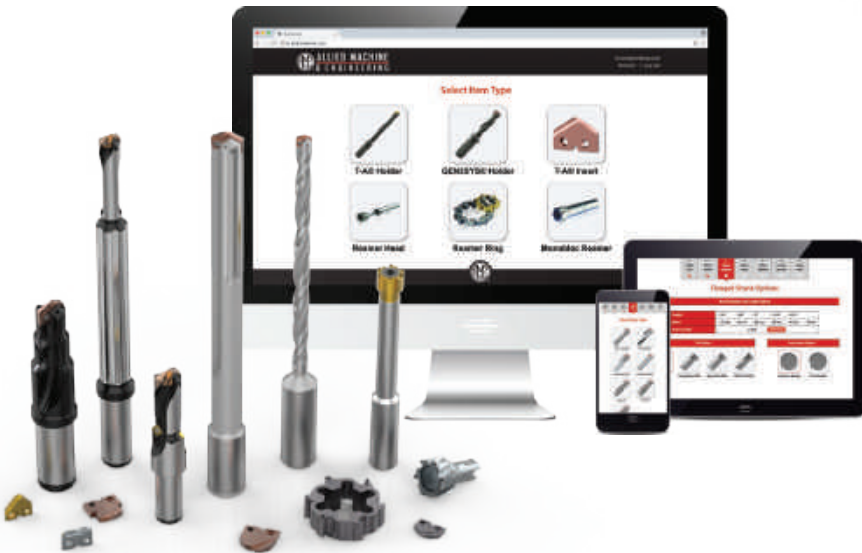
Insta-Code also has a **Cycle Time Calculator**

[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
- Generate the solution you need in just a few steps
- 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
- Locate distributors
- Stay up to date on news and events



## Machinist Tool App

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

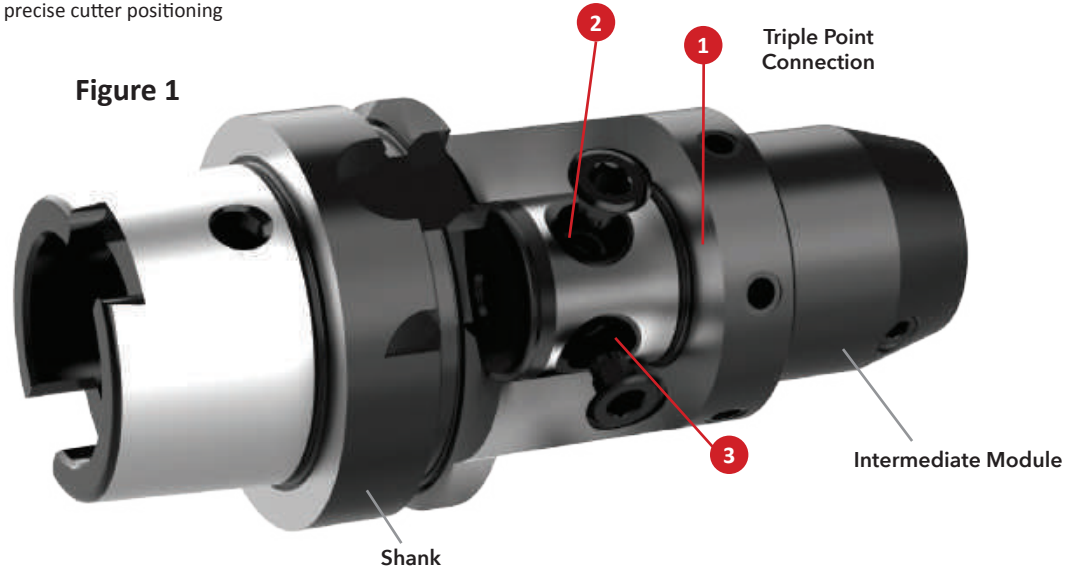
- Input data to calculate the RPM and speed and feed rates
- Also features the Boring Insert Selector
- Access product literature right at your fingertips



## The MVS Connection

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

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



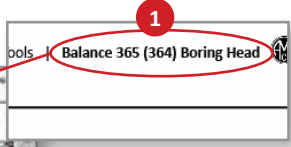
### MVS Connection Color Guide

Wohlhaupter™ created a unique color-coding system to find the right connections for different tool components quickly and easily. Each Wohlhaupter / MVS connection size has its own color-coding. Simply match the colors to select the correct combination of tool components (Figure 2). We've also incorporated the color-coding system into our packaging to reduce setup time even more.



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



### Example Machining Parameters

Hole Diameter: 1.968" (50.00mm)  
 Hole Depth: 3.149" (80.00mm)  
 Machine Spindle: HSK-A 63 DIN 69893

- 1 **Select your boring tool**  
 Example: 364 Balance Boring Head
- 2 **Select the tool that meets the required boring range**  
 MVS connection: 32 - 18  
 A = 1.496" - 1.988" (38.00mm - 50.50mm)  
 Part No. : 364033

MVS Connection	Boring Range	Part No.
19 - 11	20.00 - 24.50	364077 364030
22 - 11	24.50 - 29.50	210059 364031
22 - 11	24.50 - 29.50	210069 364031
25 - 14	29.00 - 38.50	210059 364032
25 - 14	29.00 - 38.50	210069 364032
32 - 18	38.00 - 50.50	264051 364033
32 - 18	38.00 - 50.50	264077 364033
40 - 22	50.00 - 65.50	210052 364034
40 - 22	50.00 - 65.50	210062 364034



- 3 **Select the master shank that fits your spindle**  
 Machine spindle: DIN 69893 HSK
- 4 **Choose the connection that fits your application**  
 MVS connection: 50 - 28  
 Part No. : 245012



Taper Size	Conn. 1	Connection	Part No.
40	40	40 - 22	246016
40	50	30 - 28	246014
50	40	40 - 22	246015
50	50	50 - 28	245011
60	25	25 - 14	246013
60	32	32 - 18	246013
60	40	40 - 22	246014
68	50	50 - 28	245012
68	63	63 - 36	245013
68	80	80 - 29	240009
68	F	FR. AD	252000*

- 5 **Select the correct intermediate module**  
 Must meet the hole depth requirements and MVS connections for both the boring head and shank  
 Hole depth: 3.149" (80.00mm)  
 Boring tool 364033 length (X<sub>1</sub>): 2.598" (66mm)  
 Min. required length of adapter: 0.551" (14mm)  
 Boring tool 364033 MVS connection: 32 - 18  
 Master shank 245012 MVS connection: 50 - 28  
 Adapter Part No.: 219032

MVS Connection	Part No.
40 - 22	219038
40 - 22	219039
40 - 22	219040
50 - 28	219051
50 - 28	219041
50 - 28	219052
50 - 28	119094
50 - 28	119054
50 - 28	119055
50 - 28	119010
50 - 28	219030*
50 - 28	219085
50 - 28	219086
50 - 28	219012
50 - 28	219032
50 - 28	219037
50 - 28	219088
50 - 28	119058



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SECTION

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# B10-A

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Versatile Boring Heads

# Wohlhaupter™ Versatile Boring Heads

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

► Diameter Range: 0.016" - 8.188" (0.40mm - 208.00mm)



## WOHLHAUPTER®

Precision boring at its finest.

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

### Applicable Industries



Aerospace



Agriculture



Automotive



Firearms



General  
Machining



Oil & Gas



Renewable  
Energy

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



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

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

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

**WARNING** (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.

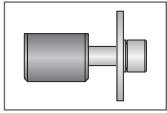
**NOTE** and **IMPORTANT** are also used. These are important that you read and follow but are not safety-related.

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



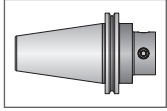
### Reference Icons

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



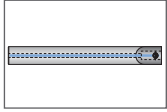
#### Clamping Elements

For use with insert holders and boring heads



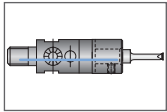
#### Shanks

A variety of shanks for different machines



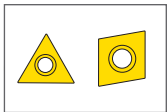
#### 249 (248) Shanks

A variety of shanks for different machines



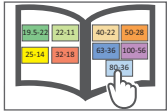
#### 249 (248) Boring Head

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



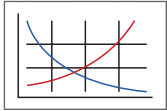
#### Inserts

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



#### MVS Connection Color Guide

Detailed instructions and information regarding the MVS connection(s)



#### Recommended Cutting Data

Speed and feed recommendations for optimum and safe boring

## Versatile Boring Head Contents

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Series	Diameter Range	
	Imperial (inch)	Metric (mm)
VarioBore 563 (536)	0.016 - 5.984	0.40 - 152.00
249 (248) Boring Head	0.118 - 1.188	3.00 - 30.20
PrimeBore 451 (450)	0.118 - 8.189	3.00 - 208.00
Digital 511 (510)	0.016 - 0.472	0.40 - 12.00
DigiBore 504 (501)	0.118 - 8.189	3.00 - 208.00

# VarioBore Product Overview

## VarioBore with 3E<sup>TECH</sup> VERSATILE BORING

### Need more versatility?

The Wohlhaupter™ VarioBore head offers precision and versatility, and the 3E<sup>TECH</sup> docking port provides convenient and simple diameter adjustments. Turn your vernier VarioBore tools into easy-to-read digital boring tools with the 3E<sup>TECH</sup> external digital module.

Experience *precision boring* for yourself.

- Diameter range: 0.016" - 5.984" (0.40mm - 152.00mm)
- Offers outside turning capabilities: 0.157" - 4.488" (4.00mm - 114.00mm)
- Ease the stress of working on different day-to-day projects with boring kits
- 3E<sup>TECH</sup> module provides a simple digital readout
- Max spindle speed: 27,500 RPM



**NOTE:** Imperial item pictured

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

**IMPORTANT:** Max spindle speed refers to maximum possible speed for an individual boring head and is not a recommended parameter. Refer to page B10-N: 10 for recommended application-specific parameters. Factory technical assistance is available for your specific applications through our Application Engineering department.  
ext: 7611 | email: [appeng@alliedmachine.com](mailto:appeng@alliedmachine.com)





3E TECH  
Universal Digital  
Module



VarioBore Head

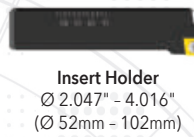
NOTE: Imperial item pictured  
NOTE: Adjustment accuracy of  
0.0001" or 0.002mm on diameter

# VARIO BORE

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



Coolant  
Delivery  
System



Insert Holder  
Ø 2.047" - 4.016"  
(Ø 52mm - 102mm)



Outside Turning  
Ø 0.157" - 2.598"  
(Ø 4mm - 66mm)



Serrated Tool Body



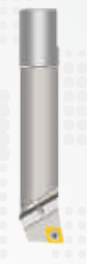
Serrated Tool  
Body



Carbide Boring Bar  
Ø 0.394" - 0.787"  
(Ø 10mm - 20mm)



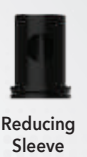
Heavy Metal  
Boring Bar  
Ø 0.236" - 0.394"  
(Ø 6mm - 10mm)



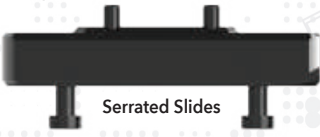
Steel Boring  
Bar  
Ø 0.236" - 1.063"  
(Ø 6mm - 27mm)



Adapter



Reducing  
Sleeve



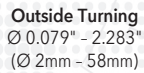
Serrated Slides



Counter  
Weight



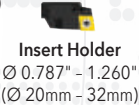
Insert Holder  
Ø 2.677" - 5.984"  
(Ø 68mm - 152mm)



Outside Turning  
Ø 0.079" - 2.283"  
(Ø 2mm - 58mm)



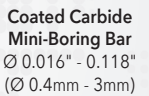
Insert Holder  
Ø 1.142" - 2.087"  
(Ø 29mm - 53mm)



Insert Holder  
Ø 0.787" - 1.260"  
(Ø 20mm - 32mm)



Mini-Boring Bar  
Ø 0.118" - 0.394"  
(Ø 3mm - 10mm)



Coated Carbide  
Mini-Boring Bar  
Ø 0.016" - 0.118"  
(Ø 0.4mm - 3mm)

## OPERATION **VERSATILITY**

from **0.016"** to **5.984"** (0.4mm to 152mm)  
*plus outside turning*



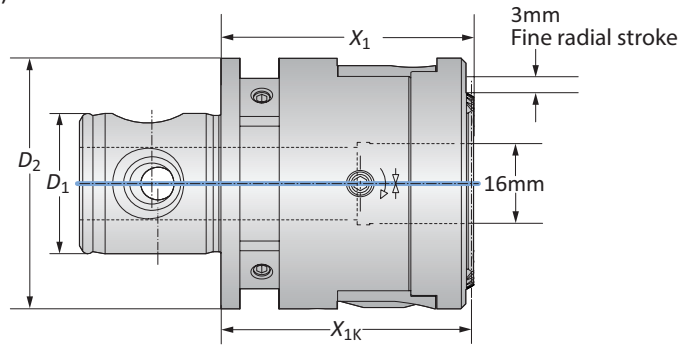
NOTE: Imperial item pictured  
NOTE: Adjustment  
accuracy of 0.0001" or  
0.002mm on diameter





## Boring Heads

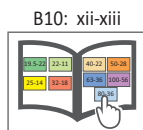
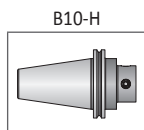
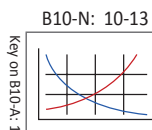
Diameter Range: 0.016" - 5.984" (0.40mm - 152.00mm)



### VarioBore Boring Heads

	MVS Connection		Boring Head		Weight	Part No.
	$D_2   D_1$	Boring Range	$X_1$	$X_{1K}$		
<b>i</b>	50 - 28	0.016 - 5.984	1.968	1.948	1.543 (lbs)	<b>563001</b>
<b>m</b>	50 - 28	0.40 - 152.00	50.00	49.50	0.70 (kg)	<b>536001</b>

**NOTE:** VarioBore heads are compatible with Kaiser® connection

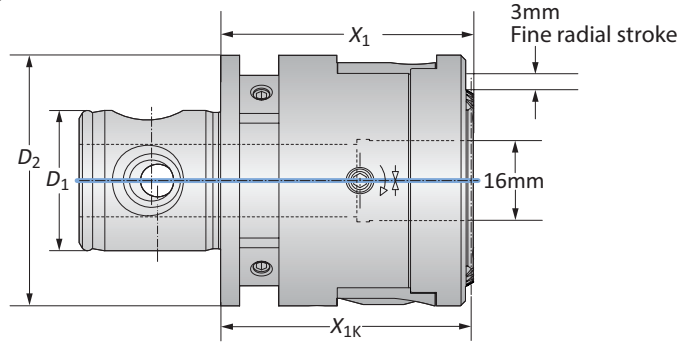


**i** = Imperial (in)  
**m** = Metric (mm)

**IMPORTANT:** Max spindle speed refers to maximum possible speed for an individual boring head and is not a recommended parameter. Refer to page B10-N: 10 for recommended application-specific parameters. Factory technical assistance is available for your specific applications through our Application Engineering department.  
ext: 7611 | email: [appeng@alliedmachine.com](mailto:appeng@alliedmachine.com)

## Boring Heads with 3E<sup>TECH</sup>

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



### VarioBore Boring Head

MVS Connection		Boring Head				
	$D_2$   $D_1$	Boring Range	$X_1$	$X_{1K}$	Weight	Part No.
<b>i</b>	50 - 28	0.016 - 5.984	1.968	1.948	1.543 (lbs)	<b>563002</b>
<b>m</b>	50 - 28	0.40 - 152.00	50.00	49.50	0.70 (kg)	<b>536002</b>

**NOTE:** 3E<sup>TECH</sup> digital readout module must be ordered separately.

**NOTE:** VarioBore heads are compatible with Kaiser® connection

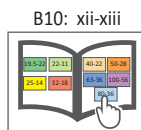
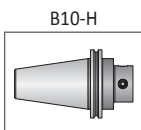
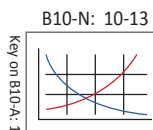
### 3E<sup>TECH</sup> Digital Readout Module

	Part No.
<b>i</b>	563010
<b>m</b>	536010



**NOTE:** Imperial item pictured

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



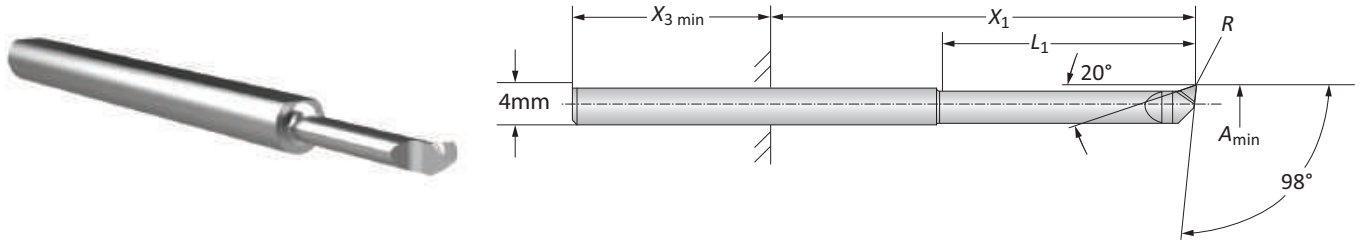
Key on B10-A: 1

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

**IMPORTANT:** Max spindle speed refers to maximum possible speed for an individual boring head and is not a recommended parameter. Refer to page B10-N: 10 for recommended application-specific parameters. Factory technical assistance is available for your specific applications through our Application Engineering department.  
ext: 7611 | email: [appeng@alliedmachine.com](mailto:appeng@alliedmachine.com)

## Mini Boring Bars

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



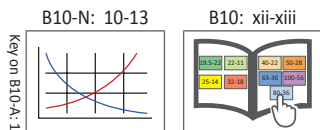
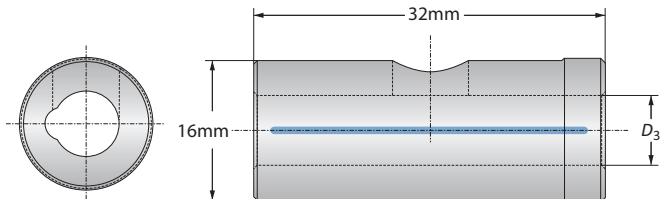
### Mini Boring Bars

	Boring Range		Boring Bar			Part No.
	$A_{min}$	$X_1$	$X_{3 \text{ min}}$	$L_1$	$R$	
i	0.016	0.118 - 0.669	0.980	0.079	0.0010	081401HC126
	0.024	0.157 - 0.709	0.980	0.118	0.0020	081402HC126
	0.031	0.197 - 0.748	0.980	0.157	0.0020	081403HC126
	0.039	0.236 - 0.787	0.980	0.197	0.0025	081404HC126
	0.059	0.335 - 0.886	0.980	0.295	0.0025	081405HC126
	0.079	0.433 - 0.984	0.980	0.394	0.0025	081406HC126
	0.098	0.531 - 1.083	0.980	0.492	0.0025	081407HC126
	0.110	0.591 - 1.142	0.980	0.551	0.0030	081408HC126
m	0.40	3.00 - 17.00	25.00	2.00	0.03	081401HC126
	0.60	4.00 - 18.00	25.00	3.00	0.04	081402HC126
	0.80	5.00 - 19.00	25.00	4.00	0.04	081403HC126
	1.00	6.00 - 20.00	25.00	5.00	0.05	081404HC126
	1.50	8.50 - 22.50	25.00	7.50	0.05	081405HC126
	2.00	11.00 - 25.00	25.00	10.00	0.05	081406HC126
	2.50	13.50 - 27.50	25.00	12.50	0.05	081407HC126



### Reducing Sleeve

Reducing Sleeve		
$D_3$	Weight	Part No.
4.00	0.05 (kg)	450129

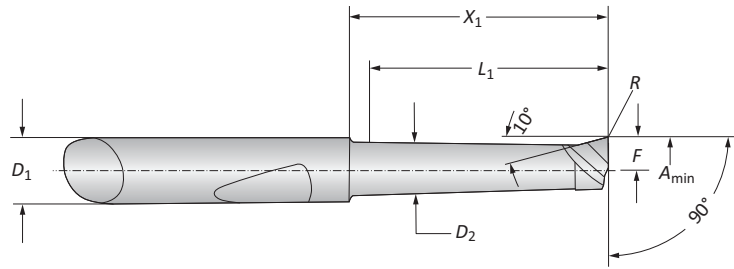


i = Imperial (in)  
m = Metric (mm)



## Mini Boring Bars

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



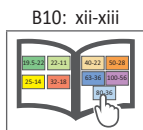
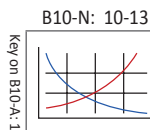
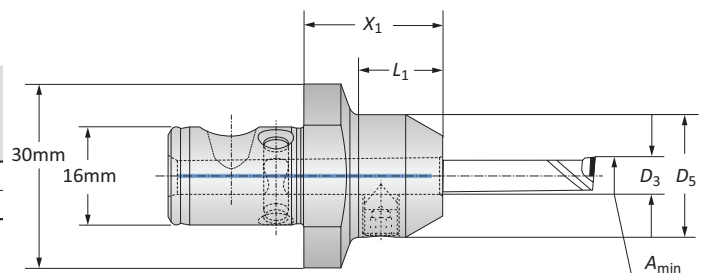
### Mini Boring Bars

	Boring Range		Boring Bar					Part No.		
	$A_{min}$	$D_1$	$D_2$	$X_1$	$L_1$	$F$	$R$	Coated Carbide	Uncoated Carbide	CBN
i	0.118	0.236	0.102	0.452	0.393	0.055	0.003	081306HC05	-	081322BN150
	0.118	0.236	0.102	0.649	0.590	0.055	0.003	081307HC05	081307HW04	-
	0.157	0.236	0.141	0.472	0.393	0.074	0.007	081308HC05	-	081317BN150
	0.157	0.236	0.141	0.669	0.590	0.074	0.007	081309HC05	-	081341BN150
	0.157	0.236	0.141	0.866	0.787	0.074	0.007	081310HC05	081310HW04	-
	0.196	0.236	0.181	0.472	0.393	0.074	0.007	081311HC05	-	081318BN150
	0.196	0.236	0.181	0.866	0.787	0.074	0.007	081312HC05	-	081319BN150
	0.196	0.236	0.181	1.259	1.181	0.074	0.007	081313HC05	081313HW04	-
	0.236	0.236	0.220	0.866	0.787	0.114	0.007	081314HC05	-	081320BN150
	0.236	0.236	0.220	1.259	1.181	0.114	0.007	081315HC05	-	081321BN150
	0.236	0.236	0.220	1.653	1.574	0.114	0.007	081316HC05	081316HW04	-
	0.314	0.314	0.229	0.984	0.905	0.153	0.007	081323HC05	-	-
0.314	0.314	0.229	1.968	1.889	0.153	0.007	081324HC05	-	-	
m	3.00	6.00	2.60	11.50	10.00	1.40	0.10	081306HC05	-	081322BN150
	3.00	6.00	2.60	16.50	15.00	1.40	0.10	081307HC05	081307HW04	-
	4.00	6.00	3.60	12.00	10.00	1.90	0.20	081308HC05	-	081317BN150
	4.00	6.00	3.60	17.00	15.00	1.90	0.20	081309HC05	-	081341BN150
	4.00	6.00	3.60	22.00	20.00	1.90	0.20	081310HC05	081310HW04	-
	5.00	6.00	4.60	12.00	10.00	2.40	0.20	081311HC05	-	081318BN150
	5.00	6.00	4.60	22.00	20.00	2.40	0.20	081312HC05	-	081319BN150
	5.00	6.00	4.60	32.00	30.00	2.40	0.20	081313HC05	081313HW04	-
	6.00	6.00	5.60	22.00	20.00	2.90	0.20	081314HC05	-	081320BN150
	6.00	6.00	5.60	32.00	30.00	2.90	0.20	081315HC05	-	081321BN150
	6.00	6.00	5.60	42.00	40.00	2.90	0.20	081316HC05	081316HW04	-
	8.00	8.00	7.60	25.00	23.00	3.90	0.20	081323HC05	-	-
8.00	8.00	7.60	50.00	48.00	3.90	0.20	081324HC05	-	-	



### Adapters

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

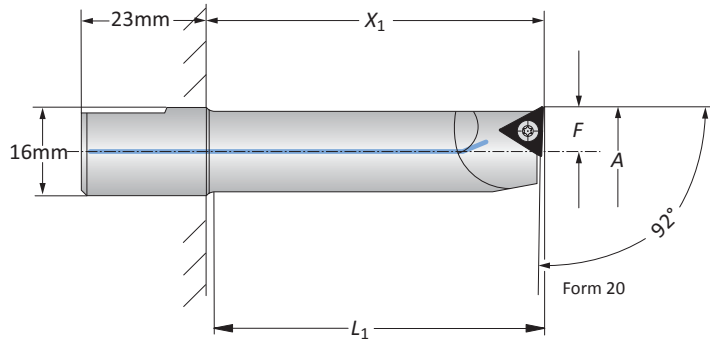


i = Imperial (in)  
m = Metric (mm)

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## Boring Bars

Steel 92° Angle | Diameter Range: 0.236" - 1.063" (6.00mm - 27.00mm)



	Boring Range		Boring Bar		Weight	Insert Form	Part No.	Insert Form	Part No.
	A	X <sub>1</sub>	L <sub>1</sub>	F					
	0.236 - 0.315	0.866	0.748	0.110	0.070 (lbs)	-	-	211	081053
	0.315 - 0.394	1.181	1.063	0.150	0.090 (lbs)	-	-	211	218071
	0.394 - 0.472	1.772	1.654	0.189	0.110 (lbs)	-	-	20*	081044
	0.394 - 0.472	0.984	0.866	0.189	0.090 (lbs)	101*	218047	20*	218058
	0.394 - 0.472	1.378	1.260	0.189	0.110 (lbs)	101*	218048	20*	218059
	0.472 - 0.551	1.181	1.063	0.228	0.110 (lbs)	101*	218012	20*	218014
	0.472 - 0.551	1.772	1.654	0.228	0.130 (lbs)	101*	218049	20*	218060
	0.551 - 0.630	1.378	1.260	0.268	0.130 (lbs)	101*	218050	20*	218061
i	0.551 - 0.630	1.969	1.850	0.268	0.180 (lbs)	101*	218051	20*	218062
	0.591 - 0.669	1.457	1.339	0.291	0.130 (lbs)	-	-	20*	081048
	0.591 - 0.669	2.362	2.244	0.291	0.180 (lbs)	101*	081041	20*	081045
	0.630 - 0.786	1.575	1.457	0.307	0.180 (lbs)	101*	218052	20*	218063
	0.630 - 0.786	2.362	2.244	0.307	0.200 (lbs)	101*	218053	20*	218064
	0.787 - 0.983	1.457	1.299	0.386	0.150 (lbs)	-	-	20*	081049
	0.787 - 0.866	2.756	2.480	0.386	0.240 (lbs)	101*	081042	20*	081046
	0.984 - 1.063	1.457	1.299	0.484	0.150 (lbs)	-	-	20*	081050
	0.984 - 1.063	2.756	2.638	0.484	0.240 (lbs)	101*	081043	20*	081047
<hr/>									
	6.00 - 8.00	22.00	19.00	2.80	0.03 (kg)	-	-	211	081053
	8.00 - 10.00	30.00	27.00	3.80	0.04 (kg)	-	-	211	218071
	10.00 - 12.00	45.00	42.00	4.80	0.05 (kg)	-	-	20*	081044
	10.00 - 12.00	25.00	22.00	4.80	0.04 (kg)	101*	218047	20*	218058
	10.00 - 12.00	35.00	32.00	4.80	0.05 (kg)	101*	218048	20*	218059
	12.00 - 14.00	30.00	27.00	5.80	0.05 (kg)	101*	218012	20*	218014
	12.00 - 14.00	45.00	42.00	5.80	0.06 (kg)	101*	218049	20*	218060
	14.00 - 16.00	35.00	32.00	6.80	0.06 (kg)	101*	218050	20*	218061
m	14.00 - 16.00	50.00	47.00	6.80	0.08 (kg)	101*	218051	20*	218062
	15.00 - 17.00	37.00	34.00	7.40	0.06 (kg)	-	-	20*	081048
	15.00 - 17.00	60.00	57.00	7.40	0.08 (kg)	101*	081041	20*	081045
	16.00 - 20.00	40.00	37.00	7.80	0.08 (kg)	101*	218052	20*	218063
	16.00 - 20.00	60.00	57.00	7.80	0.09 (kg)	101*	218053	20*	218064
	20.00 - 25.00	37.00	33.00	9.80	0.07 (kg)	-	-	20*	081049
	20.00 - 22.00	70.00	63.00	9.80	0.11 (kg)	101*	081042	20*	081046
	25.00 - 27.00	37.00	33.00	12.30	0.07 (kg)	-	-	20*	081050
	25.00 - 27.00	70.00	67.00	12.30	0.11 (kg)	101*	081043	20*	081047

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

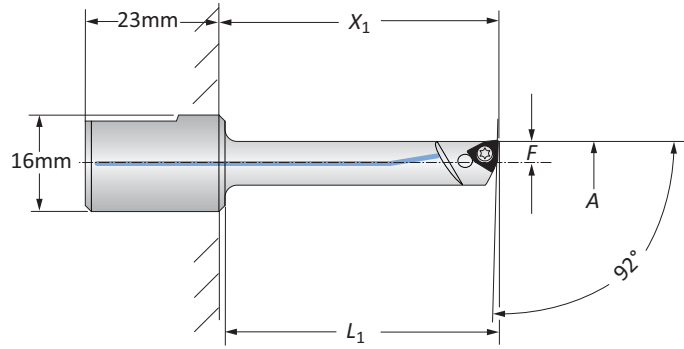
B10: 10-13 B10-F B10: xii-xiii

Key on B10-A:1

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

## Boring Bars

Heavy Metal | Carbide

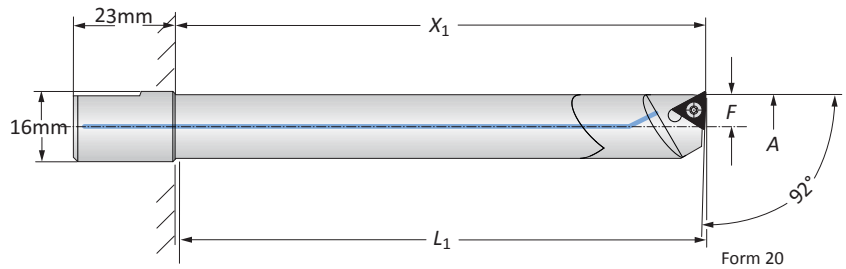


Heavy Metal Boring Bars | Diameter Range: 0.236" - 0.394" (6.00mm - 10.00mm)

	Boring Range		Boring Bar			Weight	Insert Form	Part No.
	A	X <sub>1</sub>	L <sub>1</sub>	F				
<b>i</b>	0.236 - 0.315	1.260	1.142	0.110	0.176 (lbs)	211	<b>081055</b>	
	0.315 - 0.394	1.772	1.654	0.150	0.198 (lbs)	211	<b>218072</b>	
<b>m</b>	6.00 - 8.00	32.00	29.00	2.80	0.08 (kg)	211	<b>081055</b>	
	8.00 - 10.00	45.00	42.00	3.80	0.09 (kg)	211	<b>218072</b>	



Form 101



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

	Boring Range		Boring Bar			Weight	Insert Form	Part No.	Insert Form	Part No.
	A	X <sub>1</sub>	L <sub>1</sub>	F						
<b>i</b>	0.394 - 0.472	2.165	2.047	0.189	0.154 (lbs)	101*	<b>218042</b>	20*	<b>218037</b>	
	0.394 - 0.472	2.953	2.835	0.189	0.198 (lbs)	101*	<b>218032</b>	20*	<b>218029</b>	
	0.472 - 0.551	2.756	2.638	0.228	0.220 (lbs)	101*	<b>218043</b>	20*	<b>218038</b>	
	0.472 - 0.551	3.543	3.425	0.228	0.331 (lbs)	101*	<b>218033</b>	20*	<b>218030</b>	
	0.551 - 0.630	2.953	2.835	0.268	0.353 (lbs)	101*	<b>218044</b>	20*	<b>218039</b>	
	0.551 - 0.630	3.937	3.819	0.268	0.441 (lbs)	101*	<b>218045</b>	20*	<b>218040</b>	
	0.630 - 0.787	3.543	3.425	0.307	0.573 (lbs)	101*	<b>218046</b>	20*	<b>218041</b>	
<b>m</b>	0.630 - 0.787	4.724	4.606	0.307	0.728 (lbs)	101*	<b>218034</b>	20*	<b>218031</b>	
	10.00 - 12.00	55.00	52.00	4.80	0.07 (kg)	101*	<b>218042</b>	20*	<b>218037</b>	
	10.00 - 12.00	75.00	72.00	4.80	0.09 (kg)	101*	<b>218032</b>	20*	<b>218029</b>	
	12.00 - 14.00	70.00	67.00	5.80	0.10 (kg)	101*	<b>218043</b>	20*	<b>218038</b>	
	12.00 - 14.00	90.00	87.00	5.80	0.15 (kg)	101*	<b>218033</b>	20*	<b>218030</b>	
	14.00 - 16.00	75.00	72.00	6.80	0.16 (kg)	101*	<b>218044</b>	20*	<b>218039</b>	
	14.00 - 16.00	100.00	97.00	6.80	0.20 (kg)	101*	<b>218045</b>	20*	<b>218040</b>	
	16.00 - 20.00	90.00	87.00	7.80	0.26 (kg)	101*	<b>218046</b>	20*	<b>218041</b>	
16.00 - 20.00	120.00	117.00	7.80	0.33 (kg)	101*	<b>218034</b>	20*	<b>218031</b>		

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

B10: 10-13

B10-F

B10: xii-xiii

Key on B10-A: 1

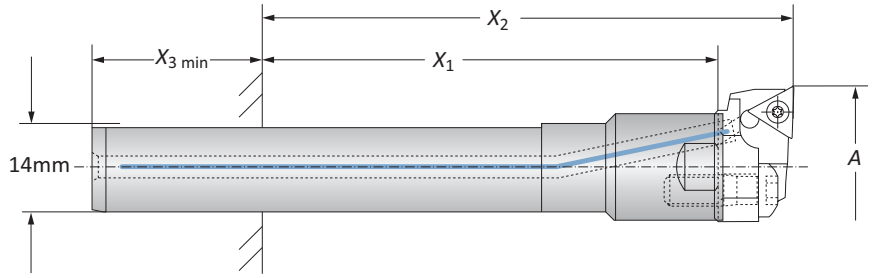
**i** = Imperial (in)  
**m** = Metric (mm)  
 Inserts sold separately

A  
B  
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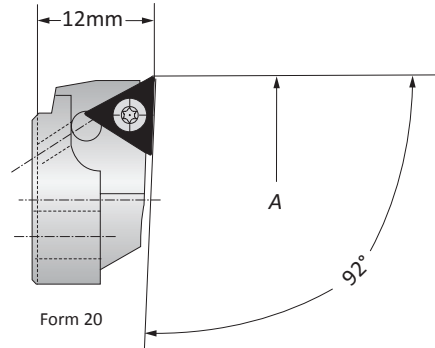
## Serrated Tool Bodies | Insert Holders

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



### Serrated Tool Bodies

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



### Insert Holders

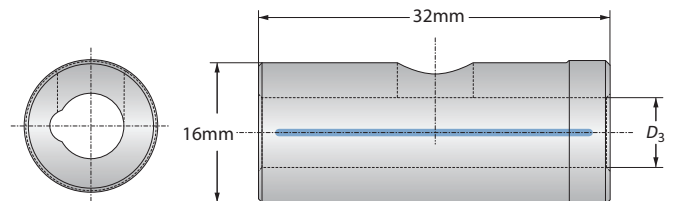
	Boring Range	Weight	Insert Form	Part No.	Insert Form	Part No.
	A					
i	0.787 - 0.866	0.022 (lbs)	101*	502052	20*	502046
	0.866 - 0.945	0.022 (lbs)	101*	502053	20*	502047
	0.945 - 1.024	0.022 (lbs)	101*	502054	20*	502048
	1.024 - 1.102	0.022 (lbs)	101*	502055	20*	502049
	1.102 - 1.181	0.022 (lbs)	101*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

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



### Reducing Sleeve

Reducing Sleeve	Weight	Part No.
D <sub>3</sub> 14.00	0.01 (kg)	450136



Key on B10-A: 1

B10-N: 10-13

B10-A: 16

B10-F

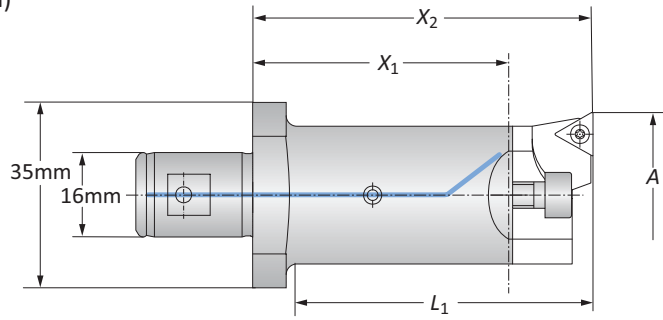
B10: xii-xiii

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

Inserts sold separately

## Serrated Tool Bodies | Insert Holders

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

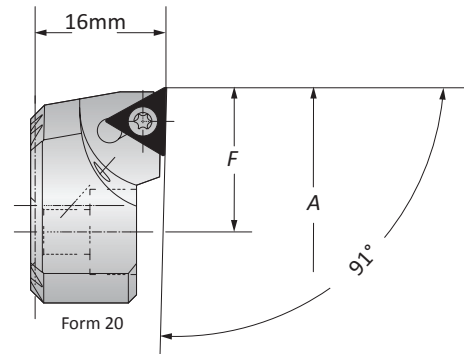


### Serrated Tool Bodies

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



Form 101



Form 20

### Insert Holders

	Boring Range	Insert Holder	Weight	Insert Form	Part No.
	A	F			
i	1.142 - 1.614	0.698	0.088 (lbs)	20*	236022
	1.142 - 1.614	0.698	0.088 (lbs)	101	236023
	1.575 - 2.087	0.925	0.132 (lbs)	20*	236024
	1.575 - 2.087	0.925	0.132 (lbs)	101	236025
m	29.00 - 41.00	17.75	0.04 (kg)	20*	236022
	29.00 - 41.00	17.75	0.04 (kg)	101	236023
	40.00 - 53.00	23.50	0.06 (kg)	20*	236024
	40.00 - 53.00	23.50	0.06 (kg)	101	236025

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

Key on B10-A-1

B10-N: 10-13

B10-A: 16

B10-F

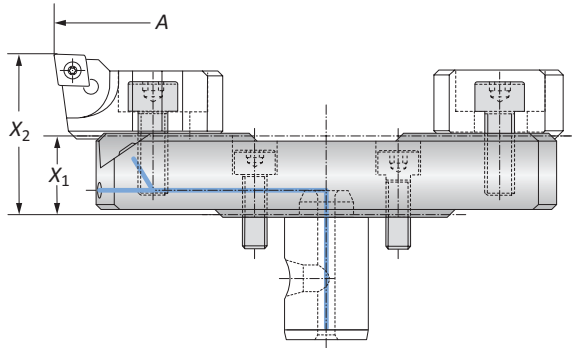
B10: xii-xiii

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

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## Alu-Line Serrated Slides | Insert Holders

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

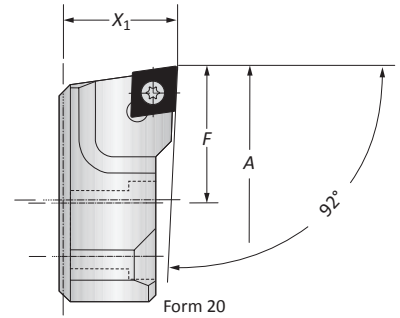
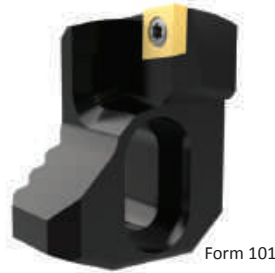


### Alu-Line Serrated Slides

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

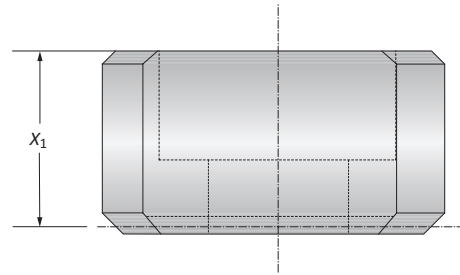
### Insert Holders

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



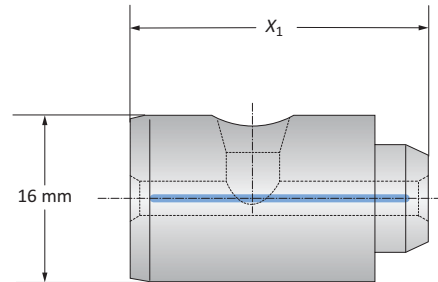
### Counter Weights

	Counter Weight	Weight	Part No.
	X <sub>1</sub>		
i	1.004	0.110 (lbs)	502165
m	13.40	0.05 (kg)	502165



### Alu-Line Coolant Delivery Sections

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



B10-N: 10-13

B10-A: 16

B10-F

B10: xii-xiii

Key on B10-A: 1

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

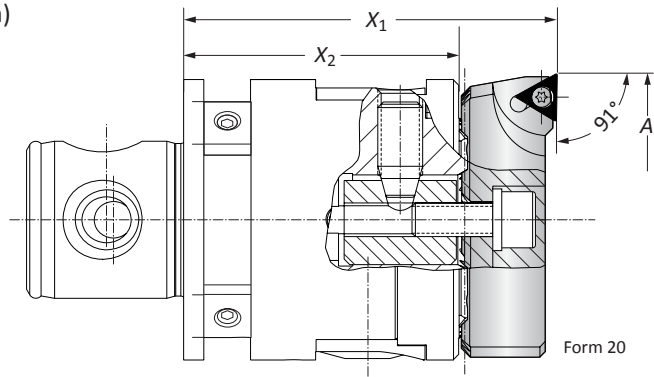


### Insert Holders for Boring Heads

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



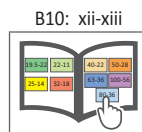
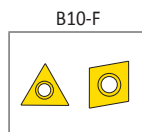
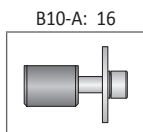
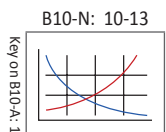
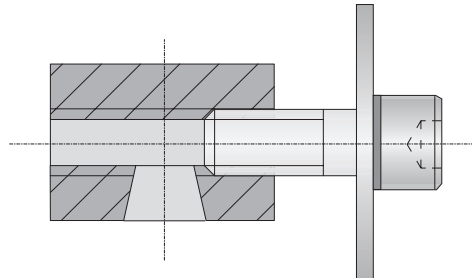
Form 101



	Boring Range		Insert Holder		Weight	Insert Form	Part No.
	A	X <sub>1</sub>	X <sub>2</sub>				
i	2.047 - 3.031	2.598	1.949		0.132 (lbs)	20	236026
	2.047 - 3.031	2.598	1.949		0.132 (lbs)	101	236027
	2.992 - 4.016	2.598	1.949		0.220 (lbs)	20	236028
	2.992 - 4.016	2.598	1.949		0.220 (lbs)	101	236029
m	52.00 - 77.00	66.00	49.50		0.06 (kg)	20	236026
	52.00 - 77.00	66.00	49.50		0.06 (kg)	101	236027
	76.00 - 102.00	66.00	49.50		0.10 (kg)	20	236028
	76.00 - 102.00	66.00	49.50		0.10 (kg)	101	236029

### Clamping Piece for Insert Holder for Boring Heads

Boring Range	Complete Part No.
52.00 - 102.00	236020



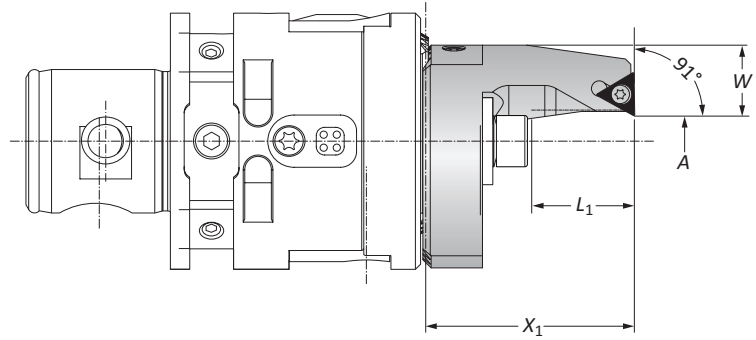
Key on B10-A-1

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

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## Outside Turning Insert Holders for Boring Heads

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

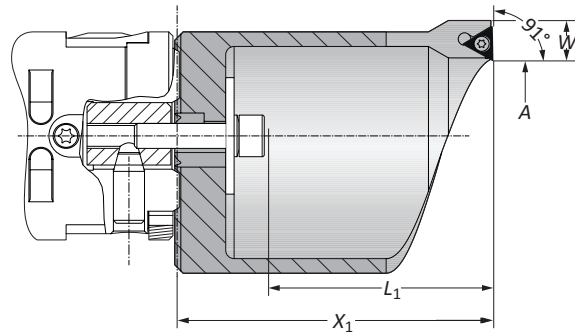


### Type A Insert Holders

	Boring Range		Insert Holder			Weight	Type	Insert Form	Part No.
	A	X <sub>1</sub>	L <sub>1</sub>	W					
i	0.157 - 0.689	3.543	0.787	0.653	0.220	A	20*	236081	
	0.650 - 1.181	3.937	1.181	0.437	0.220	A	20*	236082	
m	4.00 - 17.50	45.00	20.00	16.60	0.10	A	20*	236081	
	16.50 - 30.00	52.50	30.00	11.10	0.10	A	20*	236082	

NOTE: Clockwise and neutral execution

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



### Type B Insert Holders

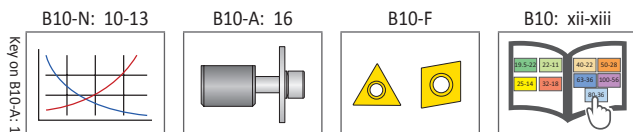
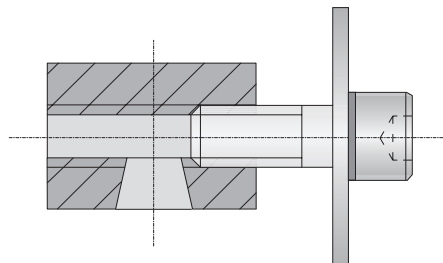
	Boring Range		Insert Holder			Weight	Type	Insert Form	Part No.
	A	X <sub>1</sub>	L <sub>1</sub>	W					
i	1.142 - 1.732	4.921	2.126	0.377	0.661 (lbs)	B	20*	236083	
	1.693 - 2.598	5.905	3.110	0.377	0.882 (lbs)	B	20*	236084	
m	29.00 - 44.00	63.50	54.00	9.60	0.30 (kg)	B	20*	236083	
	43.00 - 66.00	85.50	79.00	9.60	0.40 (kg)	B	20*	236084	

NOTE: Clockwise and neutral execution

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

### Clamping Pieces for Outside Turning Insert Holders

	Boring Range	Complete Part No.
m	4.00 - 30.00	236088
	29.00 - 66.00	236089

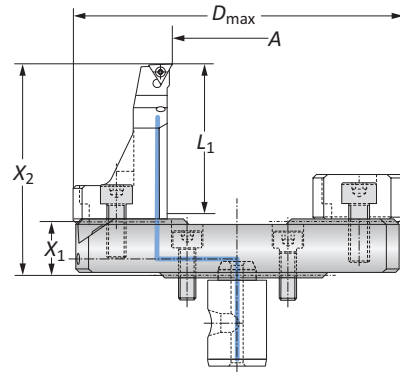


i = Imperial (in)  
m = Metric (mm)

Inserts sold separately

## Outside Turning Serrated Slides | Insert Holders

Diameter Range: 0.079" - 4.488" (2.00mm - 114.00mm)



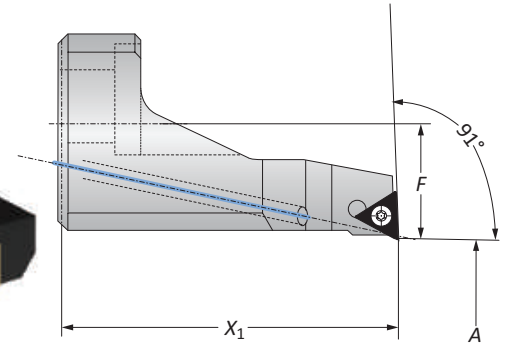
### Serrated Slides

	Outside Turning Range	Serrated Slide			Weight	Interfering Diameter	Part No.
	A	X <sub>1</sub>	X <sub>2</sub>	L <sub>1</sub>			
i	0.079 - 1.181	0.630	2.874	2.165	0.771 (lbs)	3.976	501065
	1.181 - 2.283	0.630	2.874	2.165	0.970 (lbs)	5.079	501066
m	2.00 - 30.00	16.00	73.00	55.00	0.35 (kg)	101.00	501065
	30.00 - 58.00	16.00	73.00	55.00	0.44 (kg)	129.00	501066



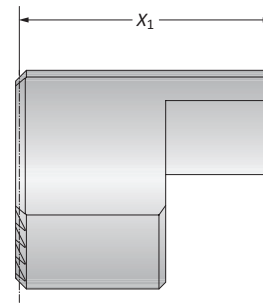
### Insert Holders

	Boring Range	Insert Holder		Weight	Inset Form	Part No.
	A	X <sub>1</sub>	F			
i	0.079 - 4.488	2.244	0.776	0.331 (lbs)	20	502082
m	2.00 - 114.00	57.00	19.70	0.15 (kg)	20	502082



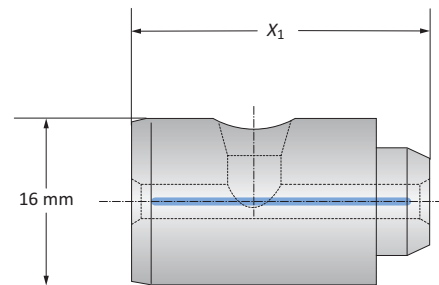
### Counter Weights

	Counter Weight	Weight	Part No.
	X <sub>1</sub>		
i	1.486	0.352 (lbs)	502183
m	37.75	0.16 (kg)	502183



### Alu-Line Coolant Delivery Sections

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



B10-N: 10-13

B10-A: 16

B10-F

B10: xii-xiii

Key: on B10-A: 1

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

A  
B  
C  
D  
E  
F  
G  
H  
I  
J  
K  
L  
M  
N  
INDEX

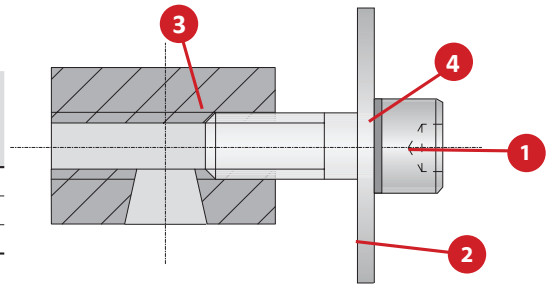


## Accessories

Clamping Elements | Thread Pin | Balancing Element | 3E<sup>TECH</sup> Accessories

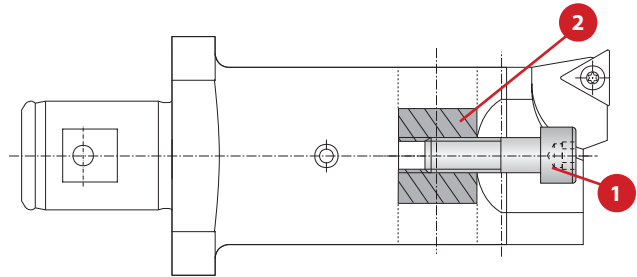
### Clamping Elements for Insert Holders

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



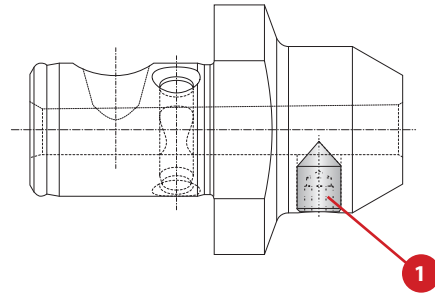
### Clamping Elements for Serrated Tool Body

1 Cap Screw	Hex Size	2 Clamping Piece
027154	s4	145184



### Thread Pin

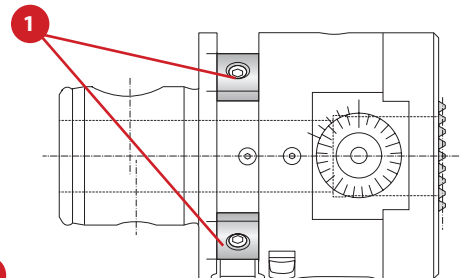
Service Key	1 Part No.
S3 / A	415244



### Balancing Element

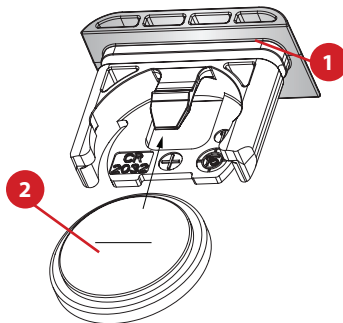
Nominal Size	Key Size / Type	1 Part No.
M8x8	s2 / A	536005

NOTE: Sold in quantities of 1



### 3E<sup>TECH</sup> Accessories

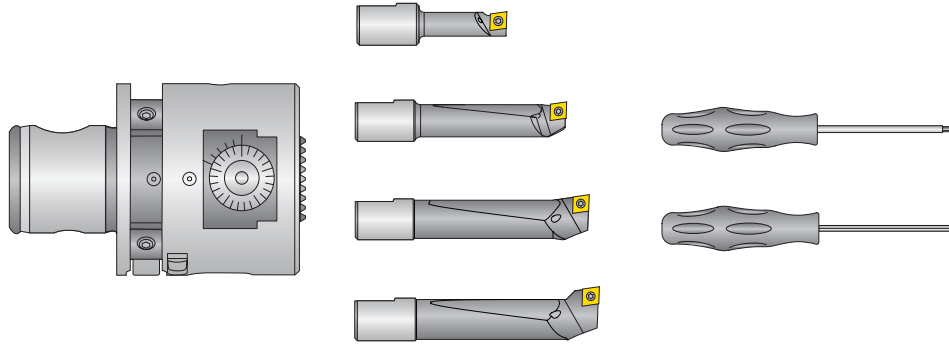
1 Sealing Ring	2 Battery CR2032
Part No.	Part No.
215483	515491



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

## Kit Components

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



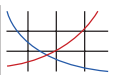
Kit Components					
	Boring Head	Boring Bar Range	Boring Bars	Service Keys	Kit No.
<b>i</b>	563001	0.393 - 0.590	218048	115575 (s2.5)	<b>104050</b>
		0.590 - 0.787	081041	215403 (s4)	
		0.787 - 0.984	081042	115590 (T7)	
		0.984 - 1.181	081043		
<b>m</b>	536001	10.00 - 15.00	218048	115575 (s2.5)	<b>103050</b>
		15.00 - 20.00	081041	215403 (s4)	
		20.00 - 25.00	081042	115590 (T7)	
		25.00 - 30.00	081043		

**NOTE:** Inserts sold separately

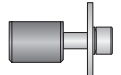


Key on B10-A: 1

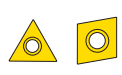
B10-N: 10-13



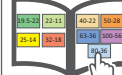
B10-A: 16



B10-F



B10: xii-xiii

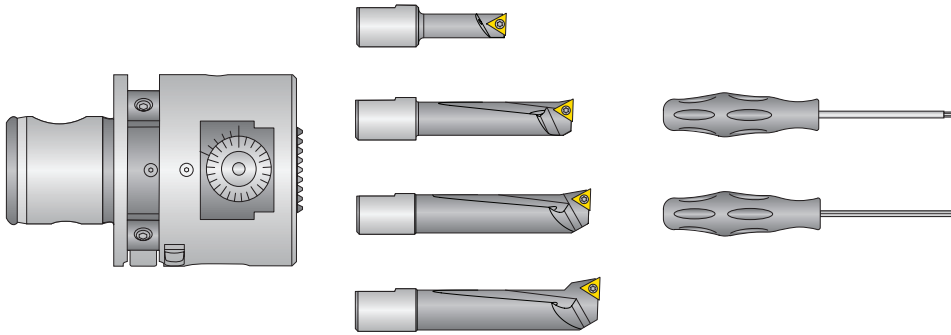


**i** = Imperial (in)  
**m** = Metric (mm)  
 Inserts sold separately

**IMPORTANT:** Max spindle speed refers to maximum possible speed for an individual boring head and is not a recommended parameter. Refer to page B10-N: 10 for recommended application-specific parameters. Factory technical assistance is available for your specific applications through our Application Engineering department.  
 ext: 7611 | email: [appeng@alliedmachine.com](mailto:appeng@alliedmachine.com)

## Kit Components

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



Kit Components					
	Boring Head	Boring Bar Range	Boring Bars	Service Keys	Kit No.
i	563001	0.393 - 0.590	218059	115575 (s2.5)	104049
		0.590 - 0.787	081045	215403 (s4)	
		0.787 - 0.984	081046	115590 (T7)	
		0.984 - 1.181	081047		
m	536001	10.00 - 15.00	218059	115575 (s2.5)	103049
		15.00 - 20.00	081045	215403 (s4)	
		20.00 - 25.00	081046	115590 (T7)	
		25.00 - 30.00	081047		

NOTE: Inserts sold separately



B10-N: 10-13

Key on B10-A: 1

B10-A: 16

B10-F

B10: xii-xiii

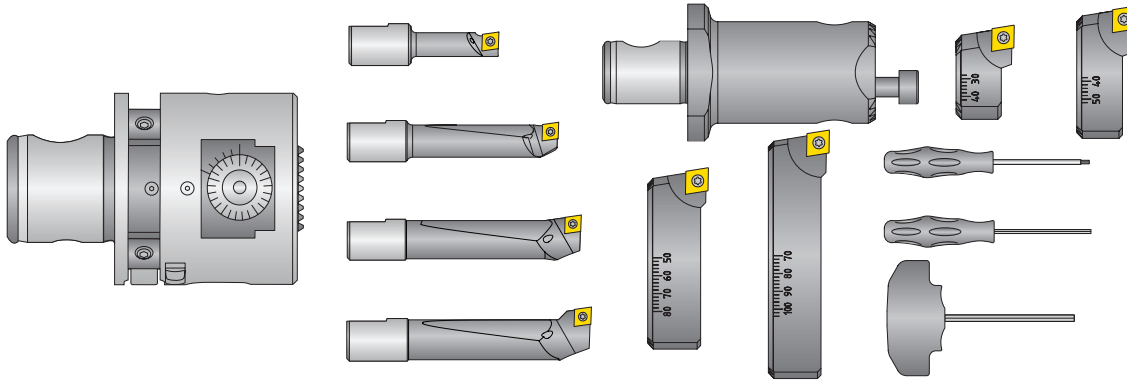
i = Imperial (in)  
m = Metric (mm)

Inserts sold separately

**IMPORTANT:** Max spindle speed refers to maximum possible speed for an individual boring head and is not a recommended parameter. Refer to page B10-N: 10 for recommended application-specific parameters. Factory technical assistance is available for your specific applications through our Application Engineering department.  
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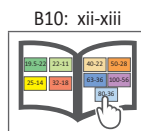
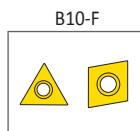
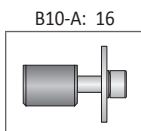
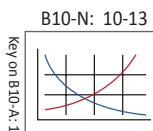
## Kit Components

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



Kit Components											
	Boring Head	Boring Bars		Insert Holders for Boring Head			Serrated Tool Body & Insert Holders			Service Keys	Kit No.
		Boring Bar Range	Part No.	Insert Holder Range	Part No.	Clamping Piece	Serrated Tool Body	Insert Holder Range	Part No.		
i	563001	0.393 - 0.590	218048	1.141 - 1.614	236023	236020	236021	2.047 - 3.031	236027	115575 (s2.5)	104052
		0.590 - 0.787	081041	1.574 - 2.086	236025			2.992 - 4.016	236029	215403 (s4)	
		0.787 - 0.984	081042							215521 (s5)	
		0.984 - 1.181	081043							115590 (T7)	
m	536001	10.00 - 15.00	218048	29.00 - 41.00	236023	236020	236021	52.00 - 77.00	236027	115575 (s2.5)	103052
		15.00 - 20.00	081041	40.00 - 53.00	236025			76.00 - 102.00	236029	215403 (s4)	
		20.00 - 25.00	081042							215521 (s5)	
		25.00 - 30.00	081043							115590 (T7)	

NOTE: Inserts sold separately



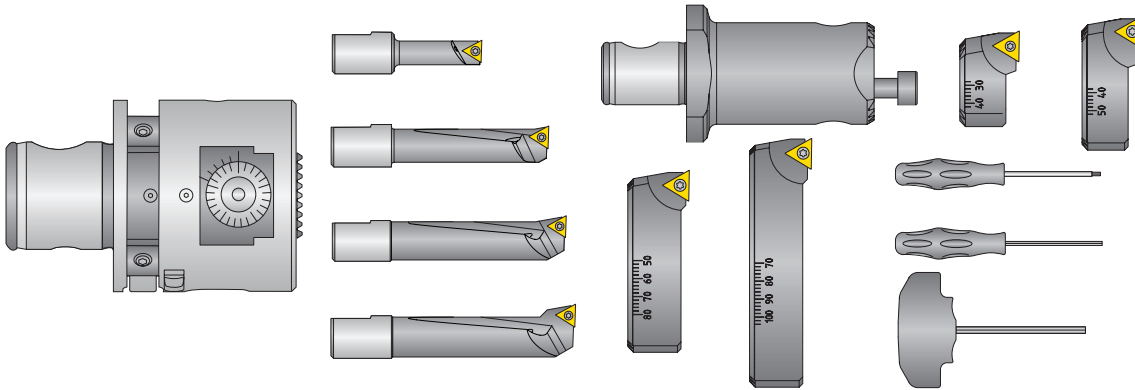
i = Imperial (in)  
m = Metric (mm)  
Inserts sold separately

**IMPORTANT:** Max spindle speed refers to maximum possible speed for an individual boring head and is not a recommended parameter. Refer to page B10-N: 10 for recommended application-specific parameters. Factory technical assistance is available for your specific applications through our Application Engineering department.  
ext: 7611 | email: [appeng@alliedmachine.com](mailto:appeng@alliedmachine.com)



## Kit Components

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



Kit Components										
Boring Head	Boring Bars		Insert Holders for Boring Head			Serrated Tool Body & Insert Holders			Service Keys	Kit No.
	Boring Bar Range	Part No.	Insert Holder Range	Part No.	Clamping Piece	Serrated Tool Body	Insert Holder Range	Part No.		
i	0.393 - 0.590	218059	1.141 - 1.614	236022	236020	236021	2.047 - 3.031	236026	115575 (s2.5)	104051
	0.590 - 0.787	081045	1.574 - 2.086	236024			2.992 - 4.016	236028	215403 (s4)	
	0.787 - 0.984	081046							215521 (s5)	
	0.984 - 1.181	081047							115590 (T7)	
m	10.00 - 15.00	218059	29.00 - 41.00	236022	236020	236021	52.00 - 77.00	236026	115575 (s2.5)	103051
	15.00 - 20.00	081045	40.00 - 53.00	236024			76.00 - 102.00	236028	215403 (s4)	
	20.00 - 25.00	081046							215521 (s5)	
	25.00 - 30.00	081047							115590 (T7)	

NOTE: Inserts sold separately



B10-N: 10-13

B10-A: 16

B10-F

B10: xii-xiii

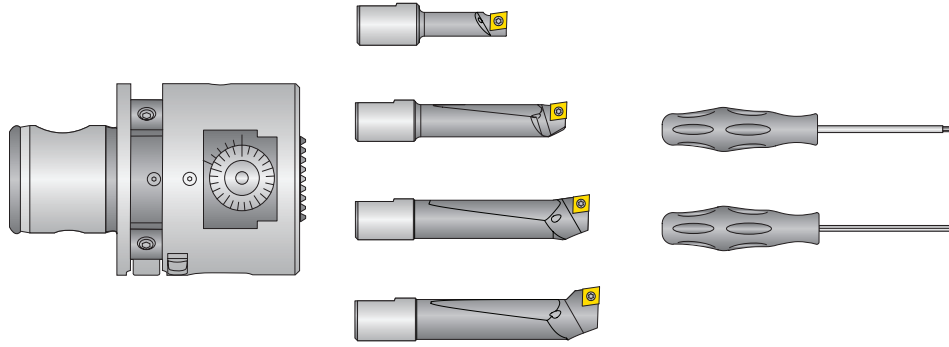
i = Imperial (in)  
m = Metric (mm)

Inserts sold separately

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ext: 7611 | email: [appeng@alliedmachine.com](mailto:appeng@alliedmachine.com)

## Kit Components

3E<sup>TECH</sup> | Insert Form 101 | Diameter Range: 0.393" - 1.181" (10.00mm - 30.00mm)



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

NOTE: Inserts sold separately

NOTE: 3E<sup>TECH</sup> digital readout module sold separately



### 3E<sup>TECH</sup> Digital Readout Module

	Part No.
i	563010
m	536010



NOTE: Imperial item pictured

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

Key on B10-A-1

B10-N: 10-13

B10-A: 16

B10-F

B10: xii-xiii

i = Imperial (in)

m = Metric (mm)

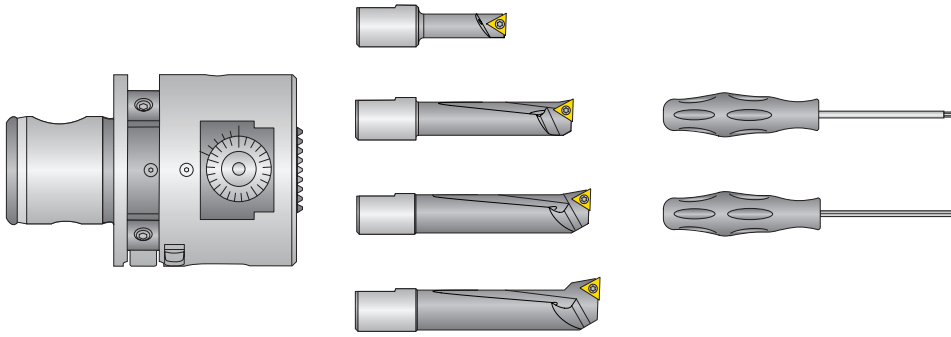
Inserts sold separately

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## Kit Components

3E<sup>TECH</sup> | Insert Form 20 | Diameter Range: 0.393" - 1.181" (10.00mm - 30.00mm)



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

NOTE: Inserts sold separately

NOTE: 3E<sup>TECH</sup> digital readout module sold separately



### 3E<sup>TECH</sup> Digital Readout Module

	Part No.
i	563010
m	536010



NOTE: Imperial item pictured

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

B10-N: 10-13

B10-A: 16

B10-F

B10: xii-xiii

Key on B10-A: 1

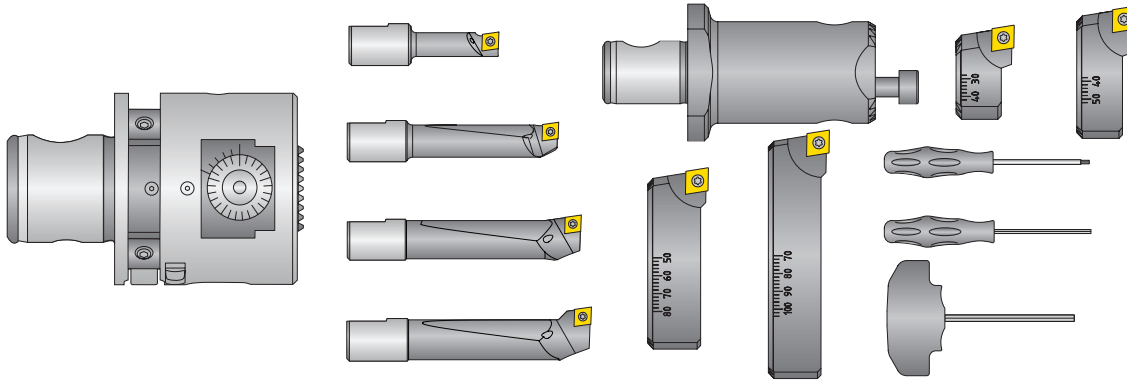
i = Imperial (in)  
m = Metric (mm)

Inserts sold separately

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ext: 7611 | email: [appeng@alliedmachine.com](mailto:appeng@alliedmachine.com)

### Kit Components

3E<sup>TECH</sup> | Insert Form 101 | Diameter Range: 0.393" - 4.016" (10.00mm - 102.00mm)



Kit Components											
	Boring Head	Boring Bars		Insert Holders for Boring Head			Serrated Tool Body & Insert Holders			Service Keys	Kit No.
		Boring Bar Range	Part No.	Insert Holder Range	Part No.	Clamping Piece	Serrated Tool Body	Insert Holder Range	Part No.		
i	563002	0.393 - 0.590	218048	1.141 - 1.614	236023	236020	236021	2.047 - 3.031	236027	115575 (s2.5)	104048
		0.590 - 0.787	081041	1.574 - 2.086	236025			2.992 - 4.016	236029	215403 (s4)	
		0.787 - 0.984	081042							215521 (s5)	
		0.984 - 1.181	081043							115590 (T7)	
m	536002	10.00 - 15.00	218048	29.00 - 41.00	236023	236020	236021	52.00 - 77.00	236027	115575 (s2.5)	103048
		15.00 - 20.00	081041	40.00 - 53.00	236025			76.00 - 102.00	236029	215403 (s4)	
		20.00 - 25.00	081042							215521 (s5)	
		25.00 - 30.00	081043							115590 (T7)	

NOTE: Inserts sold separately

NOTE: 3E<sup>TECH</sup> digital readout module sold separately



#### 3E<sup>TECH</sup> Digital Readout Module

	Part No.
i	563010
m	536010



NOTE: Imperial item pictured

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

B10-N: 10-13

B10-A: 16

B10-F

B10: xii-xiii

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

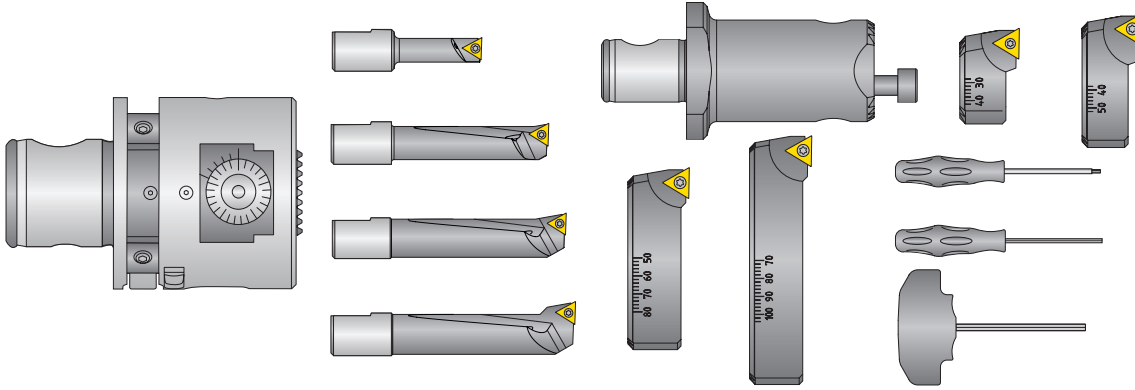
Inserts sold separately

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ext: 7611 | email: [appeng@alliedmachine.com](mailto:appeng@alliedmachine.com)



## Kit Components

3E<sup>TECH</sup> | Insert Form 20 | Diameter Range: 0.393" - 4.016" (10.00mm - 102.00mm)



Kit Components

Boring Head	Boring Bars		Insert Holders for Boring Head			Serrated Tool Body & Insert Holders			Service Keys	Kit No.
	Boring Bar Range	Part No.	Insert Holder Range	Part No.	Clamping Piece	Serrated Tool Body	Insert Holder Range	Part No.		
i	0.393 - 0.590	218059	1.141 - 1.614	236022	236020	236021	2.047 - 3.031	236026	115575 (s2.5)	104047
	0.590 - 0.787	081045	1.574 - 2.086	236024			2.992 - 4.016	236028	215403 (s4)	
	0.787 - 0.984	081046							215521 (s5)	
	0.984 - 1.181	081047							115590 (T7)	
m	10.00 - 15.00	218059	29.00 - 41.00	236022	236020	236021	52.00 - 77.00	236026	115575 (s2.5)	103047
	15.00 - 20.00	081045	40.00 - 53.00	236024			76.00 - 102.00	236028	215403 (s4)	
	20.00 - 25.00	081046							215521 (s5)	
	25.00 - 30.00	081047							115590 (T7)	

NOTE: Inserts sold separately

NOTE: 3E<sup>TECH</sup> digital readout module sold separately



3E<sup>TECH</sup> Digital Readout Module

	Part No.
i	563010
m	536010



NOTE: Imperial item pictured

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

Key on B10-A:1

B10-N: 10-13

B10-A: 16

B10-F

B10: xii-xiii

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

Inserts sold separately

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ext: 7611 | email: [appeng@alliedmachine.com](mailto:appeng@alliedmachine.com)



# 249 (248) Product Overview

## 249 (248) VERSATILE BORING

### Compact design. Precision boring.

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

Test this *compact design* for finish machining today.

- Diameter range: 0.118" - 1.188" (3.00mm - 30.20mm)
- Length adjustment up to 10xD
- Coolant-through boring tool
- 0.0005" (0.01mm) adjust on diameter
- Max spindle speed: 20,000 RPM



**IMPORTANT:** Max spindle speed refers to maximum possible speed for an individual boring head and is not a recommended parameter. Refer to page B10-N: 10 for recommended application-specific parameters. Factory technical assistance is available for your specific applications through our Application Engineering department.  
ext: 7611 | email: [appeng@alliedmachine.com](mailto:appeng@alliedmachine.com)



249 (248) Head



Insert Holder  
Ø 0.623" - 1.181"  
(Ø 15.9mm - 30.2mm)



Adapter



Adapter



Boring Bar  
Ø 0.146" - 0.630"  
(Ø 3.7mm - 16mm)



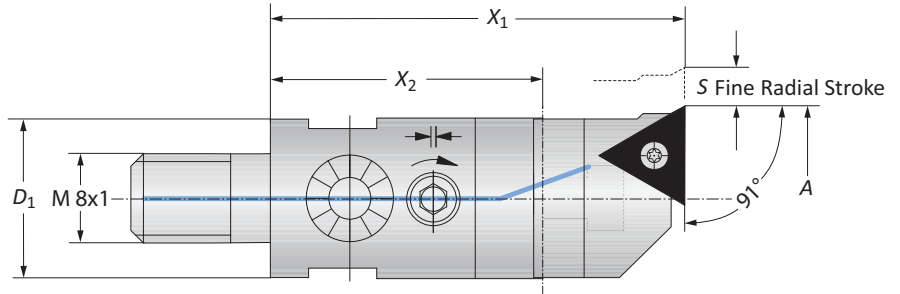
Mini Boring Bar  
Ø 0.118" - 0.236"  
(Ø 3mm - 6mm)

OPERATION **VERSATILITY**  
from **0.118"** to **1.188"** (3mm to 30.2mm)



## Boring Heads

Diameter Range: 0.625" - 1.189" (15.90mm - 30.20mm)



Boring Connection	Boring Range	Boring Head					Weight	Inset Form	Part No.	
		A	X <sub>1</sub>	X <sub>2</sub>	D <sub>1</sub>	S			Inset Holder	Boring Head
i	M 8 x 1.0	0.625 - 0.791	1.654	1.024	0.591	0.025	0.132 (lbs)	20*	248051	249001
	M 8 x 1.0	0.625 - 0.791	1.654	1.024	0.591	0.055	0.132 (lbs)	101*	248054	249001
	M 8 x 1.0	0.783 - 0.976	1.811	1.181	0.709	0.071	0.198 (lbs)	20*	248052	249002
	M 8 x 1.0	0.783 - 0.976	1.811	1.181	0.709	0.071	0.198 (lbs)	101*	248055	249002
	M 8 x 1.0	0.965 - 1.189	1.811	1.181	0.906	0.091	0.287 (lbs)	20*	248053	249003
	M 8 x 1.0	0.965 - 1.189	1.811	1.181	0.906	0.091	0.287 (lbs)	101*	248056	249003
m	M 8 x 1.0	15.90 - 20.10	42.00	26.00	15.00	1.40	0.06 (kg)	20*	248051	248001
	M 8 x 1.0	15.90 - 20.10	42.00	26.00	15.00	1.40	0.06 (kg)	101*	248054	248001
	M 8 x 1.0	19.90 - 24.80	46.00	30.00	18.00	1.80	0.09 (kg)	20*	248052	248002
	M 8 x 1.0	19.90 - 24.80	46.00	30.00	18.00	1.80	0.09 (kg)	101*	248055	248002
	M 8 x 1.0	24.50 - 30.20	46.00	30.00	23.00	2.30	0.13 (kg)	20*	248053	248003
	M 8 x 1.0	24.50 - 30.20	46.00	30.00	23.00	2.30	0.13 (kg)	101*	248056	248003

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

Key on B10-A: 1

B10-N: 10-13

B10-A: 33

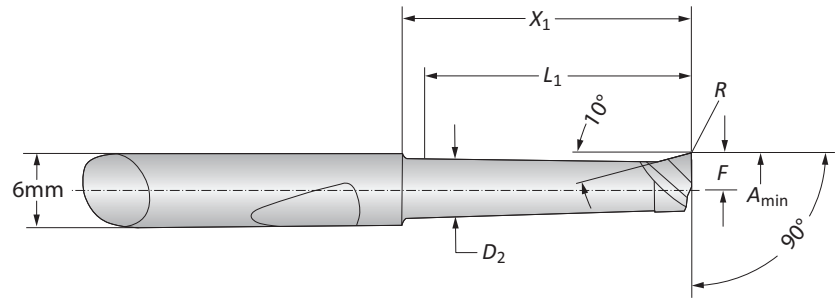
B10: xii-xiii

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

**IMPORTANT:** Max spindle speed refers to maximum possible speed for an individual boring head and is not a recommended parameter. Refer to page B10-N: 10 for recommended application-specific parameters. Factory technical assistance is available for your specific applications through our Application Engineering department.  
ext: 7611 | email: [appeng@alliedmachine.com](mailto:appeng@alliedmachine.com)

### Mini Boring Bars

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

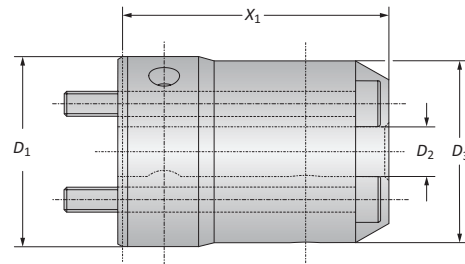


### Mini Boring Bars

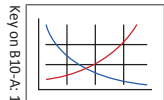
	Boring Range		Boring Bar				Part No.		
	$A_{min}$	$D_2$	$X_1$	$L_1$	$F$	$R$	Coated Carbide	Uncoated Carbide	CBN
i	0.118	0.102	0.453	0.394	0.055	0.004	081306HC05	-	081322BN150
	0.118	0.102	0.650	0.591	0.055	0.004	081307HC05	081307HW04	-
	0.157	0.142	0.472	0.394	0.075	0.008	081308HC05	-	081317BN150
	0.157	0.142	0.669	0.591	0.075	0.008	081309HC05	-	081341BN150
	0.157	0.142	0.866	0.787	0.075	0.008	081310HC05	081310HW04	-
	0.197	0.181	0.472	0.394	0.094	0.008	081311HC05	-	081318BN150
	0.197	0.181	0.866	0.787	0.094	0.008	081312HC05	-	081319BN150
	0.197	0.181	1.260	1.181	0.094	0.008	081313HC05	081313HW04	-
	0.236	0.220	0.866	0.787	0.114	0.008	081314HC05	-	081320BN150
	0.236	0.220	1.260	1.181	0.114	0.008	081315HC05	-	081321BN150
	0.236	0.220	1.654	1.575	0.114	0.008	081316HC05	081316HW04	-
m	3.00	2.60	11.50	10.00	1.40	0.10	081306HC05	-	081322BN150
	3.00	2.60	16.50	15.00	1.40	0.10	081307HC05	081307HW04	-
	4.00	3.60	12.00	10.00	1.90	0.20	081308HC05	-	081317BN150
	4.00	3.60	17.00	15.00	1.90	0.20	081309HC05	-	081341BN150
	4.00	3.60	22.00	20.00	1.90	0.20	081310HC05	081310HW04	-
	5.00	4.60	12.00	10.00	2.40	0.20	081311HC05	-	081318BN150
	5.00	4.60	22.00	20.00	2.40	0.20	081312HC05	-	081319BN150
	5.00	4.60	32.00	30.00	2.40	0.20	081313HC05	081313HW04	-
	6.00	5.60	22.00	20.00	2.90	0.20	081314HC05	-	081320BN150
	6.00	5.60	32.00	30.00	2.90	0.20	081315HC05	-	081321BN150
	6.00	5.60	42.00	40.00	2.90	0.20	081316HC05	081316HW04	-

### Adapter

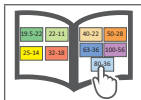
	Adapter				Part No.
	$X_1$	$D_1$	$D_2$	$D_3$	
m	32.00	23.00	6.00	22.00	248071



B10-N: 10-13



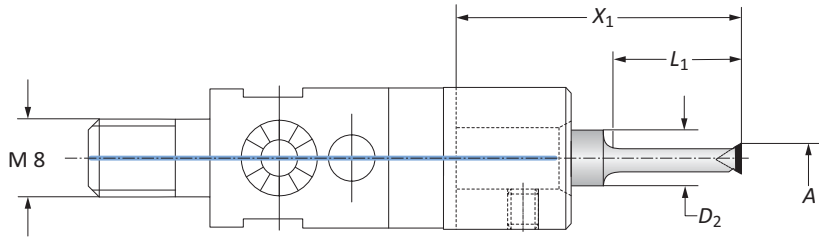
B10: xii-xiii



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

## Boring Bars

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



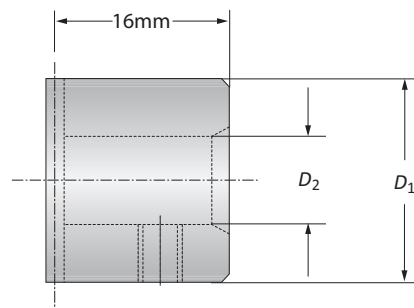
### Boring Bars

Boring Range		Boring Bar			Insert Form	Part No.
A	D <sub>2</sub>	X <sub>1</sub>	L <sub>1</sub>			
0.146 - 0.197	-	2.618	0.709	325*	218074	
0.193 - 0.236	-	2.835	0.906	47*	218075	
0.232 - 0.315	-	2.874	0.984	211*	218076	
0.311 - 0.394	-	3.071	1.181	211*	218077	
					218085	
<b>i</b> 0.390 - 0.472	-	3.268	1.378	20*	218079	
0.390 - 0.472	-	3.268	1.378	101*	218082	
0.469 - 0.551	-	3.661	1.772	20*	218080	
0.469 - 0.551	-	3.661	1.772	101*	218083	
0.547 - 0.630	-	3.858	1.968	20*	218081	
0.547 - 0.630	-	3.858	1.968	101*	218084	
<hr/>						
3.70 - 5.00	8.00	66.50	18.00	325*	218074	
4.90 - 6.00	8.00	72.00	23.00	47*	218075	
5.90 - 8.00	8.00	73.00	25.00	211*	218076	
7.90 - 10.00	8.00	78.00	30.00	211*	218077	
					218085	
<b>m</b> 9.90 - 12.00	8.00	83.00	35.00	20*	218079	
9.90 - 12.00	8.00	83.00	35.00	101*	218082	
11.90 - 14.00	10.00	93.00	45.00	20*	218080	
11.90 - 14.00	10.00	93.00	45.00	101*	218083	
13.90 - 16.00	10.00	98.00	50.00	20*	218081	
13.90 - 16.00	10.00	98.00	50.00	101*	218084	

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

### Adapters

Adapter		Part No.
D <sub>1</sub>	D <sub>2</sub>	
<b>i</b> 0.709	-	248063
0.906	-	248064
0.906	-	248065
<hr/>		
<b>m</b> 18.00	8.00	248063
23.00	8.00	248064
23.00	10.00	248065



Key on B10-A: 1

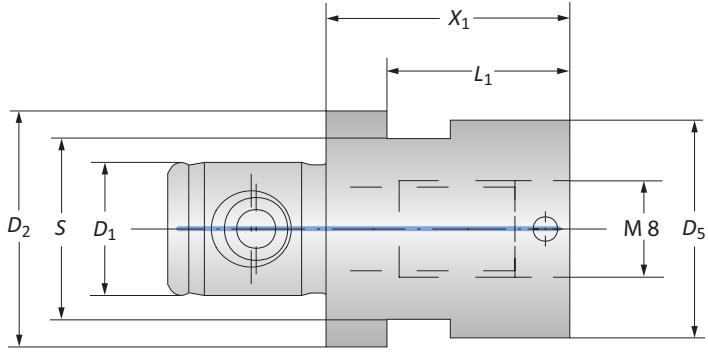
B10-N: 10-13

B10-F

B10: xii-xiii

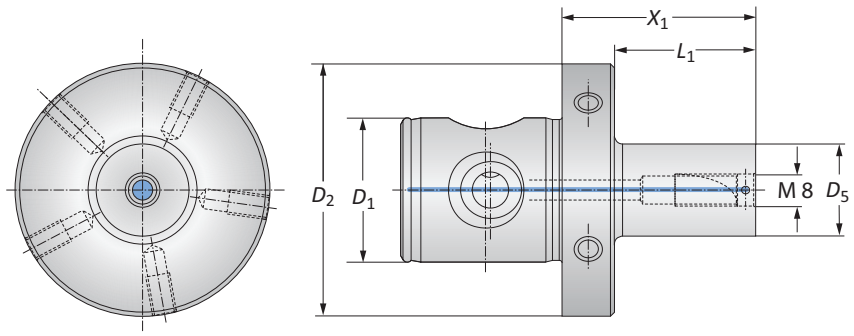
**i** = Imperial (in)  
**m** = Metric (mm)  
 Inserts sold separately

## Adapters



### Adapters

	MVS Connection		Adapter				Weight	Service Key	Part No.
	$D_2$   $D_1$	Boring Connection	$X_1$	$L_1$	$S$	$D_5$			
i	19.5 - 11	M8	0.787	0.590	15/P	0.708	0.110 (lbs)	15mm / P	219168
	23 - 11	M8	0.787	-	19/P	0.905	0.154 (lbs)	19mm / P	219169
m	19.5 - 11	M8	20.00	15.00	15/P	18.00	0.05 (kg)	15mm / P	219168
	23 - 11	M8	20.00	-	19/P	23.00	0.07 (kg)	19mm / P	219169

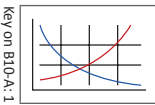


### Adapters

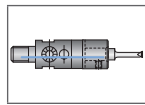
	MVS Connection		Adapter			Weight	Thread Precision	Part No.
	$D_2$   $D_1$	Boring Connection	$X_1$	$L_1$	$D_5$			
i	50 - 28	M8	1.259	0.748	0.590	0.771 (lbs)	M6 x 10	219185
	50 - 28	M8	1.890	1.377	0.708	0.881 (lbs)	M6 x 10	219176
	50 - 28	M8	1.890	1.377	0.905	0.992 (lbs)	M6 x 10	219177
m	50 - 28	M8	32.00	19.00	15.00	0.35 (kg)	M6 x 10	219185
	50 - 28	M8	48.00	35.00	18.00	0.40 (kg)	M6 x 10	219176
	50 - 28	M8	48.00	35.00	23.00	0.45 (kg)	M6 x 10	219177

**NOTE:** Balance refers to a specific residual imbalance of  $\leq 10$  g mm/kg

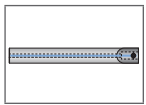
B10-N: 10-13



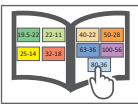
B10-A: 28



B10-A: 33



B10: xii-xiii



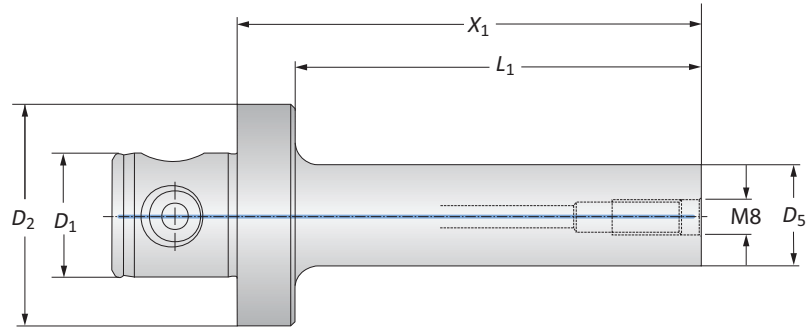
i = Imperial (in)  
m = Metric (mm)

A  
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L  
M  
N  
INDEX



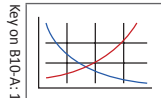
## Adapters

Heavy Metal

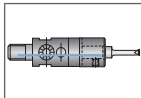


	MVS Connection		Adapter			Weight	Part No.
	$D_2$   $D_1$	Boring Connection	$X_1$	$L_1$	$D_5$		
i	50 - 28	M8	2.677	2.165	0.590	1.763 (lbs)	248147
	50 - 28	M8	3.307	2.795	0.748	2.204 (lbs)	248148
	50 - 28	M8	4.094	3.582	0.905	2.866 (lbs)	248149
m	50 - 28	M8	68.00	55.00	15.00	0.80 (kg)	248147
	50 - 28	M8	84.00	71.00	19.00	1.00 (kg)	248148
	50 - 28	M8	104.00	91.00	23.00	1.30 (kg)	248149

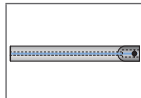
B10-N: 10-13



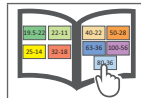
B10-A: 28



B10-A: 33

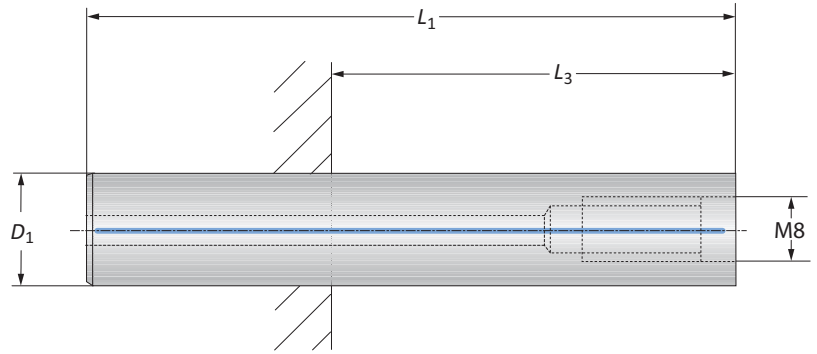


B10: xii-xiii



## Shanks

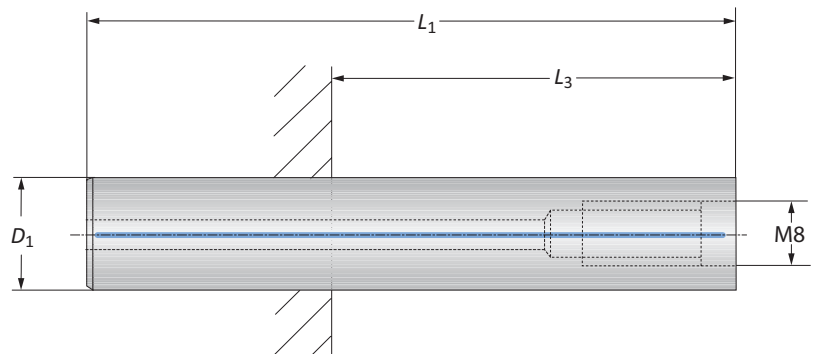
Steel | Carbide



### Steel Shanks

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

\* $L_3$  dimensions apply to collet chucks

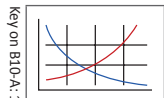


### Carbide Shanks

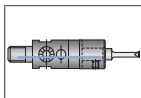
Connection	Shank			$L_3$ min*				Weight	Part No.	
	$D_1$	$L_1$	$L_3$ max*	SK 40	SK 50	HSK-A 63	HSK-A 100			
i	M8	0.591	5.118	3.228	0.787	0.787	1.377	1.653	0.661 (lbs)	248142
	M8	0.709	6.102	4.212	1.535	0.826	2.362	2.637	1.322 (lbs)	248143
	M8	0.906	7.086	5.196	2.519	1.811	3.346	3.622	2.425 (lbs)	248144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

\* $L_3$  dimensions apply to collet chucks

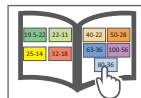
B10-N: 10-13



B10-A: 28



B10: xii-xiii

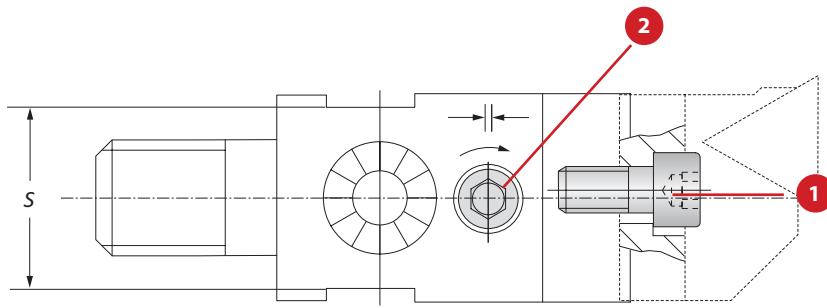


i = Imperial (in)  
m = Metric (mm)

A  
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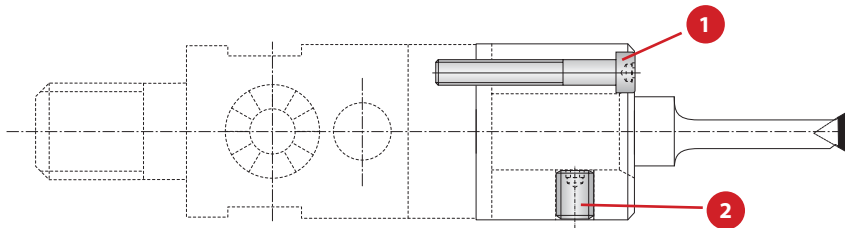
## Accessories

### Clamping Elements



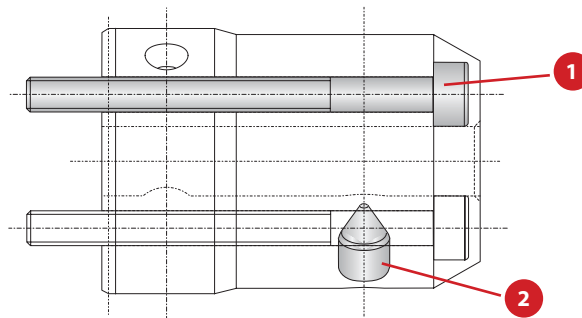
#### Clamping Elements for Boring Heads

Boring Head	Service Key S / Type	1 Cap Screw		2 Set Screw	
		Part No.	Service Key	Part No.	Service Key
249001	13mm / P	315631	s3 / A	315629	s2 / A
249002	15mm / P	315631	s3 / A	315684	s2 / A
249003	19mm / P	315631	s3 / A	315687	s2 / A
248001	13mm / P	315631	s3 / A	315629	s2 / A
248002	15mm / P	315631	s3 / A	315684	s2 / A
248003	19mm / P	315631	s3 / A	315687	s2 / A



#### Clamping Elements for Adapters

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



#### Screws

Boring Head	1 Cap Screw Part No.	Service Key	2 Set Screw Part No.	Service Key
248063	515166	S 2.5 / A	415244	S 3 / A

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





# PrimeBore Product Overview

## PrimeBore VERSATILE BORING

### Advancing versatile technology.

With over 30 years of development, the Wohlhaupter™ PrimeBore boring head offers versatility and precision. The PrimeBore head can bore multiple hole sizes ranging from 0.118" - 8.189" (3mm - 208mm) with our broad range of compatible boring bars.

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

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

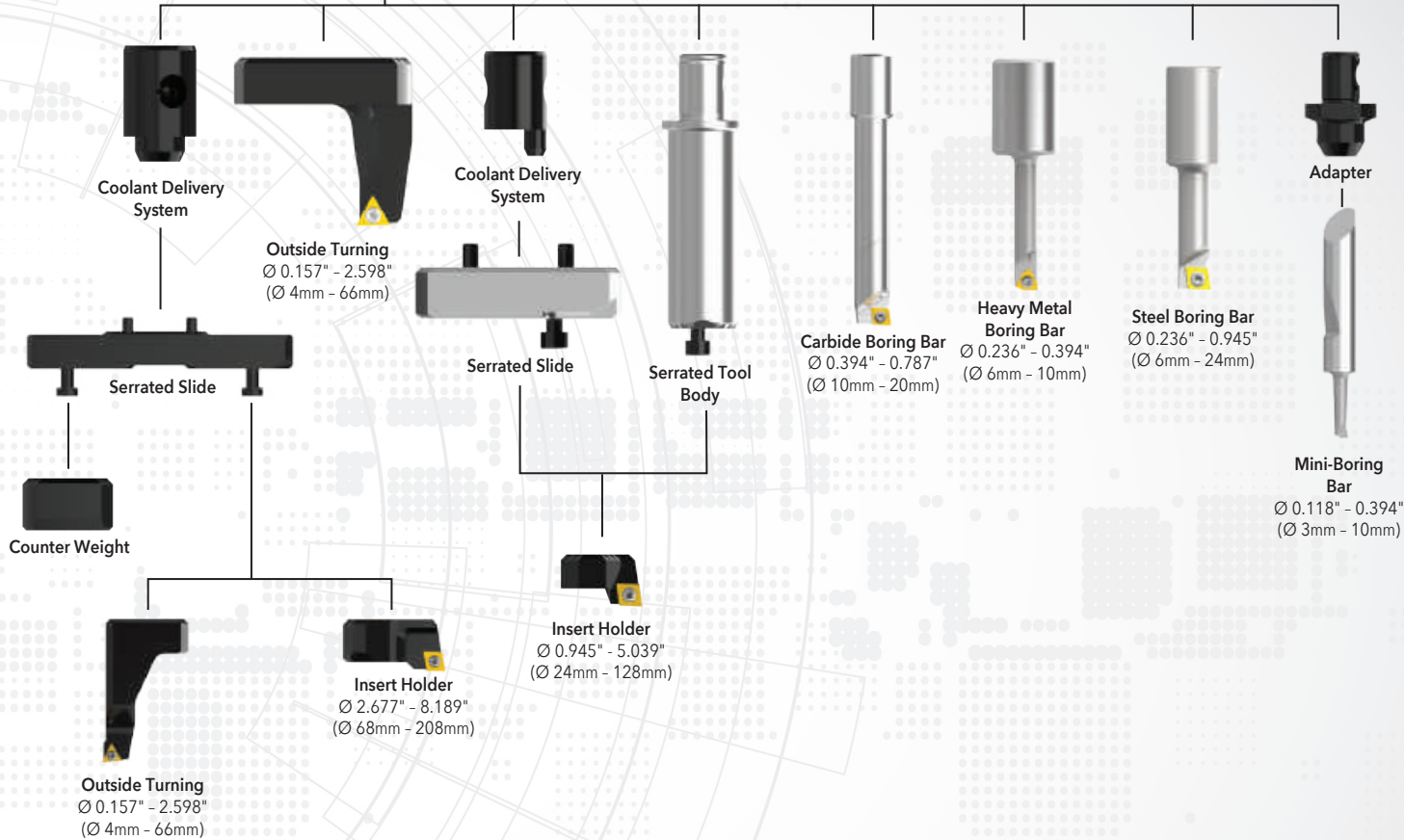


**IMPORTANT:** Max spindle speed refers to maximum possible speed for an individual boring head and is not a recommended parameter. Refer to page B10-N: 10 for recommended application-specific parameters. Factory technical assistance is available for your specific applications through our Application Engineering department.  
ext: 7611 | email: [appeng@alliedmachine.com](mailto:appeng@alliedmachine.com)

# PRIME BORE



PrimeBore Head



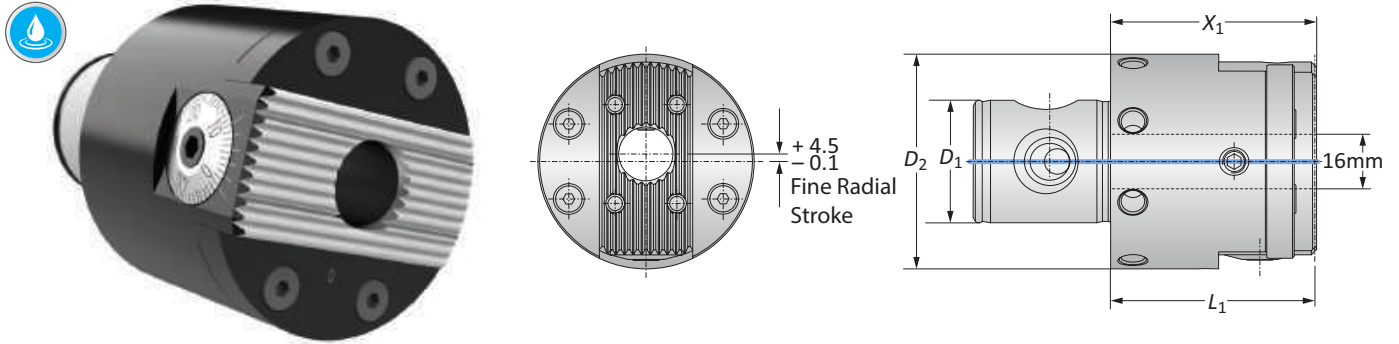
## OPERATION **VERSATILITY**

from **0.118"** to **8.189"** (3mm to 208mm)  
*plus outside turning*



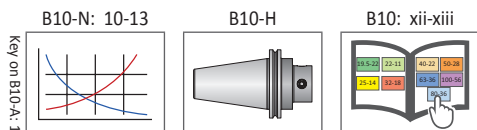
## Boring Heads

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



	Connection		Boring Head		Weight	Part No.
	$D_2$   $D_1$	Boring Range	$X_1$	$L_1$		
<b>i</b>	63 - 36	0.118 - 8.189	2.362	2.343	2.866 (lbs)	451001
<b>m</b>	63 - 36	3.00 - 208.00	60.00	59.50	1.30 (kg)	450001

**NOTE:** PrimeBore heads are compatible with Kaiser® connection

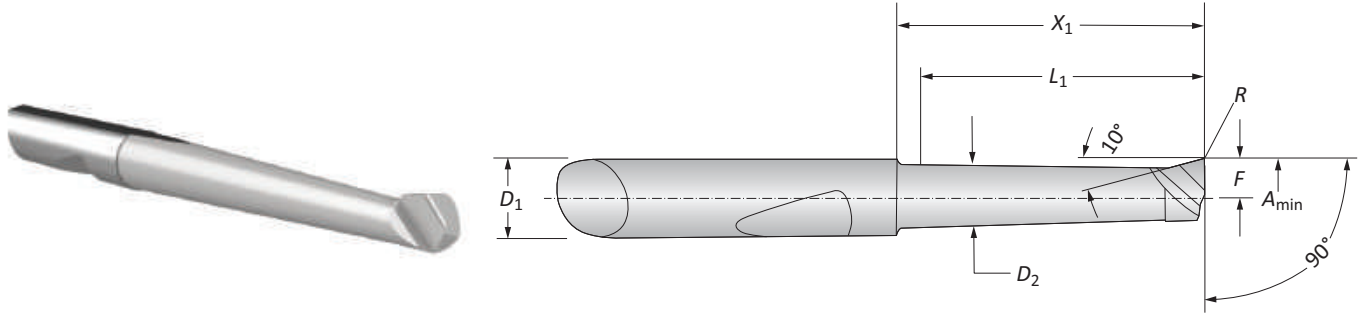


**i** = Imperial (in)  
**m** = Metric (mm)

**IMPORTANT:** Max spindle speed refers to maximum possible speed for an individual boring head and is not a recommended parameter. Refer to page B10-N: 10 for recommended application-specific parameters. Factory technical assistance is available for your specific applications through our Application Engineering department.  
ext: 7611 | email: [appeng@alliedmachine.com](mailto:appeng@alliedmachine.com)

## Mini Boring Bars

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



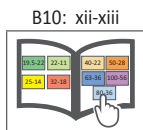
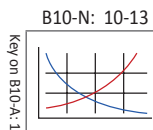
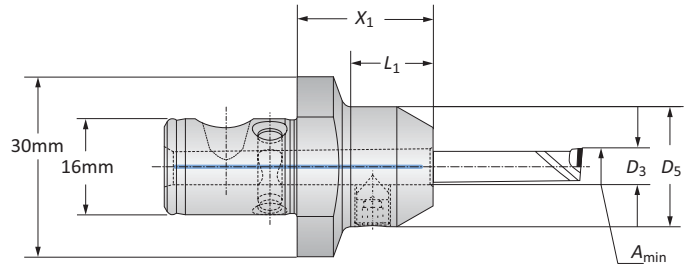
### Mini Boring Bars

Boring Range	Boring Bar						Part No.			
	$A_{min}$	$D_1$	$D_2$	$X_1$	$L_1$	$F$	$R$	Coated Carbide	Uncoated Carbide	CBN
i	0.118	-	0.102	0.453	0.394	0.055	0.004	081306HC05	-	081322BN150
	0.118	-	0.102	0.650	0.590	0.055	0.004	081307HC05	081307HW04	-
	0.157	-	0.142	0.472	0.394	0.075	0.008	081308HC05	-	081317BN150
	0.157	-	0.142	0.669	0.590	0.075	0.008	081309HC05	-	081341BN150
	0.157	-	0.142	0.866	0.787	0.075	0.008	081310HC05	081310HW04	-
	0.197	-	0.181	0.472	0.394	0.094	0.008	081311HC05	-	081318BN150
	0.197	-	0.181	0.866	0.787	0.094	0.008	081312HC05	-	081319BN150
	0.197	-	0.181	1.260	1.181	0.094	0.008	081313HC05	081313HW04	-
	0.236	-	0.220	0.866	0.787	0.114	0.008	081314HC05	-	081320BN150
	0.236	-	0.220	1.260	0.181	0.114	0.008	081315HC05	-	081321BN150
	0.236	-	0.220	1.654	1.575	0.114	0.008	081316HC05	081316HW04	-
	0.315	-	0.299	0.984	0.906	0.154	0.008	081323HC05	-	-
	0.315	-	0.299	1.968	1.890	0.154	0.008	081324HC05	-	-
	m	3.00	6.00	2.60	11.50	10.00	1.40	0.10	081306HC05	-
3.00		6.00	2.60	16.50	15.00	1.40	0.10	081307HC05	081307HW04	-
4.00		6.00	3.60	12.00	10.00	1.90	0.20	081308HC05	-	081317BN150
4.00		6.00	3.60	17.00	15.00	1.90	0.20	081309HC05	-	081341BN150
4.00		6.00	3.60	22.00	20.00	1.90	0.20	081310HC05	081310HW04	-
5.00		6.00	4.60	12.00	10.00	2.40	0.20	081311HC05	-	081318BN150
5.00		6.00	4.60	22.00	20.00	2.40	0.20	081312HC05	-	081319BN150
5.00		6.00	4.60	32.00	30.00	2.40	0.20	081313HC05	081313HW04	-
6.00		6.00	5.60	22.00	20.00	2.90	0.20	081314HC05	-	081320BN150
6.00		6.00	5.60	32.00	30.00	2.90	0.20	081315HC05	-	081321BN150
6.00		6.00	5.60	42.00	40.00	2.90	0.20	081316HC05	081316HW04	-
8.00		8.00	7.60	25.00	23.00	3.90	0.20	081323HC05	-	-
8.00		8.00	7.60	50.00	48.00	3.90	0.20	081324HC05	-	-



### Adapters

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



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

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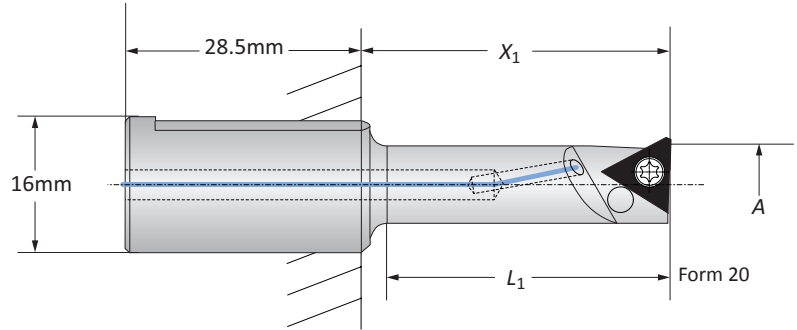


## Boring Bars

Steel | Heavy Metal



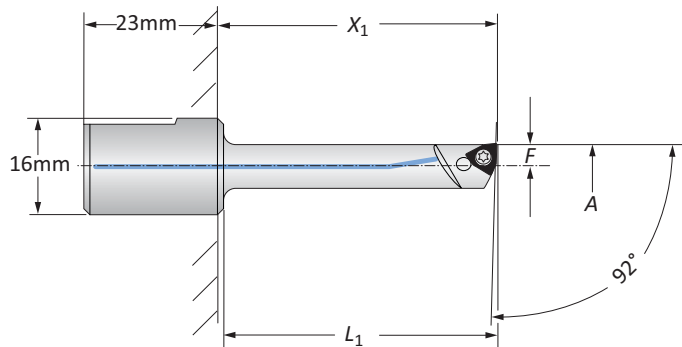
Form 101



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

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

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



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

	Boring Range		Boring Bar		Weight	Insert Form	Part No.
	A	X <sub>1</sub>	L <sub>1</sub>	F			
i	0.236 - 0.315	1.260	1.142		0.176 (lbs)	211	081055
	0.315 - 0.394	1.772	1.654		0.198 (lbs)	211	218072
m	6.00 - 8.00	32.00	29.00	2.80	0.08 (kg)	211	081056
	8.00 - 10.00	45.00	42.00	3.80	0.09 (kg)	211	218072

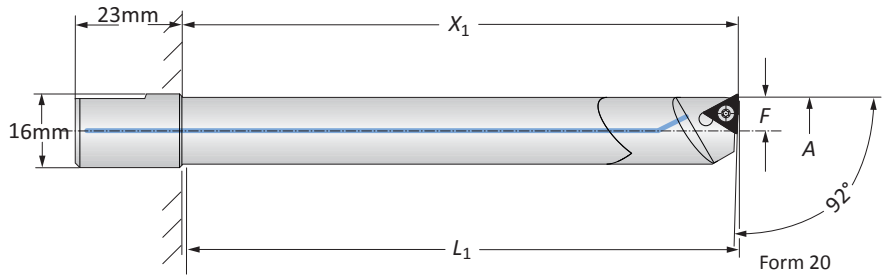
B10: 10-13 B10-F B10: xii-xiii

Key on B10-A:1

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

## Boring Bars

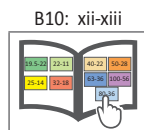
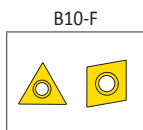
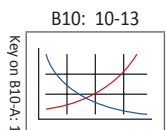
Carbide | Diameter Range: 0.393" - 0.787" (10.00mm - 20.00mm)



### Carbide Boring Bars

	Boring Range		Boring Bar				Insert Form	Part No.	Insert Form	Part No.
	A	X <sub>1</sub>	L <sub>1</sub>	F	Weight					
i	0.394 - 0.472	2.165	2.047	0.189	0.154 (lbs)	101*	218042	20*	218037	
	0.394 - 0.472	2.953	2.835	0.189	0.198 (lbs)	101*	218032	20*	218029	
	0.472 - 0.551	2.756	2.638	0.228	0.220 (lbs)	101*	218043	20*	218038	
	0.472 - 0.551	3.543	3.425	0.228	0.331 (lbs)	101*	218033	20*	218030	
	0.551 - 0.630	2.953	2.835	0.268	0.353 (lbs)	101*	218044	20*	218039	
	0.551 - 0.630	3.937	3.819	0.268	0.441 (lbs)	101*	218045	20*	218040	
	0.630 - 0.709	3.543	3.425	0.307	0.573 (lbs)	101*	218046	20*	218041	
	0.630 - 0.709	4.724	4.606	0.307	0.728 (lbs)	101*	218034	20*	218031	
m	10.00 - 12.00	55.00	52.00	4.80	0.07 (kg)	101*	218042	20*	218037	
	10.00 - 12.00	75.00	72.00	4.80	0.09 (kg)	101*	218032	20*	218029	
	12.00 - 14.00	70.00	67.00	5.80	0.10 (kg)	101*	218043	20*	218038	
	12.00 - 14.00	90.00	87.00	5.80	0.15 (kg)	101*	218033	20*	218030	
	14.00 - 16.00	75.00	72.00	6.80	0.16 (kg)	101*	218044	20*	218039	
	14.00 - 16.00	100.00	97.00	6.80	0.20 (kg)	101*	218045	20*	218040	
	16.00 - 20.00	90.00	87.00	7.80	0.26 (kg)	101*	218046	20*	218041	
	16.00 - 20.00	120.00	117.00	7.80	0.33 (kg)	101*	218034	20*	218031	

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

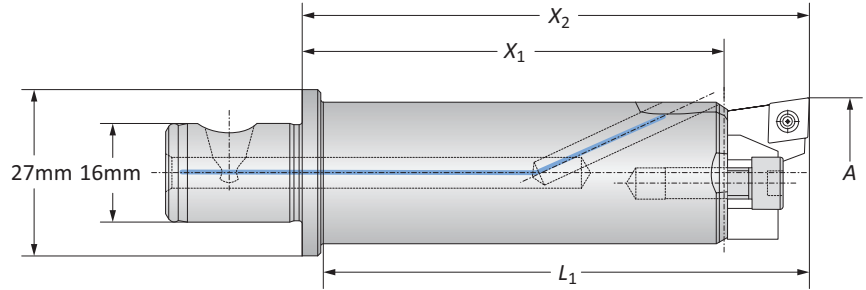


i = Imperial (in)  
m = Metric (mm)  
Inserts sold separately

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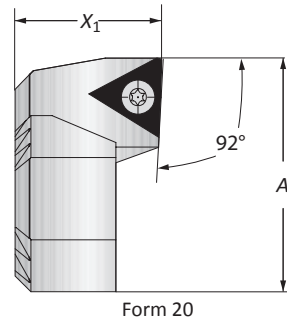
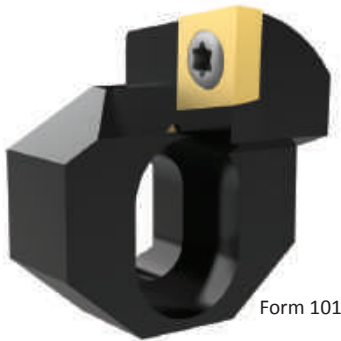
## Serrated Tool Bodies | Insert Holders

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



### Serrated Tool Bodies

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



### Insert Holders

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

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

Key on B10-A: 1

B10-N: 10-13

B10-A: 47

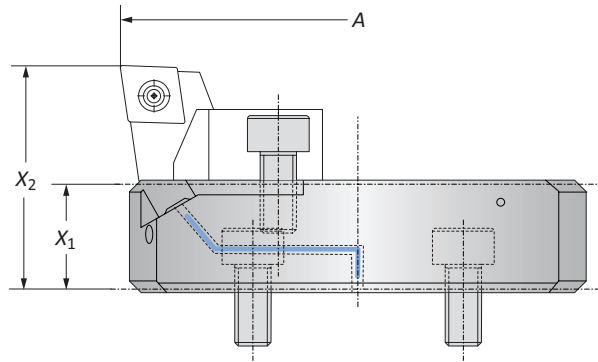
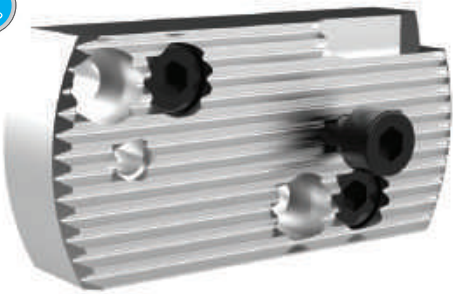
B10-F

B10: xii-xiii

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

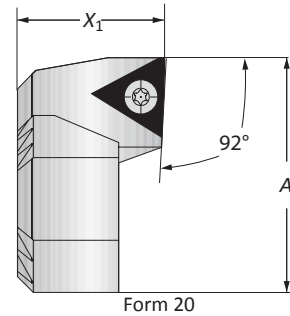
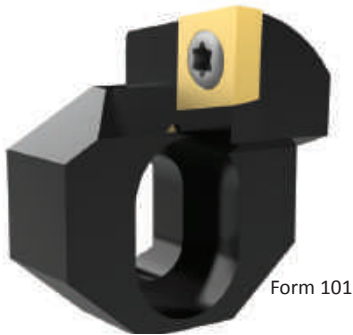
## Serrated Slides | Insert Holders

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



### Serrated Slides

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



### Insert Holders

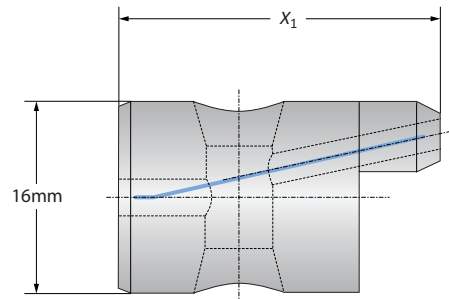
	Boring Range	Insert Holder	Weight	Insert Form	Part No.
	A	X <sub>1</sub>			
<b>i</b>	2.559 - 5.039	0.551	0.066 (lbs)	101*	<b>450023</b>
	2.559 - 5.039	0.551	0.066 (lbs)	20*	<b>450041</b>
<b>m</b>	65.00 - 128.00	14.00	0.03 (kg)	101*	<b>450023</b>
	65.00 - 128.00	14.00	0.03 (kg)	20*	<b>450041</b>

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

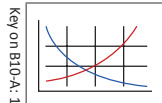


### Alu-Line Coolant Delivery Sections

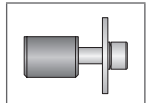
	Coolant Delivery Section		Part No.
	X <sub>1</sub>	Weight	
<b>m</b>	26.75	0.01 (kg)	<b>450125</b>



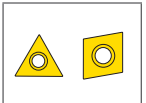
B10-N: 10-13



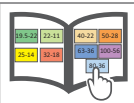
B10-A: 47



B10-F



B10: xii-xiii



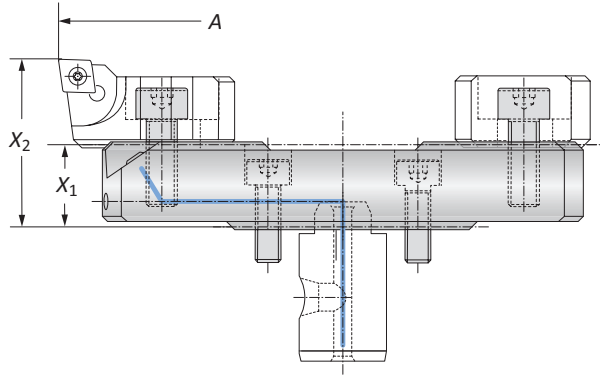
**i** = Imperial (in)  
**m** = Metric (mm)  
 Inserts sold separately

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## Alu-Line Serrated Slides | Insert Holders

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

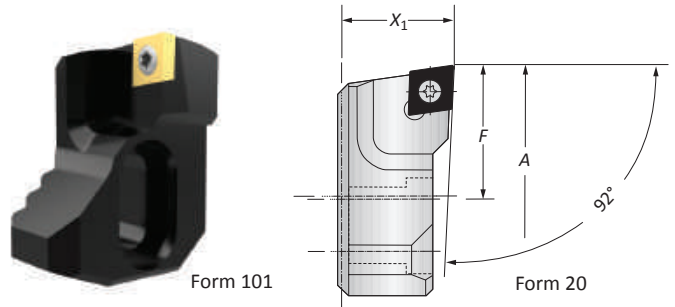


### Alu-Line Serrated Slides

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

### Insert Holders

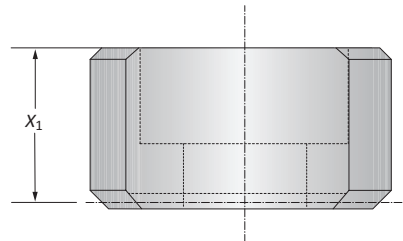
	Boring Range	Weight	Insert Form	Part No.
i	2.677 - 8.189	0.110 (lbs)	101	502064
	2.677 - 8.189	0.110 (lbs)	20	502069
m	68.00 - 208.00	0.05 (kg)	101	502064
	68.00 - 208.00	0.05 (kg)	20	502069



NOTE: Other insert holders available upon request

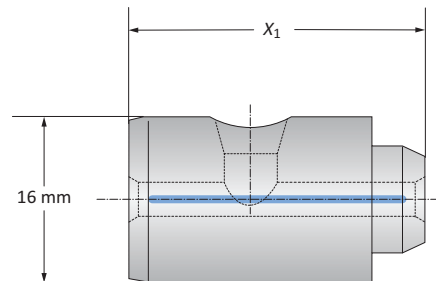
### Counter Weights

	Counter Weights	Weight	Part No.
	X <sub>1</sub>		
i	0.528	0.110 (lbs)	502165
m	13.40	0.05 (kg)	502165



### Alu-Line Coolant Delivery Sections

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



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B10-A: 47

B10-F

B10: xii-xiii

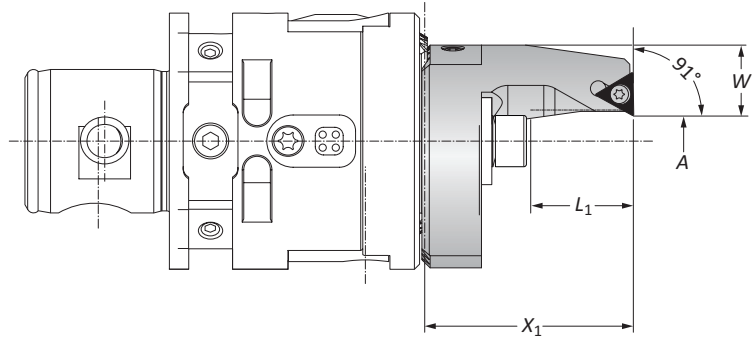
Key on B10-A: 1

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

Inserts sold separately

## Outside Turning Insert Holders for Boring Heads

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

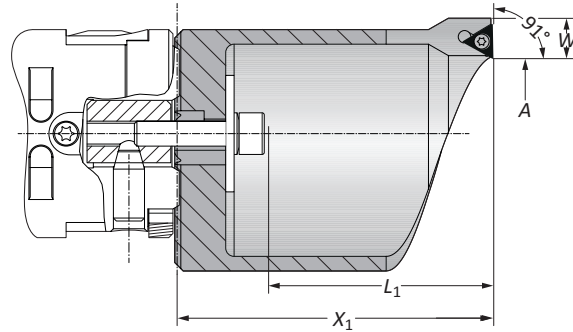


### Type A Insert Holders | Diameter Range: 0.157" - 1.181" (4.00mm - 30.00mm)

	Boring Range		Insert Holder				Weight	Type	Insert Form	Part No.
	A	X <sub>1</sub>	L <sub>1</sub>	W						
i	0.157 - 0.689	3.543	0.787	0.653	0.220 (lbs)	A	20*	236081		
	0.650 - 1.181	3.937	1.181	0.437	0.220 (lbs)	A	20*	236082		
m	4.00 - 17.50	45.00	20.00	16.60	0.10 (kg)	A	20*	236081		
	16.50 - 30.00	52.50	30.00	11.10	0.10 (kg)	A	20*	236082		

NOTE: Clockwise and neutral execution

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



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

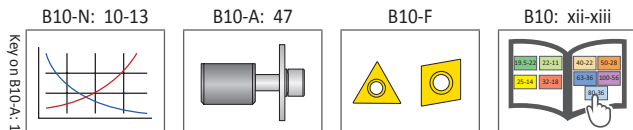
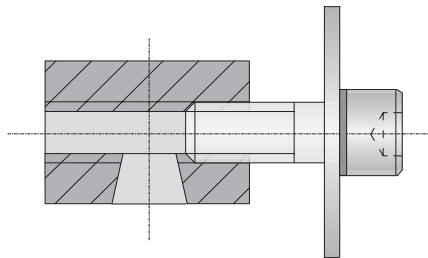
	Boring Range		Insert Holder				Weight	Type	Insert Form	Part No.
	A	X <sub>1</sub>	L <sub>1</sub>	W						
i	1.142 - 1.732	4.921	2.126	0.377	0.661 (lbs)	B	20*	236083		
	1.693 - 2.598	5.905	3.110	0.377	0.882 (lbs)	B	20*	236084		
m	29.00 - 44.00	63.50	54.00	9.60	0.30 (kg)	B	20*	236083		
	43.00 - 66.00	85.50	79.00	9.60	0.40 (kg)	B	20*	236084		

NOTE: Clockwise and neutral execution

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

### Clamping Pieces for Outside Turning Insert Holders

	Boring Range	Complete Part No.
m	4.00 - 30.00	236088
	29.00 - 66.00	236089

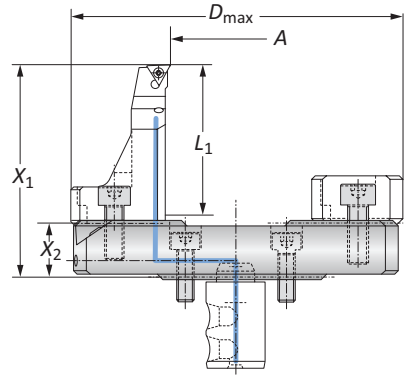


i = Imperial (in)  
m = Metric (mm)  
Inserts sold separately

A  
B  
C  
D  
E  
F  
G  
H  
I  
J  
K  
L  
M  
N  
INDEX

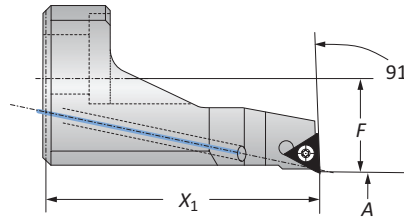
## Outside Turning Serrated Slides | Insert Holders

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



### Outside Turning Serrated Slides

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



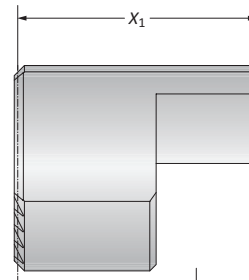
### Insert Holders

	Outside Turning Range		Insert Holder		Weight	Insert Form	Part No.
	A	X <sub>1</sub>	F				
i	0.079 - 4.488	2.244	0.776		0.331 (lbs)	20	502082
m	2.00 - 114.00	57.00	19.70		0.15 (kg)	20	502082

NOTE: clockwise and neutral execution

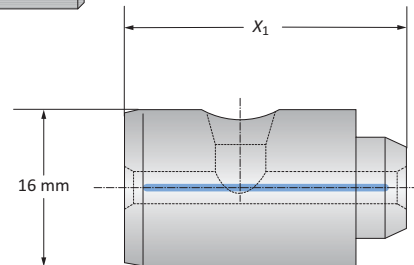
### Counter Weights

	Counter Weight		Part No.
	X <sub>1</sub>	Weight	
i	1.486	0.350 (lbs)	502183
m	37.75	0.16 (kg)	502183



### Coolant Delivery Sections

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



Key on B10-A: 1

B10-N: 10-13

B10-A: 47

B10-F

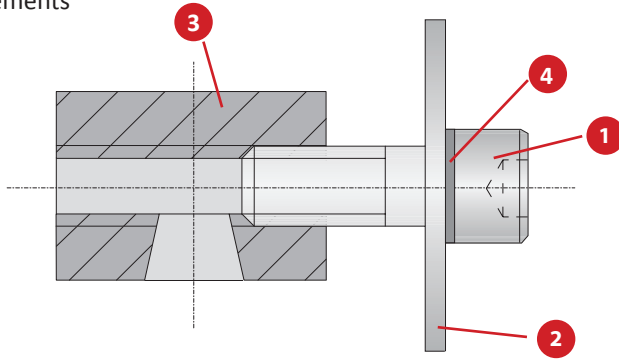
B10: xii-xiii

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

Inserts sold separately

## Accessories

### Clamping Elements

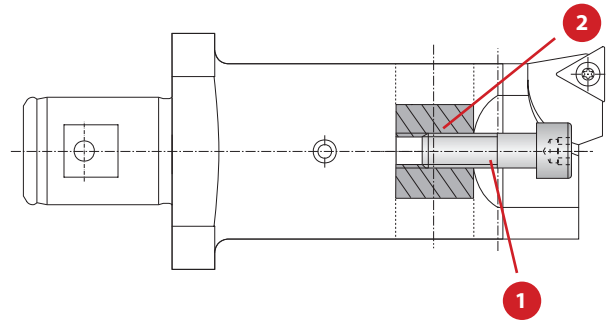


#### Clamping Elements for Insert Holders

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

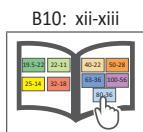
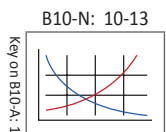
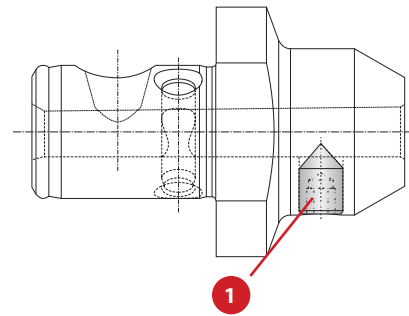
#### Clamping Elements for Serrated Tool Body

1	2
Cap Screw	Clamping Piece
027154	145184



#### Thread Pin

Service Key	1
	Part No.
S3 / A	415244

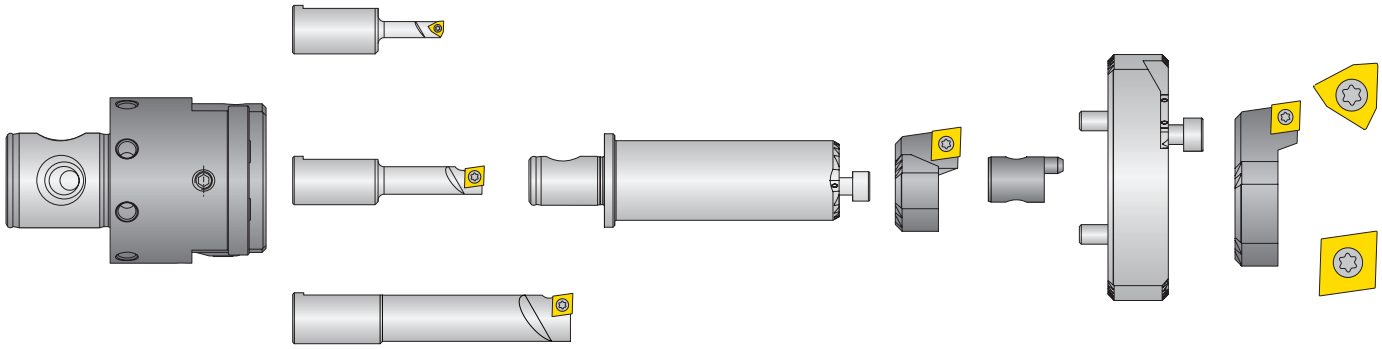


**i** = Imperial (in)  
**m** = Metric (mm)



## Kit Components

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



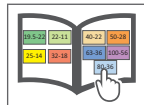
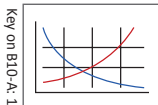
Kit Components									
Boring Head	Boring Bars	Insert Holders	Serrated Tool Body	Serrated Slide	Coolant Delivery Section	Service Keys	Inserts (2x)	Inserts (3x)	Kit No.
<b>i</b> 451001	450026 (Form 211) 450027 (Form 101) 450028 (Form 101)	450022 450023	450021	450024	450125	003195 (s4) 515451 (T6) 515452 (T8)	397676WHC19	297531WHC19	<b>104088</b>
<b>m</b> 450001	450026 (Form 211) 450027 (Form 101) 450028 (Form 101)	450022 450023	450021	450024	450125	003195 (s4) 515451 (T6) 515452 (T8)	397676WHC19	297531WHC19	<b>103088</b>

**NOTE:** Inserts are included in PrimeBore kits



B10-N: 10-13

B10: xii-xiii



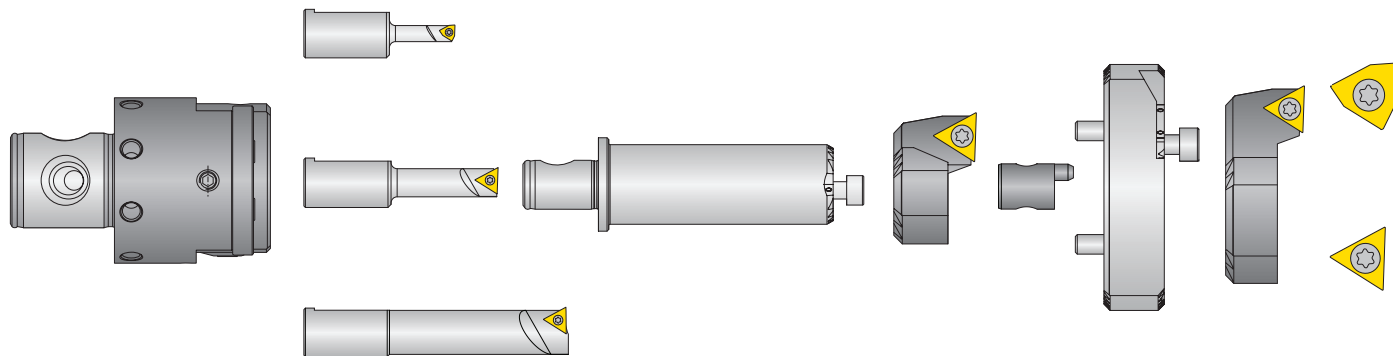
**i** = Imperial (in)  
**m** = Metric (mm)

Inserts sold separately

**IMPORTANT:** Max spindle speed refers to maximum possible speed for an individual boring head and is not a recommended parameter. Refer to page B10-N: 10 for recommended application-specific parameters. Factory technical assistance is available for your specific applications through our Application Engineering department.  
ext: 7611 | email: [appeng@alliedmachine.com](mailto:appeng@alliedmachine.com)

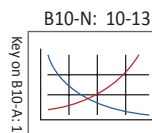
## Kit Components

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



Kit Components									
Boring Head	Boring Bars	Insert Holders	Serrated Tool Body	Serrated Slide	Coolant Delivery Section	Service Keys	Inserts (2x)	Inserts (2x)	Kit No.
<b>i</b> 451001	450026 (Form 211) 450038 (Form 20) 450039 (Form 20)	450040 450041	450021	450024	450125	003195 (s4) 515451 (T6) 515452 (T8)	397676WHC19	397673WHC19	<b>104089</b>
<b>m</b> 450001	450026 (Form 211) 450038 (Form 20) 450039 (Form 20)	450040 450041	450021	450024	450125	003195 (s4) 515451 (T6) 515452 (T8)	397676WHC19	397673WHC19	<b>103089</b>

**NOTE:** Inserts are included in PrimeBore kits



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

**IMPORTANT:** Max spindle speed refers to maximum possible speed for an individual boring head and is not a recommended parameter. Refer to page B10-N: 10 for recommended application-specific parameters. Factory technical assistance is available for your specific applications through our Application Engineering department.  
 ext: 7611 | email: [appeng@alliedmachine.com](mailto:appeng@alliedmachine.com)

# Digital 511 (510) Product Overview



## Digital 511 (510) VERSATILE BORING

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

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

Experience *precision boring* for yourself.

- Diameter range: 0.016" - 0.472" (0.40mm - 12.00mm)
- Easy-to-read digital display
- Coolant-through
- External counter weight for balancing
- Protected against coolant and dust according to IP65
- Fine adjustments of 0.0001" (0.002mm)
- Ideal for CAT40, BT30, HSK40
- Max spindle speed: 35,000 RPM



**NOTE:** Imperial item pictured

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

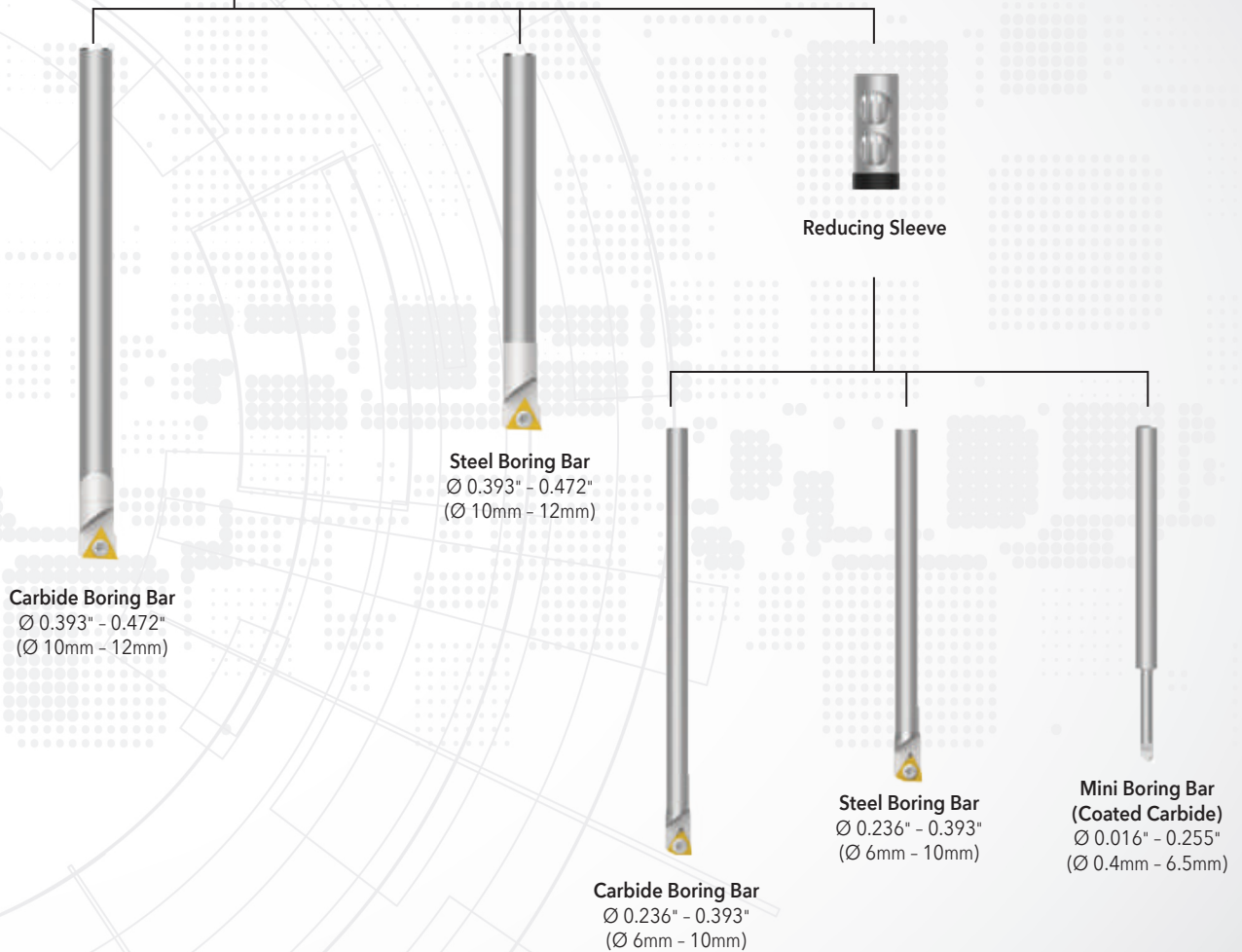
**IMPORTANT:** Max spindle speed refers to maximum possible speed for an individual boring head and is not a recommended parameter. Refer to page B10-N: 10 for recommended application-specific parameters. Factory technical assistance is available for your specific applications through our Application Engineering department.  
ext: 7611 | email: [appeng@alliedmachine.com](mailto:appeng@alliedmachine.com)

# DIGITAL



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

Digital 511 (510) Boring Head

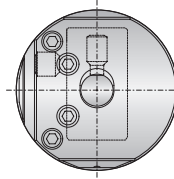


OPERATION **VERSATILITY**  
from **0.016"** to **0.472"** (**0.4mm** to **12mm**)

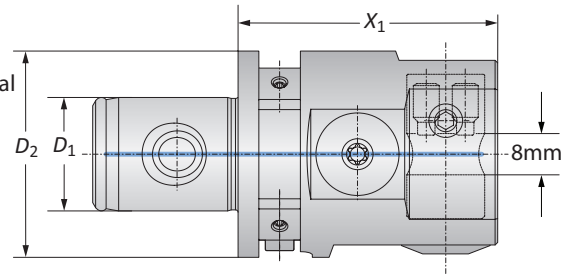


## Boring Heads

Diameter Range: 0.016" - 0.472" (0.40mm - 12.00mm)



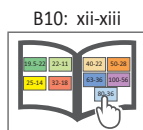
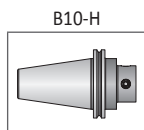
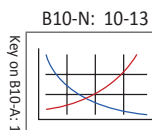
Fine Radial Stroke  
+1.1 mm  
-0.1 mm



NOTE: Imperial item pictured

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

Connection	Boring Range	Boring Head	Weight	Part No.
$D_2   D_1$		$X_1$		
<b>i</b> 40 - 22	0.016 - 0.472	1.969	0.926 (lbs)	511001
<b>m</b> 40 - 22	0.40 - 12.00	50.00	2.19 (kg)	510001



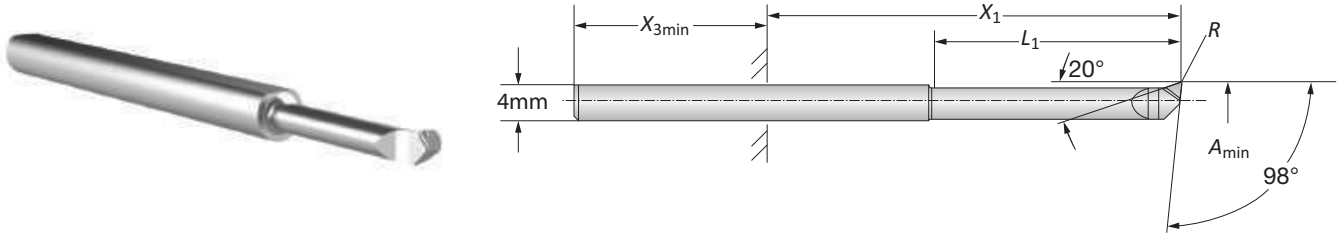
**i** = Imperial (in)  
**m** = Metric (mm)

**IMPORTANT:** Max spindle speed refers to maximum possible speed for an individual boring head and is not a recommended parameter. Refer to page B10-N: 10 for recommended application-specific parameters. Factory technical assistance is available for your specific applications through our Application Engineering department.  
ext: 7611 | email: [appeng@alliedmachine.com](mailto:appeng@alliedmachine.com)



## Mini Boring Bars

Diameter Range: 0.016" - 0.118" (0.40mm - 3.00mm)



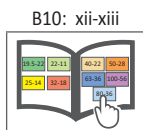
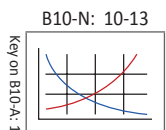
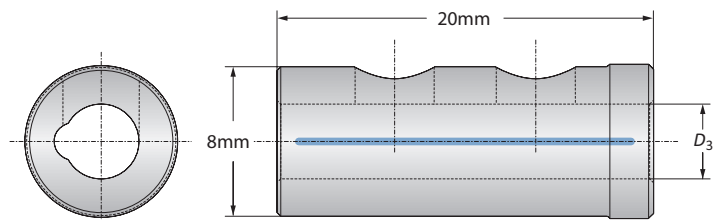
### Mini Boring Bars

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



### Reducing Sleeve

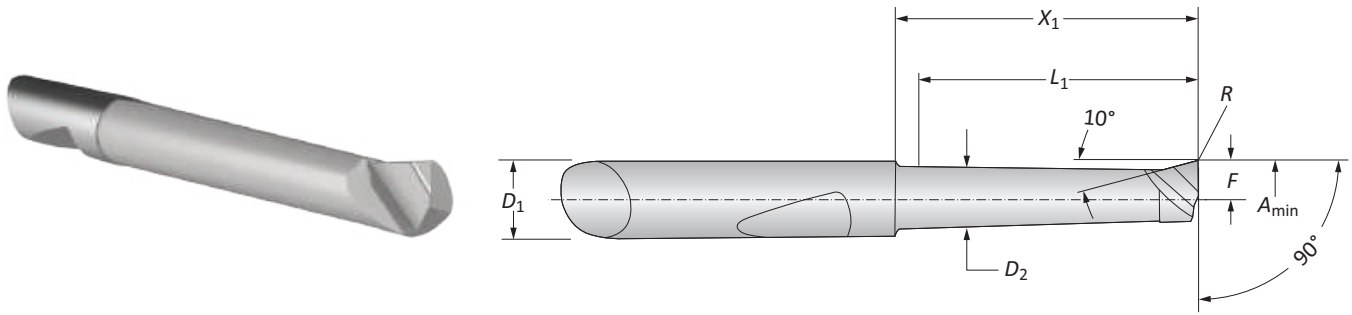
Reducing Sleeve	
$D_3$	Part No.
4.00	514201



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

## Mini Boring Bars

WHC05 | WHW04 | WBN150 | Diameter Range: 0.118" - 0.393" (3.00mm - 10.00mm)



### Mini Boring Bars

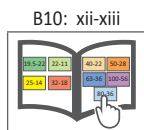
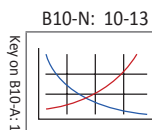
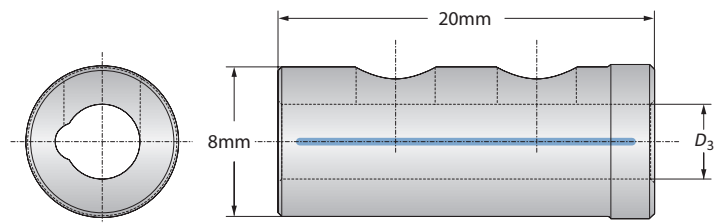
Boring Range	Boring Bar							Part No.		
	$A_{min}$	$D_1$	$D_2$	$X_1$	$L_1$	$F$	$R$	Coated Carbide	Uncoated Carbide	CBN
	0.118	-	0.102	0.452	0.393	0.055	0.003	081306HC05	-	081322BN150
	0.118	-	0.102	0.649	0.590	0.055	0.003	081307HC05	081307HW04	-
	0.157	-	0.141	0.472	0.393	0.074	0.007	081308HC05	-	081317BN150
	0.157	-	0.141	0.669	0.590	0.074	0.007	081309HC05	-	081341BN150
	0.157	-	0.141	0.866	0.787	0.074	0.007	081310HC05	081310HW04	-
	0.196	-	0.181	0.472	0.393	0.094	0.007	081311HC05	-	081318BN150
i	0.196	-	0.181	0.866	0.787	0.094	0.007	081312HC05	-	081319BN150
	0.196	-	0.181	1.259	1.181	0.094	0.007	081313HC05	081313HW04	-
	0.236	-	0.220	0.866	0.787	0.114	0.007	081314HC05	-	081320BN150
	0.236	-	0.220	1.259	1.181	0.114	0.007	081315HC05	-	081321BN150
	0.236	-	0.220	1.653	1.574	0.114	0.007	081316HC05	081316HW04	-
	0.314	-	0.299	0.984	0.905	0.153	0.007	081323HC05	-	-
	0.314	-	0.299	1.968	1.889	0.153	0.007	081324HC05	-	-
	3.00	6.00*	2.60	11.50	10.00	1.40	0.10	081306HC05	-	081322BN150
	3.00	6.00*	2.60	16.50	15.00	1.40	0.10	081307HC05	081307HW04	-
	4.00	6.00*	3.60	12.00	10.00	1.90	0.20	081308HC05	-	081317BN150
	4.00	6.00*	3.60	17.00	15.00	1.90	0.20	081309HC05	-	081341BN150
	4.00	6.00*	3.60	22.00	20.00	1.90	0.20	081310HC05	081310HW04	-
m	5.00	6.00*	4.60	12.00	10.00	2.40	0.20	081311HC05	-	081318BN150
	5.00	6.00*	4.60	22.00	20.00	2.40	0.20	081312HC05	-	081319BN150
	5.00	6.00*	4.60	32.00	30.00	2.40	0.20	081313HC05	081313HW04	-
	6.00	6.00*	5.60	22.00	20.00	2.90	0.20	081314HC05	-	081320BN150
	6.00	6.00*	5.60	32.00	30.00	2.90	0.20	081315HC05	-	081321BN150
	6.00	6.00*	5.60	42.00	40.00	2.90	0.20	081316HC05	081316HW04	-
	8.00	8.00	7.60	25.00	23.00	3.90	0.20	081323HC05	-	-
	8.00	8.00	7.60	50.00	48.00	3.90	0.20	081324HC05	-	-

\*Fixture through reducing sleeves



### Reducing Sleeve

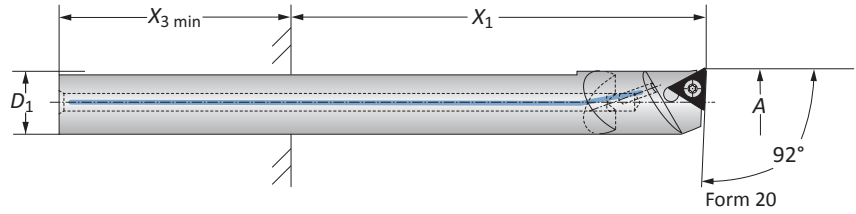
Reducing Sleeve	
$D_3$	Part No.
m 6.00	514210



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

## Boring Bars

Diameter Range: 0.236" - 0.472" (6.00mm - 12.00mm)

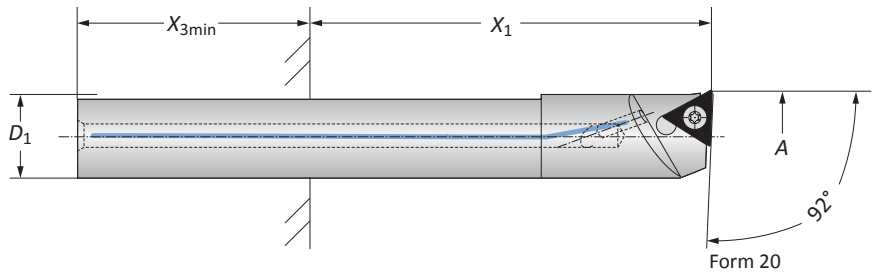


### Carbide Boring Bars

	Boring Range A	Boring Bar			Weight	Part No.			
		D <sub>1</sub>	X <sub>1</sub>	X <sub>3 min</sub>		Insert Form	Boring Bar	Insert Form	Boring Bar
i	0.236 - 0.315	-	0.492 - 2.559	0.630	0.044 (lbs)	211**	514034	-	-
	0.315 - 0.394	-	0.826 - 3.307	0.630	0.110 (lbs)	211**	514035	-	-
	0.394 - 0.472	-	2.047 - 3.622	0.748	0.154 (lbs)	101**	514015	20**	514016
m	6.00 - 8.00	5.00*	12.50 - 65.00	16.00	0.02 (kg)	211**	514034	-	-
	8.00 - 10.00	7.00*	21.00 - 84.00	16.00	0.05 (kg)	211**	514035	-	-
	10.00 - 12.00	8.00	52.00 - 92.00	19.00	0.07 (kg)	101**	514015	20**	514016

\*Fixture-through reducing sleeves

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



### Steel Boring Bars

	Boring Range A	Boring Bar			Weight	Part No.			
		D <sub>1</sub>	X <sub>1</sub>	X <sub>3 min</sub>		Insert Form	Boring Bar	Insert Form	Boring Bar
i	0.236 - 0.315	-	0.492 - 1.772	0.630	0.022 (lbs)	211**	514032	-	-
	0.315 - 0.394	-	0.689 - 2.205	0.630	0.044 (lbs)	211**	514033	-	-
	0.394 - 0.472	-	0.787 - 2.362	0.748	0.066 (lbs)	101**	514003	20**	514004
m	6.00 - 8.00	5.00*	12.50 - 45.00	16.00	0.01 (kg)	211**	514032	-	-
	8.00 - 10.00	7.00*	17.50 - 56.00	16.00	0.02 (kg)	211**	514033	-	-
	10.00 - 12.00	8.00	20.00 - 60.00	19.00	0.03 (kg)	101**	514003	20**	514004

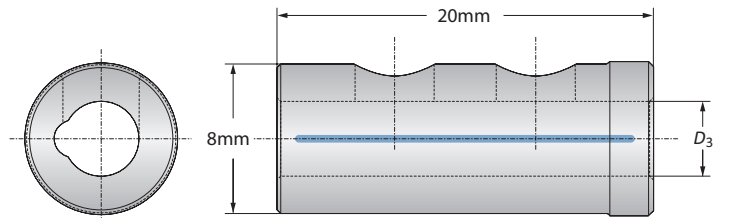
\*Fixture-through reducing sleeves

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



### Reducing Sleeves

Reducing Sleeve		Part No.
D <sub>3</sub>		
5.00		514202
7.00		514203



B10-N: 10-13

B10-A: 56

B10-F

B10: xii-xiii

Key on B10-A: 1

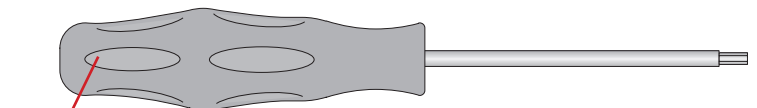
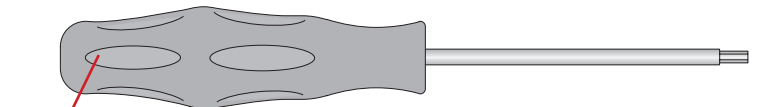
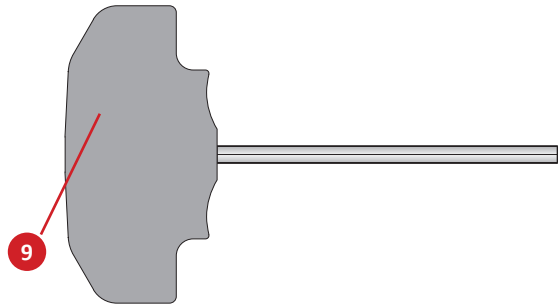
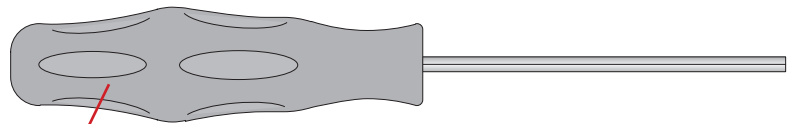
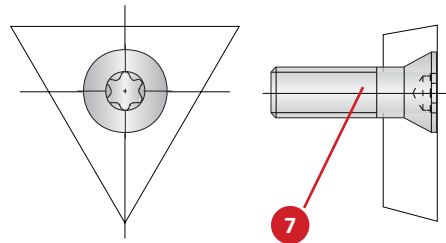
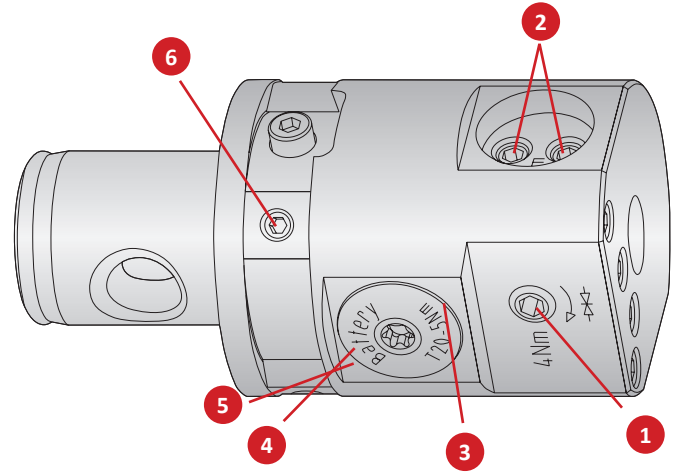
i = Imperial (in)  
m = Metric (mm)  
Inserts sold separately

A  
B  
C  
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## Boring Head Accessories

No.	Part	Insert Form	Size	Part No.
1	Clamping screw	-	-	115985
2	Thread pin for tool clamping	-	-	070333
3	Sealing ring for battery cover	-	-	415895
4	Battery*	-	-	415896
5	Battery cover	-	-	501016
6	Thread pin	-	-	510114
7	Insert screws	Form 20 Form 101 Form 337	T7 T8 T6	115535-1 115676-1 515286
8	Hex wrench	-	s2	215473
9	Hex wrench	-	s2.5 s3.0	415577 415578
10	Torx driver	-	T6 T7 T8 T20	115537 115591 115590 215150
11	Torx screwdriver	Form 211 Form 20 Form 101	T6 T7 T8	415507 415508 415514

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







# DigiBore Product Overview



## DigiBore VERSATILE BORING

### Advanced versatile technology.

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

Engineered with the *future in mind*.

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



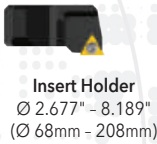
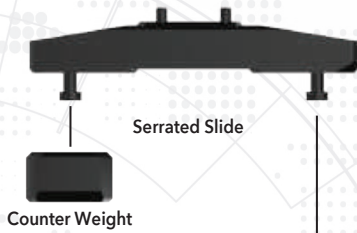
**NOTE:** Imperial items pictured

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

**IMPORTANT:** Max spindle speed refers to maximum possible speed for an individual boring head and is not a recommended parameter. Refer to page B10-N: 10 for recommended application-specific parameters. Factory technical assistance is available for your specific applications through our Application Engineering department.  
ext: 7611 | email: [appeng@alliedmachine.com](mailto:appeng@alliedmachine.com)

# DIGI BORE

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



## OPERATION **VERSATILITY**

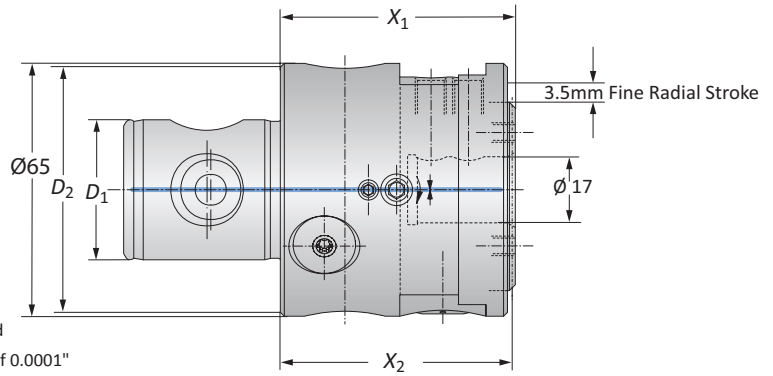
from **0.118"** to **8.189"** (3mm to 208mm)  
*plus outside turning*



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

## Boring Heads

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



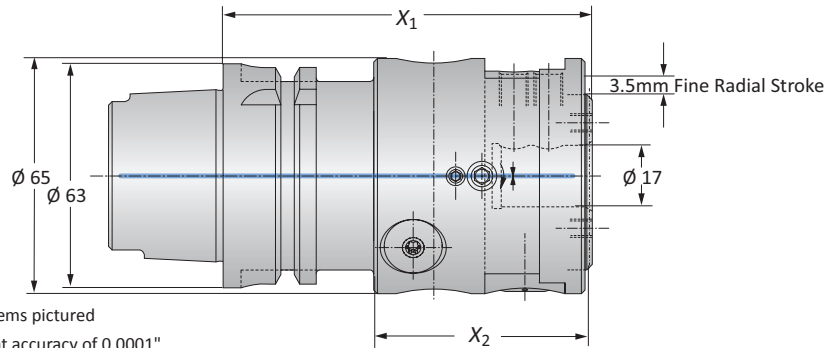
NOTE: Imperial items pictured

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

### DigiBore Boring Heads

	Connection		Boring Head		Weight	Part No.
	D <sub>2</sub>   D <sub>1</sub>	Boring Range	X <sub>1</sub>	X <sub>2</sub>		
i	50 - 28	0.118 - 8.189	2.362	2.342	2.866 (lbs)	504003
	63 - 36	0.118 - 8.189	2.362	2.342	3.307 (lbs)	504001
m	50 - 28	3.00 - 208.00	60.00	59.50	1.30 (kg)	501005
	63 - 36	3.00 - 208.00	60.00	59.50	1.50 (kg)	501001

NOTE: DigiBore heads are compatible with Kaiser® connection



NOTE: Imperial items pictured

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

### DigiBore Boring Heads

	Connection		Boring Head		Weight	Part No.
	Boring Range	X <sub>1</sub>	X <sub>2</sub>			
i	HSK-A 63	0.118 - 8.189	4.015	2.342	4.630 (lbs)	504004
	PSC 63 (Polygon Shank)	0.118 - 8.189	4.015	2.342	4.630 (lbs)	504019
m	HSK-A 63	3.00 - 208.00	102.00	59.50	2.10 (kg)	501004
	PSC 63 (Polygon Shank)	3.00 - 208.00	102.00	59.50	2.10 (kg)	501019

Key on B10-A: 1

B10-N: 10-13

B10-H

B10: xii-xiii

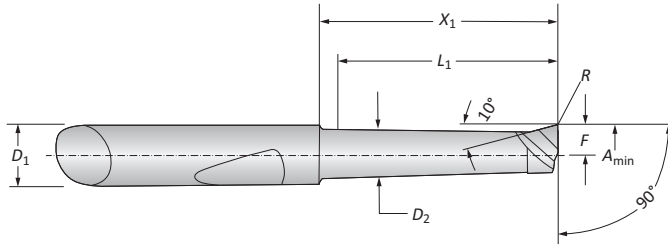
i = Imperial (in)  
m = Metric (mm)

**IMPORTANT:** Max spindle speed refers to maximum possible speed for an individual boring head and is not a recommended parameter. Refer to page B10-N: 10 for recommended application-specific parameters. Factory technical assistance is available for your specific applications through our Application Engineering department.  
ext: 7611 | email: [appeng@alliedmachine.com](mailto:appeng@alliedmachine.com)



### Mini Boring Bars

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



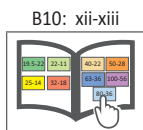
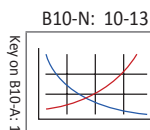
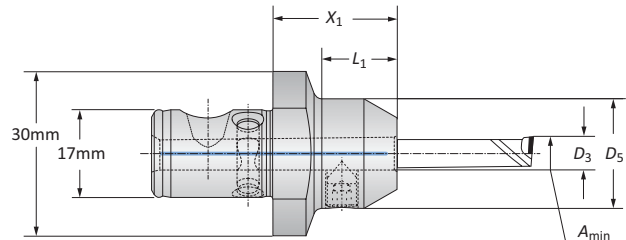
#### Mini Boring Bars

Boring Range	Boring Bar						Part No.			
	$A_{min}$	$D_1$	$D_2$	$X_1$	$L_1$	$F$	$R$	Coated Carbide	Uncoated Carbide	CBN
i	0.118	-	0.102	0.453	0.394	0.055	0.004	081306HC05	-	081322BN150
	0.118	-	0.102	0.650	0.590	0.055	0.004	081307HC05	081307HW04	-
	0.157	-	0.142	0.472	0.394	0.075	0.008	081308HC05	-	081317BN150
	0.157	-	0.142	0.669	0.590	0.075	0.008	081309HC05	-	081341BN150
	0.157	-	0.142	0.866	0.787	0.075	0.008	081310HC05	081310HW04	-
	0.197	-	0.181	0.472	0.394	0.094	0.008	081311HC05	-	081318BN150
	0.197	-	0.181	0.866	0.787	0.094	0.008	081312HC05	-	081319BN150
	0.197	-	0.181	1.260	1.181	0.094	0.008	081313HC05	081313HW04	-
	0.236	-	0.220	0.866	0.787	0.114	0.008	081314HC05	-	081320BN150
	0.236	-	0.220	1.260	0.181	0.114	0.008	081315HC05	-	081321BN150
	0.236	-	0.220	1.654	1.575	0.114	0.008	081316HC05	081316HW04	-
	0.315	-	0.299	0.984	0.906	0.154	0.008	081323HC05	-	-
	0.315	-	0.299	1.968	1.890	0.154	0.008	081324HC05	-	-
	m	3.00	6.00	2.60	11.50	10.00	1.40	0.10	081306HC05	-
3.00		6.00	2.60	16.50	15.00	1.40	0.10	081307HC05	081307HW04	-
4.00		6.00	3.60	12.00	10.00	1.90	0.20	081308HC05	-	081317BN150
4.00		6.00	3.60	17.00	15.00	1.90	0.20	081309HC05	-	081341BN150
4.00		6.00	3.60	22.00	20.00	1.90	0.20	081310HC05	081310HW04	-
5.00		6.00	4.60	12.00	10.00	2.40	0.20	081311HC05	-	081318BN150
5.00		6.00	4.60	22.00	20.00	2.40	0.20	081312HC05	-	081319BN150
5.00		6.00	4.60	32.00	30.00	2.40	0.20	081313HC05	081313HW04	-
6.00		6.00	5.60	22.00	20.00	2.90	0.20	081314HC05	-	081320BN150
6.00		6.00	5.60	32.00	30.00	2.90	0.20	081315HC05	-	081321BN150
6.00		6.00	5.60	42.00	40.00	2.90	0.20	081316HC05	081316HW04	-
8.00		8.00	7.60	25.00	23.00	3.90	0.20	081323HC05	-	-
8.00		8.00	7.60	50.00	48.00	3.90	0.20	081324HC05	-	-



#### Adapters

Boring Range	Adapter				Weight	Part No.
	$X_1$	$L_1$	$D_3$	$D_5$		
3.00 - 8.00	22.50	14.00	6.00	20.00	0.04 (kg)	501050
8.00 - 10.00	22.50	14.00	8.00	22.00	0.04 (kg)	501051



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

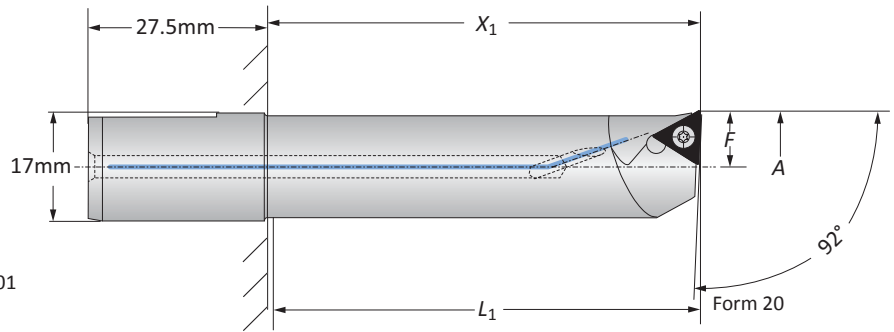


## Boring Bars

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



Form 101



Boring Range	Boring Bar				Weight	Insert Form	Part No.	Insert Form	Part No.
	A	X <sub>1</sub>	L <sub>1</sub>	F					
0.236 - 0.315	0.866	0.748	0.110	0.110 (lbs)	211	502068	-	-	
0.315 - 0.394	1.181	1.063	0.150	0.110 (lbs)	211	502066	-	-	
0.394 - 0.433	1.181	1.063	0.189	0.132 (lbs)	101*	502012	20*	502001	
0.433 - 0.472	1.181	1.063	0.203	0.132 (lbs)	101*	502075	20*	502070	
0.472 - 0.512	1.772	1.654	0.228	0.154 (lbs)	101*	502013	20*	502002	
0.512 - 0.551	1.772	1.654	0.248	0.176 (lbs)	101*	502076	20*	502071	
0.551 - 0.591	1.968	1.850	0.268	0.176 (lbs)	101*	502014	20*	502003	
0.591 - 0.630	1.968	1.850	0.287	0.198 (lbs)	101*	502077	20*	502072	
0.630 - 0.669	2.362	2.244	0.307	0.220 (lbs)	101*	502015	20*	502004	
0.669 - 0.709	2.362	2.244	0.327	0.265 (lbs)	101*	502078	20*	502073	
0.709 - 0.748	2.677	2.559	0.346	0.287 (lbs)	101*	502016	20*	502005	
0.748 - 0.787	2.677	2.559	0.366	0.309 (lbs)	101*	502079	20*	502074	
6.00 - 8.00	22.00	19.00	2.80	0.05 (kg)	211	502068	-	-	
8.00 - 10.00	30.00	27.00	3.80	0.05 (kg)	211	502066	-	-	
10.00 - 11.00	30.00	27.00	4.80	0.06 (kg)	101*	502012	20*	502001	
11.00 - 12.00	30.00	27.00	5.30	0.06 (kg)	101*	502075	20*	502070	
12.00 - 13.00	45.00	42.00	5.80	0.07 (kg)	101*	502013	20*	502002	
13.00 - 14.00	45.00	42.00	6.30	0.08 (kg)	101*	502076	20*	502071	
14.00 - 15.00	50.00	47.00	6.80	0.08 (kg)	101*	502014	20*	502003	
15.00 - 16.00	50.00	47.00	7.30	0.09 (kg)	101*	502077	20*	502072	
16.00 - 17.00	60.00	57.00	7.80	0.10 (kg)	101*	502015	20*	502004	
17.00 - 18.00	60.00	57.00	8.30	0.12 (kg)	101*	502078	20*	502073	
18.00 - 19.00	68.00	65.00	8.80	0.13 (kg)	101*	502016	20*	502005	
19.00 - 20.00	68.00	65.00	9.30	0.14 (kg)	101*	502079	20*	502074	

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

Key on B10-A: 1

B10-N: 10-13

B10-F

B10: xii-xiii

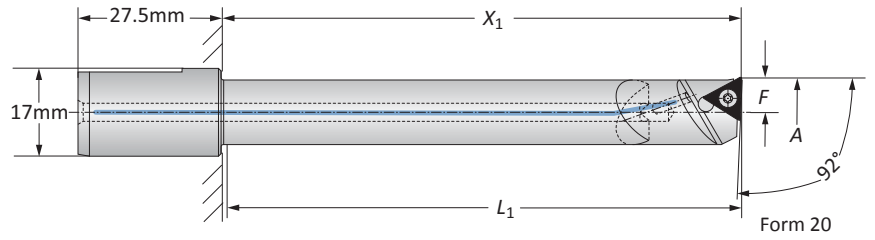
i = Imperial (in)  
m = Metric (mm)  
Inserts sold separately

## Boring Bars

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

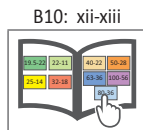
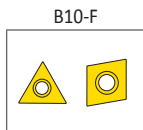
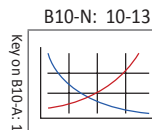


Form 101



	Boring Range		Boring Bar				Insert Form	Part No.	Insert Form	Part No.
	A	X <sub>1</sub>	L <sub>1</sub>	F	Weight					
<b>i</b>	0.394 - 0.472	2.165	2.047	0.189	0.265 (lbs)	101*	502093	20*	502088	
	0.394 - 0.472	2.756	2.638	0.189	0.309 (lbs)	101*	502034	20*	502023	
	0.472 - 0.551	2.559	2.441	0.228	0.287 (lbs)	101*	502094	20*	502089	
	0.472 - 0.551	3.346	3.228	0.228	3.975 (lbs)	101*	502035	20*	502024	
	0.551 - 0.630	2.953	2.835	0.268	0.375 (lbs)	101*	502095	20*	502090	
	0.551 - 0.630	3.543	3.425	0.268	0.485 (lbs)	101*	502036	20*	502025	
	0.630 - 0.709	3.346	3.228	0.307	0.573 (lbs)	101*	502096	20*	502091	
	0.630 - 0.709	4.331	4.213	0.307	0.706 (lbs)	101*	502037	20*	502026	
	0.709 - 0.787	3.740	3.622	0.346	0.617 (lbs)	101*	502097	20*	502092	
0.709 - 0.787	4.724	4.606	0.346	0.882 (lbs)	101*	502038	20*	502027		
<b>m</b>	10.00 - 12.00	55.00	52.00	4.80	0.12 (kg)	101*	502093	20*	502088	
	10.00 - 12.00	70.00	67.00	4.80	0.14 (kg)	101*	502034	20*	502023	
	12.00 - 14.00	65.00	62.00	5.80	0.13 (kg)	101*	502094	20*	502089	
	12.00 - 14.00	85.00	82.00	5.80	0.18 (kg)	101*	502035	20*	502024	
	14.00 - 16.00	75.00	72.00	6.80	0.17 (kg)	101*	502095	20*	502090	
	14.00 - 16.00	90.00	87.00	6.80	0.22 (kg)	101*	502036	20*	502025	
	16.00 - 18.00	85.00	82.00	7.80	0.26 (kg)	101*	502096	20*	502091	
	16.00 - 18.00	110.00	107.00	7.80	0.32 (kg)	101*	502037	20*	502026	
	18.00 - 20.00	95.00	92.00	8.80	0.28 (kg)	101*	502097	20*	502092	
18.00 - 20.00	120.00	117.00	8.80	0.40 (kg)	101*	502038	20*	502027		

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

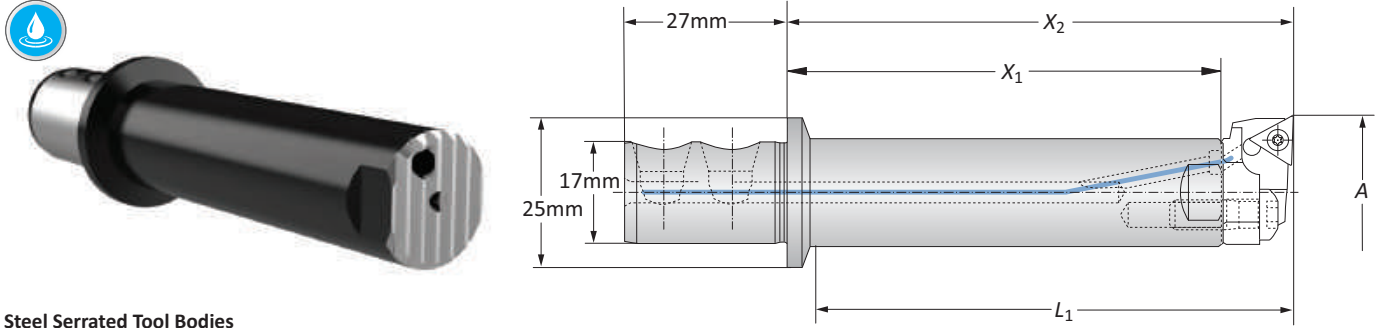


**i** = Imperial (in)  
**m** = Metric (mm)  
 Inserts sold separately

A  
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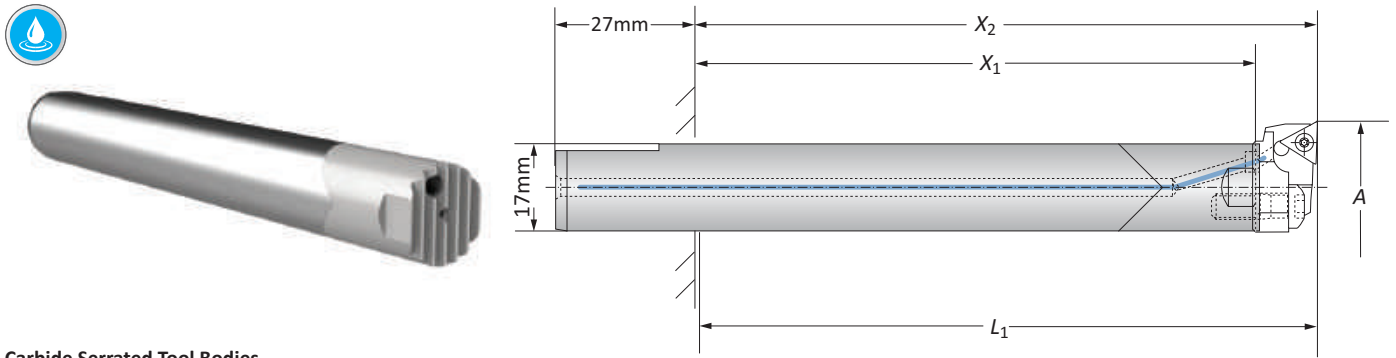
## Serrated Tool Bodies | Insert Holders

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



### Steel Serrated Tool Bodies

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



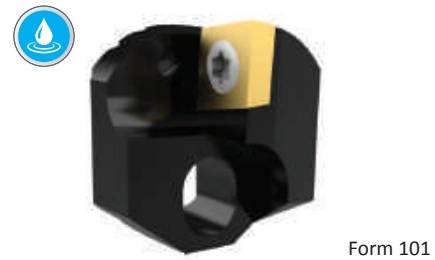
### Carbide Serrated Tool Bodies

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

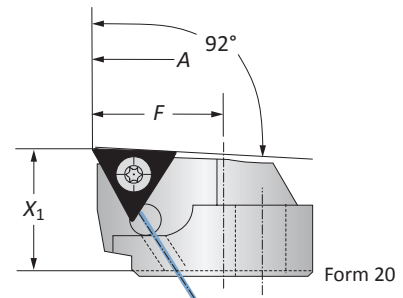
### Insert Holders

	Boring Range		Insert Holder		Weight	Insert Form		Insert Form	
	A	X <sub>1</sub>	F			Part No.	Part No.	Part No.	Part No.
<b>i</b>	0.787 - 0.866	0.472	0.386	0.022 (lbs)	101*	<b>502052</b>	20*	<b>502046</b>	
	0.866 - 0.945	0.472	0.425	0.022 (lbs)	101*	<b>502053</b>	20*	<b>502047</b>	
	0.945 - 1.024	0.472	0.465	0.022 (lbs)	101*	<b>502054</b>	20*	<b>502048</b>	
	1.024 - 1.102	0.472	0.504	0.022 (lbs)	101*	<b>502055</b>	20*	<b>502049</b>	
	1.102 - 1.181	0.472	0.543	0.022 (lbs)	101*	<b>502056</b>	20*	<b>502050</b>	
	1.181 - 1.260	0.472	0.583	0.022 (lbs)	101*	<b>502057</b>	20*	<b>502051</b>	
<b>m</b>	20.00 - 22.00	12.00	9.80	0.01 (kg)	101*	<b>502052</b>	20*	<b>502046</b>	
	22.00 - 24.00	12.00	10.80	0.01 (kg)	101*	<b>502053</b>	20*	<b>502047</b>	
	24.00 - 26.00	12.00	11.80	0.01 (kg)	101*	<b>502054</b>	20*	<b>502048</b>	
	26.00 - 28.00	12.00	12.80	0.01 (kg)	101*	<b>502055</b>	20*	<b>502049</b>	
	28.00 - 30.00	12.00	13.80	0.01 (kg)	101*	<b>502056</b>	20*	<b>502050</b>	
	30.00 - 32.00	12.00	14.80	0.01 (kg)	101*	<b>502057</b>	20*	<b>502051</b>	

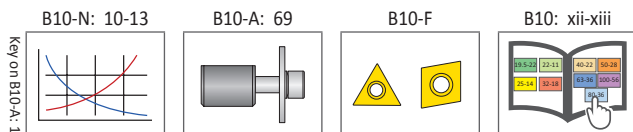
\*Not suitable for indexable inserts with a radius of 0.031" (0.80mm)



Form 101



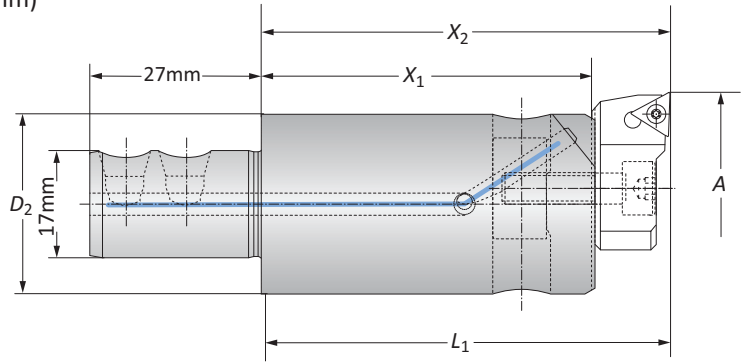
Form 20



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

## Alu-Line Serrated Tool Bodies | Insert Holders

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

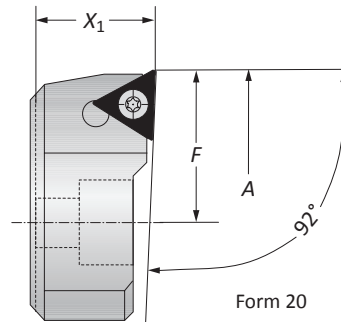


### Alu-Line Serrated Tool Bodies

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



Form 101

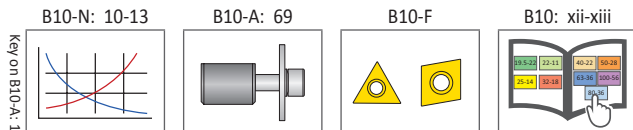


Form 20

### Insert Holders

	Serrated Tool Body	Boring Range	Insert Holder		Weight	Insert Form	Part No.
		A	X <sub>1</sub>	F			
<b>i</b>	<b>501052 / 501060</b>	1.260 - 1.614	0.551	0.809	0.066 (lbs)	20*	<b>502060</b>
		1.614 - 1.968	0.551	0.889	0.088 (lbs)	20*	<b>502061</b>
		1.260 - 1.614	0.551	0.809	0.066 (lbs)	101	<b>502058</b>
		1.614 - 1.968	0.551	0.886	0.088 (lbs)	101	<b>502059</b>
	<b>501053 / 501061</b>	1.968 - 2.323	0.551	0.809	0.066 (lbs)	20*	<b>502060</b>
		2.323 - 2.677	0.551	0.886	0.088 (lbs)	20*	<b>502061</b>
		1.968 - 2.323	0.551	0.809	0.066 (lbs)	101	<b>502058</b>
		2.323 - 2.677	0.551	0.886	0.088 (lbs)	101	<b>502059</b>
<b>m</b>	<b>501052 / 501060</b>	32.00 - 41.00	14.00	18.00	0.03 (kg)	20*	<b>502060</b>
		41.00 - 50.00	14.00	22.50	0.04 (kg)	20*	<b>502061</b>
		32.00 - 41.00	14.00	18.00	0.03 (kg)	101	<b>502058</b>
		41.00 - 50.00	14.00	22.50	0.04 (kg)	101	<b>502059</b>
	<b>501053 / 501061</b>	50.00 - 59.00	14.00	18.00	0.03 (kg)	20*	<b>502060</b>
		59.00 - 68.00	14.00	22.50	0.04 (kg)	20*	<b>502061</b>
		50.00 - 59.00	14.00	18.00	0.03 (kg)	101	<b>502058</b>
		59.00 - 68.00	14.00	22.50	0.04 (kg)	101	<b>502059</b>

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

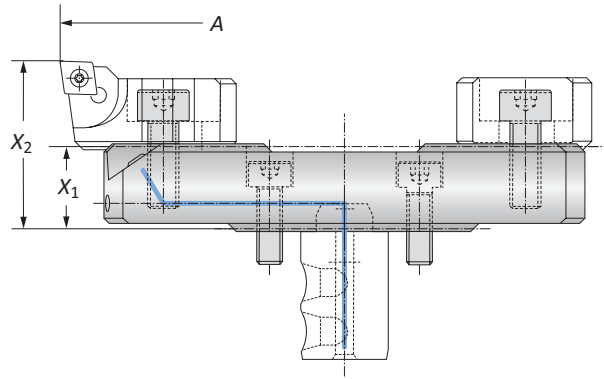


**i** = Imperial (in)  
**m** = Metric (mm)  
 Inserts sold separately

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## Alu-Line Serrated Slides | Insert Holders

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



### Alu-Line Serrated Slides

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

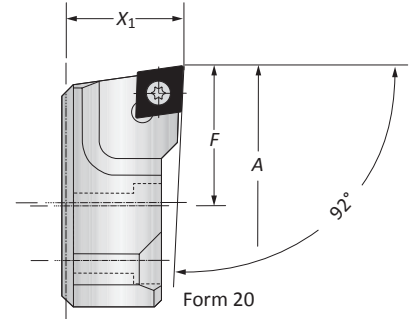
### Insert Holders

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

NOTE: Other insert holders available upon request



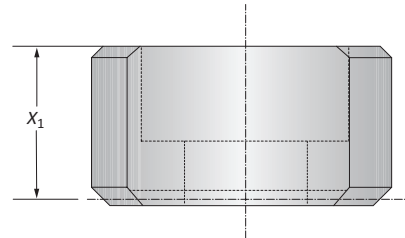
Form 101



Form 20

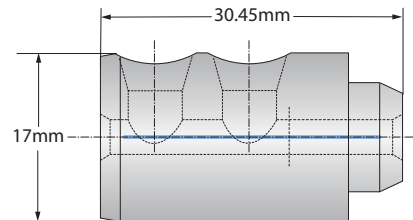
### Counter Weights

	Counter Weight	Weight	Part No.
i	X <sub>1</sub>		
i	0.528	0.110 (lbs)	502165
m	13.40	0.05 (kg)	502165



### Coolant Delivery Systems

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



B10-N: 10-13

B10-A: 69

B10-F

B10: xii-xiii

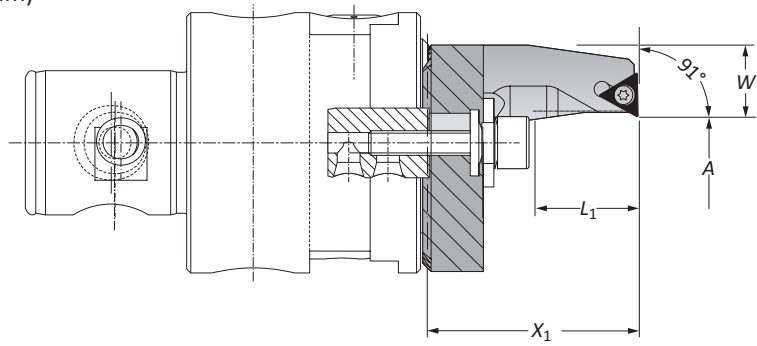
Key on B10-A: 1

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



## Outside Turning Insert Holders for Boring Heads

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

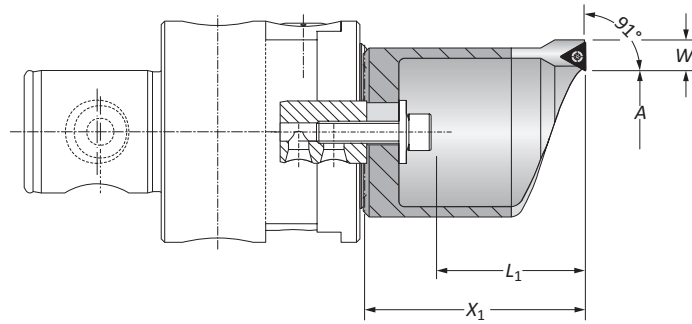


### Type A Insert Holders | Diameter Range: 0.157" - 1.181" (4.00mm - 30.00mm)

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

NOTE: Clockwise and neutral execution

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



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

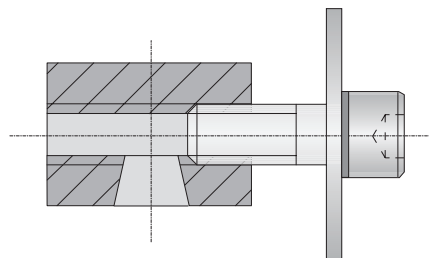
	Boring Range		Insert Holder				Weight	Type	Insert Form	Part No.
	A	X <sub>1</sub>	L <sub>1</sub>	W						
i	1.142 - 1.732	2.952	2.126	0.377	0.661 (lbs)	B	20*	236083		
	1.693 - 2.598	3.956	3.110	0.377	0.882 (lbs)	B	20*	236084		
m	29.00 - 44.00	75.50	54.00	9.60	0.30 (kg)	B	20*	236083		
	43.00 - 66.00	100.50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

NOTE: Clockwise and neutral execution

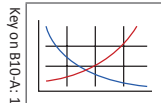
\*Not suitable for indexable inserts with a radius of 0.031" (0.80mm)

### Clamping Pieces for Outside Turning Insert Holders

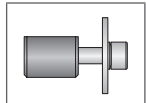
	Boring Range	Complete Part No.
m	4.00 - 30.00	236088
	29.00 - 66.00	236089



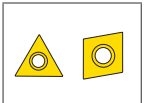
B10-N: 10-13



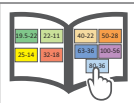
B10-A: 69



B10-F



B10: xii-xiii

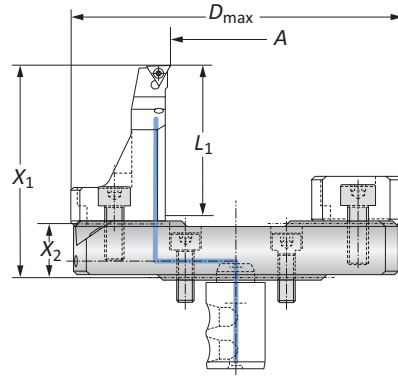


i = Imperial (in)  
m = Metric (mm)  
Inserts sold separately

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## Outside Turning Serrated Slides | Insert Holders

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



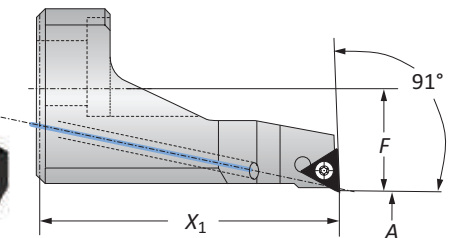
### Outside Turning Serrated Slides

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



### Outside Turning Insert Holders

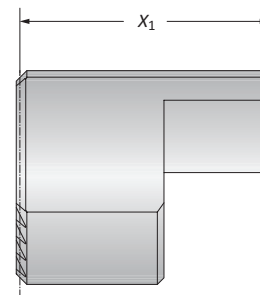
	Outside Turning Range		Insert Holder		Weight	Insert Form	Part No.
	A	X <sub>1</sub>	F	Weight			
i	0.079 - 4.488	2.244	0.776	0.331 (lbs)	20	502082	
m	2.00 - 114.00	57.00	19.70	0.15 (kg)	20	502082	



NOTE: Clockwise and neutral execution

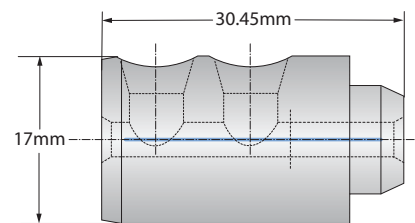
### Counter Weights

Counter Weight		
X <sub>1</sub>	Weight	Part No.
i	1.486	0.352 (lbs)
m	37.75	0.16 (kg)



### Coolant Delivery Systems

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



Key on B10-A: 1

B10-N: 10-13

B10-A: 69

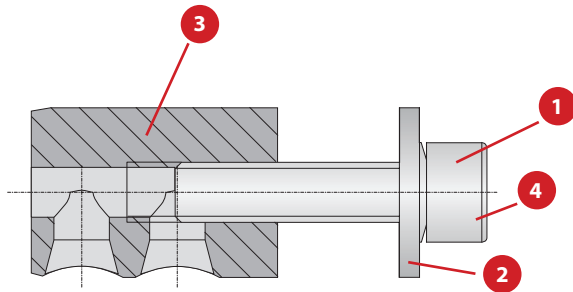
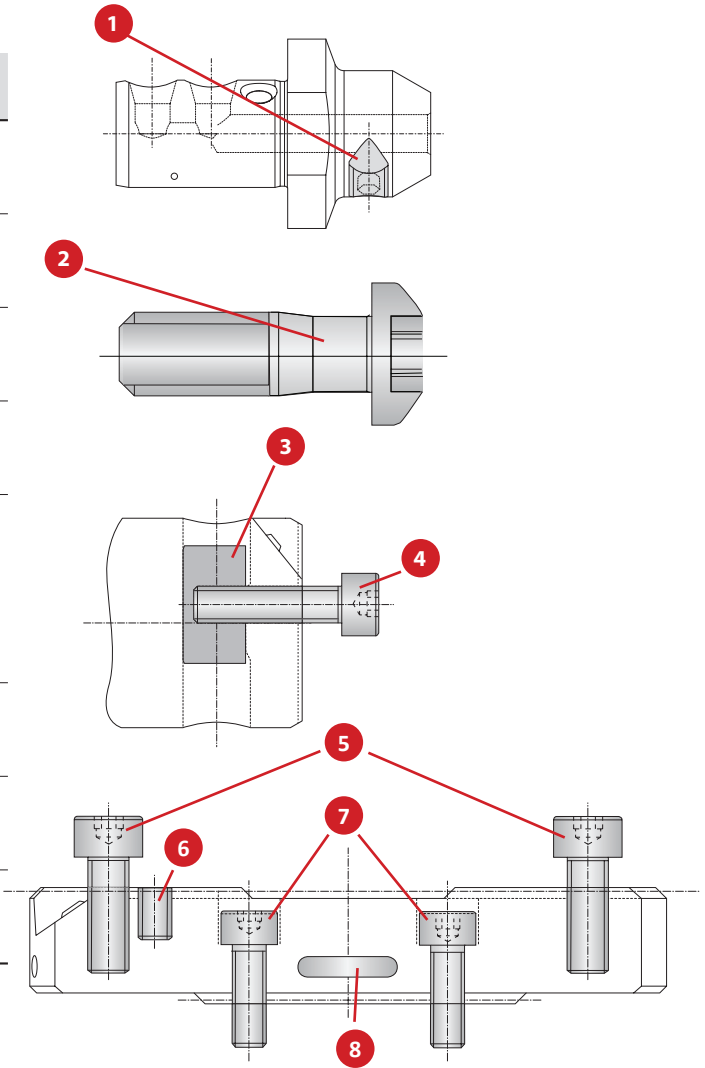
B10-F

B10: xii-xiii

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

Accessories

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



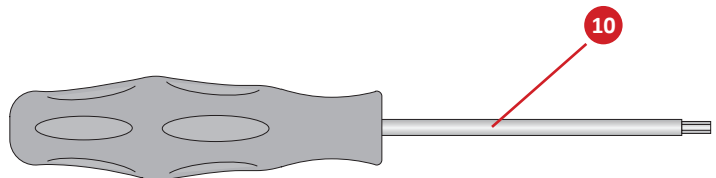
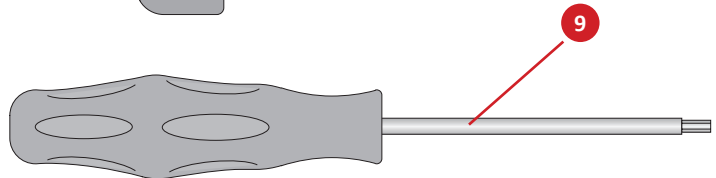
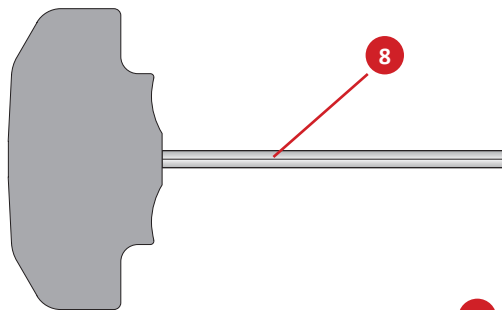
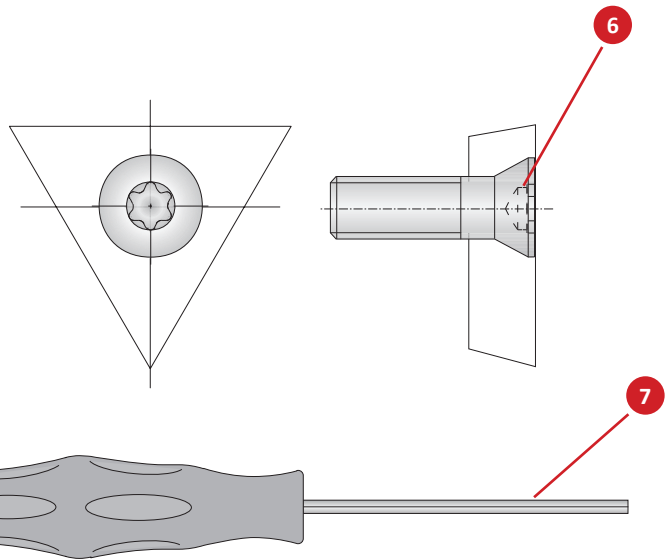
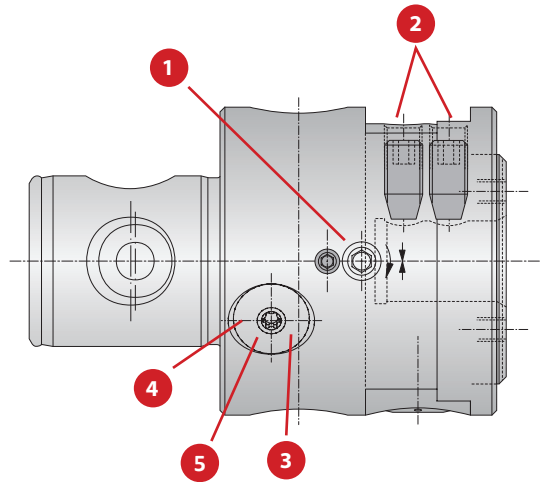
	Boring Range	Type	Hex Size	Clamping Screw Parts				Complete Part No.
				1 Cap Screw	2 Washer	3 Clamping Piece	4 Locking Washer	
i	0.157 - 1.181	A	s5	070153	315155	502180	215254	502080
	1.142 - 2.598	B	s5	070153	315156	502180	215254	502081
m	4.00 - 30.00	A	s5	070153	315155	502180	215254	502080
	29.00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

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Accessories

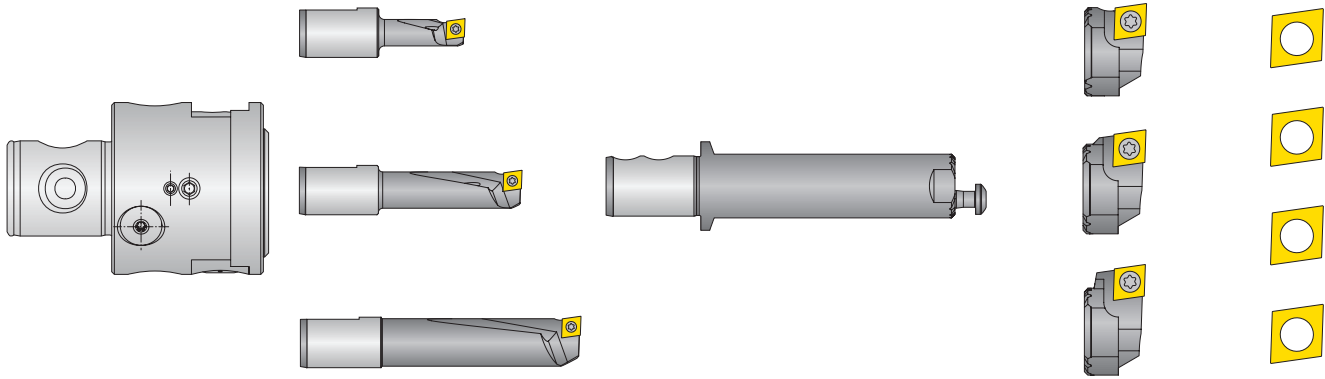
No.	Part	Insert Form	Size	Part No.
1	Clamping screw	-	-	415353
2	Set screw for clamping tool	-	-	215674
3	Battery cover	-	-	415895
4	Battery*	-	-	415896
5	Battery access cover with sealing ring	-	-	501016
6	Insert screws	Form 211 Form 20 Form 101	T6 T7 T8	215377 115535-1 115676-1
7	Hex driver	-	s1.5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

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



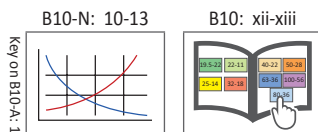
## Kit Components

Insert Form 101 | Diameter Range: 0.393" - 1.259" (10.00mm - 32.00mm)



		Kit Components						
	Boring Range	Boring Head	Boring Bars	Serrated Tool Body	Insert Holders	Inserts (x4)	Service Keys	Kit No.
<b>i</b>	0.393 - 1.259	504001	502012 502014 502016	502045	502052 502054 502056	297531WHC19	115576 (s4) 415121 (T25) 115590 (T8)	<b>104061</b>
<b>m</b>	10.00 - 32.00	501001	502012 502014 502016	502045	502052 502054 502056	297531WHC19	115576 (s4) 415121 (T25) 115590 (T8)	<b>103061</b>

**NOTE:** Inserts are included in DigiBore kits



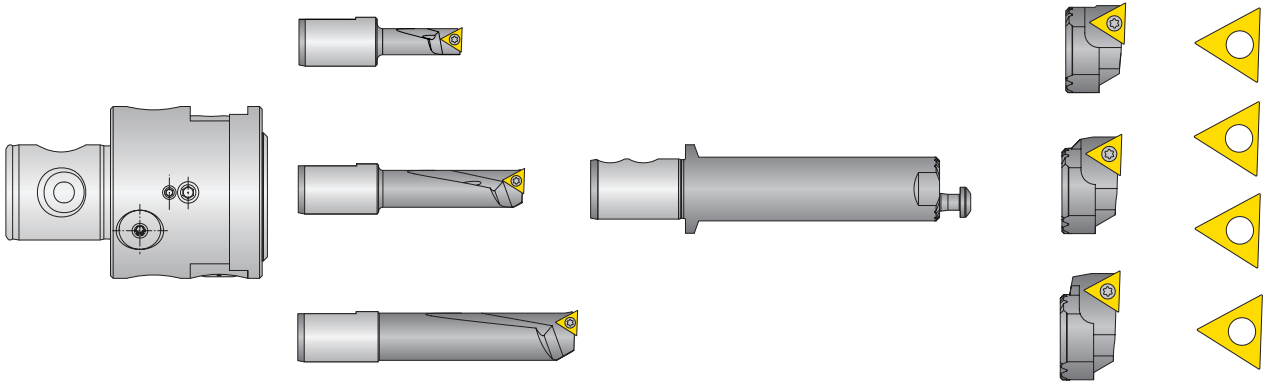
**i** = Imperial (in)  
**m** = Metric (mm)  
Inserts sold separately

**IMPORTANT:** Max spindle speed refers to maximum possible speed for an individual boring head and is not a recommended parameter. Refer to page B10-N: 10 for recommended application-specific parameters. Factory technical assistance is available for your specific applications through our Application Engineering department.  
ext: 7611 | email: [appeng@alliedmachine.com](mailto:appeng@alliedmachine.com)



## Kit Components

Insert Form 20 | Diameter Range: 0.393" - 1.259" (10.00mm - 32.00mm)



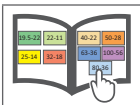
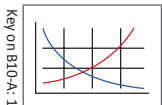
		Kit Components						
Boring Range	Boring Head	Boring Bars	Serrated Tool Body	Insert Holders	Inserts (x4)	Service Keys	Kit No.	
i	0.393 - 1.259	504001	502001	502045	502046	397673WHC19	115576 (s4) 415121 (T25) 115591 (T7)	<b>104062</b>
			502003		502048			
			502005		502050			
m	10.00 - 32.00	501001	502001	502045	502046	397673WHC19	115576 (s4) 415121 (T25) 115591 (T7)	<b>103062</b>
			502003		502048			
			502005		502050			

**NOTE:** Inserts are included in DigiBore kits



B10-N: 10-13

B10: xii-xiii



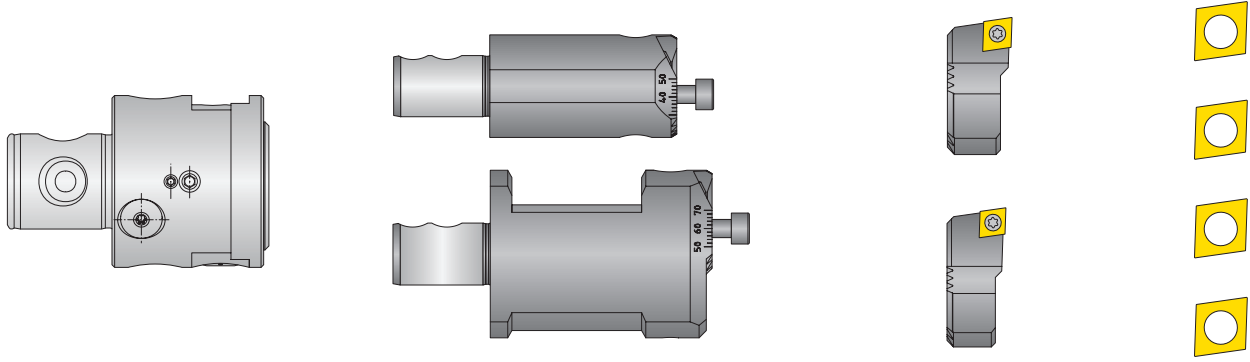
i = Imperial (in)  
m = Metric (mm)

Inserts sold separately

**IMPORTANT:** Max spindle speed refers to maximum possible speed for an individual boring head and is not a recommended parameter. Refer to page B10-N: 10 for recommended application-specific parameters. Factory technical assistance is available for your specific applications through our Application Engineering department.  
ext: 7611 | email: [appeng@alliedmachine.com](mailto:appeng@alliedmachine.com)

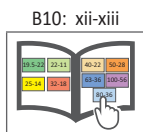
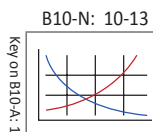
## Kit Components

Insert Form 101 | Diameter Range: 1.259" - 2.677" (32.00mm - 68.00mm)



Kit Components						
Boring Range	Boring Head	Serrated Tool Body	Insert Holders	Inserts (x4)	Service Keys	Kit No.
<b>i</b> 1.259 - 2.667	504001	501052 501053	502058 502059	297531WHC19	115576 (s4) 115590 (T8)	<b>104063</b>
<b>m</b> 32.00 - 68.00	501001	501052 501053	502058 502059	297531WHC19	115576 (s4) 115590 (T8)	<b>103063</b>

**NOTE:** Inserts are included in DigiBore kits

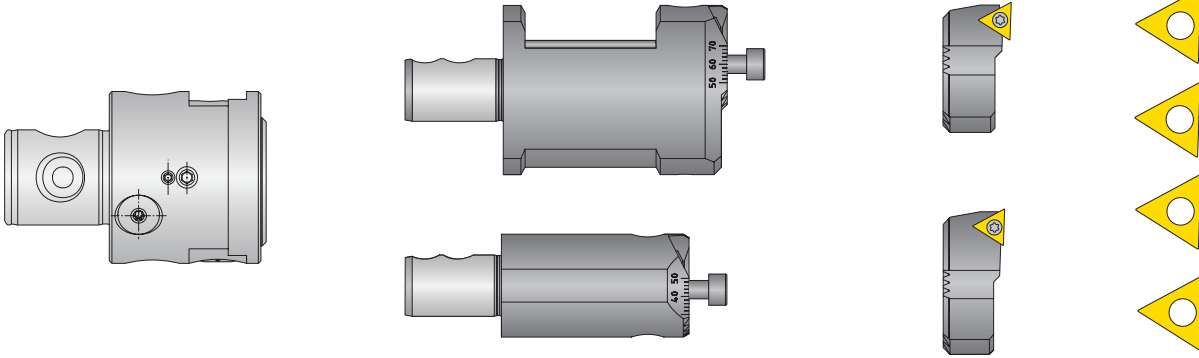


**i** = Imperial (in)  
**m** = Metric (mm)  
 Inserts sold separately

**IMPORTANT:** Max spindle speed refers to maximum possible speed for an individual boring head and is not a recommended parameter. Refer to page B10-N: 10 for recommended application-specific parameters. Factory technical assistance is available for your specific applications through our Application Engineering department.  
 ext: 7611 | email: [appeng@alliedmachine.com](mailto:appeng@alliedmachine.com)

## Kit Components

Insert Form 20 | Diameter Range: 1.259" - 2.677" (32.00mm - 68.00mm)



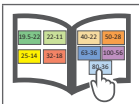
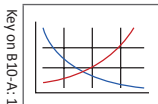
		Kit Components					
	Boring Range	Boring Head	Serrated Tool Body	Insert Holders	Inserts (x4)	Service Keys	Kit No.
<b>i</b>	1.259 - 2.667	504001	501052 501053	502060 502061	397673WHC19	115576 (s4) 115591 (T7)	<b>104064</b>
<b>m</b>	32.00 - 68.00	501001	501052 501053	502060 502061	397673WHC19	115576 (s4) 115591 (T7)	<b>103064</b>

**NOTE:** Inserts are included in DigiBore kits



B10-N: 10-13

B10: xii-xiii



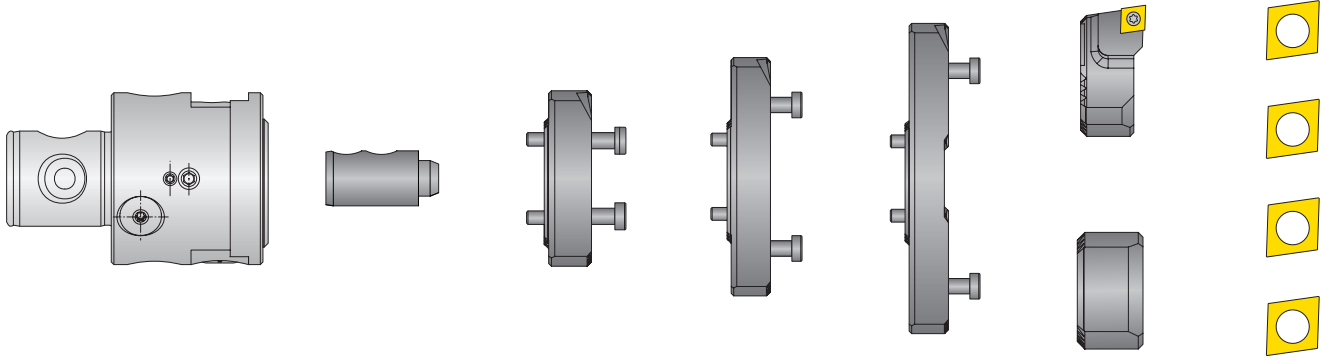
**i** = Imperial (in)  
**m** = Metric (mm)

Inserts sold separately

**IMPORTANT:** Max spindle speed refers to maximum possible speed for an individual boring head and is not a recommended parameter. Refer to page B10-N: 10 for recommended application-specific parameters. Factory technical assistance is available for your specific applications through our Application Engineering department.  
ext: 7611 | email: [appeng@alliedmachine.com](mailto:appeng@alliedmachine.com)

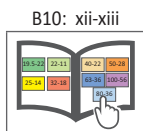
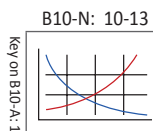
## Kit Components

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



		Kit Components							
	Boring Range	Boring Head	Serrated Slides	Insert Holder	Inserts (x4)	Counter Weight	Coolant Delivery	Service Keys	Kit No.
<b>i</b>	2.667 - 5.984	504001	501054 501055 501056	502064	297531WHC19	502165	501157	115576 (s4) 115590 (T8)	<b>104065</b>
<b>m</b>	68.00 - 152.00	501001	501054 501055 501056	502064	297531WHC19	502165	501157	115576 (s4) 115590 (T8)	<b>103065</b>

**NOTE:** Inserts are included in DigiBore kits

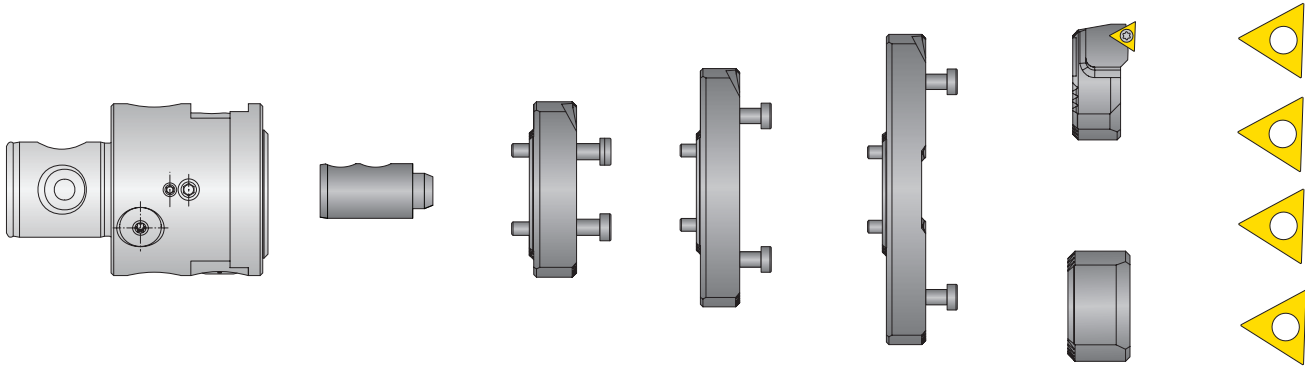


**i** = Imperial (in)  
**m** = Metric (mm)  
 Inserts sold separately

**IMPORTANT:** Max spindle speed refers to maximum possible speed for an individual boring head and is not a recommended parameter. Refer to page B10-N: 10 for recommended application-specific parameters. Factory technical assistance is available for your specific applications through our Application Engineering department.  
 ext: 7611 | email: [appeng@alliedmachine.com](mailto:appeng@alliedmachine.com)

## Kit Components

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



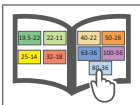
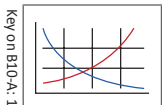
		Kit Components							
	Boring Range	Boring Head	Serrated Slides	Insert Holder	Inserts (x4)	Counter Weight	Coolant Delivery	Service Keys	Kit No.
<b>i</b>	2.667 - 5.984	504001	501054 501055 501056	502069	397673WHC19	502165	501157	115576 (s4) 115591 (T7)	<b>104066</b>
<b>m</b>	68.00 - 152.00	501001	501054 501055 501056	502069	397673WHC19	502165	501157	115576 (s4) 115591 (T7)	<b>103066</b>

NOTE: Inserts are included in DigiBore kits



B10-N: 10-13

B10: xii-xiii



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

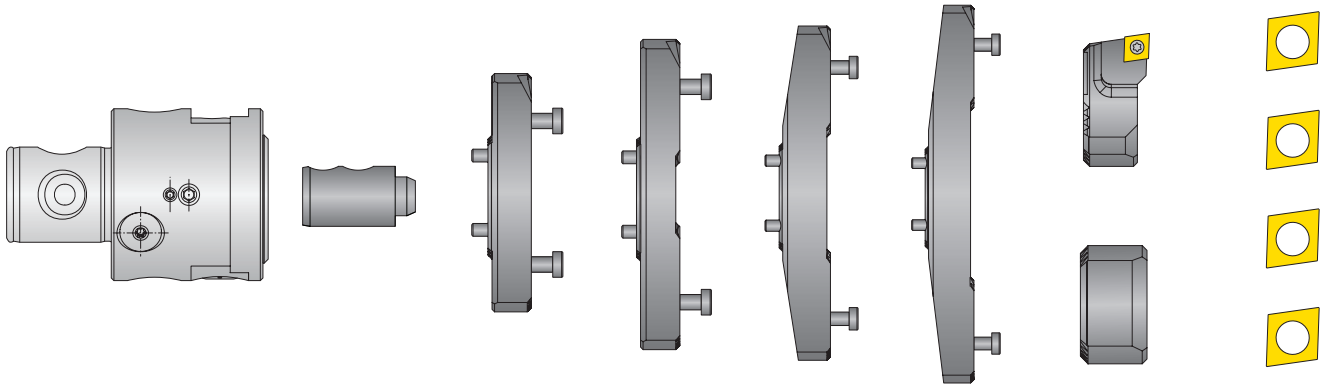
Inserts sold separately

**IMPORTANT:** Max spindle speed refers to maximum possible speed for an individual boring head and is not a recommended parameter. Refer to page B10-N: 10 for recommended application-specific parameters. Factory technical assistance is available for your specific applications through our Application Engineering department.  
ext: 7611 | email: [appeng@alliedmachine.com](mailto:appeng@alliedmachine.com)



## Kit Components

Insert Form 101 | Diameter Range: 3.779" - 8.188" (96.00mm - 208.00mm)



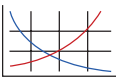
		Kit Components							
	Boring Range	Boring Head	Serrated Slides	Insert Holder	Inserts (x4)	Counter Weight	Coolant Delivery	Service Keys	Kit No.
<b>i</b>	3.779 - 8.188	504001	501055 501056 501058 501059	502064	297531WHC19	502165	501157	115576 (s4) 115590 (T8)	<b>104081</b>
<b>m</b>	96.00 - 208.00	501001	501055 501056 501058 501059	502064	297531WHC19	502165	501157	115576 (s4) 115590 (T8)	<b>103081</b>

**NOTE:** Inserts are included in DigiBore kits




Key on B10-A: 1

B10-N: 10-13



B10: xii-xiii

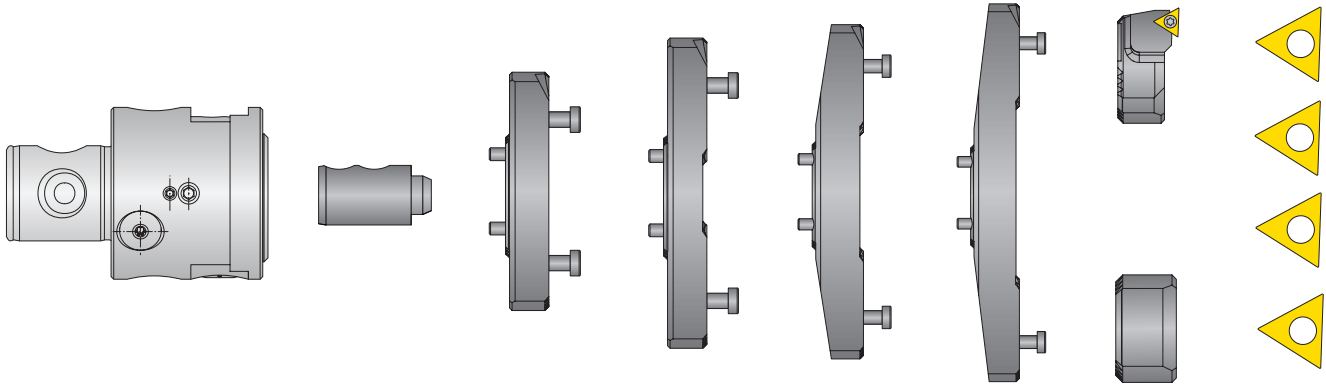


**i** = Imperial (in)  
**m** = Metric (mm)  
 Inserts sold separately

**IMPORTANT:** Max spindle speed refers to maximum possible speed for an individual boring head and is not a recommended parameter. Refer to page B10-N: 10 for recommended application-specific parameters. Factory technical assistance is available for your specific applications through our Application Engineering department.  
 ext: 7611 | email: [appeng@alliedmachine.com](mailto:appeng@alliedmachine.com)

## Kit Components

Insert Form 20 | Diameter Range: 3.779" - 8.188" (96.00mm - 208.00mm)



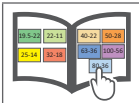
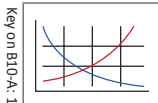
		Kit Components							
	Boring Range	Boring Head	Serrated Slides	Insert Holder	Inserts (x4)	Counter Weight	Coolant Delivery	Service Keys	Kit No.
<b>i</b>	3.779 - 8.188	504001	501055 501056 501058 501059	502069	397673WHC19	502165	501157	115576 (s4) 115591 (T7)	<b>104080</b>
<b>m</b>	96.00 - 208.00	501001	501055 501056 501058 501059	502060	397673WHC19	502165	501157	115576 (s4) 115591 (T7)	<b>103080</b>

**NOTE:** Inserts are included in DigiBore kits



B10-N: 10-13

B10: xii-xiii



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

Inserts sold separately

**IMPORTANT:** Max spindle speed refers to maximum possible speed for an individual boring head and is not a recommended parameter. Refer to page B10-N: 10 for recommended application-specific parameters. Factory technical assistance is available for your specific applications through our Application Engineering department.  
ext: 7611 | email: [appeng@alliedmachine.com](mailto:appeng@alliedmachine.com)





SECTION

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# B10-B

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Fine Boring



# Wohlhaupter™ Fine Boring

320 (310) | 365 (364) | 565 (564) | 338 (337) | 538 (537)

▶ Diameter Range: 0.787" - 8.070" (20.00mm - 205.00mm)



## Boring has never been more exciting.

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

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.

## Applicable Industries



Aerospace



Agriculture



Automotive



Firearms



General  
Machining



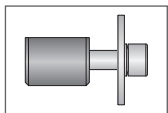
Oil & Gas



Renewable  
Energy

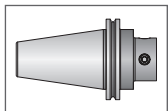
### Reference Icons

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



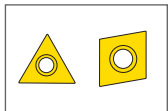
#### Clamping Elements

For use with insert holders and boring heads



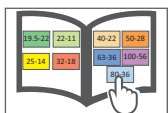
#### Shanks

A variety of shanks for different machines



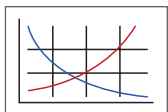
#### Inserts

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



#### MVS Connection Color Guide

Detailed instructions and information regarding the MVS connection(s)



#### Recommended Cutting Data

Speed and feed recommendations for optimum and safe boring

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Series	Diameter Range	
	Imperial (inch)	Metric (mm)
<b>320 (310)</b>	0.787 - 8.070	20.00 - 205.00
<b>365 (364)</b>	0.787 - 8.070	20.00 - 205.00
<b>565 (564)</b>	1.968 - 8.070	50.00 - 205.00
<b>338 (337)</b>	3.937 - 8.070	100.00 - 205.00
<b>538 (537)</b>	3.937 - 8.070	100.00 - 205.00

# 320 (310) Product Overview

## 320 (310) FINE BORING

### Engineered with wear and tear in mind.

Wohlhaupter's 320 (310) boring head is made from steel for  $\varnothing$  0.787" - 4.077" (20.00mm - 103.00mm), and coated Alu-Line material for  $\varnothing$  3.937" - 8.070" (100.00mm - 205.00mm) boring heads to protect against corrosion and wear. The insert holder can be rotated quickly for reverse machining.

- Diameter range: 0.787" - 4.055" (20.00mm - 103.00mm)  
Alu-Line: 3.937" - 8.070" (100.00mm - 205.00mm)
- Special coating on Alu-Line provides hard, durable surface
- Alu-Line body reduces tool weight by 50%, reducing stress on the spindle
- Coolant through
- Vernier diameter adjustment of 0.0001" (0.002mm)
- Max cutting speed: 3,281 SFM (1,000 m/min)



**IMPORTANT:** Max spindle speed refers to maximum possible speed for an individual boring head and is not a recommended parameter. Refer to page B10-N: 10 for recommended application-specific parameters. Factory technical assistance is available for your specific applications through our Application Engineering department.  
ext: 7611 | email: [appeng@alliedmachine.com](mailto:appeng@alliedmachine.com)



# WOHLHAUPTER™ 320 BORING HEAD with NOVI<sup>TECH</sup>™

## Time is money, so make it count.

If you want to improve your machining processes, cycle time is a key factor to examine. After all, the longer it takes you to produce a part, the fewer parts you can produce in a given time. Our customer was experiencing lengthy cycle times while machining pumps from gray cast iron. The parts required 3 bored holes, each with a 12" depth and a 22" reach.



In order to free up machine time, the customer questioned if their process could be more efficient. The main objectives were to decrease the current cycle time and to maintain a 160 Ra finish, which was required to perform the burnishing process that followed.

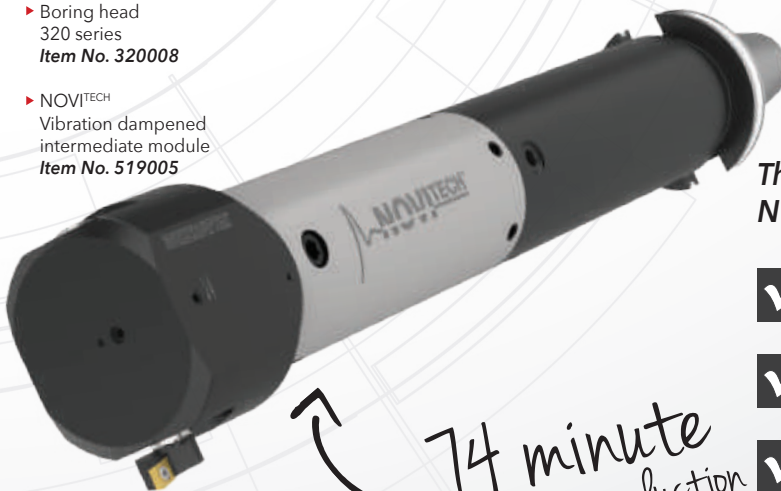
The previous tooling ran at a slow 0.47 IPM and a paint-drying 84-minute cycle time to bore the three holes on each part. With our **Wohlhaupter 320 Boring Head** utilizing the **NOVI<sup>TECH</sup>™ Vibration Dampened Module**, the customer increased to a more efficient 3.75 IPM and slashed the cycle time to 10.5 minutes (*an 87% decrease*). Along with the increased speed, the Wohlhaupter tooling also achieved a 155 Ra finish, accomplishing everything the customer needed.

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

Product:	Wohlhaupter™ 320 Boring Head with NOVI <sup>TECH</sup> ™	Measure	Competitor Boring Head	320 Boring Head w/ NOVI <sup>TECH</sup>
Objectives:	(1) Decrease cycle time (2) Maintain 160 Ra hole finish	RPM	39	469
Industry:	Oil & gas/petrochemical	Speed Rate	56 SFM	675 SFM
Part:	Pump	Feed Rate	0.012 IPR	0.008 IPR
Material:	Gray cast iron	Penetration Rate	0.47 IPM	3.75 IPM
Hole Ø:	5.500"	Cycle Time (per hole)	27 min 54 sec	3 min 32 sec
Hole Depth:	12.000"	Hole Finish	160 Ra	155 Ra

▶ Boring head  
320 series  
Item No. 320008

▶ NOVI<sup>TECH</sup>  
Vibration dampened  
intermediate module  
Item No. 519005



The Wohlhaupter 320 boring head with the NOVI<sup>TECH</sup>™ vibration dampened module provided:

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

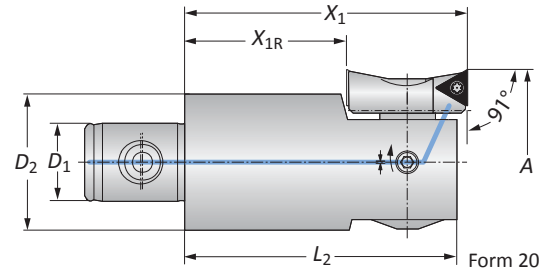
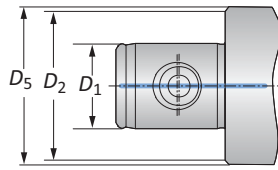
*74 minute  
cycle time reduction*

## Boring Heads

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



Form 101



Form 20

### 320 Boring Heads

MVS Connection	Boring Range	Boring Head				Weight	Insert Form	Part No.		
		$D_2   D_1$	A	$X_1$	$X_{1R}$			$L_2$	$D_5$	Insert Holder
	19 - 11	0.787 - 0.965	1.810	-	1.693	0.748	0.221 (lbs)	20	364077*	320010
	22 - 11	0.965 - 1.161	1.810	-	1.713	0.906	0.331 (lbs)	20	210059	320020
	22 - 11	0.965 - 1.161	1.810	-	1.713	0.906	0.331 (lbs)	101	210069	320020
	25 - 14	1.142 - 1.457	2.200	-	2.106	1.024	0.441 (lbs)	20	210059	320001
	25 - 14	1.142 - 1.457	2.200	-	2.106	1.024	0.441 (lbs)	101	210069	320001
	25 - 14	1.417 - 1.732	2.200	1.100	2.106	1.024	0.441 (lbs)	20	210052	320001
	25 - 14	1.417 - 1.732	2.200	1.100	2.106	1.024	0.441 (lbs)	101	210062	320001
	32 - 18	1.693 - 2.126	2.590	1.490	2.500	-	0.882 (lbs)	20	210052	320003
i	32 - 18	1.693 - 2.126	2.590	1.490	2.500	-	0.882 (lbs)	101	210062	320003
	40 - 22	2.087 - 2.598	2.950	1.530	2.854	-	1.543 (lbs)	20	210020	320004
	40 - 22	2.087 - 2.598	2.950	1.530	2.854	-	1.543 (lbs)	101	210063	320004
	40 - 22	2.087 - 2.598	2.950	1.530	2.854	-	1.543 (lbs)	103	210064	320004
	50 - 28	2.559 - 3.267	2.950	1.530	2.854	-	2.646 (lbs)	20	210020	320005
	50 - 28	2.559 - 3.267	2.950	1.530	2.854	-	2.646 (lbs)	101	210063	320005
	50 - 28	2.559 - 3.267	2.950	1.530	2.854	-	2.646 (lbs)	103	210064	320005
	63 - 36	3.228 - 4.055	3.540	2.120	3.445	-	4.850 (lbs)	20	210020	320006
	63 - 36	3.228 - 4.055	3.540	2.120	3.445	-	4.850 (lbs)	101	210063	320006
	63 - 36	3.228 - 4.055	3.540	2.120	3.445	-	4.850 (lbs)	103	210064	320006

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

NOTE:  $X_{1R}$  = rotated inset holder for reverse machining

NOTE: Insert holders and inserts sold separately

### 310 Boring Heads

MVS Connection	Boring Range	Boring Head				Weight	Insert Form	Part No.		
		$D_2   D_1$	A	$X_1$	$X_{1R}$			$L_2$	$D_5$	Insert Holder
	19 - 11	20.00 - 24.50	46.00	-	43.00	19.00	0.10 (kg)	20	364077*	310010
	22 - 11	24.50 - 29.50	46.00	-	43.50	23.00	0.15 (kg)	20	210059	310020
	22 - 11	24.50 - 29.50	46.00	-	43.50	23.00	0.15 (kg)	101	210069	310020
	25 - 14	29.00 - 37.00	56.00	-	53.50	26.00	0.20 (kg)	20	210059	310001
	25 - 14	29.00 - 37.00	56.00	-	53.50	26.00	0.20 (kg)	101	210069	310001
	25 - 14	36.00 - 44.00	56.00	28.00	53.50	26.00	0.20 (kg)	20	210052	310001
	25 - 14	36.00 - 44.00	56.00	28.00	53.50	26.00	0.20 (kg)	101	210062	310001
	32 - 18	43.00 - 54.00	66.00	38.00	63.50	-	0.40 (kg)	20	210052	310003
m	32 - 18	43.00 - 54.00	66.00	38.00	63.50	-	0.40 (kg)	101	210062	310003
	40 - 22	53.00 - 65.90	75.00	39.00	72.50	-	0.70 (kg)	20	210020	310004
	40 - 22	53.00 - 65.90	75.00	39.00	72.50	-	0.70 (kg)	101	210063	310004
	40 - 22	53.00 - 65.90	75.00	39.00	72.50	-	0.70 (kg)	103	210064	310004
	50 - 28	65.00 - 83.00	75.00	39.00	72.50	-	1.20 (kg)	20	210020	310005
	50 - 28	65.00 - 83.00	75.00	39.00	72.50	-	1.20 (kg)	101	210063	310005
	50 - 28	65.00 - 83.00	75.00	39.00	72.50	-	1.20 (kg)	103	210064	310005
	63 - 36	82.00 - 103.00	90.00	54.00	87.50	-	2.20 (kg)	20	210020	310006
	63 - 36	82.00 - 103.00	90.00	54.00	87.50	-	2.20 (kg)	101	210063	310006
	63 - 36	82.00 - 103.00	90.00	54.00	87.50	-	2.20 (kg)	103	210064	310006

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

NOTE:  $X_{1R}$  = rotated inset holder for reverse machining

NOTE: Insert holders and inserts sold separately

i = Imperial (in)

m = Metric (mm)

**IMPORTANT:** Max spindle speed refers to maximum possible speed for an individual boring head and is not a recommended parameter. Refer to page B10-N: 10 for recommended application-specific parameters. Factory technical assistance is available for your specific applications through our Application Engineering department.

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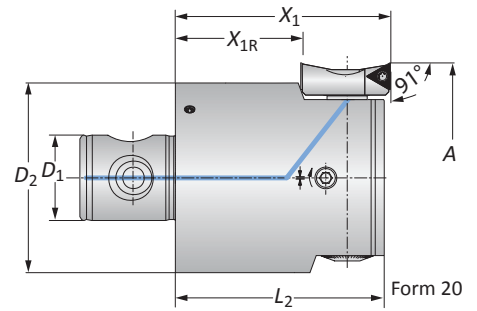
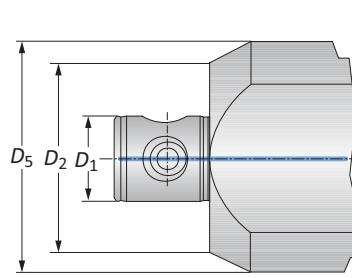


## Boring Heads

Alu-Line | Diameter Range: 3.937" - 8.070" (100.00mm - 205.00mm)



Form 101



Form 20

### Alu-Line 320 Boring Heads

	MVS Connection	Boring Range	Boring Head				Weight	Insert Form	Part No.	
			$D_2   D_1$	A	$X_1$	$X_{1R}$			$L_2$	$D_5$
i	80 - 36	3.937 - 5.118	3.543	2.126	3.445	3.150	3.086 (lbs)	20	210020	320007
	80 - 36	3.937 - 5.118	3.543	2.126	3.445	3.150	3.086 (lbs)	101	210063	320007
	80 - 36	3.937 - 5.118	3.543	2.126	3.445	3.150	3.086 (lbs)	103	210064	320007
	80 - 36	4.921 - 6.594	3.543	2.126	3.445	3.150	3.968 (lbs)	20	210020	320008
	80 - 36	4.921 - 6.594	3.543	2.126	3.445	3.150	3.968 (lbs)	101	210063	320008
	80 - 36	4.921 - 6.594	3.543	2.126	3.445	3.937	3.968 (lbs)	103	210064	320008
	80 - 36	6.397 - 8.070	3.543	2.126	3.445	3.937	5.291 (lbs)	20	210020	320009
	80 - 36	6.397 - 8.070	3.543	2.126	3.445	3.937	5.291 (lbs)	101	210063	320009
	80 - 36	6.397 - 8.070	3.543	2.126	3.445	3.937	5.291 (lbs)	103	210064	320009

NOTE:  $X_{1R}$  = rotated inset holder for reverse machining

NOTE: Insert holders and inserts sold separately

### Alu-Line 310 Boring Heads

	MVS Connection	Boring Range	Boring Head				Weight	Insert Form	Part No.	
			$D_2   D_1$	A	$X_1$	$X_{1R}$			$L_2$	$D_5$
m	80 - 36	100.00 - 130.00	90.00	54.00	87.50	80.00	1.40 (kg)	20	210020	310007
	80 - 36	100.00 - 130.00	90.00	54.00	87.50	80.00	1.40 (kg)	101	210063	310007
	80 - 36	100.00 - 130.00	90.00	54.00	87.50	80.00	1.40 (kg)	103	210064	310007
	80 - 36	125.00 - 167.50	90.00	54.00	87.50	100.00	1.80 (kg)	20	210020	310008
	80 - 36	125.00 - 167.50	90.00	54.00	87.50	100.00	1.80 (kg)	101	210063	310008
	80 - 36	125.00 - 167.50	90.00	54.00	87.50	100.00	1.80 (kg)	103	210064	310008
	80 - 36	162.50 - 205.00	90.00	54.00	87.50	135.00	2.40 (kg)	20	210020	310009
	80 - 36	162.50 - 205.00	90.00	54.00	87.50	135.00	2.40 (kg)	101	210063	310009
	80 - 36	162.50 - 205.00	90.00	54.00	87.50	135.00	2.40 (kg)	103	210064	310009

NOTE:  $X_{1R}$  = rotated inset holder for reverse machining

NOTE: Insert holders and inserts sold separately

B10:-N: 10-13

B10-H

B10: xii-xiii

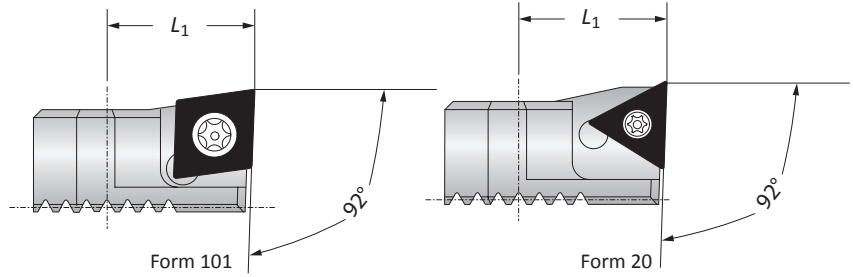
i = Imperial (in)

m = Metric (mm)

**IMPORTANT:** Max spindle speed refers to maximum possible speed for an individual boring head and is not a recommended parameter. Refer to page B10-N: 10 for recommended application-specific parameters. Factory technical assistance is available for your specific applications through our Application Engineering department.  
 ext: 7611 | email: [appeng@alliedmachine.com](mailto:appeng@alliedmachine.com)

## Insert Holders for Abrasive Materials | Serrated Shims

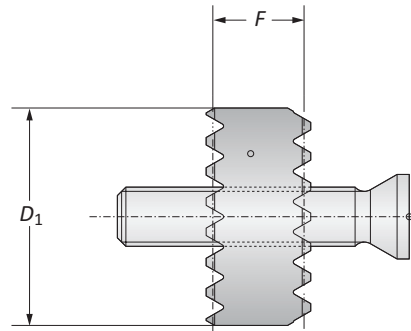
Diameter Range: 2.559" - 8.070" (65.00mm - 205.00mm)



### Insert Holders

		Insert Holder		Part No.	
Boring Range		$L_1$	Weight	Insert Form	
i	2.559 - 8.070	0.709	0.066 (lbs)	20	211061
	2.559 - 8.070	0.709	0.066 (lbs)	101	211063
	2.559 - 8.070	0.709	0.066 (lbs)	103	211065
m	65.00 - 205.00	18.00	0.03 (kg)	20	211061
	65.00 - 205.00	18.00	0.03 (kg)	101	211063
	65.00 - 205.00	18.00	0.03 (kg)	103	211065

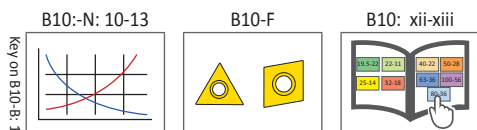
NOTE: 320 (310) insert holders are used for abrasive materials to protect boring head against chip wash



### Serrated Shims

		Serrated Shim			Part No.	
Boring Range		$F$	$D_1$	Weight	Serrated Shim	Set Screw
i	1.141 - 2.125	0.157	0.472	0.022 (lbs)	310070	415360
	1.141 - 2.125	0.236	0.472	0.022 (lbs)	310071	415342
	2.086 - 8.070	0.196	0.708	0.022 (lbs)	310074	515595
	2.086 - 8.070	0.295	0.708	0.022 (lbs)	310075	515596
m	29.00 - 54.00	4.00	12.00	0.01 (kg)	310070	415360
	29.00 - 54.00	6.00	12.00	0.01 (kg)	310071	415342
	53.00 - 205.00	5.00	18.00	0.01 (kg)	310074	515595
	53.00 - 205.00	7.50	18.00	0.01 (kg)	310075	515596

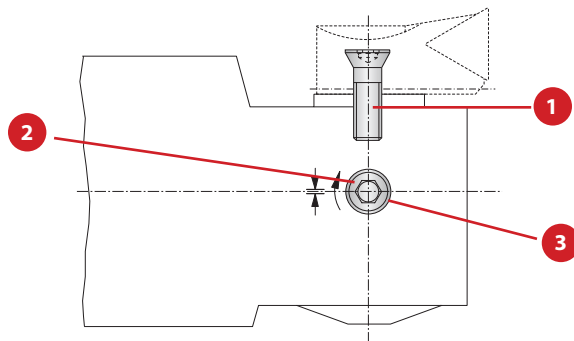
NOTE: Serrated shim must be used with required screw



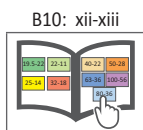
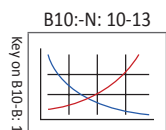
i = Imperial (in)  
m = Metric (mm)  
Inserts sold separately

## Accessories

### Screws



Boring Head	1 Countersunk Screw		2 Clamping Screw		3 Ball
	Part No.	Service Key	Part No.	Service Key	Part No.
310010	215323	T15 / H	364260	s2.0 / A	364270
310020	215338	T15 / H	364138	s2.5 / A	364139
310001	215338	T15 / H	115136	s2.5 / A	-
310003	215338	T15 / H	115180	s2.5 / A	-
310004	214462	T20 / H	115249	s4 / B	-
310005	215462	T20 / H	115185	s4 / B	-
310006	215462	T20 / H	315279	s4 / B	-
310007	215462	T20 / H	115186	s4 / B	-
310008	215462	T20 / H	115186	s4 / B	-
310009	215462	T20 / H	115186	s4 / B	-



 = Imperial (in)  
 = Metric (mm)

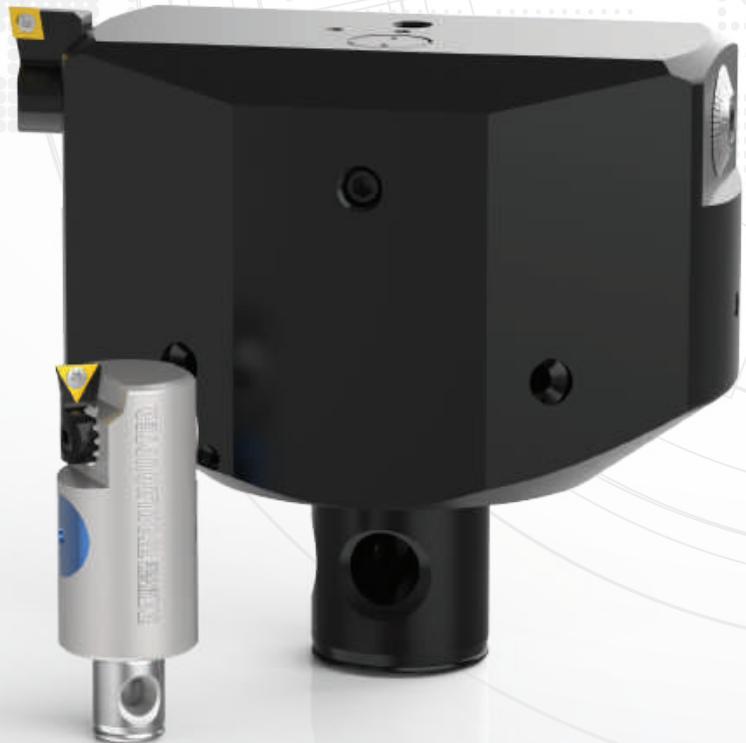
# 365 (364) Product Overview

## Balance 365 (364) FINE BORING

### Boring for the future.

The Wohlhaupter™ Balance 365 (364) boring head offers precision boring with automatic balancing. Its lightweight aluminum design from 2.559" - 8.070" (65.00mm - 205.00mm) with a wear-resistant coating reduces weight on the spindle up to 50%, yet is durable in boring applications. It is specifically engineered to minimize the residual imbalance produced by insert holder displacement. The insert holder can also be rotated for reverse machining jobs.

- Steel boring head diameter range: 0.787" - 2.579" (20.00mm - 65.50mm)
- Alu-Line boring head diameter range: 2.559" - 8.070" (65.00mm - 205.00mm)
- Special coating on Alu-Line for wear-resistant surface
- Alu-Line body reduces tool weight by 50%, reducing stress on the spindle
- Coolant through
- Vernier diameter adjustment of 0.0001" (0.002mm)
- Internal balancing improves tool life and surface finish
- Max cutting speed: 6,562 SFM (2,000 m/min)
- Insert holder can be rotated for back boring jobs



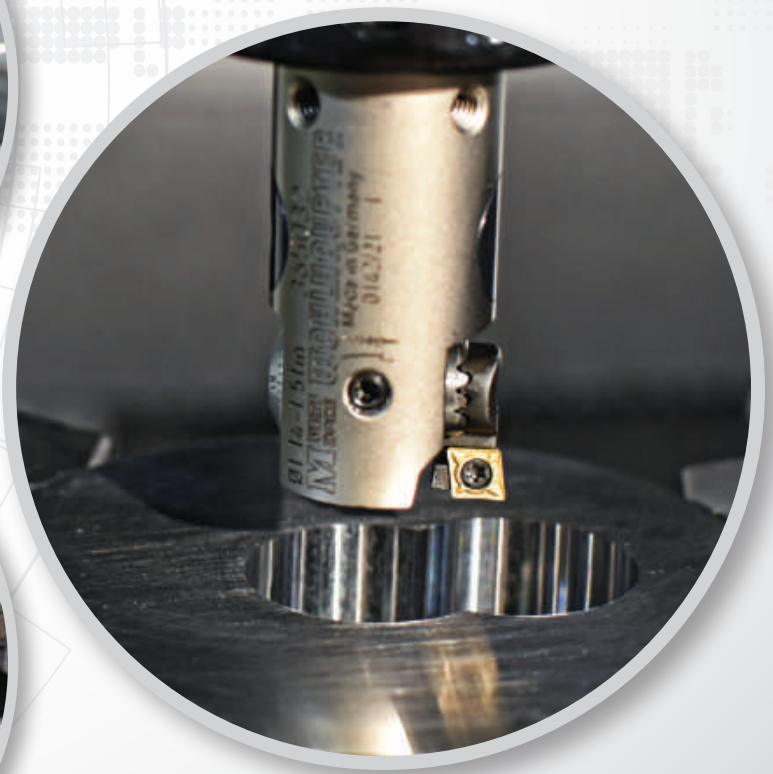
**IMPORTANT:** Max spindle speed refers to maximum possible speed for an individual boring head and is not a recommended parameter. Refer to page B10-N: 10 for recommended application-specific parameters. Factory technical assistance is available for your specific applications through our Application Engineering department.  
ext: 7611 | email: [appeng@alliedmachine.com](mailto:appeng@alliedmachine.com)

# WOHLHAUPTER™ 365 (364) BORING HEAD

<b>Product:</b>	Wohlhaupter™ 365 Boring Head
<b>Material:</b>	4150
<b>Hole Ø:</b>	1.2402" ± 0.0002" (31.50mm ± 0.005mm)
<b>Hole Depth:</b>	1.500" (38.10mm)

Measure	365 Boring Head
RPM	1,540
Speed Rate	500 SFM
Feed Rate	0.0025 IPR (0.064 mm/rev)
Penetration Rate	3.85 IPM (98.6mm/min)
Cycle Time/Hole	23 seconds
Hole Finish/Hole	30 Ra

## Finished "Figure 8" Boring Application



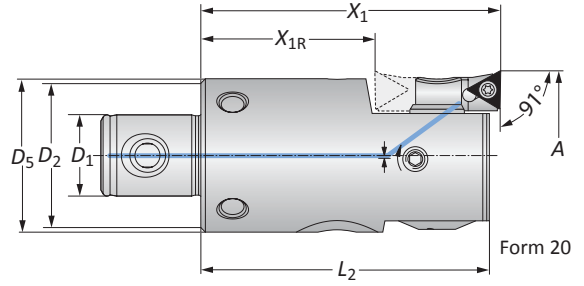
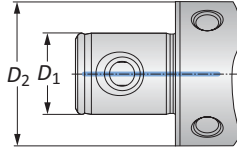


## Boring Heads

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



Form 101



Form 20

### 365 Boring Heads

MVS Connection	Boring Range	Boring Head					Weight	Insert Form	Part No.	
		$D_2   D_1$	A	$X_1$	$X_{1R}$	$L_2$			$D_5$	Insert Holder
	19 - 11	0.787 - 0.965	1.811	-	1.693	-	0.198 (lbs)	20	364077*	365030
	22 - 11	0.965 - 1.161	1.811	-	1.713	0.906	0.331 (lbs)	20	210059	365031
	22 - 11	0.965 - 1.161	1.811	-	1.713	0.906	0.331 (lbs)	101	210069	365031
	25 - 14	1.142 - 1.516	2.205	-	2.106	1.063	0.441 (lbs)	20	210059	365032
<b>i</b>	25 - 14	1.142 - 1.516	2.205	-	2.106	1.063	0.441 (lbs)	101	210069	365032
	32 - 18	1.496 - 1.988	2.598	1.496	2.450	1.339	0.882 (lbs)	20	264051	365033
	32 - 18	1.496 - 1.988	2.598	1.496	2.450	1.339	0.882 (lbs)	101	264077	365033
	40 - 22	1.968 - 2.579	2.953	1.850	2.854	1.654	1.764 (lbs)	20	210052	365034
	40 - 22	1.968 - 2.579	2.953	1.850	2.854	1.654	1.764 (lbs)	101	210062	365034

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

NOTE:  $X_{1R}$  = rotated inset holder for reverse machining

NOTE: Insert holders and inserts sold separately

### 364 Boring Heads

MVS Connection	Boring Range	Boring Head					Weight	Insert Form	Part No.	
		$D_2   D_1$	A	$X_1$	$X_{1R}$	$L_2$			$D_5$	Insert Holder
	19 - 11	20.00 - 24.50	46.00	-	43.00	-	0.09 (kg)	20	364077*	364030
	22 - 11	24.50 - 29.50	46.00	-	43.50	23.00	0.15 (kg)	20	210059	364031
	22 - 11	24.50 - 29.50	46.00	-	43.50	23.00	0.15 (kg)	101	210069	364031
	25 - 14	29.00 - 38.50	56.00	-	53.50	27.00	0.20 (kg)	20	210059	364032
<b>m</b>	25 - 14	29.00 - 38.50	56.00	-	53.50	27.00	0.20 (kg)	101	210069	364032
	32 - 18	38.00 - 50.50	66.00	38.00	63.50	34.00	0.40 (kg)	20	264051	364033
	32 - 18	38.00 - 50.50	66.00	38.00	63.50	34.00	0.40 (kg)	101	264077	364033
	40 - 22	50.00 - 65.50	75.00	47.00	72.50	42.00	0.80 (kg)	20	210052	364034
	40 - 22	50.00 - 65.50	75.00	47.00	72.50	42.00	0.80 (kg)	101	210062	364034

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

NOTE:  $X_{1R}$  = rotated inset holder for reverse machining

NOTE: Insert holders and inserts sold separately

B10-N: 10-13

B10-H

B10: xii-xiii

Key on B10-B: 1

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

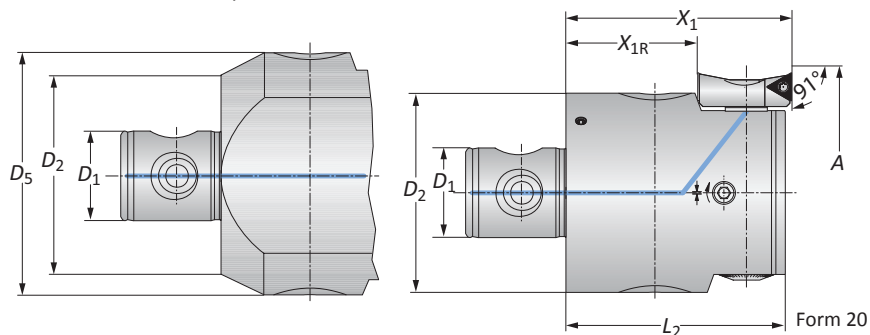
**IMPORTANT:** Max spindle speed refers to maximum possible speed for an individual boring head and is not a recommended parameter. Refer to page B10-N: 10 for recommended application-specific parameters. Factory technical assistance is available for your specific applications through our Application Engineering department.  
ext: 7611 | email: [appeng@alliedmachine.com](mailto:appeng@alliedmachine.com)

## Boring Heads

Alu-Line | Diameter Range: 2.559" - 8.070" (20.00mm - 205.00mm)



Form 101



### 365 Alu-Line Boring Heads

MVS Connection	Boring Range	Boring Head					Weight	Insert Form	Part No.	
		$D_2   D_1$	A	$X_1$	$X_{1R}$	$L_2$			$D_5$	Insert Holder
	50 - 28	2.559 - 3.268	2.953	1.535	2.854	1.968	1.323 (lbs)	20	210020	365045
	50 - 28	2.559 - 3.268	2.953	1.535	2.854	1.968	1.323 (lbs)	101	210063	365045
	50 - 28	2.559 - 3.268	2.953	1.535	2.854	1.968	1.323 (lbs)	103	210064	365045
	63 - 36	3.228 - 4.055	3.543	2.126	3.445	2.480	2.205 (lbs)	20	210020	365046
	63 - 36	3.228 - 4.055	3.543	2.126	3.445	2.480	2.205 (lbs)	101	210063	365046
	63 - 36	3.228 - 4.055	3.543	2.126	3.445	2.480	2.205 (lbs)	103	210064	365046
	80 - 36	3.937 - 5.118	3.543	2.126	3.445	3.150	3.307 (lbs)	20	210020	365047
	80 - 36	3.937 - 5.118	3.543	2.126	3.445	3.150	3.307 (lbs)	101	210063	365047
	80 - 36	3.937 - 5.118	3.543	2.126	3.445	3.150	3.307 (lbs)	103	210064	365047
	80 - 36	4.921 - 6.594	3.543	2.126	3.445	3.937	4.189 (lbs)	20	210020	365048
	80 - 36	4.921 - 6.594	3.543	2.126	3.445	3.937	4.189 (lbs)	101	210063	365048
	80 - 36	4.921 - 6.594	3.543	2.126	3.445	3.937	4.189 (lbs)	103	210064	365048
	80 - 36	6.398 - 8.070	3.543	2.126	3.445	5.315	5.512 (lbs)	20	210020	365049
	80 - 36	6.398 - 8.070	3.543	2.126	3.445	5.315	5.512 (lbs)	101	210063	365049
	80 - 36	6.398 - 8.070	3.543	2.126	3.445	5.315	5.512 (lbs)	103	210064	365049

NOTE:  $X_{1R}$  = rotated inset holder for reverse machining

NOTE: Insert holders and inserts sold separately

### 364 Alu-Line Boring Heads

MVS Connection	Boring Range	Boring Head					Weight	Insert Form	Part No.	
		$D_2   D_1$	A	$X_1$	$X_{1R}$	$L_2$			$D_5$	Insert Holder
	50 - 28	65.00 - 83.00	75.00	39.00	72.50	50.00	0.60 (kg)	20	210020	364045
	50 - 28	65.00 - 83.00	75.00	39.00	72.50	50.00	0.60 (kg)	101	210063	364045
	50 - 28	65.00 - 83.00	75.00	39.00	72.50	50.00	0.60 (kg)	103	210064	364045
	63 - 36	82.00 - 103.00	90.00	54.00	87.50	63.00	1.00 (kg)	20	210020	364046
	63 - 36	82.00 - 103.00	90.00	54.00	87.50	63.00	1.00 (kg)	101	210063	364046
	63 - 36	82.00 - 103.00	90.00	54.00	87.50	63.00	1.00 (kg)	103	210064	364046
	80 - 36	100.00 - 130.00	90.00	54.00	87.50	80.00	1.50 (kg)	20	210020	364047
	80 - 36	100.00 - 130.00	90.00	54.00	87.50	80.00	1.50 (kg)	101	210063	364047
	80 - 36	100.00 - 130.00	90.00	54.00	87.50	80.00	1.50 (kg)	103	210064	364047
	80 - 36	125.00 - 167.50	90.00	54.00	87.50	100.00	1.90 (kg)	20	210020	364048
	80 - 36	125.00 - 167.50	90.00	54.00	87.50	100.00	1.90 (kg)	101	210063	364048
	80 - 36	125.00 - 167.50	90.00	54.00	87.50	100.00	1.90 (kg)	103	210064	364048
	80 - 36	162.50 - 205.00	90.00	54.00	87.50	135.00	2.50 (kg)	20	210020	364049
	80 - 36	162.50 - 205.00	90.00	54.00	87.50	135.00	2.50 (kg)	101	210063	364049
	80 - 36	162.50 - 205.00	90.00	54.00	87.50	135.00	2.50 (kg)	103	210064	364049

NOTE:  $X_{1R}$  = rotated inset holder for reverse machining

NOTE: Insert holders and inserts sold separately

B10:-N: 10-13

B10-H

B10: xii-xiii

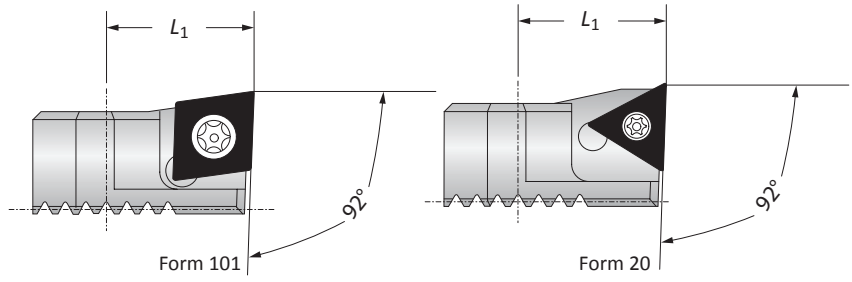
Key on B10-B: 1

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

**IMPORTANT:** Max spindle speed refers to maximum possible speed for an individual boring head and is not a recommended parameter. Refer to page B10-N: 10 for recommended application-specific parameters. Factory technical assistance is available for your specific applications through our Application Engineering department.  
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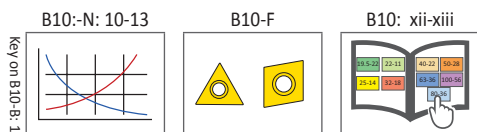
## Insert Holders for Abrasive Materials

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



		Insert Holder			
Boring Range		$L_1$	Weight	Insert Form	Part No.
i	2.559 - 8.070	0.709	0.066 (lbs)	20	211061
	2.559 - 8.070	0.709	0.066 (lbs)	101	211063
	2.559 - 8.070	0.709	0.066 (lbs)	103	211065
m	65.00 - 205.00	18.00	0.03 (kg)	20	211061
	65.00 - 205.00	18.00	0.03 (kg)	101	211063
	60.00 - 205.00	18.00	0.03 (kg)	103	211065

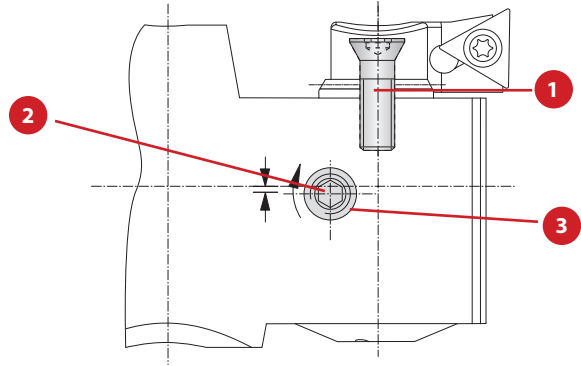
**NOTE:** Insert holders are used for abrasive materials to protect boring head against chip wash



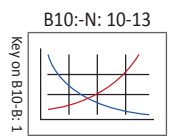
i = Imperial (in)  
m = Metric (mm)  
Inserts sold separately



Accessories

Screws



Boring Head	Part No.				
	1 Countersunk Screw	Countersunk Screw Service Key	2 Clamping Screw	Clamping Screw Service Key	3 Ball
365030	215323	Tx - 15 / H	364260	s2.5 / A	364270
365031	215338	Tx - 15 / H	364138	s2.5 / A	364139
365032	215338	Tx - 15 / H	364138	s2.5 / A	364139
365033	215338	Tx - 15 / H	315278	s2.5 / A	-
365034	215338	Tx - 15 / H	115505	s3 / B	-
365045	215462	Tx - 20 / H	115249	s4 / B	-
365046	215462	Tx - 20 / H	115185	s4 / B	-
365047	215462	Tx - 20 / H	115834	s4 / B	-
365048	215462	Tx - 20 / H	115834	s4 / B	-
365049	215462	Tx - 20 / H	115834	s4 / B	-



 = Imperial (in)  
 = Metric (mm)

A  
B  
C  
D  
E  
F  
G  
H  
I  
J  
K  
L  
M  
N  
INDEX

# Balance Digital 565 (564) Product Overview

## Balance Digital 565 (564) FINE BORING

### Adjustable diameter for precise machining.

The Wohlhaupter™ Balance Digital 565 (564) boring head, for a diameter range above 2.559" (65.50mm), features a lightweight aluminum boring head with automatic balancing in the easy-to-read digital display. It is specifically engineered to minimize the residual imbalance produced by insert holder displacement. The boring insert holders can be rotated easily for reverse machining boring applications.

Test the *engineered lightweight* boring head today.

- Steel boring head diameter range: 1.968" - 2.579" (50.00mm - 65.50mm)
- Alu-Line diameter range: 2.559" - 8.070" (65.00mm - 205.00mm)
- Special coating on Alu-Line for wear-resistant surface
- Alu-Line body reduces tool weight by 50%, reducing stress on the spindle
- Digital readout advantage for diameter adjustments of 0.0001" (0.002mm)
- Coolant through
- Internal balancing improves tool life and surface finish
- Insert holder can be rotated for back boring jobs
- Max cutting speed: 6,562 SFM (2,000 m/min)
- Max coolant pressure: 580 PSI (40 bar)



**Aluminum Boring Head**  
2.559" - 8.071" (65mm - 205mm)

**Steel Boring Head**  
1.968" - 2.579" (50mm - 65.5mm)

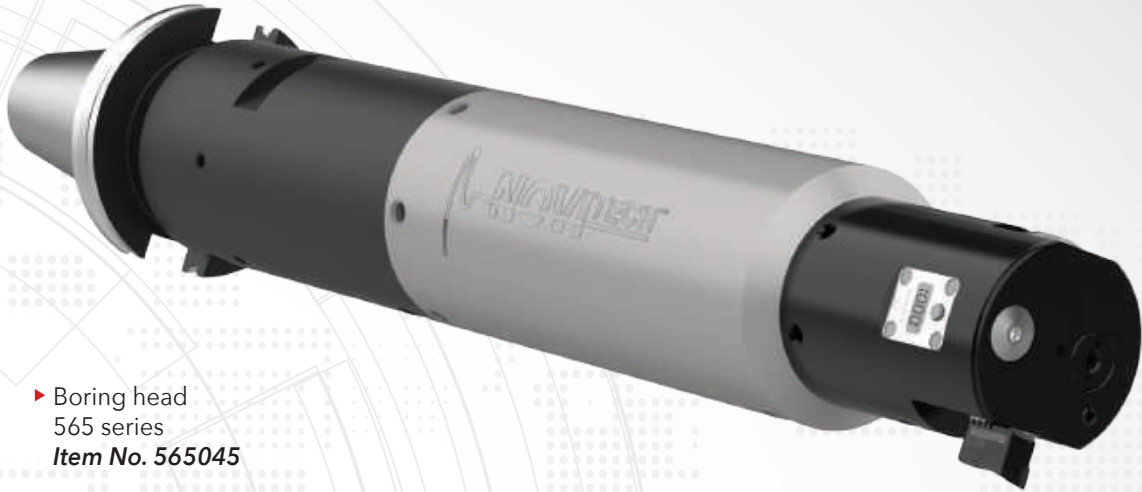
**NOTE:** Imperial items pictured

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

**IMPORTANT:** Max spindle speed refers to maximum possible speed for an individual boring head and is not a recommended parameter. Refer to page B10-N: 10 for recommended application-specific parameters. Factory technical assistance is available for your specific applications through our Application Engineering department.  
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# WOHLHAUPTER™ 565 BORING HEAD with NOVI<sup>TECH</sup>™



- ▶ Boring head  
565 series  
**Item No. 565045**
- ▶ NOVI<sup>TECH</sup> Vibration dampened  
intermediate module  
**Item No. 519005**

**NOTE:** Imperial item pictured

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

*The Wohlhaupter 565 boring head with the  
NOVI<sup>TECH</sup>™ vibration dampened module provided:*



**Excellent surface finish**

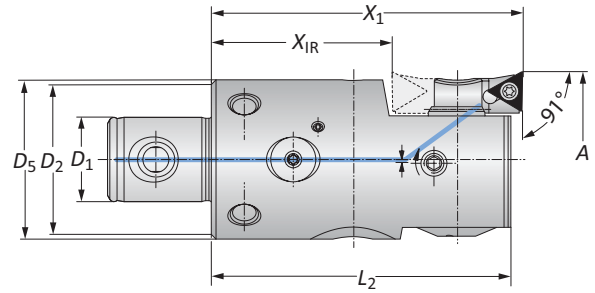
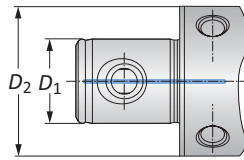


**Eliminated vibration and chatter**

		Measure	565 Boring Head with NOVI <sup>TECH</sup>
<b>Product:</b>	Wohlhaupter™ 565 Boring Head with NOVI <sup>TECH</sup> ™	RPM	430 RPM
<b>Objectives:</b>	0.002" concentricity over the length of 2 bores spaced 14" apart	Speed Rate	352 SFM
<b>Material:</b>	Cast iron	Feed Rate	0.003 IPR
<b>Hole Ø:</b>	3.125"	Penetration Rate	1.29 IPM
<b>Depth:</b>	7xD	Cycle Time (per hole)	3 min 32 sec
		Hole Finish	155 Ra

## Boring Heads

Diameter Range: 1.968" - 2.579" (50.00mm - 65.50mm)



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

### 565 Digital Boring Heads

Form 101

Form 20

	MVS Connection	Boring Range	Boring Head				Weight	Insert Form	Part No.	
	$D_2$   $D_1$	A	$X_1$	$X_{IR}$	$L_2$	$D_5$			Insert Holder	Boring Head
<b>i</b>	40 - 22	1.968 - 2.579	2.953	1.850	2.854	1.654	1.764 (lbs)	20	210052	565034
	40 - 22	1.968 - 2.579	2.953	1.850	2.854	1.654	1.764 (lbs)	101	210062	565034

NOTE:  $X_{IR}$  = rotated inset holder for reverse machining

NOTE: Insert holders and inserts sold separately

### 564 Digital Boring Heads

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

NOTE:  $X_{IR}$  = rotated inset holder for reverse machining

NOTE: Insert holders and inserts sold separately

B10-N: 10-13

B10-H

B10: xii-xiii

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

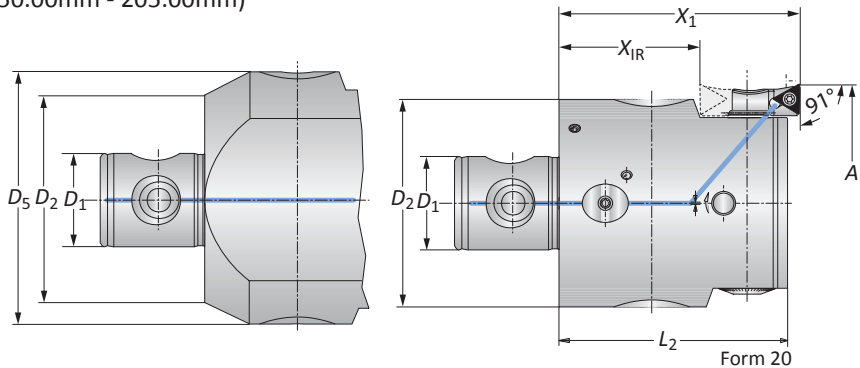
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## Boring Heads

Alu-Line | Diameter Range: 2.559" - 8.070" (50.00mm - 205.00mm)



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



565 Digital Alu-Line Boring Heads Form 101

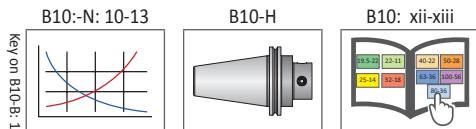
MVS Connection	Boring Range	Boring Head					Weight	Insert Form	Part No.	
		$D_2   D_1$	A	$X_1$	$X_{1R}$	$L_2$			$D_5$	Insert Holder
50 - 28	2.559 - 3.268	2.953	1.535	2.874	-	1.323 (lbs)	20	210020	565045	
50 - 28	2.559 - 3.268	2.953	1.535	2.874	-	1.323 (lbs)	101	210063	565045	
50 - 28	2.559 - 3.268	2.953	1.535	2.874	-	1.323 (lbs)	103	210064	565045	
63 - 36	3.228 - 4.005	3.543	2.126	3.464	-	2.205 (lbs)	20	210020	565046	
63 - 36	3.228 - 4.005	3.543	2.126	3.464	-	2.205 (lbs)	101	210063	565046	
63 - 36	3.228 - 4.005	3.543	2.126	3.464	-	2.205 (lbs)	103	210064	565046	
80 - 36	3.937 - 5.118	3.543	2.126	3.464	-	3.307 (lbs)	20	210020	565047	
80 - 36	3.937 - 5.118	3.543	2.126	3.464	-	3.307 (lbs)	101	210063	565047	
80 - 36	3.937 - 5.118	3.543	2.126	3.464	-	3.307 (lbs)	103	210064	565047	
80 - 36	4.921 - 6.594	3.543	2.126	3.464	-	3.307 (lbs)	20	210020	565048	
80 - 36	4.921 - 6.594	3.543	2.126	3.464	3.937	4.189 (lbs)	101	210063	565048	
80 - 36	4.921 - 6.594	3.543	2.126	3.464	3.937	4.189 (lbs)	103	210064	565048	
80 - 36	6.397 - 8.070	3.543	2.126	3.464	3.937	4.189 (lbs)	20	210020	565049	
80 - 36	6.397 - 8.070	3.543	2.126	3.464	3.937	4.189 (lbs)	101	210063	565049	
80 - 36	6.397 - 8.070	3.543	2.126	3.464	5.315	5.512 (lbs)	103	210064	565049	

**NOTE:**  $X_{1R}$  = rotated inset holder for reverse machining  
**NOTE:** Insert holders and inserts sold separately

564 Digital Alu-Line Boring Heads

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

**NOTE:**  $X_{1R}$  = rotated inset holder for reverse machining  
**NOTE:** Insert holders and inserts sold separately



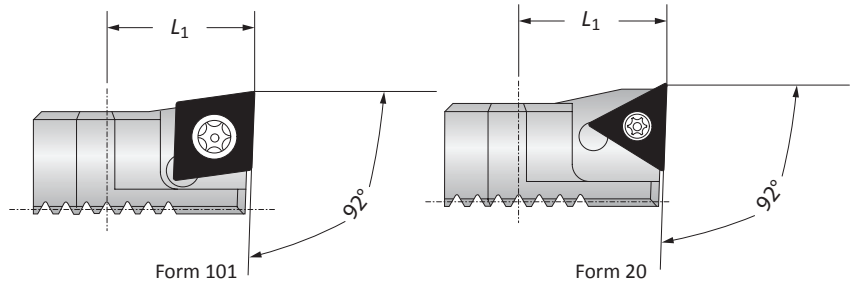
**i** = Imperial (in)  
**m** = Metric (mm)

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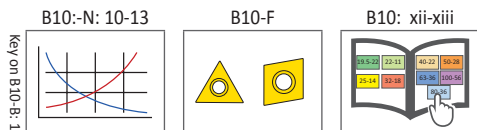
### Insert Holder for Abrasive Materials

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



		Insert Holder			
		$L_1$	Weight	Insert Form	Part No.
i	2.559 - 8.070	0.709	0.066 (lbs)	20	211061
	2.559 - 8.070	0.709	0.066 (lbs)	101	211063
	2.559 - 8.070	0.709	0.066 (lbs)	103	211065
m	65.00 - 205.00	18.00	0.03 (kg)	20	211061
	66.00 - 205.00	18.00	0.03 (kg)	101	211063
	67.00 - 205.00	18.00	0.03 (kg)	103	211065

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

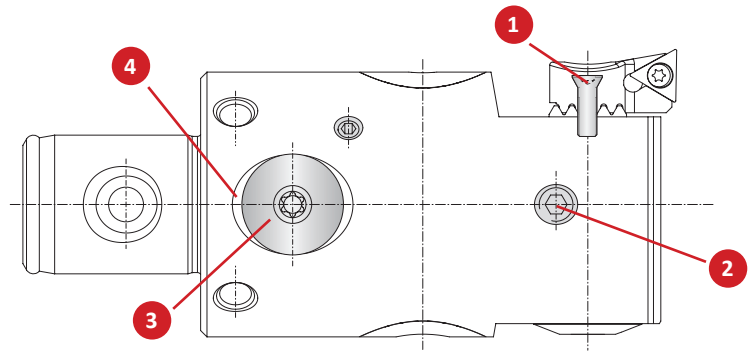


i = Imperial (in)  
m = Metric (mm)  
Inserts sold separately



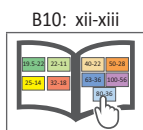
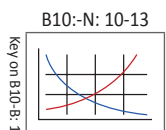
## Accessories

Screws | Battery Cover | Batteries



Boring Head	Part No.							
	1 Countersunk Screw	Service Key	2 Clamping Screw	Service Key	3 Battery Cover	Service Key	4 Sealing Ring	Battery*
565034	<b>215338</b>	T15 / H	<b>115505</b>	s3 / B	<b>501016</b>	T20 / H	<b>415895</b>	<b>415896</b>
565045	<b>215462</b>	T20 / H	<b>315943</b>	s4 / B	<b>501016</b>	T20 / H	<b>415895</b>	<b>415896</b>
565046	<b>215462</b>	T20 / H	<b>515178</b>	s4 / B	<b>501016</b>	T20 / H	<b>415895</b>	<b>415896</b>
565047	<b>215462</b>	T20 / H	<b>515178</b>	s4 / B	<b>501016</b>	T20 / H	<b>415895</b>	<b>415896</b>
565048	<b>215462</b>	T20 / H	<b>515178</b>	s4 / B	<b>501016</b>	T20 / H	<b>415895</b>	<b>415896</b>
565049	<b>215462</b>	T20 / H	<b>515178</b>	s4 / B	<b>501016</b>	T20 / H	<b>415895</b>	<b>415896</b>

\*Replace both batteries



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



# 338 (337) Product Overview

## 338 (337) FINE BORING

### Go big with the lightweight 338 (337).

The Wohlhaupter™ 338 (337) cassette is engineered with lightweight aluminum that can be used on serrated tool bodies and serrated slides for large diameter boring. The insert holder can also be rotated for reverse machining.

#### Engineered for *large diameter boring*.

- Diameter range: 3.937" - 8.070" (100.00mm - 205.00mm)
- Cassettes can be used on large diameter serrated slides (**pg. B10-E: 8**): 7.874" - 128.100" (100.00mm - 3255.00mm)
- Coolant through
- Vernier diameter adjustments of 0.0001" (0.002mm)
- Special coating for increased durability
- Max cutting speed: 3,937 SFM (1,200 m/min)



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# WOHLHAUPTER COMBI-LINE

## with 338 boring cassette

### One tooling switch can provide a smörgåsbord of benefits.

When you're searching for a new tooling solution, it's always nice when you find an answer that goes above and beyond the improvements you need. Our customer was roughing and finishing steel roller housings for the structural steel/fabricator industry. The application required 3 boring passes to complete, resulting in lengthy cycle times and sub-par hole finishes. Each pass was made by a different tool, which caused additional headaches and increased inventory costs. And on top of that, the tooling produced non-round holes and inconsistent insert wear that caused tool failures.



Our customer tested the **Wohlhaupter Combi-Line** boring system, and the results provided even more improvements than they had hoped for. For starters, the Combi-Line tool completed both the rough and finish processes in a single pass, eliminating 2 tools and our customer's inventory woes in one shot. It also eliminated the tool failures. The one pass completion also slashed cycle time from nearly 4.5 minutes to 3 minutes (a **33% reduction**).

But the benefits didn't stop there. The Combi-Line tool impressed our customer with a significant increase in tool life. Where the previous tooling produced 150 linear inches, the Combi-Line produced 400 linear inches (a **167% increase**). Also, the Combi-Line improved the resulting hole surface finish from 125 Ra to a much nicer 63 Ra (a **50% improvement**).

Cycle time decrease, inventory reduction, tool life increase, tool failure elimination, surface finish improvement...this smörgåsbord of benefits resulted from one switch in tooling. **Don't underestimate the impact a simple tooling change can have on your productivity; feast on the benefits.**

		Measure	Competitor Boring Tool	Combi-Line
<b>Product:</b>	Wohlhaupter™ Combi-Line	RPM	215	290
<b>Objectives:</b>	(1) Reduce inventory requirements (2) Decrease cycle time	Speed Rate	500 SFM	675 SFM
<b>Industry:</b>	Structural steel/fabricator	Feed Rate	0.004 IPR	0.004 IPR
<b>Part:</b>	Steel roller housing	Penetration Rate	0.86 IPM	1.16 IPM
<b>Material:</b>	4140 alloy steel/A36 structural steel	Cycle Time	4 min 20 sec	3 min
<b>Hole Ø:</b>	8.858"	Hole Finish	125 Ra	63 Ra
<b>Hole Depth:</b>	3.500"	Tool Life	150 linear inches	400 linear inches
		Tool Failure?	Yes	No

- ▶ Combi-Line assembly:
  - (1) Serrated slide: 349051
  - (2) Precision boring tool: 338037
  - (3) Insert holder: 210064
  - (4) Roughing unit: 149059
  - (5) Master shank: 357003

- ▶ Boring inserts  
Item No. 297653WHC19

#### The Wohlhaupter Combi-Line tool:

- Decreased cycle time ✓
- Increased tool life ✓
- Reduced inventory requirements ✓
- Improved hole surface finish ✓
- Eliminated tool failures ✓

167% tool life increase

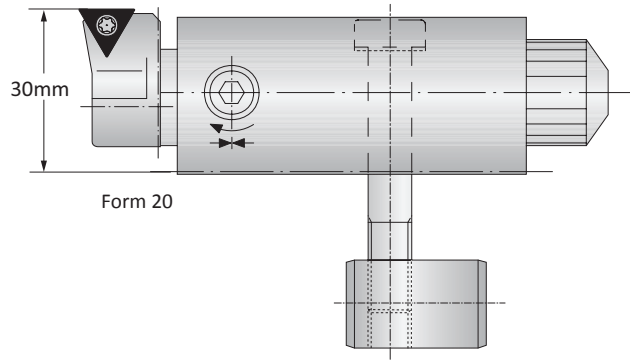


## Cassettes | Serrated Tool Bodies

Diameter Range: 3.937" - 8.070" (100.00mm - 205.00mm)



Form 101



Form 20

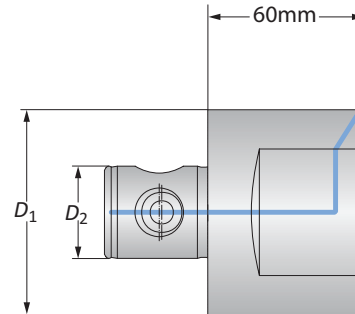
### 338 (337) Cassettes

	Boring Range	Weight	Insert Form	Insert Holder	Part No.	
					Clamping Piece	Cassette*
i	3.937 - 8.070	0.6831 (lbs)	20	210020	137026	338037
	3.937 - 8.070	0.6831 (lbs)	101	210063	137026	338037
	3.937 - 8.070	0.6831 (lbs)	103	210064	137026	338037
m	100.00 - 205.00	0.31 (kg)	20	210020	137026	337017
	100.00 - 205.00	0.31 (kg)	101	210063	137026	337017
	100.00 - 205.00	0.31 (kg)	103	210064	137026	337017

\*Required serrated tool body sold separately

**NOTE:** Cassette and insert holder can be used on large diameter serrated slides (B10-E: 8)

**NOTE:** Insert holders and inserts sold separately



### Serrated Tool Bodies

	MVS Connection	Boring Range	Part No.
	D <sub>2</sub>   D <sub>1</sub>		
i	80 - 36	3.937 - 6.102	148007
	80 - 36	5.905 - 8.070	148009
m	80 - 36	100.00 - 155.00	148007
	80 - 36	150.00 - 205.00	148009

B10-N: 10-13

B10-H

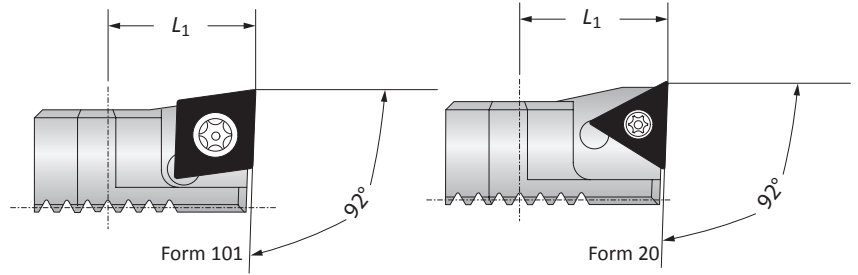
B10: xii-xiii

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

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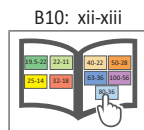
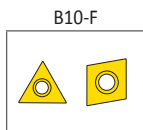
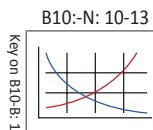
## Insert Holders for Abrasive Materials

Diameter Range: 3.937" - 128.150" (100.00mm - 3255.00mm)



	Boring Range	Insert Holder $L_1$	Weight	Insert Form	Part No.
<b>i</b>	3.937 - 128.150	0.709	0.066 (lbs)	20	<b>211061</b>
	3.937 - 128.150	0.709	0.066 (lbs)	101	<b>211063</b>
	3.937 - 128.150	0.709	0.066 (lbs)	103	<b>211065</b>
<b>m</b>	100.00 - 3255.00	18.00	0.03 (kg)	20	<b>211061</b>
	100.00 - 3255.00	18.00	0.03 (kg)	101	<b>211063</b>
	100.00 - 3255.00	18.00	0.03 (kg)	103	<b>211065</b>

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

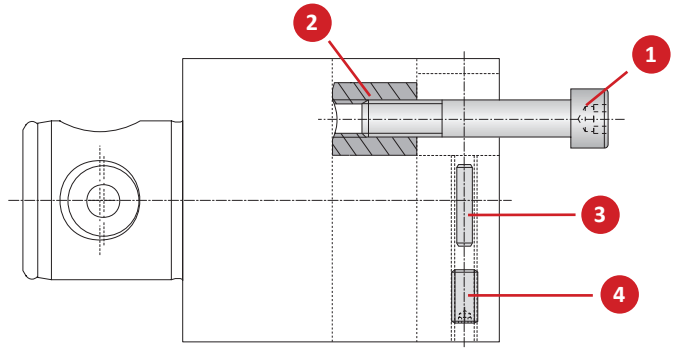


Key on B10-B: 1

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

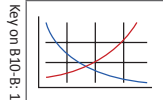
Accessories

Screws | Clamping Pieces | Adjustment Pins



Serrated Tool Body	Part No.					
	1 Cap Screw	Hex Size / Type	2 Clamping Nut	3 Adjustment Pin	4 Set Screw	Hex Size / Type
148007	115730	s6 / B	140119	-	364270	s2.5 / A
148009	115730	s6 / B	140119	140120	364139	s2.5 / A

B10:-N: 10-13



B10: xii-xiii



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





# Digital 538 (537) Product Overview

## Digital 538 (537) FINE BORING

### Engineered for easy precision.

The Wohlhaupter™ Digital 538 (537) features an integrated digital readout and lightweight aluminum body that can be used with serrated tool bodies and serrated slides. The insert holder can be rotated easily for reverse machining applications.

Experience *digital precision boring* for yourself.

- Diameter range: 3.937" - 8.070" (100.00mm - 205.00mm)
- Cassette can be used on large diameter serrated slides (**pg. B10-E: 8**): 7.874" - 128.100" (100.00mm - 3255.00mm)
- Coolant through
- Digital readout advantage for diameter adjustments of 0.0001" (0.002mm)
- Special coating for increased durability
- Max cutting speed: 3,937 SFM (1,200 m/min)



**NOTE:** Imperial items pictured

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

**IMPORTANT:** Max spindle speed refers to maximum possible speed for an individual boring head and is not a recommended parameter. Refer to page B10-N: 10 for recommended application-specific parameters. Factory technical assistance is available for your specific applications through our Application Engineering department.  
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# WOHLHAUPTER™ COMBI-LINE with 538 boring cassette

## Cycle time is crucial, so what's taking you so long?

Time is money when it comes to moving finished parts through your manufacturing process. Our customer was machining 316 stainless steel to produce pump covers for the food processing industry. Each part had 2 holes that included an interrupted cut, and our customer needed 2 different tools to complete the process. The roughing tool they used ran for 8.5 minutes per hole, and the finishing tool ran for 23.5 minutes per hole. Overall, our customer was spending over 1 hour to complete a single part.



The cycle time was killing productivity, and our customer knew there had to be a more efficient solution available. They tested the **Wohlhaupter Combi-Line** boring system, and the results were exactly what our customer needed. The Combi-Line tool slashed the cycle time from 1 hour to just 17 minutes, less than 1/3 the previous cycle time (**a 73% reduction**). Equipped with a height adjustable roughing unit on one side and a precision finishing tool on the other, the Combi-Line achieved both the rough and finish processes with 1 solution. This multi-function combination eliminated the need for multiple tools and reduced our customer's inventory requirements.

Another challenge our customer faced with their previous tooling was insert damage. They struggled to produce even 1 part without chipping an insert in the stainless steel material. With Wohlhaupter's stainless steel grade inserts designed specifically for success in this type of material, the Combi-Line tool solved the chip damage issue for our customer.

Thanks to the Combi-Line tooling solution, our customer's lengthy, troublesome process became a worry-free application that could be completed 73% faster. **Don't struggle with inefficient applications; call your local tooling specialist, and find the right tool for your job today.**

Product:	Wohlhaupter™ Combi-Line	Measure	Previous Process		Wohlhaupter Combi-Line
			Roughing Tool	Finishing Tool	
<b>Objectives:</b>	(1) Improve cycle time (2) Eliminate insert damage	RPM	200	180	250
<b>Industry:</b>	General machining	Speed Rate	445 SFM	401 SFM	556 SFM
<b>Part:</b>	Pump cover	Feed Rate	0.005 IPR	0.002 IPR	0.004 IPR
<b>Material:</b>	316 stainless steel	Penetration Rate	1.00 IPM	0.36 IPM	1.00 IPM
<b>Hole Ø:</b>	8.500"	Cycle Time (per hole)	8 min 30 sec	23 min 36 sec	8 min 30 sec
<b>Hole Depth:</b>	8.500"	Cycle Time (per part)	1 hr 4 min		17 min

- ▶ Combi-Line assembly:
  - (1) Serrated slide: 349051
  - (2) Digital finish boring tool: 538001
  - (3) Insert holder: 210064
  - (4) Rough boring tool: 149059
  - (5) Master shank: 327023

- ▶ Boring inserts  
Item No. 397166WHC114

73% cycle time decrease



NOTE: Imperial item pictured

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

### The Wohlhaupter Combi-Line tool:

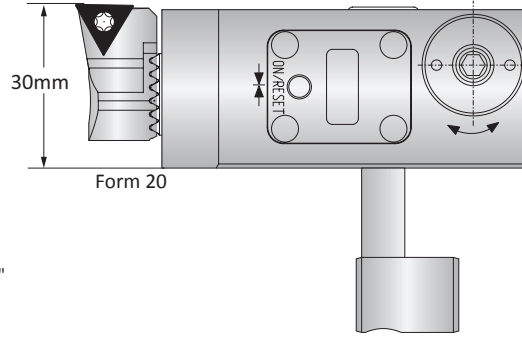
- Decreased cycle time ✓
- Eliminated insert damage ✓
- Reduced inventory requirements ✓
- Provided worry-free machining ✓

## Cassettes | Serrated Tool Bodies

Diameter Range: 3.937" - 8.070" (100.00mm - 205.00mm)



Form 101



Form 20

NOTE: Imperial item pictured

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

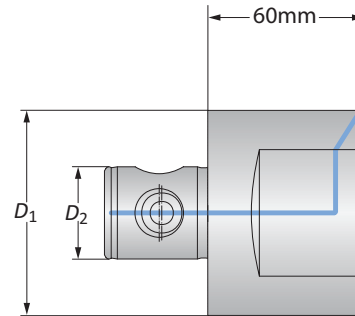
### Digital 538 (537) Cassettes

	Boring Range	Weight	Insert Form	Insert Holder	Part No.	
					Clamping Piece	Cassette*
i	3.937 - 8.070	0.816 (lbs)	20	210020	137026	538001
	3.937 - 8.070	0.816 (lbs)	101	210063	137026	538001
	3.937 - 8.070	0.816 (lbs)	103	210064	137026	538001
m	100.00 - 205.00	0.37 (kg)	20	210020	137026	537001
	100.00 - 205.00	0.37 (kg)	101	210063	137026	537001
	100.00 - 205.00	0.37 (kg)	103	210064	137026	537001

\*Required serrated tool body sold separately

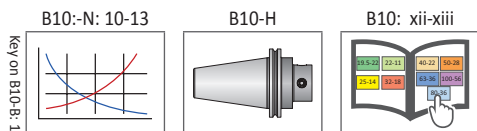
NOTE: Cassette and insert holder can be used on large diameter serrated slides (B10-E: 8)

NOTE: Insert holders and inserts sold separately



### Serrated Tool Bodies

	MVS Connection	Serrated Tool Body	
	D <sub>2</sub>   D <sub>1</sub>	Boring Range	Part No.
i	80 - 36	3.937 - 6.102	148007
	80 - 36	5.905 - 8.070	148009
m	80 - 36	100.00 - 155.00	148007
	80 - 36	150.00 - 205.00	148009

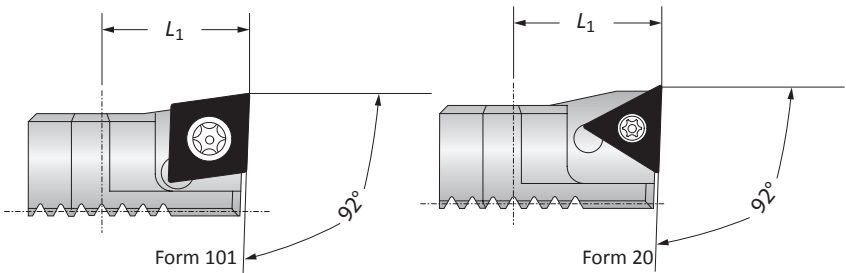
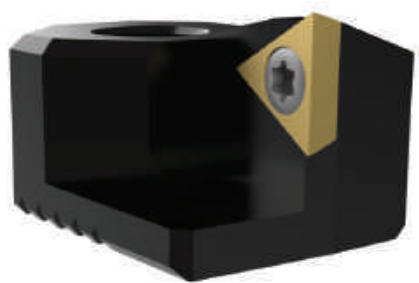


i = Imperial (in)  
m = Metric (mm)

**IMPORTANT:** Max spindle speed refers to maximum possible speed for an individual boring head and is not a recommended parameter. Refer to page B10-N: 10 for recommended application-specific parameters. Factory technical assistance is available for your specific applications through our Application Engineering department.  
ext: 7611 | email: [appeng@alliedmachine.com](mailto:appeng@alliedmachine.com)

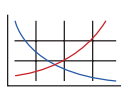
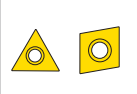

### Insert Holders for Abrasive Materials

Diameter Range: 3.937" - 128.150" (100.00mm - 3255.00mm)



	Boring Range	Insert Holder $L_1$	Weight	Insert Form	Part No.
<b>i</b>	3.937 - 128.150	0.709	0.066 (lbs)	20	<b>211061</b>
	3.937 - 128.150	0.709	0.066 (lbs)	101	<b>211063</b>
	3.937 - 128.150	0.709	0.066 (lbs)	103	<b>211065</b>
<b>m</b>	100.00 - 3255.00	18.00	0.03 (kg)	20	<b>211061</b>
	100.00 - 3255.00	18.00	0.03 (kg)	101	<b>211063</b>
	100.00 - 3255.00	18.00	0.03 (kg)	103	<b>211065</b>

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

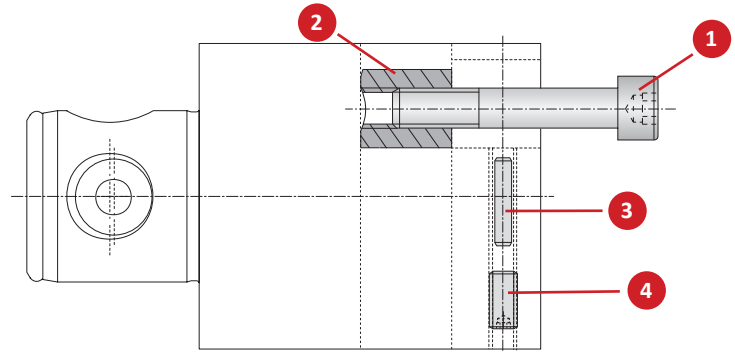
B10--N: 10-13  B10-F  B10: xii-xiii 

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

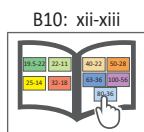
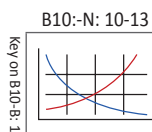
A  
B  
C  
D  
E  
F  
G  
H  
I  
J  
K  
L  
M  
N  
INDEX



## Accessories



Serrated Tool Body	Part No.					
	1 Cap Screw	Hex Size / Type	2 Clamping Nut	3 Adjustment Pin	4 Set Screw	Hex Size / Type
148007 / 348007	<b>115730</b>	s6 / B	<b>140119</b>	–	<b>116550</b>	s2.5 / A
148009 / 348009	<b>115730</b>	s6 / B	<b>140119</b>	<b>140120</b>	<b>115519</b>	s2.5 / A



 = Imperial (in)  
 = Metric (mm)





SECTION

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# B10-C

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Combi-Line Rough and Finish Boring

# Wohlhaupter™ Rough and Finish Boring

## Combi-Line

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



## One tool. Two operations.

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

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



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

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

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

### **WARNING**

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

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

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

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

## Applicable Industries



Aerospace



Agriculture



Automotive



Firearms



General  
Machining



Oil & Gas

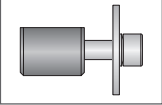
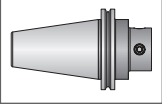
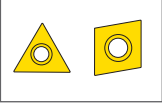
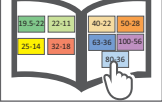
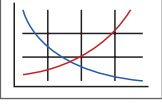


Renewable  
Energy



# Combined Rough and Finish Boring Table of Contents

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

- 
**Clamping Elements**  
For use with insert holders and boring heads
- 
**Shanks**  
A variety of shanks for different machines
- 
**Inserts**  
For use with insert holder boring heads and boring bars using indexable inserts
- 
**MVS Connection Color Guide**  
Detailed instructions and information regarding the MVS connection(s)
- 
**Recommended Cutting Data**  
Speed and feed recommendations for optimum and safe boring

## Combi-Line Introduction

- Combi-Line Product Overview . . . . . 2 - 3
- Boring Head and Insert Holder . . . . . 4
- Accessories . . . . . 5

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

# Combi-Line Product Overview

## Combi-Line ROUGH & FINISH BORING

### Two operations. One Tool.

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

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

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



**IMPORTANT:** Max spindle speed refers to maximum possible speed for an individual boring head and is not a recommended parameter. Refer to page B10-N: 10 for recommended application-specific parameters. Factory technical assistance is available for your specific applications through our Application Engineering department.  
ext: 7611 | email: [appeng@alliedmachine.com](mailto:appeng@alliedmachine.com)

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

**Application:** Ductile Cast Iron

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

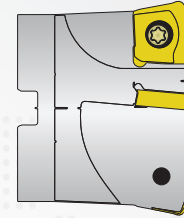
**Pre-Hole Diameter:** 1.771" (45mm)

**Boring Depth:** 8.228" (209mm)

**Hole Finish:** 32 Ra



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



1.5" High Feed Milling Tool



Wohlhaupter 320 Boring Head

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



Wohlhaupter Twin Cutter



Wohlhaupter 320 Boring Head

## OUR **SOLUTION** Combi-Line Rough and Finish Boring

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

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

- Boring inserts
- ▶ *Item No. 297653WHC19*



*60 seconds of  
total cycle time saved*

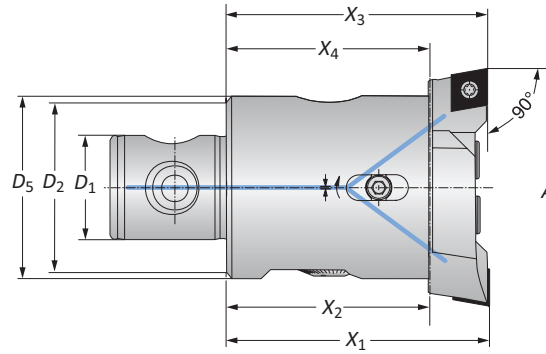


**1 tool vs. 2 tools saves you time and money**



## Boring Heads and Insert Holders

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



### COMBI LINE

Connection	Boring Range	Boring Head					Weight	Insert Form	Part No.		
		$D_2   D_1$	A	$X_1$	$X_2$	$X_3$			$X_4$	$D_5$	(x2)* Insert Holder**
i	22 - 11	0.965 - 1.161	1.803	1.338	1.800	1.330	33.750	0.220 (lbs)	101	402029	404003
	25 - 14	1.142 - 1.457	2.205	1.614	2.192	1.600	40.750	0.440 (lbs)	101	402009	404004
	25 - 14	1.142 - 1.458	2.205	1.614	2.192	1.600	40.750	0.440 (lbs)	103	402011	404004
	25 - 14	1.417 - 1.732	2.205	1.614	2.192	1.600	40.750	0.661 (lbs)	101	402017	404005
	25 - 14	1.417 - 1.733	2.205	1.614	2.192	1.600	40.750	0.661 (lbs)	103	402019	404005
	32 - 18	1.693 - 2.126	2.598	1.889	2.592	1.880	47.700	0.881 (lbs)	103	402021	404006
	40 - 22	2.087 - 2.598	2.953	2.165	2.940	2.150	54.700	1.543 (lbs)	103	402005	404007
	50 - 28	2.559 - 3.268	2.953	2.165	2.940	2.150	54.700	2.425 (lbs)	103	402013	404008
	63 - 36	3.228 - 4.055	3.543	2.755	3.530	2.740	69.700	4.850 (lbs)	103	402001	404009
	80 - 36	4.016 - 5.000	3.543	2.598	3.530	2.590	65.700	6.613 (lbs)	103	402025	404010
G	80 - 36	5.000 - 5.984	3.543	2.598	3.530	2.590	65.700	6.834 (lbs)	103	402026	404010
	80 - 36	5.945 - 7.913	3.543	2.598	3.530	2.590	65.700	8.377 (lbs)	103	402025	404011
80 - 36	6.929 - 7.913	3.543	2.598	3.530	2.590	65.700	8.598 (lbs)	103	402026	404011	
H	22 - 11	24.50 - 29.50	46.00	34.00	45.70	33.70	22.00	0.10 (kg)	101	402029	401003
	25 - 14	29.00 - 37.00	56.00	41.00	55.70	40.70	26.00	0.20 (kg)	101	402009	401004
	25 - 14	29.00 - 37.00	56.00	41.00	55.70	40.70	26.00	0.20 (kg)	103	402011	401004
	25 - 14	36.00 - 44.00	56.00	41.00	55.70	40.70	30.00	0.30 (kg)	101	402017	401005
	25 - 14	36.00 - 44.00	56.00	41.00	55.70	40.70	30.00	0.30 (kg)	103	402019	401005
	32 - 18	43.00 - 54.00	66.00	48.00	65.70	47.70	34.00	0.40 (kg)	103	402021	401006
	40 - 22	53.00 - 66.00	75.00	55.00	74.70	54.70	40.00	0.70 (kg)	103	402005	401007
	50 - 28	65.00 - 83.00	75.00	55.00	74.70	54.70	50.00	1.10 (kg)	103	402013	401008
	63 - 36	82.00 - 103.00	90.00	70.00	89.70	69.70	63.00	2.20 (kg)	103	402001	401009
	80 - 36	102.00 - 127.00	90.00	66.00	89.70	65.70	85.00	3.00 (kg)	103	402025	401010
J	80 - 36	127.00 - 152.00	90.00	66.00	89.70	65.70	85.00	3.10 (kg)	103	402026	401010
	80 - 36	151.00 - 176.00	90.00	66.00	89.70	65.70	134.00	3.80 (kg)	103	402025	401011
	80 - 36	176.00 - 201.00	90.00	66.00	89.70	65.70	134.00	3.90 (kg)	103	402026	401011

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

Key on B10-C: 1

B10-N: 10-13

B10-C: 5

B10-H

B10-F

B10: xii-xiii

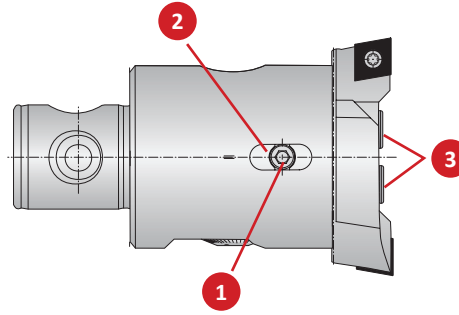
i = Imperial (in)  
 m = Metric (mm)

Inserts sold separately

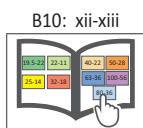
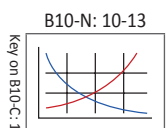
**IMPORTANT:** Max spindle speed refers to maximum possible speed for an individual boring head and is not a recommended parameter. Refer to page B10-N: 10 for recommended application-specific parameters. Factory technical assistance is available for your specific applications through our Application Engineering department.  
 ext: 7611 | email: [appeng@alliedmachine.com](mailto:appeng@alliedmachine.com)

Accessories

Screws | Clamping Elements



Boring Head Part No.	Part No.					
	1 Clamp Screw	Service Key	2 Clamping Piece	3 Cap Screw	Service Key	
<b>i</b>	404003	401223	s2.5 / B	401203	401323	s3 / B
	404004	401224	s2.5 / B	401204	401324	s4 / B
	404005	401225	s2.5 / B	401205	401324	s4 / B
	404006	401226	s3 / B	401206	401324	s4 / B
	404007	402227	s3 / B	401207	401327	s5 / B
	404008	115288	s4 / B	401208	401329	s6 / B
	404009	215501	s4 / B	401209	401329	s6 / B
	404010	401230	s4 / B	401210	019183	s8 / C
	404011	401230	s4 / B	401210	019138	s8 / C
<b>m</b>	401003	401223	s2.5 / B	401203	401323	s3 / B
	401004	401224	s2.5 / B	401204	401324	s4 / B
	401005	401225	s2.5 / B	401205	401324	s4 / B
	401006	401226	s3 / B	401206	401324	s4 / B
	401007	402227	s3 / B	401207	401327	s5 / B
	401008	115288	s4 / B	401208	401329	s6 / B
	401009	215501	s4 / B	401209	401329	s6 / B
	401010	401230	s4 / B	401210	019183	s8 / C
	401011	401230	s4 / B	401210	019138	s8 / C



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





SECTION

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# B10-D

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Rough Machining

# Wohlhaupter™ Rough Machining

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

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



## Variety of tooling. Versatile operations.

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

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### **WARNING**

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

## Applicable Industries



Aerospace



Agriculture



Automotive



Firearms



General  
Machining



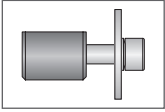
Oil & Gas



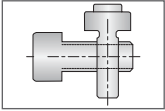
Renewable  
Energy

### Reference Icons

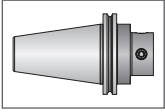
The following icons will appear throughout the catalog to help you navigate between products.



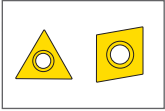
**Clamping Elements**  
For use with insert holders and boring heads



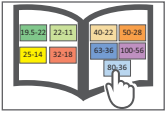
**Recessing Tools**



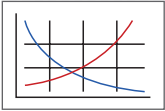
**Shanks**  
A variety of shanks for different machines



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



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



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

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Series	Diameter Range	
	Imperial (inch)	Metric (mm)
<b>Twin Cutters</b>	0.767 - 8.070	19.50 - 205.00
<b>Chamfering</b>	0.984 - 7.913	20.00 - 201.00
<b>Grooving</b>	0.787 - 8.501	20.00 - 79.00
<b>Axial Grooving</b>	0.787 - 8.070	20.00 - 205.00
<b>Reverse Machining</b>	1.141 - 9.645	29.00 - 245.00



# Rough Machining Product Preview

## Roughing Tools ROUGH MACHINING

### Versatile tools for a variety of applications.

- Diameter range: 0.768" - 9.645" (19.50mm - 245.00mm)
- Tangential inserts and insert holders also available
- Serrated tool bodies can be used for multiple applications, including rough boring, chamfering, back boring, and axial grooving
- Insert holders can be used on large diameter Alu-Line serrated tool bodies and slides located in section E: 3.940" - 128.15" (100.00mm - 3255.00mm)

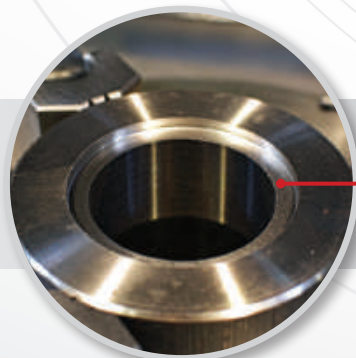
## Roughing Applications



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



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



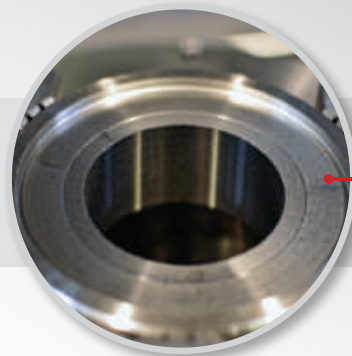
First Tangential Cut





▶ **Tangential Cutter Assembly:**

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

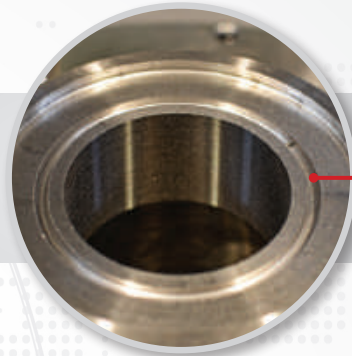


Second Tangential Cut



▶ **Axial Grooving Assembly:**

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

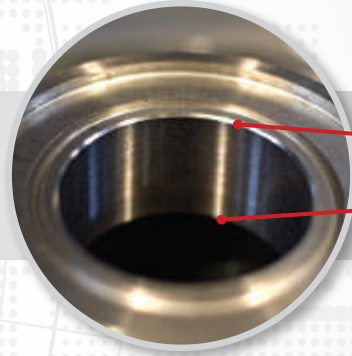


Axial Groove Cut



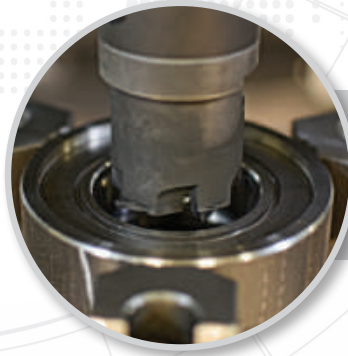
▶ **Chamfer Assembly:**

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



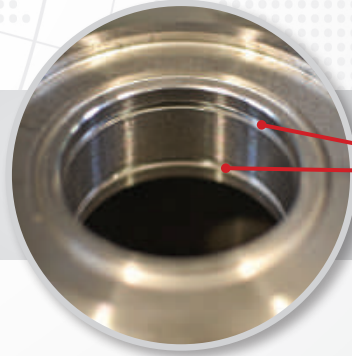
Top Chamfer

Bottom Chamfer



▶ **Radial Grooving Assembly:**

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



Grooves



▶ **Finished Application**

Case Study

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

Application: Ductile Cast Iron

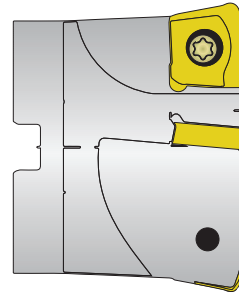
Finish Diameter: 1.930" (49mm)

Pre-Hole Diameter: 1.77" (45mm)

Boring Depth: 8.23" (209mm)



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



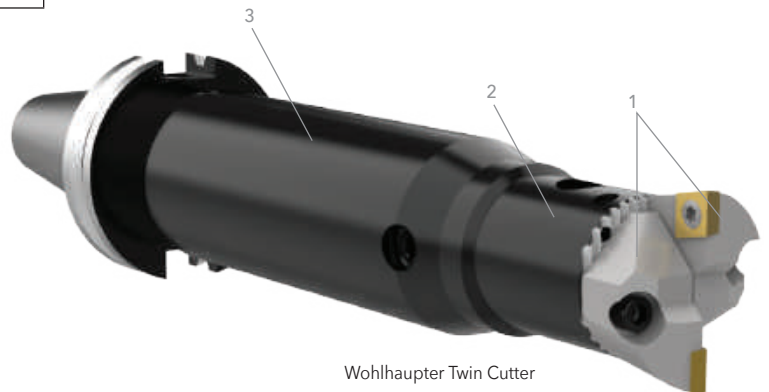
1.5" High Feed Milling Tool

► **OUR SOLUTION**  
Wohlhaupter™ Twin Cutter

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

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

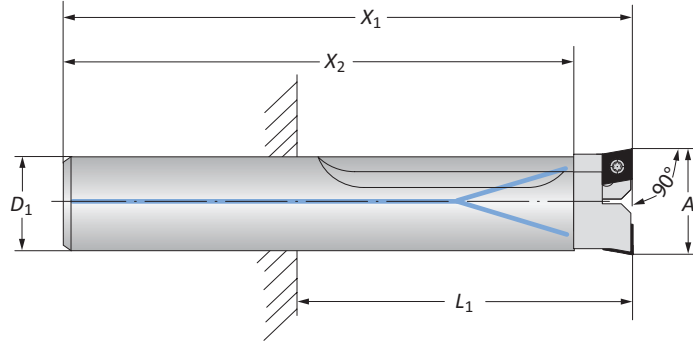
- Boring inserts
- *Item No.: 297239WHC79*



Wohlhaupter Twin Cutter

### Twin Cutters Same Level

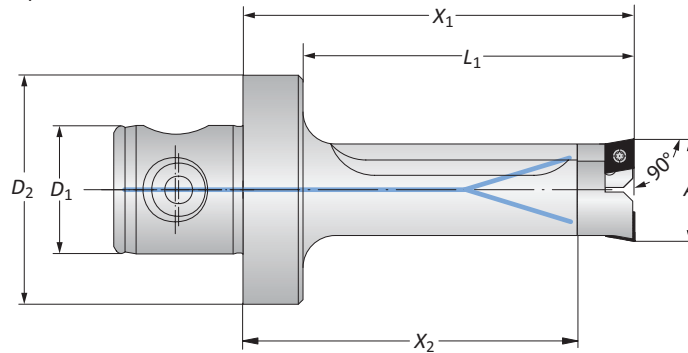
90° | Diameter Range: 0.767" - 1.181" (19.50mm - 30.00mm)



#### Twin Cutters Same Level

	Connection	Boring Range	Twin Cutter			Weight	Insert Form	Part No.	
	D <sub>1</sub>	A	X <sub>1</sub>	X <sub>2</sub>	L <sub>1</sub>			Insert Holder	Serrated Body
<b>i</b>	18	0.767 - 0.905	5.910	5.433	3.149	0.661 (lbs)	101	235031	235021
	20	0.885 - 1.023	5.910	5.433	3.543	0.661 (lbs)	101	235032	235022
	23	1.003 - 1.181	6.299	5.826	3.937	0.661 (lbs)	101	235033	235023
<b>m</b>	18	19.50 - 23.00	150.00	138.00	80.00	0.30 (kg)	101	235031	235021
	20	22.50 - 26.00	150.00	138.00	90.00	0.30 (kg)	101	235032	235022
	23	25.50 - 30.00	160.00	148.00	100.00	0.30 (kg)	101	235033	235023

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



#### Twin Cutters Same Level

	Connection	Boring Range	Twin Cutter			Weight	Insert Form	Part No.	
	D <sub>2</sub>   D <sub>1</sub>	A	X <sub>1</sub>	X <sub>2</sub>	L <sub>1</sub>			Insert Holder	Serrated Body
<b>i</b>	50 - 28	0.767 - 0.905	3.346	2.874	2.834	0.881 (lbs)	101	235031	235001
	50 - 28	0.885 - 1.023	3.543	3.070	3.031	1.102 (lbs)	101	235032	235002
	50 - 28	1.003 - 1.181	3.740	3.268	3.228	1.102 (lbs)	101	235033	235003
	63 - 36	0.767 - 0.905	3.346	2.874	2.834	1.543 (lbs)	101	235031	235011
	63 - 36	0.885 - 1.023	3.543	3.070	3.031	1.543 (lbs)	101	235032	235012
	63 - 36	1.003 - 1.181	3.740	3.268	3.228	1.843 (lbs)	101	235033	235013
<b>m</b>	50 - 28	19.50 - 23.00	85.00	73.00	72.00	0.40 (kg)	101	235031	235001
	50 - 28	22.50 - 26.00	90.00	78.00	77.00	0.50 (kg)	101	235032	235002
	50 - 28	25.50 - 30.00	95.00	83.00	82.00	0.50 (kg)	101	235033	235003
	63 - 36	19.50 - 23.00	85.00	73.00	72.00	0.70 (kg)	101	235031	235011
	63 - 36	22.50 - 26.00	90.00	78.00	77.00	0.70 (kg)	101	235032	235012
	63 - 36	25.50 - 30.00	95.00	83.00	82.00	0.83 (kg)	101	235033	235013

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

Key on B10-D-1

B10-N: 10-13

B10-D: 23

B10-H

B10-F

B10: xii-xiii

**i** = Imperial (in)

**m** = Metric (mm)

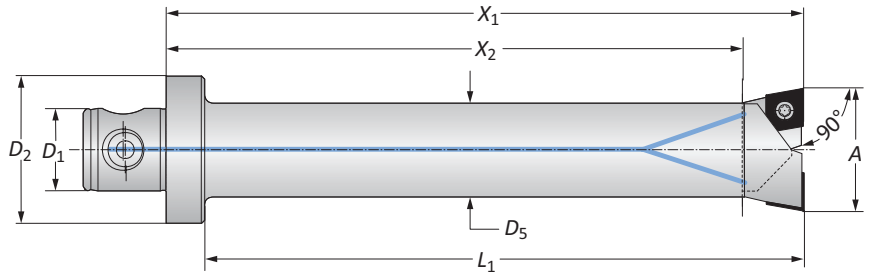
Inserts sold separately

**IMPORTANT:** Max spindle speed refers to maximum possible speed for an individual boring head and is not a recommended parameter. Refer to page B10-N: 10 for recommended application-specific parameters. Factory technical assistance is available for your specific applications through our Application Engineering department.

ext: 7611 | email: [appeng@alliedmachine.com](mailto:appeng@alliedmachine.com)

## Twin Cutters Same Level

90° | 5xD | Diameter Range: 1.141" - 2.598" (29.00mm - 66.00mm)



Connection	Boring Range	Twin Cutter					Weight	Insert Form	Part No.	
		$D_2   D_1$	A	$X_1$	$X_2$	$L_1$			$D_5$	Insert Holder
i	50 - 28	1.141 - 1.456	6.102	5.551	5.590	1.023	1.984 (lbs)	103	151001	148021
	50 - 28	1.417 - 1.732	6.889	6.338	6.377	1.259	2.866 (lbs)	103	151002	148022
	50 - 28	1.692 - 2.125	8.465	7.677	7.952	1.456	4.188 (lbs)	103	151023	148023
	50 - 28	1.692 - 2.125	8.465	7.677	7.952	1.456	4.188 (lbs)	104	151003	148023
	50 - 28	2.086 - 2.598	8.465	7.677	7.952	1.732	5.511 (lbs)	103	151024	148024
	50 - 28	2.086 - 2.598	8.465	7.677	7.952	1.732	5.511 (lbs)	104	151004	148024
m	50 - 28	29.00 - 37.00	155.00	141.00	142.00	26.00	0.90 (kg)	103	151001	148021
	50 - 28	36.00 - 44.00	175.00	161.00	162.00	32.00	1.30 (kg)	103	151002	148022
	50 - 28	43.00 - 54.00	215.00	195.00	202.00	37.00	1.90 (kg)	103	151023	148023
	50 - 28	43.00 - 54.00	215.00	195.00	202.00	37.00	1.90 (kg)	104	151003	148023
	50 - 28	53.00 - 66.00	215.00	195.00	202.00	44.00	2.50 (kg)	103	151024	148024
	50 - 28	53.00 - 66.00	215.00	195.00	202.00	44.00	2.50 (kg)	104	151004	148024

NOTE: Different lengths available upon request.

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

Key on B10-D: 1

B10-N: 10-13

B10-D: 23

B10-H

B10-F

B10: xii-xiii

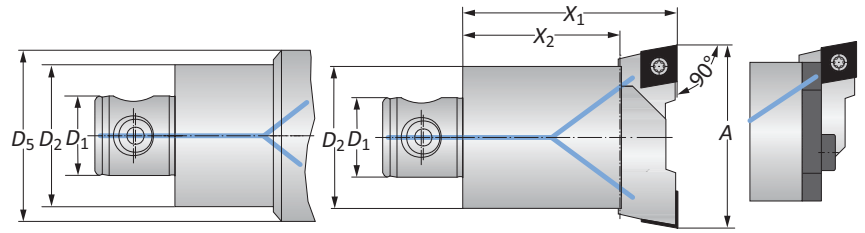
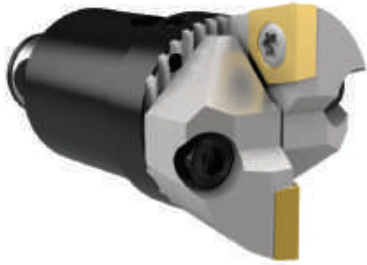
i = Imperial (in)  
m = Metric (mm)

Inserts sold separately

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ext: 7611 | email: [appeng@alliedmachine.com](mailto:appeng@alliedmachine.com)

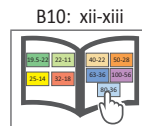
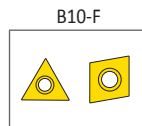
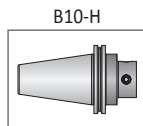
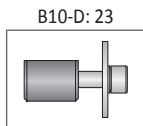
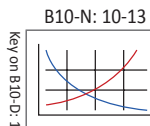
## Twin Cutters Same Level

90° | Diameter Range: 1.141" - 4.055" (29.00mm - 103.00mm)



Connection	Boring Range	Twin Cutter			Weight	Insert Form	Part No.		
		$D_2   D_1$	A	$X_1$			$X_2$	$D_5$	Insert Holder
i	25 - 14	1.141 - 1.456	2.205	1.653	-	0.441 (lbs)	103	151001	148001
	25 - 14	1.417 - 1.732	2.205	1.653	1.811	0.441 (lbs)	103	151002	148002
	32 - 18	1.417 - 1.732	2.205	1.653	1.811	0.881 (lbs)	103	151002	148017
	32 - 18	1.692 - 2.125	2.598	1.811	1.417	0.881 (lbs)	103	151023	148003
	32 - 18	1.692 - 2.125	2.598	1.811	1.417	0.881 (lbs)	104	151003	148003
	40 - 22	1.692 - 2.125	2.598	1.811	1.417	1.543 (lbs)	104	151003	148018
	40 - 22	2.086 - 2.598	2.953	2.165	1.417	1.543 (lbs)	103	151023	148018
	40 - 22	2.086 - 2.598	2.953	2.165	-	1.543 (lbs)	103	151024	148004
	40 - 22	2.086 - 2.598	2.953	2.165	-	1.543 (lbs)	104	151004	148004
	50 - 28	2.559 - 3.267	2.953	2.165	-	2.425 (lbs)	103	151025	148005
	50 - 28	2.559 - 3.267	2.953	2.165	-	2.425 (lbs)	104	151005	148005
	63 - 36	3.228 - 4.055	3.543	2.362	-	4.188 (lbs)	103	151026	148006
	63 - 36	3.228 - 4.055	3.543	2.362	-	4.188 (lbs)	104	151086	148006
	63 - 36	3.228 - 4.055	3.543	2.362	-	4.188 (lbs)	105	151006	148006
	m	25 - 14	29.00 - 37.00	56.00	42.00	-	0.20 (kg)	103	151001
25 - 14		36.00 - 44.00	56.00	42.00	30.00	0.20 (kg)	103	151002	148002
32 - 18		36.00 - 44.00	56.00	42.00	30.00	0.40 (kg)	103	151002	148017
32 - 18		43.00 - 54.00	66.00	46.00	36.00	0.40 (kg)	103	151023	148003
32 - 18		43.00 - 54.00	66.00	46.00	36.00	0.40 (kg)	104	151003	148003
40 - 22		43.00 - 54.00	66.00	46.00	36.00	0.70 (kg)	104	151003	148018
40 - 22		53.00 - 66.00	75.00	55.00	36.00	0.70 (kg)	103	151023	148018
40 - 22		53.00 - 66.00	75.00	55.00	-	0.70 (kg)	103	151024	148004
40 - 22		53.00 - 66.00	75.00	55.00	-	0.70 (kg)	104	151004	148004
50 - 28		65.00 - 83.00	75.00	55.00	-	1.10 (kg)	103	151025	148005
50 - 28		65.00 - 83.00	75.00	55.00	-	1.10 (kg)	104	151005	148005
63 - 36		82.00 - 103.00	90.00	60.00	-	1.90 (kg)	103	151026	148006
63 - 36		82.00 - 103.00	90.00	60.00	-	1.90 (kg)	104	151086	148006
63 - 36		82.00 - 103.00	90.00	60.00	-	1.90 (kg)	105	151006	148006

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



i = Imperial (in)

m = Metric (mm)

Inserts sold separately

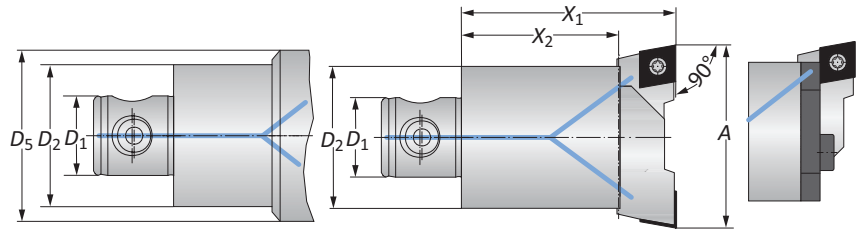
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A  
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## Twin Cutters Same Level

90° | Diameter Range: 3.937" - 8.070" (100.00mm - 205.00mm)



	Connection	Boring Range	Twin Cutter			Weight	Insert Form	Part No.	
			$D_2$   $D_1$	A	$X_1$			$X_2$	$D_5$
i	80 - 36	3.937 - 5.118	3.543	2.362	-	6.613 (lbs)	104	151087	148007*
	80 - 36	3.937 - 5.118	3.543	2.362	-	6.613 (lbs)	105	151007	148007*
	80 - 36	3.937 - 5.118	3.543	2.362	-	6.613 (lbs)	103	151027	148007*
	80 - 36	4.921 - 6.102	3.543	2.362	-	7.054 (lbs)	104	151088	148007*
	80 - 36	4.921 - 6.102	3.543	2.362	-	7.054 (lbs)	105	151008	148007*
	80 - 36	4.921 - 6.102	3.543	2.362	-	7.054 (lbs)	103	151028	148007*
	80 - 36	5.905 - 8.070	3.543	2.362	4.921	8.818 (lbs)	104	151088	148009*
	80 - 36	5.905 - 8.070	3.543	2.362	4.921	8.818 (lbs)	105	151008	148009*
	80 - 36	5.905 - 8.070	3.543	2.362	4.921	8.818 (lbs)	103	151028	148009*
m	80 - 36	100.00 - 130.00	90.00	60.00	-	3.00 (kg)	104	151087	148007*
	80 - 36	100.00 - 130.00	90.00	60.00	-	3.00 (kg)	105	151007	148007*
	80 - 36	100.00 - 130.00	90.00	60.00	-	3.00 (kg)	103	151027	148007*
	80 - 36	125.00 - 155.00	90.00	60.00	-	3.20 (kg)	104	151088	148007*
	80 - 36	125.00 - 155.00	90.00	60.00	-	3.20 (kg)	105	151008	148007*
	80 - 36	125.00 - 155.00	90.00	60.00	-	3.20 (kg)	103	151028	148007*
	80 - 36	150.00 - 205.00	90.00	60.00	125.00	4.00 (kg)	104	151088	148009*
	80 - 36	150.00 - 205.00	90.00	60.00	125.00	4.00 (kg)	105	151008	148009*
	80 - 36	150.00 - 205.00	90.00	60.00	125.00	4.00 (kg)	103	151028	148009*

**NOTE:** Insert holders sold in quantities of 1 and inserts sold separately  
 \*For aluminum serrated tool bodies, use item number 348007 and 348009

B10-N: 10-13

B10-D: 23

B10-H

B10-F

B10: xii-xiii

Key on B10-D: 1

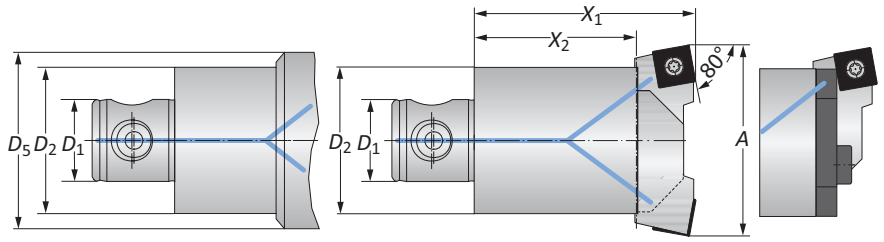
i = Imperial (in)  
 m = Metric (mm)

Inserts sold separately

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## Twin Cutters Same Level

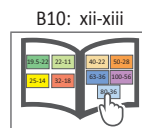
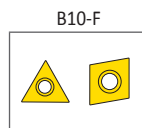
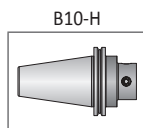
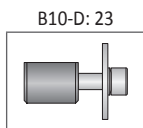
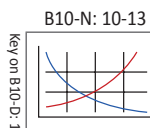
80° | Diameter Range: 1.141" - 8.070" (29.00mm - 205.00mm)



Connection	Boring Range	Twin Cutter				Weight	Insert Form	Part No.	
		$D_2$   $D_1$	A	$X_1$	$X_2$			$D_5$	Insert Holder
i	25 - 14	1.141 - 1.456	2.205	1.653	-	0.440 (lbs)	112	151011	148001
	25 - 14	1.417 - 1.732	2.205	1.653	1.181	0.440 (lbs)	112	151012	148002
	32 - 18	1.417 - 1.732	2.441	1.653	1.181	0.881 (lbs)	112	151012	148017
	32 - 18	1.692 - 2.125	2.598	1.811	1.417	0.440 (lbs)	113	151013	148003
	40 - 22	1.692 - 2.125	2.598	1.811	1.417	1.543 (lbs)	113	151013	148018
	40 - 22	2.086 - 2.598	2.952	1.811	1.417	1.543 (lbs)	112	151014	148004
	50 - 28	2.559 - 3.267	2.952	2.165	-	2.425 (lbs)	113	151015	148005
	63 - 36	3.228 - 4.055	3.543	2.165	-	5.070 (lbs)	112	151036	148006
	80 - 36	3.937 - 5.118	3.543	2.165	-	6.613 (lbs)	133	151037	148007*
	80 - 36	3.937 - 6.102	3.543	2.362	-	7.054 (lbs)	113	151038	148007*
m	25 - 14	29.00 - 37.00	56.00	42.00	-	0.20 (kg)	112	151011	148001
	25 - 14	36.00 - 44.00	56.00	42.00	30.00	0.20 (kg)	112	151012	148002
	32 - 18	36.00 - 44.00	62.00	42.00	30.00	0.40 (kg)	112	151012	148017
	32 - 18	43.00 - 54.00	66.00	46.00	36.00	0.40 (kg)	113	151013	148003
	40 - 22	43.00 - 54.00	66.00	46.00	36.00	0.70 (kg)	113	151013	148018
	40 - 22	53.00 - 66.00	75.00	46.00	36.00	0.70 (kg)	112	151014	148004
	50 - 28	65.00 - 83.00	75.00	55.00	-	1.10 (kg)	113	151015	148005
	63 - 36	82.00 - 103.00	90.00	55.00	-	2.30 (kg)	112	151036	148006
	80 - 36	100.00 - 130.00	90.00	55.00	-	3.00 (kg)	133	151037	148007*
	80 - 36	100.00 - 155.00	90.00	60.00	-	3.20 (kg)	113	151038	148007*
80 - 36	150.00 - 205.00	90.00	60.00	125.00	4.00 (kg)	114	151038	148009*	

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

\*For aluminum serrated tool bodies, use item number 348007 and 348009



i = Imperial (in)

m = Metric (mm)

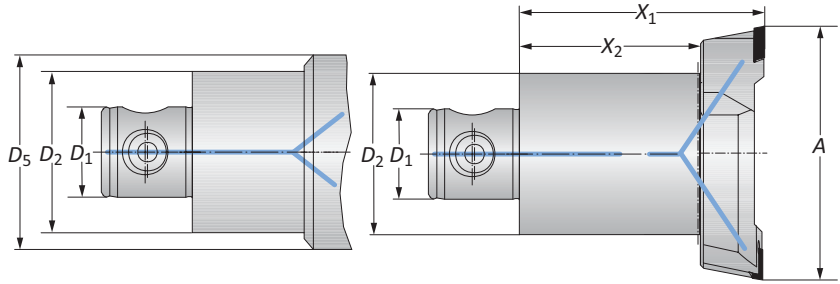
Inserts sold separately

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## Twin Cutters Same Level Tangential Inserts

Diameter Range: 2.086" - 8.070" (53.00mm - 205.00mm)



Connection	Boring Range	Twin Cutter			Weight	Insert Form	Part No.		
		$D_2$   $D_1$	$A$	$X_1$			$X_2$	$D_5$	Insert Holder
i	40 - 22	2.086 - 2.598	2.953	2.165	-	1.543 (lbs)	04	151022	148004
	50 - 28	2.559 - 3.267	2.953	2.165	-	2.204 (lbs)	04	151032	148005
	50 - 28	2.559 - 3.267	2.953	2.165	-	2.204 (lbs)	05	151043	148005
	63 - 36	3.228 - 4.055	3.543	2.362	-	4.850 (lbs)	05	151035	148006
	80 - 36	3.937 - 5.118	3.543	2.362	-	6.613 (lbs)	05	151009	148007*
	80 - 36	4.921 - 6.102	3.543	2.362	-	6.843 (lbs)	05	151010	148007*
m	80 - 36	5.905 - 8.070	3.543	2.362	4.921	8.818 (lbs)	05	151010	148009*
	40 - 22	53.00 - 66.00	75.00	55.00	-	0.70 (kg)	04	151022	148004
	50 - 28	65.00 - 83.00	75.00	55.00	-	1.00 (kg)	04	151032	148005
	50 - 28	65.00 - 83.00	75.00	55.00	-	1.00 (kg)	05	151043	148005
	63 - 36	82.00 - 103.00	90.00	60.00	-	2.20 (kg)	05	151035	148006
	80 - 36	100.00 - 130.00	90.00	60.00	-	3.00 (kg)	05	151009	148007*
m	80 - 36	125.00 - 155.00	90.00	60.00	-	3.10 (kg)	05	151010	148007*
	80 - 36	150.00 - 205.00	90.00	60.00	125.00	4.00 (kg)	05	151010	148009*

**NOTE:** Insert holders sold in quantities of 1 and inserts sold separately  
 \*For aluminum serrated tool bodies, use item number 348007 and 348009

Key on B10-D: 1

B10-N: 10-13

B10-D: 23

B10-H

B10-F

B10: xii-xiii

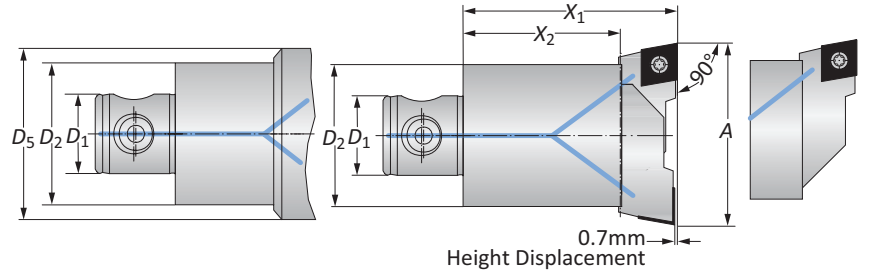
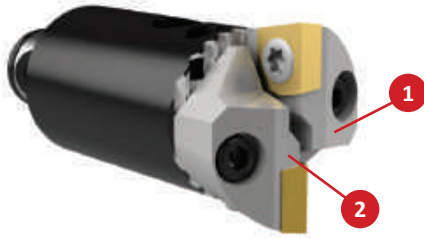
i = Imperial (in)  
 m = Metric (mm)

Inserts sold separately

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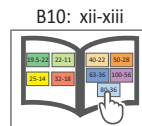
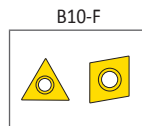
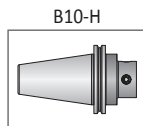
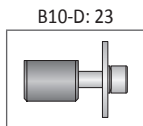
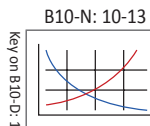
## Twin Cutters Height Displaced

Diameter Range: 1.141" - 4.055" (29.00mm - 103.00mm)



Connection	Boring Range	Twin Cutter				Weight	Insert Form	Part No.		
		$D_2   D_1$	A	$X_1$	$X_2$			$D_5$	1 Insert Holder	2. Insert Holder
i	25 - 14	1.141 - 1.456	2.205	1.653	—	0.440 (lbs)	103	151001	151061	148001
	25 - 14	1.417 - 1.732	2.205	1.653	1.811	0.440 (lbs)	103	151002	151062	148002
	32 - 18	1.417 - 1.732	2.205	1.653	1.811	0.881 (lbs)	103	151002	151062	148017
	32 - 18	1.692 - 2.125	2.598	1.811	1.417	0.881 (lbs)	104	151003	151093	148003
	40 - 22	1.692 - 2.125	2.598	1.811	1.417	1.543 (lbs)	104	151003	151093	148018
	40 - 22	2.086 - 2.598	2.953	2.165	—	1.543 (lbs)	104	151004	151094	148004
	50 - 28	2.559 - 3.267	2.953	2.165	—	2.425 (lbs)	104	151005	151095	148005
	63 - 36	3.229 - 4.055	3.543	2.362	—	5.291 (lbs)	104	151086	151090	148006
	63 - 36	3.229 - 4.055	3.543	2.362	—	5.291 (lbs)	105	151006	151096	148006
m	25 - 14	29.00 - 37.00	56.00	42.00	—	0.20 (kg)	103	151001	151061	148001
	25 - 14	36.00 - 44.00	56.00	42.00	30.00	0.20 (kg)	103	151002	151062	148002
	32 - 18	36.00 - 44.00	56.00	42.00	30.00	0.40 (kg)	103	151002	151062	148017
	32 - 18	43.00 - 54.00	66.00	46.00	36.00	0.40 (kg)	104	151003	151093	148003
	40 - 22	43.00 - 54.00	66.00	46.00	36.00	0.70 (kg)	104	151003	151093	148018
	40 - 22	53.00 - 66.00	75.00	55.00	—	0.70 (kg)	104	151004	151094	148004
	50 - 28	65.00 - 83.00	75.00	55.00	—	1.10 (kg)	104	151005	151095	148005
	63 - 36	82.00 - 103.00	90.00	60.00	—	2.40 (kg)	104	151086	151090	148006
	63 - 36	82.00 - 103.00	90.00	60.00	—	2.40 (kg)	105	151006	151096	148006

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



i = Imperial (in)

m = Metric (mm)

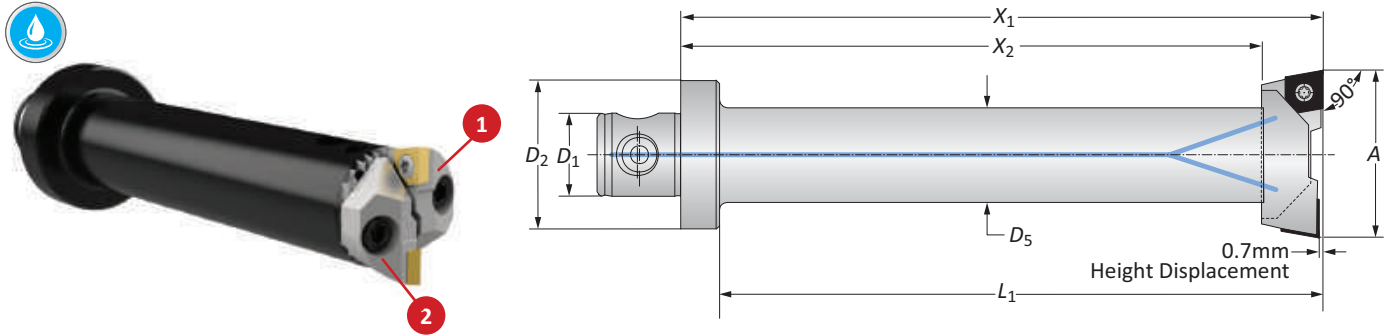
Inserts sold separately

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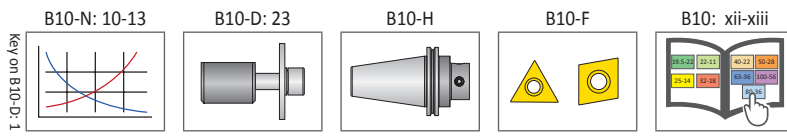
## Twin Cutters Height Displaced

5xD | Diameter Range: 1.141" - 2.598" (29.00mm - 66.00mm)



Connection	Boring Range	Twin Cutter					Weight	Insert Form	Part No.		
		$D_2$   $D_1$	A	$X_1$	$X_2$	$L_1$			$D_5$	1. Insert Holder	2. Insert Holder
i	50 - 28	1.141 - 1.456	6.102	5.551	5.590	1.023	1.984 (lbs)	103	151001	151061	148021
	50 - 28	1.417 - 1.732	6.889	6.338	6.377	1.259	2.866 (lbs)	103	151002	151062	148022
	50 - 28	1.692 - 2.125	8.465	7.677	7.952	1.456	4.188 (lbs)	104	151003	151093	148023
	50 - 28	2.086 - 2.598	8.465	7.677	7.951	1.732	5.511 (lbs)	104	151004	151094	148024
m	50 - 28	29.00 - 37.00	155.00	141.00	142.00	26.00	0.90 (kg)	103	151001	151061	148021
	50 - 28	36.00 - 44.00	175.00	161.00	162.00	32.00	1.30 (kg)	103	151002	151062	148022
	50 - 28	43.00 - 54.00	215.00	195.00	202.00	37.00	1.90 (kg)	104	151003	151093	148023
	50 - 28	53.00 - 66.00	215.00	195.00	202.00	44.00	2.50 (kg)	104	151004	151094	148024

NOTE: Different lengths available upon request.  
 NOTE: Insert holders sold in quantities of 1 and inserts sold separately



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

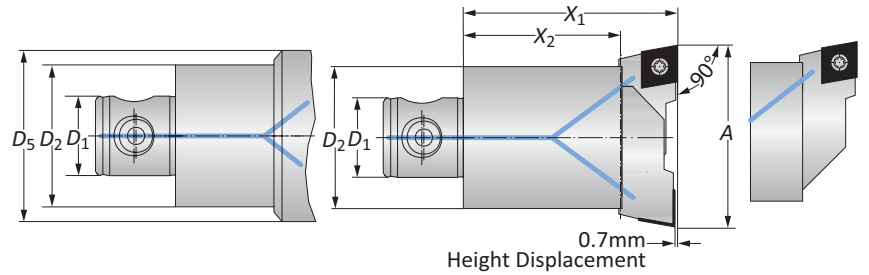
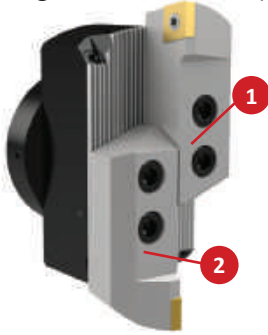
Inserts sold separately

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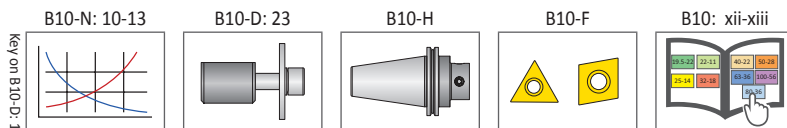
## Twin Cutters Height Displaced

Diameter Range: 3.937" - 8.070" (100.00mm - 205.00mm)



	Connection	Boring Range	Twin Cutter			Weight	Insert Form	Part No.		
			$D_2   D_1$	A	$X_1$			$X_2$	$D_5$	1. Insert Holder
i	80 - 36	3.937 - 5.118	3.543	2.362	-	6.613 (lbs)	104	151087	151091	148007*
	80 - 36	3.937 - 5.118	3.543	2.362	-	6.613 (lbs)	105	151007	151097	148007*
	80 - 36	4.921 - 6.102	3.543	2.362	-	7.054 (lbs)	104	151088	151092	148007*
	80 - 36	4.921 - 6.102	3.543	2.362	-	7.054 (lbs)	105	151008	151098	148007*
	80 - 36	5.905 - 8.070	3.543	2.362	4.921	8.818 (lbs)	104	151088	151092	148009*
	80 - 36	5.905 - 8.070	3.543	2.362	4.921	8.818 (lbs)	105	151008	151098	148009*
m	80 - 36	100.00 - 130.00	90.00	60.00	-	3.00 (kg)	104	151087	151091	148007*
	80 - 36	100.00 - 130.00	90.00	60.00	-	3.00 (kg)	105	151007	151097	148007*
	80 - 36	125.00 - 155.00	90.00	60.00	-	3.20 (kg)	104	151088	151092	148007*
	80 - 36	125.00 - 155.00	90.00	60.00	-	3.20 (kg)	105	151008	151098	148007*
	80 - 36	150.00 - 205.00	90.00	60.00	125.00	4.00 (kg)	104	151088	151092	148009*
	80 - 36	150.00 - 205.00	90.00	60.00	125.00	4.00 (kg)	105	151008	151098	148009*

**NOTE:** Insert holders sold in quantities of 1 and inserts sold separately  
 \*For aluminum serrated tool bodies, use item number 348007 and 348009



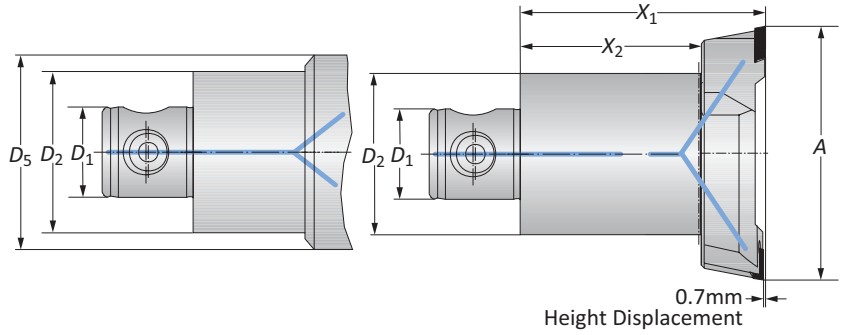
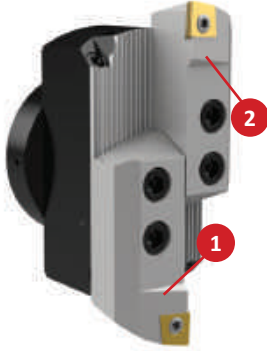
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Inserts sold separately

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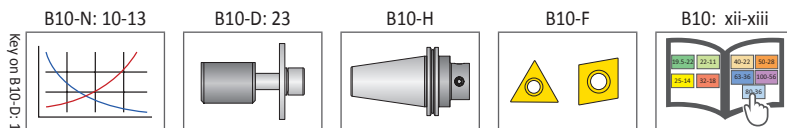
## Twin Cutters Height Displaced Tangential Inserts

Diameter Range: 2.086" - 8.070" (53.00mm - 205.00mm)



	Connection	Boring Range	Twin Cutter			Weight	Insert Form	Part No.		
	$D_2   D_1$	A	$X_1$	$X_2$	$D_5$			1. Insert Holder	2. Insert Holder	Serrated Body
i	40 - 22	2.086 - 2.598	2.953	2.165	-	1.543 (lbs)	04	151022	268009	148004
	50 - 28	2.559 - 3.267	2.953	2.165	-	2.204 (lbs)	04	151032	268010	148005
	50 - 28	2.559 - 3.267	2.953	2.165	-	2.204 (lbs)	05	151043	268019	148005
	63 - 36	3.229 - 4.055	3.543	2.362	-	5.291 (lbs)	04	151034	268020	148006
	63 - 36	3.229 - 4.055	3.543	2.362	-	5.291 (lbs)	05	151035	268021	148006
	80 - 36	3.937 - 5.118	3.543	2.362	-	6.613 (lbs)	05	151009	268022	148007*
	80 - 36	4.921 - 6.102	3.543	2.362	-	6.834 (lbs)	05	151010	268023	148007*
	80 - 36	5.905 - 8.070	3.543	2.362	4.921	8.818 (lbs)	05	151010	268023	149009*
m	40 - 22	53.00 - 66.00	75.00	55.00	-	0.70 (kg)	04	151022	268009	148004
	50 - 28	65.00 - 83.00	75.00	55.00	-	1.00 (kg)	04	151032	268010	148005
	50 - 28	65.00 - 83.00	75.00	55.00	-	1.00 (kg)	05	151043	268019	148005
	63 - 36	82.00 - 103.00	90.00	60.00	-	2.20 (kg)	04	151034	268020	148006
	63 - 36	82.00 - 103.00	90.00	60.00	-	2.20 (kg)	05	151035	268021	148006
	80 - 36	100.00 - 130.00	90.00	60.00	-	3.00 (kg)	05	151009	268022	148007*
	80 - 36	125.00 - 155.00	90.00	60.00	-	3.10 (kg)	05	151010	268023	148007*
	80 - 36	150.00 - 205.00	90.00	60.00	125.00	4.00 (kg)	05	151010	268023	149009*

NOTE: Insert holders sold in quantities of 1 and inserts sold separately  
 \*For aluminum serrated tool bodies, use item number 348007 and 348009



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

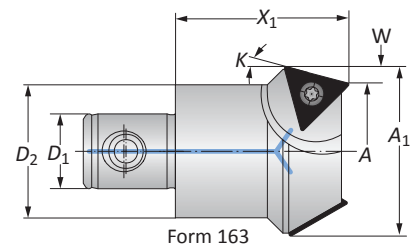
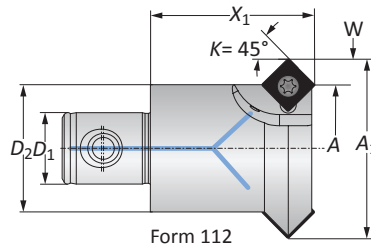
Inserts sold separately

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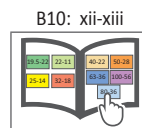
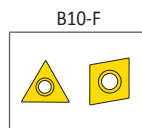
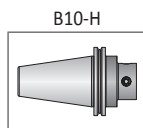
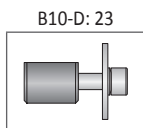
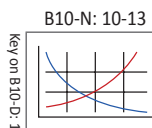
## Chamfering Tools

Diameter Range: 0.787" - 1.259" (20.00mm - 32.00mm)



	Connection $D_2   D_1$	Approach Angle K	Boring Range A	Cutter Diameter $A_1$	Chamfering Tool		Weight	Insert Form	Number of Inserts	Part No.
					$X_1$	W				
i	25 - 14	15°	0.984	1.299	1.220	0.157	0.330 (lbs)	163	2	201087
	25 - 14	45°	0.787	1.299	1.220	0.255	0.330 (lbs)	112	2	201082
	32 - 18	15°	1.259	1.574	1.614	0.157	0.440 (lbs)	163	2	201088
	32 - 18	30°	0.984	1.614	1.614	0.314	0.440 (lbs)	163	2	201089
	32 - 18	45°	1.259	1.771	1.614	0.255	0.440 (lbs)	112	3	201083
m	25 - 14	15°	25.00	33.00	31.00	4.00	0.15 (kg)	163	2	201087
	25 - 14	45°	20.00	33.00	31.00	6.50	0.15 (kg)	112	2	201082
	32 - 18	15°	32.00	40.00	41.00	4.00	0.20 (kg)	163	2	201088
	32 - 18	30°	25.00	41.00	41.00	8.00	0.20 (kg)	163	2	201089
	32 - 18	45°	32.00	45.00	41.00	6.50	0.20 (kg)	112	3	201083

NOTE: K 45° for front and reverse side chamfering  
 NOTE: Insert holders and inserts sold separately



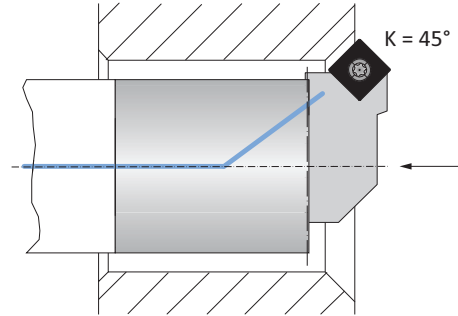
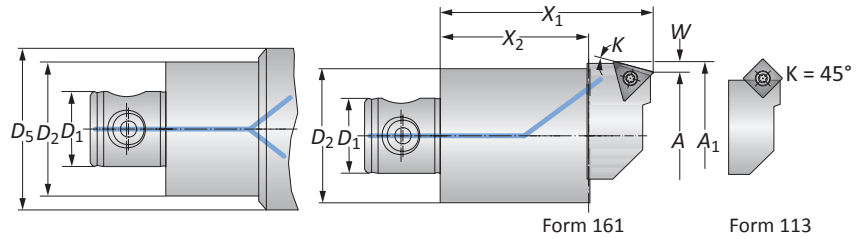
i = Imperial (in)  
 m = Metric (mm)

Inserts sold separately

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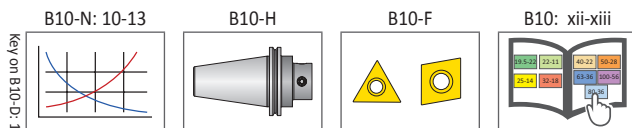
## Chamfering Tools

Imperial | Diameter Range: 0.944" - 2.204"



Connection $D_2   D_1$	Approach Angle K	Boring Range A	Chamfering Range $A_1$	Chamfering Tool				Weight (lbs)	Insert Form	Part No.	
				$X_1$	$X_2$	$D_5$	W			Insert Holder	Serrated Body
25 - 14	15°	0.945 - 1.260	1.141 - 1.456	2.362	1.653	-	0.098	0.440 (lbs)	161	201057	148001
25 - 14	15°	1.220 - 1.535	1.417 - 1.732	2.362	1.653	1.181	0.098	0.440 (lbs)	161	201058	148002
25 - 14	20°	0.866 - 1.181	1.141 - 1.456	2.362	1.653	-	0.138	0.440 (lbs)	161	201017	148001
25 - 14	20°	1.142 - 1.457	1.417 - 1.732	2.362	1.653	1.181	0.138	0.440 (lbs)	161	201018	148002
25 - 14	30°	0.787 - 1.102	1.141 - 1.456	2.362	1.653	-	0.138	0.440 (lbs)	161	201067	148001
25 - 14	30°	1.063 - 1.378	1.417 - 1.732	2.362	1.653	1.181	0.138	0.440 (lbs)	161	201068	148002
25 - 14	45°	0.748 - 1.063	1.141 - 1.456	2.283	1.653	-	0.197	0.440 (lbs)	161	201003*	148001
25 - 14	45°	1.024 - 1.339	1.417 - 1.732	2.283	1.653	-	0.197	0.440 (lbs)	161	201004*	148001
25 - 14	45°	1.220 - 1.535	1.692 - 2.007	2.362	1.653	1.181	0.236	0.440 (lbs)	112	201007	148002
32 - 18	15°	1.220 - 1.535	1.417 - 1.732	2.362	1.653	1.181	0.098	0.440 (lbs)	161	201058	148017
32 - 18	20°	1.142 - 1.457	1.417 - 1.732	2.362	1.653	1.181	0.138	0.440 (lbs)	161	201018	148017
32 - 18	30°	1.063 - 1.378	1.417 - 1.732	2.362	1.653	1.181	0.138	0.440 (lbs)	161	201068	148017
32 - 18	45°	1.220 - 1.535	1.692 - 2.007	2.362	1.653	1.181	0.236	0.440 (lbs)	112	201007	148017
32 - 18	15°	1.378 - 1.811	1.692 - 2.125	2.795	1.811	1.417	0.157	0.881 (lbs)	163	201059	148003
32 - 18	20°	1.299 - 1.732	1.692 - 2.125	2.795	1.811	1.417	0.197	0.881 (lbs)	163	201019	148003
32 - 18	45°	1.378 - 1.811	1.196 - 2.401	2.598	1.811	1.417	0.295	0.881 (lbs)	113	201008	148003
40 - 22	15°	1.378 - 1.811	1.692 - 2.125	2.795	1.811	1.417	0.157	0.881 (lbs)	163	201059	148018
40 - 22	20°	1.299 - 1.732	1.692 - 2.125	2.795	1.811	1.417	0.197	0.881 (lbs)	163	201019	148018
40 - 22	45°	1.378 - 1.811	1.196 - 2.401	2.598	1.811	1.417	0.295	0.881 (lbs)	113	201008	148018
40 - 22	15°	1.457 - 1.969	1.771 - 2.283	3.150	2.165	-	0.157	1.543 (lbs)	163	201060	148004
40 - 22	20°	1.457 - 1.969	1.850 - 2.362	3.150	2.165	-	0.197	1.543 (lbs)	163	201020	148004
40 - 22	45°	1.963 - 2.205	2.283 - 2.795	3.150	2.165	-	0.295	1.543 (lbs)	113	201009	148004

\*Insert holder cannot be used for reverse machining.  
**NOTE:** K 45° for front and reverse side chamfering above  $\varnothing$  1.220"  
**NOTE:** Insert holders and inserts sold separately



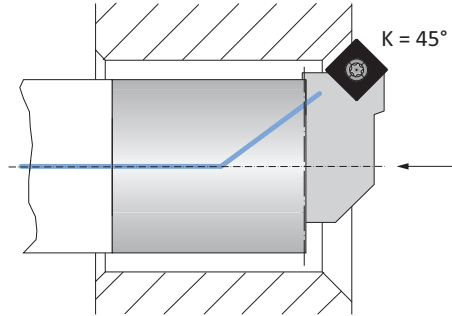
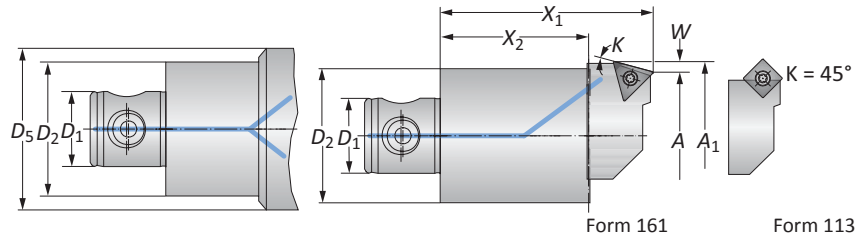
**i** = Imperial (in)  
**m** = Metric (mm)

Inserts sold separately

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## Chamfering Tools

Metric | Diameter Range: (24.00mm - 56.00mm)



Connection $D_2   D_1$	Approach Angle K	Boring Range A	Chamfering Range $A_1$	Chamfering Tool				Weight (lbs)	Insert Form	Part No.	
				$X_1$	$X_2$	$D_5$	W			Insert Holder	Serrated Body
25 - 14	15°	24.00 - 32.00	29.00 - 37.00	60.00	42.00	-	2.50	0.20 (kg)	161	201057	148001
25 - 14	15°	31.00 - 39.00	36.00 - 44.00	60.00	42.00	30.00	2.50	0.20 (kg)	161	201058	148002
25 - 14	20°	22.00 - 30.00	29.00 - 37.00	60.00	42.00	-	3.50	0.20 (kg)	161	201017	148001
25 - 14	20°	29.00 - 37.00	36.00 - 44.00	60.00	42.00	30.00	3.50	0.20 (kg)	161	201018	148002
25 - 14	30°	20.00 - 28.00	29.00 - 37.00	60.00	42.00	-	3.50	0.20 (kg)	161	201067	148001
25 - 14	30°	27.00 - 35.00	36.00 - 44.00	60.00	42.00	30.00	3.50	0.20 (kg)	161	201068	148002
25 - 14	45°	19.00 - 27.00	29.00 - 37.00	58.00	42.00	-	5.00	0.20 (kg)	161	201003	148001
25 - 14	45°	26.00 - 34.00	36.00 - 44.00	58.00	42.00	-	5.00	0.20 (kg)	161	201004	148001
25 - 14	45°	31.00 - 39.00	43.00 - 51.00	60.00	42.00	30.00	6.00	0.20 (kg)	112	201007	148002
32 - 18	15°	31.00 - 39.00	36.00 - 44.00	60.00	42.00	30.00	2.50	0.20 (kg)	161	201058	148017
32 - 18	20°	29.00 - 37.00	36.00 - 44.00	60.00	42.00	30.00	3.50	0.20 (kg)	161	201018	148017
32 - 18	30°	27.00 - 35.00	36.00 - 44.00	60.00	42.00	30.00	3.50	0.20 (kg)	161	201068	148017
32 - 18	45°	31.00 - 39.00	43.00 - 51.00	60.00	42.00	30.00	6.00	0.20 (kg)	112	201077	148017
32 - 18	15°	35.00 - 46.00	43.00 - 54.00	71.00	46.00	36.00	4.00	0.40 (kg)	163	201059	148003
32 - 18	20°	33.00 - 44.00	43.00 - 54.00	71.00	46.00	36.00	5.00	0.40 (kg)	163	201019	148003
32 - 18	45°	35.00 - 46.00	50.00 - 61.00	66.00	46.00	36.00	7.50	0.40 (kg)	113	201008	148003
40 - 22	15°	35.00 - 46.00	43.00 - 54.00	71.00	46.00	36.00	4.00	0.40 (kg)	163	201059	148018
40 - 22	20°	33.00 - 44.00	43.00 - 54.00	71.00	46.00	36.00	5.00	0.40 (kg)	163	201019	148018
40 - 22	45°	35.00 - 46.00	50.00 - 61.00	66.00	46.00	36.00	7.50	0.40 (kg)	113	201008	148018
40 - 22	15°	37.00 - 50.00	45.00 - 58.00	80.00	55.00	-	4.00	0.70 (kg)	163	201060	148004
40 - 22	20°	37.00 - 50.00	47.00 - 60.00	80.00	55.00	-	5.00	0.70 (kg)	163	201020	148004
40 - 22	45°	43.00 - 56.00	58.00 - 71.00	80.00	55.00	-	7.50	0.70 (kg)	113	201009	148004

\*Insert holder cannot be used for reverse machining.

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

**NOTE:** Insert holders and inserts sold separately

B10-N: 10-13

B10-H

B10-F

B10: xii-xiii

**i** = Imperial (in)

**m** = Metric (mm)

Inserts sold separately

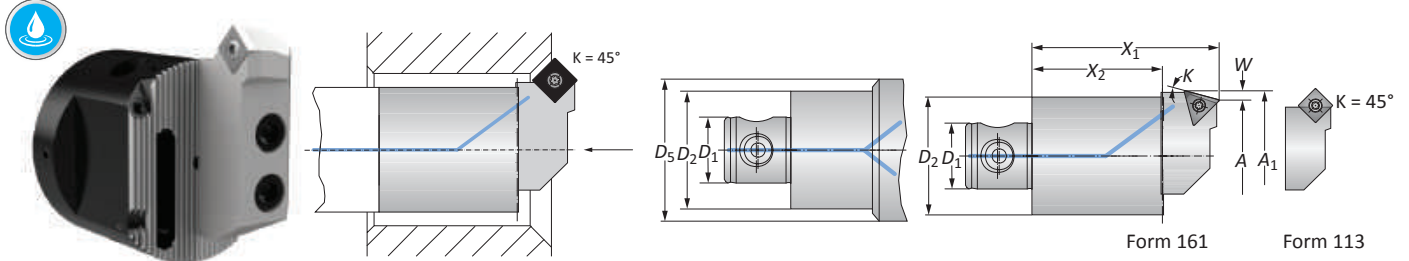
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## Chamfering Tools

Diameter Range: 1.968" - 7.913" (50.00mm - 201.00mm)

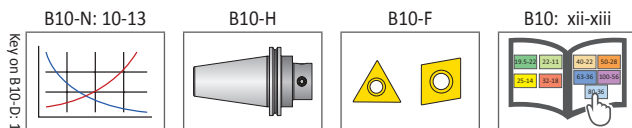


Connection	Approach Angle	Boring Range	Chamfering Range	Chamfering Tool				Weight	Insert Form	Part No.	
				D <sub>2</sub>   D <sub>1</sub>	K	A	A <sub>1</sub>			X <sub>1</sub>	X <sub>2</sub>
50 - 28	15°	1.968 - 2.677	2.283 - 2.992	3.150	2.165	-	0.157	2.204 (lbs)	163	201061	148005
50 - 28	20°	1.968 - 2.677	2.362 - 3.070	3.150	2.165	-	0.197	2.204 (lbs)	163	201021	148005
50 - 28	30°	1.968 - 2.677	2.559 - 3.267	3.150	2.165	-	0.197	2.204 (lbs)	163	201071	148005
50 - 28	45°	2.165 - 2.874	2.755 - 3.464	3.150	2.165	-	0.295	2.204 (lbs)	113	201010	148005
63 - 36	15°	2.677 - 3.503	2.992 - 3.818	3.543	2.362	-	0.157	4.188 (lbs)	163	201062	148006
63 - 36	20°	2.677 - 3.503	3.070 - 3.897	3.543	2.362	-	0.197	4.188 (lbs)	163	201022	148006
63 - 36	45°	2.834 - 3.661	3.425 - 4.251	3.543	2.362	-	0.295	4.188 (lbs)	113	201011	148006
80 - 36	15°	3.503 - 4.685	3.818 - 5.000	3.543	2.362	-	0.157	5.732 (lbs)	163	201063	148007*
80 - 36	15°	4.685 - 5.866	5.000 - 6.259	3.543	2.362	-	0.157	5.952 (lbs)	163	201064	148007*
80 - 36	15°	5.669 - 7.834	5.984 - 8.149	3.543	2.362	4.921	0.157	7.936 (lbs)	163	201064	148009*
80 - 36	20°	3.503 - 4.685	3.989 - 5.078	3.543	2.362	-	0.197	5.732 (lbs)	163	201023	148007*
80 - 36	20°	4.685 - 5.866	5.078 - 6.259	3.543	2.362	-	0.197	5.952 (lbs)	163	201024	148007*
80 - 36	20°	5.669 - 7.834	6.062 - 8.228	3.543	2.362	4.921	0.197	7.936 (lbs)	163	201024	148009*
80 - 36	30°	3.503 - 4.685	4.094 - 5.275	3.543	2.362	-	0.197	5.732 (lbs)	163	201073	148007*
80 - 36	30°	4.685 - 5.866	5.275 - 6.456	3.543	2.362	-	0.197	5.952 (lbs)	163	201074	148007*
80 - 36	30°	5.666 - 7.834	6.259 - 8.425	3.543	2.362	4.921	0.197	7.936 (lbs)	163	201074	148009*
80 - 36	45°	3.622 - 4.803	4.212 - 5.393	3.543	2.362	-	0.295	5.732 (lbs)	113	201012	148007*
80 - 36	45°	4.763 - 5.944	5.354 - 6.535	3.543	2.362	-	0.295	5.952 (lbs)	113	201013	148007*
80 - 36	45°	5.748 - 7.913	6.338 - 8.503	3.543	2.362	4.921	0.295	7.936 (lbs)	113	201013	148009*
50 - 28	15°	50.00 - 68.00	58.00 - 76.00	80.00	55.00	-	4.00	1.00 (kg)	163	201061	148005
50 - 28	20°	50.00 - 68.00	60.00 - 78.00	80.00	55.00	-	5.00	1.00 (kg)	163	201021	148005
50 - 28	30°	50.00 - 68.00	65.00 - 83.00	80.00	55.00	-	5.00	1.00 (kg)	163	201071	148005
50 - 28	45°	55.00 - 73.00	70.00 - 88.00	80.00	55.00	-	7.50	1.00 (kg)	113	201010	148005
63 - 36	15°	68.00 - 89.00	76.00 - 97.00	90.00	60.00	-	4.00	1.90 (kg)	163	201062	148006
63 - 36	20°	68.00 - 89.00	78.00 - 99.00	90.00	60.00	-	5.00	1.90 (kg)	163	201022	148006
63 - 36	45°	72.00 - 93.00	87.00 - 108.00	90.00	60.00	-	7.50	1.90 (kg)	113	201011	148006
80 - 36	15°	89.00 - 119.00	97.00 - 127.00	90.00	60.00	-	4.00	2.60 (kg)	163	201063	148007*
80 - 36	15°	119.00 - 149.00	127.00 - 159.00	90.00	60.00	-	4.00	2.70 (kg)	163	201064	148007*
80 - 36	15°	144.00 - 199.00	152.00 - 207.00	90.00	60.00	125.00	4.00	3.60 (kg)	163	201064	148009*
80 - 36	20°	89.00 - 119.00	99.00 - 129.00	90.00	60.00	-	5.00	2.60 (kg)	163	201023	148007*
80 - 36	20°	119.00 - 149.00	129.00 - 159.00	90.00	60.00	-	5.00	2.70 (kg)	163	201024	148007*
80 - 36	20°	144.00 - 199.00	154.00 - 209.00	90.00	60.00	125.00	5.00	3.60 (kg)	163	201024	148009*
80 - 36	30°	89.00 - 119.00	104.00 - 134.00	90.00	60.00	-	5.00	2.60 (kg)	163	201073	148007*
80 - 36	30°	119.00 - 149.00	134.00 - 164.00	90.00	60.00	-	5.00	2.70 (kg)	163	201074	148007*
80 - 36	30°	144.00 - 199.00	159.00 - 214.00	90.00	60.00	125.00	5.00	3.60 (kg)	163	201074	148009*
80 - 36	45°	92.00 - 122.00	107.00 - 137.00	90.00	60.00	-	7.50	2.60 (kg)	113	201012	148007*
80 - 36	45°	121.00 - 151.00	136.00 - 166.00	90.00	60.00	-	7.50	2.70 (kg)	113	201013	148007*
80 - 36	45°	146.00 - 201.00	161.00 - 216.00	90.00	60.00	125.00	7.50	3.60 (kg)	113	201013	148009*

NOTE: K 45° = front and reverse side chamfering

NOTE: Insert holders and inserts sold separately

\*For aluminum serrated tool bodies, use item number 348007 and 348009



ⓘ = Imperial (in)

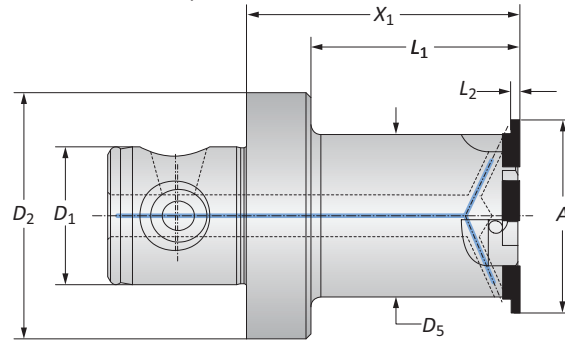
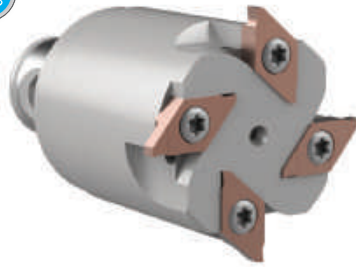
Ⓜ = Metric (mm)

Inserts sold separately

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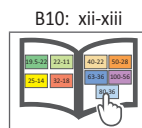
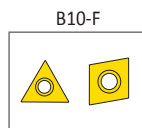
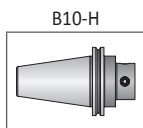
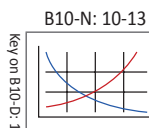
### Grooving Tools for Circular Milling

Diameter Range: > Ø 0.787" (20.00mm) 0.787" - 3.110" (20.00mm - 79.00mm)



Connection	Cutter Diameter	Grooving Tool				Groove Width	Groove Depth	Number of Inserts	Weight	Insert Form	Part No.
		$D_2   D_1$	A	$X_1$	$L_1$						
i	50 - 28	0.787	2.165	1.575	0.669	0.093	0.059	2	0.881 (lbs)	89	143051
	50 - 28	0.787	3.740	3.228	0.669	0.093	0.059	2	0.881 (lbs)	89	143052
	50 - 28	1.535	2.165	1.654	1.299	0.133	0.098	4	1.322 (lbs)	90	143053
	32 - 18	1.535	1.575	1.575	1.299	0.133	0.098	4	0.661 (lbs)	90	143054
	50 - 28	1.929	2.165	1.575	1.692	0.133	0.098	5	1.543 (lbs)	90	143055
	40 - 22	1.929	1.575	1.575	1.692	0.133	0.098	5	1.102 (lbs)	90	143056
	50 - 28	2.480	1.575	1.575	2.086	0.231	0.185	6	1.543 (lbs)	91	143057
	63 - 36	3.110	1.575	1.575	2.716	0.231	0.185	8	2.645 (lbs)	91	143058
ii	50 - 28	20.00	55.00	40.00	17.00	2.37	1.50	2	0.40 (kg)	89	143051
	50 - 28	20.00	95.00	82.00	17.00	2.37	1.50	2	0.40 (kg)	89	143052
	50 - 28	39.00	55.00	42.00	33.00	3.37	2.50	4	0.60 (kg)	90	143053
	32 - 18	39.00	40.00	40.00	33.00	3.37	2.50	4	0.30 (kg)	90	143054
	50 - 28	49.00	55.00	40.00	43.00	3.37	2.50	5	0.70 (kg)	90	143055
	40 - 22	49.00	40.00	40.00	43.00	3.37	2.50	5	0.50 (kg)	90	143056
	50 - 28	63.00	40.00	40.00	53.00	5.87	4.70	6	0.70 (kg)	91	143057
	63 - 36	79.00	40.00	40.00	69.00	5.87	4.70	8	1.20 (kg)	91	143058

NOTE: Different lengths available upon request.  
 NOTE: Insert holders and inserts sold separately



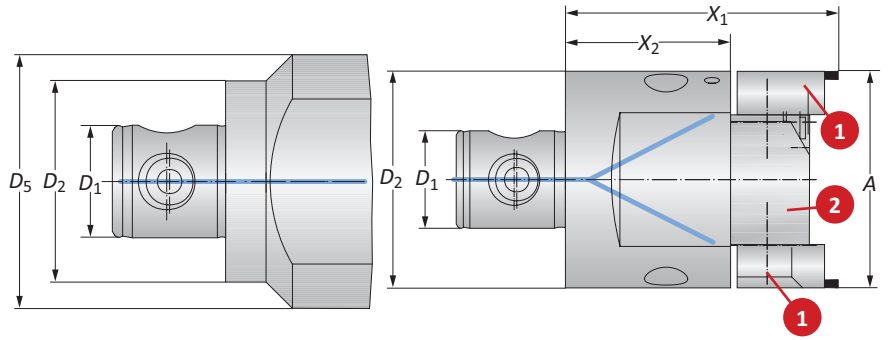
i = Imperial (in)  
 ii = Metric (mm)

Inserts sold separately

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## Axial Grooving Tools

Diameter Range: 0.787" - 8.070" (20.00mm - 205.00mm)



Connection	Boring Range	Grooving Tool				Weight	Part No.			
		$D_2   D_1$	A	$X_1$	$X_2$		$D_5$	1. Support Block	Insert Form	2. Insert Holder
i	50 - 28	0.787 - 2.125	3.268	2.165	2.480	2.866 (lbs)	—	304	226009	148010
	80 - 36	2.086 - 3.267	3.937	2.362	—	5.732 (lbs)	226011	304	226010	148007*
	80 - 36	3.228 - 6.102	3.937	2.362	4.921	8.157 (lbs)	226012	304	226010	148009*
	80 - 36	5.905 - 8.070	3.937	2.362	4.921	8.157 (lbs)	226013	304	226010	148009*
m	50 - 28	20.00 - 54.00	83.00	55.00	63.00	1.30 (kg)	—	304	226009	148010
	80 - 36	53.00 - 83.00	100.00	60.00	—	2.60 (kg)	226011	304	226010	148007*
	80 - 36	82.00 - 155.00	100.00	60.00	125.00	3.70 (kg)	226012	304	226010	148009*
	80 - 36	150.00 - 205.00	100.00	60.00	125.00	3.70 (kg)	226013	304	226010	148009*

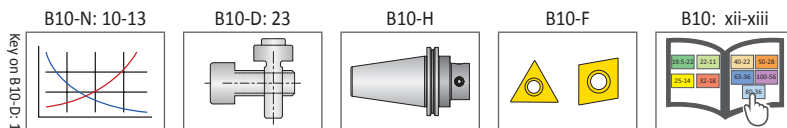
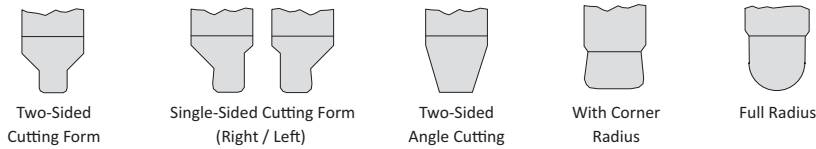
NOTE: Groove width is 0.039" - 0.196" (1.00mm - 5.00mm) | Groove depth is 0.000" - 0.157" (0.00mm - 4.00mm)

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

NOTE: Insert holders, support blocks and inserts sold separately

\*For aluminum serrated tool bodies, use item number 348007 and 348009

### Examples of recessing replaceable inserts:



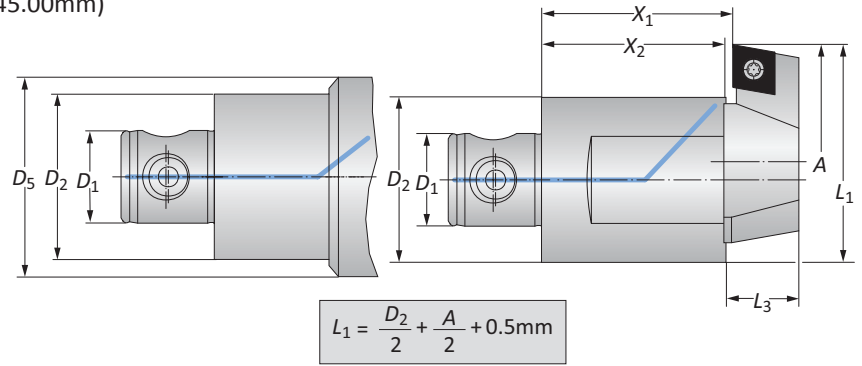
i = Imperial (in)  
m = Metric (mm)

Inserts sold separately

**IMPORTANT:** Max spindle speed refers to maximum possible speed for an individual boring head and is not a recommended parameter. Refer to page B10-N: 10 for recommended application-specific parameters. Factory technical assistance is available for your specific applications through our Application Engineering department.  
ext: 7611 | email: [appeng@alliedmachine.com](mailto:appeng@alliedmachine.com)

## Reverse Machining Tools

Diameter Range: 1.141" - 9.645" (29.00mm - 245.00mm)



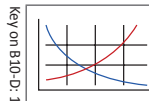
Connection	Boring Range	Reverse Machining					Weight	Insert Form	Part No.	
		$D_2$   $D_1$	A	$X_1$	$X_2$	$L_3$			$D_5$	Insert Holder
i	25 - 14	1.141 - 1.456	1.575	1.535	0.551	-	0.440 (lbs)	103	251001	148011
	25 - 14	1.338 - 1.653	1.575	1.535	0.551	-	0.440 (lbs)	103	251002	148011
	25 - 14	1.417 - 1.732	1.575	1.535	0.551	-	0.440 (lbs)	103	251002	148012
	25 - 14	1.732 - 2.047	1.575	1.535	0.708	-	0.440 (lbs)	104	251003	148012
	32 - 18	1.692 - 2.125	1.575	1.535	0.708	-	0.661 (lbs)	104	251003	148013
	32 - 18	2.165 - 2.598	1.575	1.535	0.708	-	0.881 (lbs)	104	251004	148013
	40 - 22	2.086 - 2.834	1.575	1.535	0.708	-	1.102 (lbs)	104	251004	148014
	40 - 22	2.598 - 3.346	1.575	1.535	0.708	-	1.102 (lbs)	104	251005	148014
	50 - 28	2.755 - 3.740	2.205	2.165	0.866	-	2.425 (lbs)	104	251006	148015
	50 - 28	3.622 - 4.606	2.205	2.165	0.866	-	2.866 (lbs)	104	251007	148015
	63 - 36	3.622 - 4.803	2.205	2.165	0.866	-	3.747 (lbs)	104	251007	148016
	80 - 36	4.724 - 5.905	2.441	2.362	1.023	-	5.952 (lbs)	104	251008	148007*
	80 - 36	6.535 - 7.716	2.441	2.362	1.023	-	6.393 (lbs)	104	251009	148007*
	80 - 36	5.708 - 7.874	2.441	2.362	1.023	4.921	7.936 (lbs)	104	251008	148009*
	80 - 36	7.480 - 9.645	2.441	2.362	1.023	4.921	8.157 (lbs)	104	251009	148009*
m	25 - 14	29.00 - 37.00	40.00	39.00	14.00	-	0.20 (kg)	103	251001	148011
	25 - 14	34.00 - 42.00	40.00	39.00	14.00	-	0.20 (kg)	103	251002	148011
	25 - 14	36.00 - 44.00	40.00	39.00	14.00	-	0.20 (kg)	103	251002	148012
	25 - 14	44.00 - 52.00	40.00	39.00	18.00	-	0.20 (kg)	104	251003	148012
	32 - 18	43.00 - 54.00	40.00	39.00	18.00	-	0.30 (kg)	104	251003	148013
	32 - 18	55.00 - 66.00	40.00	39.00	18.00	-	0.40 (kg)	104	251004	148013
	40 - 22	53.00 - 72.00	40.00	39.00	18.00	-	0.50 (kg)	104	251004	148014
	40 - 22	66.00 - 85.00	40.00	39.00	18.00	-	0.50 (kg)	104	251005	148014
	50 - 28	70.00 - 95.00	56.00	55.00	22.00	-	1.00 (kg)	104	251006	148015
	50 - 28	92.00 - 117.00	56.00	55.00	22.00	-	1.30 (kg)	104	251007	148015
	63 - 36	92.00 - 122.00	56.00	55.00	22.00	-	1.70 (kg)	104	251007	148016
	80 - 36	120.00 - 150.00	62.00	60.00	26.00	-	2.70 (kg)	104	251008	148007
	80 - 36	166.00 - 196.00	62.00	60.00	26.00	-	2.90 (kg)	104	251009	148007*
	80 - 36	145.00 - 200.00	62.00	60.00	26.00	125.00	3.60 (kg)	104	251008	148009*
	80 - 36	190.00 - 245.00	62.00	60.00	26.00	125.00	3.70 (kg)	104	251009	148009*

**NOTE:** Only use inserts with chip grooves all around

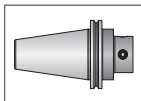
**NOTE:** Insert holders and inserts sold separately

\*For aluminum serrated tool bodies, use item number 348007 and 348009

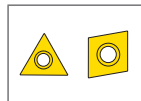
B10-N: 10-13



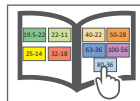
B10-H



B10-F



B10: xii-xiii



i = Imperial (in)

m = Metric (mm)

Inserts sold separately

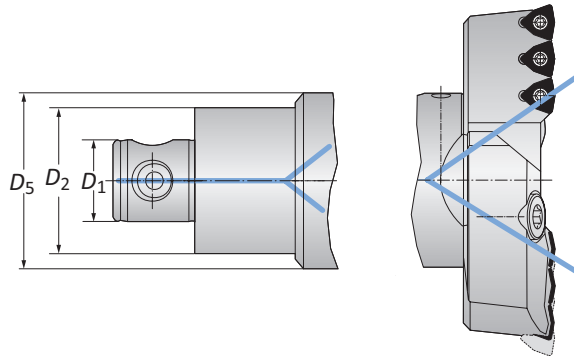
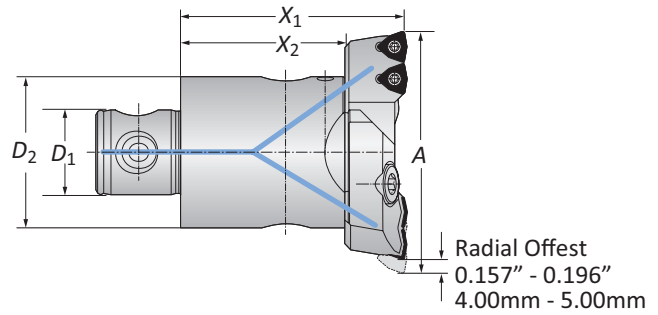
**IMPORTANT:** Max spindle speed refers to maximum possible speed for an individual boring head and is not a recommended parameter. Refer to page B10-N: 10 for recommended application-specific parameters. Factory technical assistance is available for your specific applications through our Application Engineering department.

ext: 7611 | email: [appeng@alliedmachine.com](mailto:appeng@alliedmachine.com)

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## VolCut Insert Holders

Diameter Range: 2.559" - 3.267" (65.00mm - 3255.00mm)





### Serrated Bodies with VolCut Insert Holders

Connection	Boring Range	Serrated Body			Weight	Number of Inserts	Insert Form	Part No.		
		$X_1$	$X_2$	$D_5$				VolCut Insert Holder	Serrated Body	
$D_2   D_1$	A									
50 - 28	2.559 - 3.267	2.913	2.165	-	2.425 (lbs)	2	464	151019	148005	
63 - 36	3.228 - 4.055	3.503	2.362	-	4.850 (lbs)	3	464	151039	148006	
80 - 36	3.937 - 5.118	3.503	2.362	-	6.613 (lbs)	3	464	151059	148007	
80 - 36	4.921 - 6.102	3.503	2.362	-	7.054 (lbs)	3	464	151069	148007	
80 - 36	5.905 - 8.070	3.503	2.362	4.921	11.243 (lbs)	3	464	151069	148009	
⚠ D60	7.874 - 128.149	-	-	-	-	3	464	149030	*	
<hr/>										
50 - 28	65.00 - 83.00	74.00	55.00	-	1.10 (kg)	2	464	151019	148005	
63 - 36	82.00 - 103.00	89.00	60.00	-	2.20 (kg)	3	464	151039	148006	
80 - 36	100.00 - 130.00	89.00	60.00	-	3.00 (kg)	3	464	151059	148007	
80 - 36	125.00 - 155.00	89.00	60.00	-	3.20 (kg)	3	464	151069	148007	
80 - 36	150.00 - 205.00	89.00	60.00	125.00	5.10 (kg)	3	464	151069	148009	
⚠ D60	200.00 - 3255.00	-	-	-	-	3	464	149030	*	

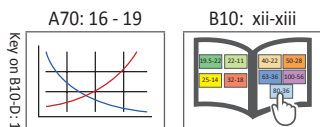
**NOTE:** Insert holders sold in quantities of 2. Inserts, insert holders, and serrated body sold separately.

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

### IC Inserts

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

**NOTE:** See section A70 in the AMPC for recommended cutting data, cutting materials, and geometries.



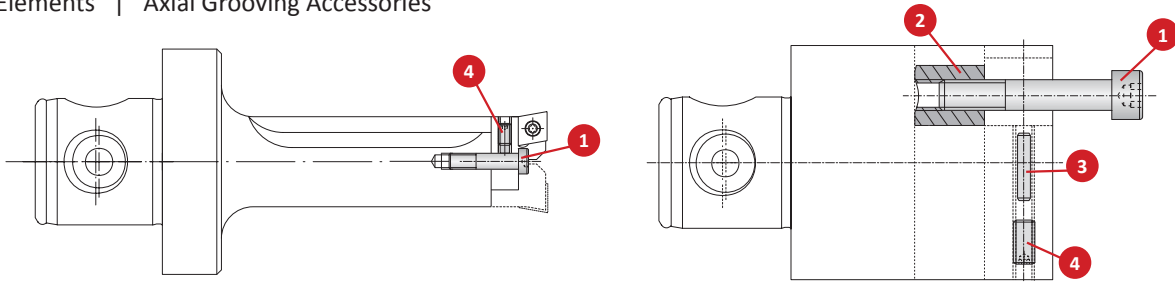
ⓘ = Imperial (in)  
Ⓜ = Metric (mm)

**⚠ WARNING** For large diameter boring with VolCut insert holders please:  
 - Contact our Application Engineering department before purchasing (330.343.4283 ext: 7611 | email: [appeng@alliedmachine.com](mailto:appeng@alliedmachine.com))  
 - Refer to section B10-E in the Wohlhaupter Master Product Catalog

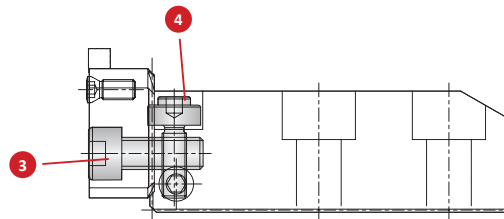


**Accessories**

Clamping Elements | Axial Grooving Accessories

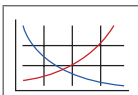
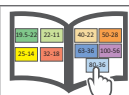


Connection	Serrated Tool Body	Part No.					
		1. Cap Screw	Service Key	2. Clamping Nut	3. Adjustment Pin	4. Thread Pin	Service Key
25 - 14	148001	140108	s4 / B	140114	-	115280	s2.5 / A
25 - 14	148002	148110	s5 / B	115667	-	126157	s2.5 / A
25 - 14	148011	148110	s5 / B	148113	-	117148	s2.5 / A
25 - 14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



**Axial Grooving Accessories**

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

B10-N: 10-13  

B10: xii-xiii

 = Imperial (in)  
 = Metric (mm)

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# B10-E

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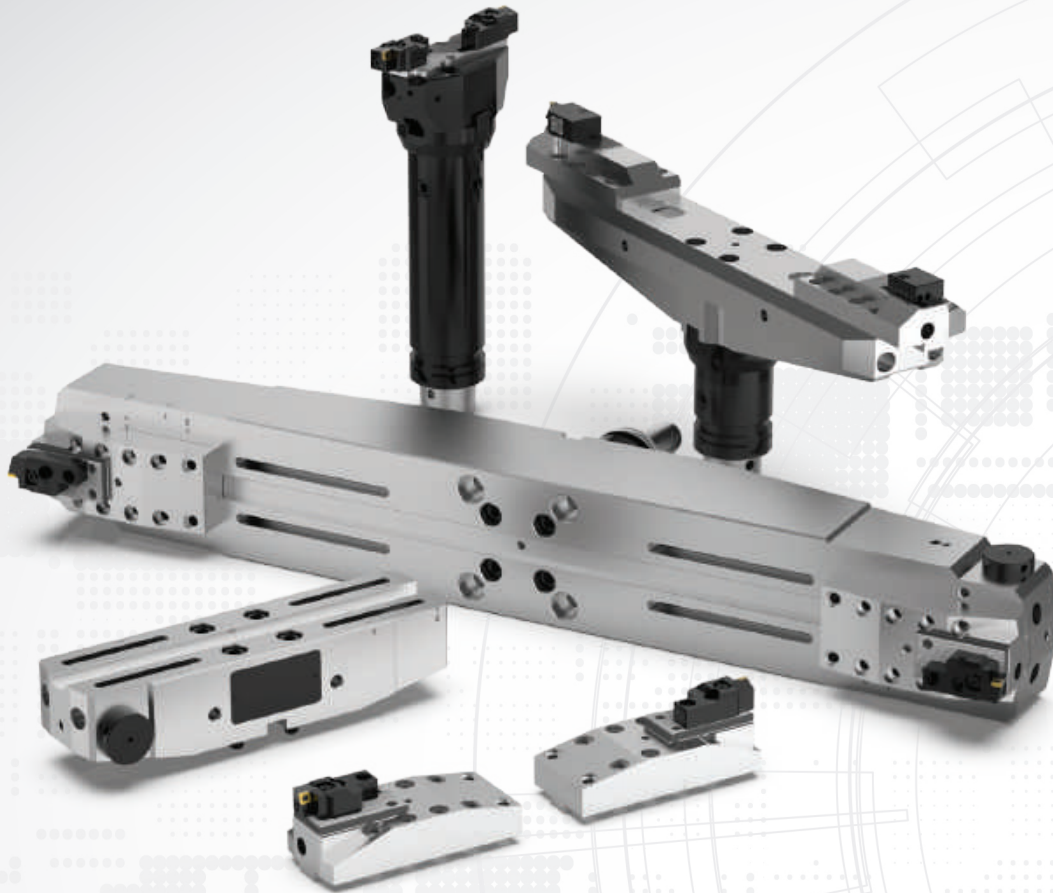
Large Diameter Boring Tools



# Wohlhaupter™ Large Diameter Boring Tools

Basic D 40 | Basic D 60 | Eco D 60 | Flex D 60

▶ Diameter Range: 7.874" - 128.150" (200.00mm - 3255.00mm)



## Boring Big?

Wohlhaupter has continued to expand our large diameter boring capabilities with Alu-Line. Our Alu-Line serrated slides and tool bodies are made of lightweight aluminum alloy to minimize the weight while still getting the heavy boring job done. The versatile serrated slides and serrated tool bodies allow for boring 7.874" (200.00mm) up to 128.150" (3255.00mm), offering the most powerful and versatile tool ranges to our customers.

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



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

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

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

### **WARNING**

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

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

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

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

## Applicable Industries



Aerospace



Agriculture



Automotive



Firearms



General  
Machining



Oil & Gas

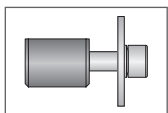


Renewable  
Energy

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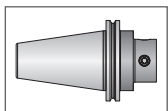
## Reference Icons

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



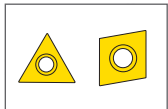
### Clamping Elements

For use with insert holders and boring heads



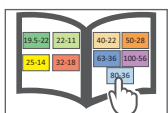
### Shanks

A variety of shanks for different machines



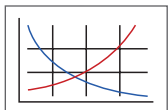
### Inserts

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



### MVS Connection Color Guide

Detailed instructions and information regarding the MVS connection(s)



### Recommended Cutting Data

Speed and feed recommendations for optimum and safe boring

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Alu-Line Eco D 60 Serrated Slides . . . . . 6

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Series	Diameter Range	
	Imperial (inch)	Metric (mm)
Basic D 40 Slides	7.874 - 20.470	200.00 - 520.00
Basic D 60 Slides	7.874 - 19.880	200.00 - 505.00
Eco D 60 Slides	18.300 - 40.150	465.00 - 1020.00
Flex D 60 Slides	19.680 - 128.150	500.00 - 3255.00



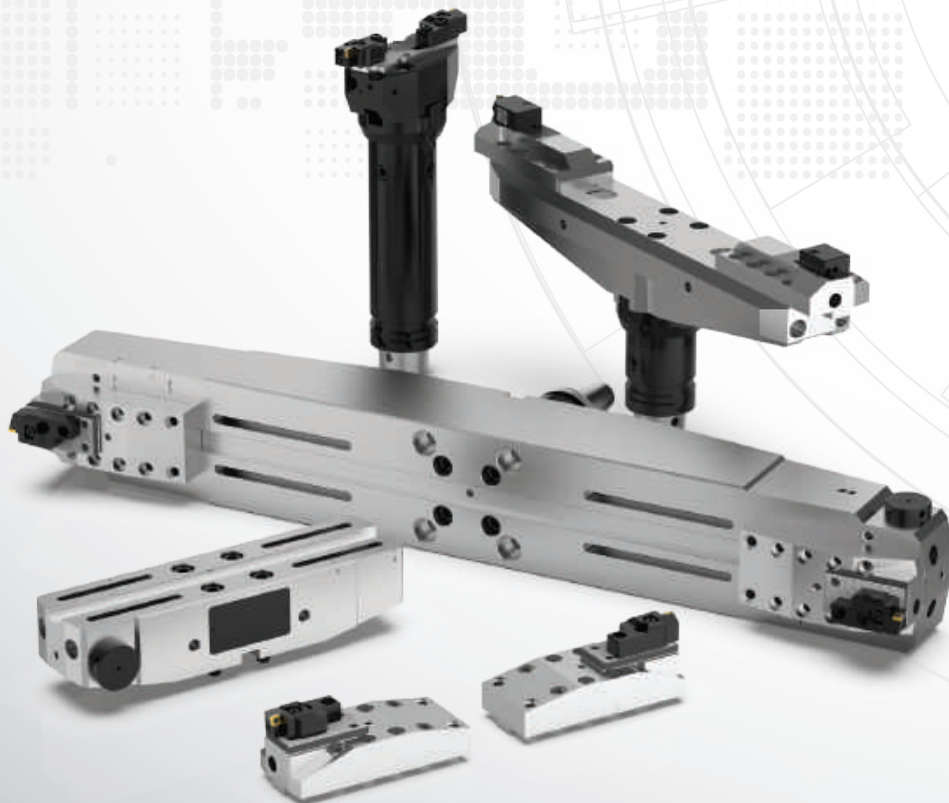
# Large Diameter Boring Tools

## Large Diameter BORING

### Boring big? We've got you covered.

Our versatile tooling system can provide the power and precision your large diameter boring jobs demand. The large diameter boring system offers four different Alu-Line serrated slides, a wide range of rough and finish boring insert holders, vernier and digital cassettes, and combined rough and finish insert holders.

- Diameter range: 7.874" - 128.150" (200.00mm - 3255.00mm)
- Basic, Eco, and Flex serrated slides
- Roughing, finishing, or combined roughing and finishing can be achieved in one pass
- Digital readout cassettes available for quick and easy adjustments
- Alu-Line serrated slides and tool bodies are made of lightweight aluminum



► **Basic D 40 Serrated Slides for Finish Boring**



**350021 (349021)**  
 Ø 7.874" - 11.023"  
 (Ø 200.00mm - 280.00mm)



**350023 (349023)**  
 Ø 14.173" - 17.322"  
 (Ø 360.00mm - 440.00mm)



**350022 (349022)**  
 Ø 11.023" - 14.173"  
 (Ø 280.00mm - 360.00mm)



**350024 (349024)**  
 Ø 17.322" - 20.472"  
 (Ø 440.00mm - 520.00mm)

► **Basic D 60 Serrated Slides for Semi Rough Finish and Finish Boring**



**350051 (349051)**  
 Ø 7.874" - 11.023"  
 (Ø 200.00mm - 280.00mm)



**350053 (349053)**  
 Ø 13.779" - 16.929"  
 (Ø 350.00mm - 430.00mm)



**350052 (349052)**  
 Ø 10.826" - 13.976"  
 (Ø 275.00mm - 355.00mm)



**350054 (349054)**  
 Ø 16.732" - 19.881"  
 (Ø 425.00mm - 505.00mm)

► **Eco D 60 Serrated Slides for Rough and Finish Boring**



**350005 (349005)**  
 Ø 18.307" - 29.330"  
 (Ø 465.00mm - 745.00mm)



**350014 (349014) / 350015 (350015)**  
 Serrated slide for base slides  
 350005 (349005) / 350006 (349006)



**350006 (349006)**  
 Ø 29.133" - 40.157"  
 (Ø 740.00mm - 1020.00mm)

► **Flex D 60 Serrated Slides for Rough and Finish Boring**



**350031 (349031)**  
 Ø 19.685" - 41.535"  
 (Ø 500.00mm - 1055.00mm)



**350035 (349035)**  
 Serrated slide for base slides  
 350031 (349031) | 350032 (349032)  
 350033 (349033) | 350034 (349034)



**350032 (349032)**  
 Ø 29.724" - 63.188"  
 (Ø 755.00mm - 1605.00mm)



**350036 (349036)**  
 Serrated slide for base slides  
 350031 (349031) | 350032 (349032)  
 350033 (349033) | 350034 (349034)



**350033 (349033)**  
 Ø 52.165" - 95.669"  
 (Ø 1325.00mm - 2430.00mm)



**350037 (349037)**  
 Serrated slide for base slides  
 350032 (349032) | 350033 (349033)  
 350034 (349034)



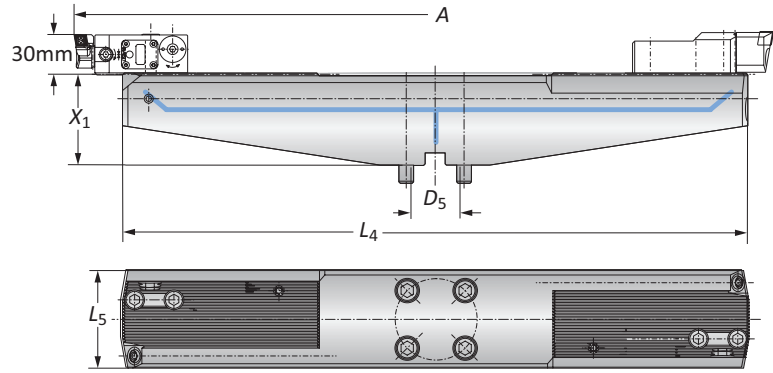
**350034 (349034)**  
 Ø 84.645" - 128.149"  
 (Ø 2150.00mm - 3255.00mm)



**350038 (349038)**  
 Serrated slide for base slides  
 350033 (349033) | 350034 (349034)

## Alu-Line Basic D 40 Serrated Slides

Diameter Range: 7.874" - 20.470" (200.00mm - 520.00mm)



	Connection	Boring Range	Serrated Slide			Weight	Part No.
	$D_5$	$A$	$X_1$	$L_4$	$L_5$		
i	D 40	7.874 - 11.020	2.952	7.480	3.149	6.172 (lbs)	350021
	D 40	11.020 - 14.170	2.952	10.620	3.149	8.377 (lbs)	350022
	D 40	14.170 - 17.320	2.952	13.770	3.149	10.800 (lbs)	350023
	D 40	17.320 - 20.470	2.952	16.320	3.149	13.000 (lbs)	350024
m	D 40	200.00 - 280.00	75.00	190.00	80.00	2.19 (kg)	349021
	D 40	280.00 - 360.00	75.00	270.00	80.00	3.80 (kg)	349022
	D 40	360.00 - 440.00	75.00	350.00	80.00	4.90 (kg)	349023
	D 40	440.00 - 520.00	75.00	430.00	80.00	5.90 (kg)	349024

Key on B10-E-1.1

B10-N: 10-13

B10-E: 22

B10-E: 16-19

B10-F

B10: xii-xiii

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

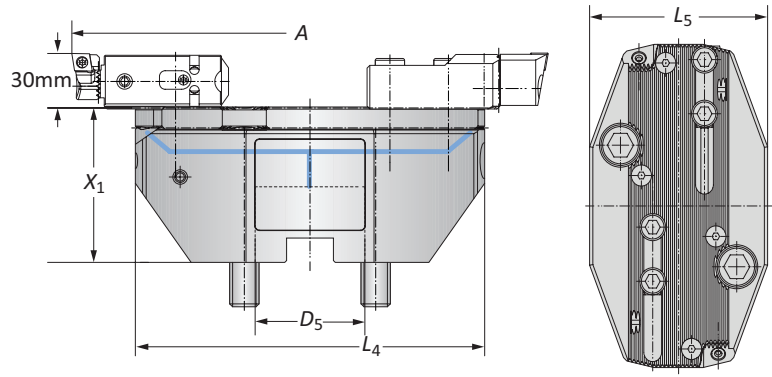
**WARNING** Exceeding weight capacity for machine tool spindle and tool changer can cause machine damage, and/or serious injury. To prevent:  
-Consult machine tool builder for machine's weight limitations.  
Factory technical assistance is also available for specific applications through our Application Engineering department. ext: 7611 | email: appeng@alliedmachine.com

**WARNING** Tool failure can cause serious injury. To prevent:  
-Do not exceed recommended 10xD length to diameter ratio or exceed 4 total components (including shank)  
-Refer to example on page B10-N: 8 for calculating length to diameter ratio  
Factory technical assistance is available for your specific applications through our Application Engineering department. ext: 7611 | email: appeng@alliedmachine.com



### Alu-Line Basic D 60 Serrated Slides

Diameter Range: 7.874" - 19.880" (200.00mm - 505.00mm)



	Connection	Boring Range	Serrated Slide			Weight	Part No.
	D <sub>5</sub>	A	X <sub>1</sub>	L <sub>4</sub>	L <sub>5</sub>		
i	D 60	7.874 - 11.020	3.346	7.519	4.330	9.038 (lbs)	350051
	D 60	10.820 - 13.970	3.346	10.390	4.330	11.464 (lbs)	350052
	D 60	13.770 - 16.920	3.346	13.340	4.921	15.211 (lbs)	350053
	D 60	16.730 - 19.880	3.346	16.290	4.921	17.637 (lbs)	350054
m	D 60	200.00 - 280.00	85.00	191.00	110.00	4.10 (kg)	349051
	D 60	275.00 - 355.00	85.00	264.00	110.00	5.20 (kg)	349052
	D 60	350.00 - 430.00	85.00	339.00	125.00	6.90 (kg)	349053
	D 60	425.00 - 505.00	85.00	414.00	125.00	8.00 (kg)	349054

Key on B10-E-1

B10-N: 10-13

B10-E: 22

B10-E: 16-19

B10-F

B10: xii-xiii

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

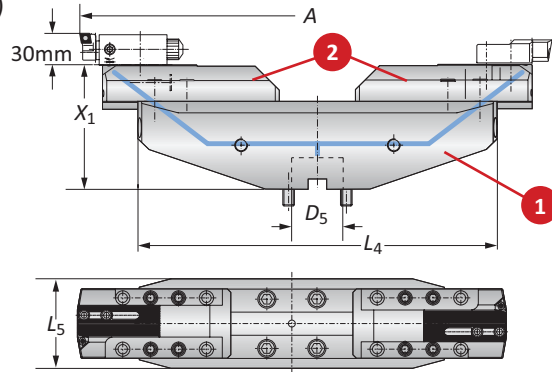
**WARNING** Exceeding weight capacity for machine tool spindle and tool changer can cause machine damage, and/or serious injury. To prevent:  
-Consult machine tool builder for machine's weight limitations.  
Factory technical assistance is also available for specific applications through our Application Engineering department. ext: 7611 | email: appeng@alliedmachine.com

**WARNING** Tool failure can cause serious injury. To prevent:  
-Do not exceed recommended 10xD length to diameter ratio or exceed 4 total components (including shank)  
-Refer to example on page B10-N: 8 for calculating length to diameter ratio  
Factory technical assistance is available for your specific applications through our Application Engineering department. ext: 7611 | email: appeng@alliedmachine.com

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## Alu-Line Eco D 60 Serrated Slides

Diameter Range: 18.300" - 40.150" (465.00mm - 1020.00mm)



	Connection	Boring Range	Serrated Slide			1 Base Slide		2 Serrated Slide (Alu-Line)*		2 Serrated Slide (steel)**	
			$D_5$	$A$	$X_1$	$L_4$	$L_5$	Weight	Part No.	Weight	Part No.
i	D 60	18.300 - 29.330	6.102	17.590	5.078	26.010 (lbs)	<b>350005</b>	4.850 (lbs)	<b>350015</b>	12.560 (lbs)	<b>350014</b>
	D 60	29.130 - 40.150	6.102	28.420	5.078	39.680 (lbs)	<b>350006</b>	4.850 (lbs)	<b>350015</b>	12.560 (lbs)	<b>350014</b>
m	D 60	465.00 - 745.00	155.00	447.00	129.00	11.80 (kg)	<b>349005</b>	2.20 (kg)	<b>349015</b>	5.70 (kg)	<b>349014</b>
	D 60	740.00 - 1020.00	155.00	722.00	129.00	18.00 (kg)	<b>349006</b>	2.20 (kg)	<b>349015</b>	5.70 (kg)	<b>349014</b>

\*Finish boring: serrated slide in Alu-Line

\*\*Rough boring: serrated slide in steel

Key on B10-E-1.1

B10-N: 10-13

B10-E: 22

B10-E: 16-19

B10-F

B10: xii-xiii

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

Inserts sold separately

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

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

Factory technical assistance is also available for specific applications through our Application Engineering department. ext: 7611 | email: [appeng@alliedmachine.com](mailto:appeng@alliedmachine.com)

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

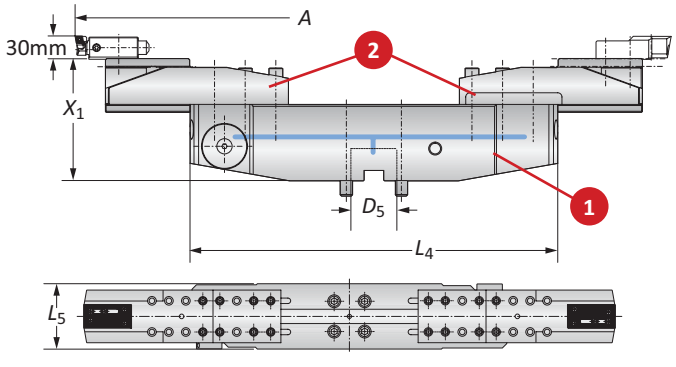
-Do not exceed recommended 10xD length to diameter ratio or exceed 4 total components (including shank)

-Refer to example on page B10-N: 8 for calculating length to diameter ratio

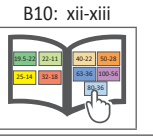
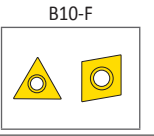
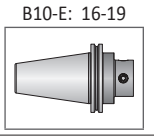
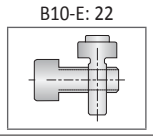
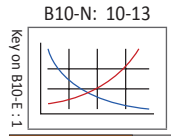
Factory technical assistance is available for your specific applications through our Application Engineering department. ext: 7611 | email: [appeng@alliedmachine.com](mailto:appeng@alliedmachine.com)

## Alu-Line Flex D 60 Serrated Slides

Diameter Range: 19.680" - 128.150" (500.00mm - 3255.00mm)



	Connection	Boring Range	Serrated Slide			Weight (1 + 2)	Part No.	
			D <sub>5</sub>	A	X <sub>1</sub>		L <sub>4</sub>	L <sub>5</sub>
i	D 60	19.680 - 30.700	6.299	18.890	5.118	53.360 (lbs)	350031	350035
	D 60	37.400 - 41.530	7.283	18.890	5.118	91.060 (lbs)	350031	350036
	D 60	29.720 - 41.530	7.283	29.720	6.102	93.710 (lbs)	350032	350035
	D 60	41.330 - 52.360	8.267	29.720	6.102	131.400 (lbs)	350032	350036
	D 60	56.770 - 63.180	8.858	29.720	6.102	190.200 (lbs)	350032	350037
	D 60	52.160 - 63.180	8.267	51.370	7.283	194.400 (lbs)	350033	350035
	D 60	52.160 - 74.010	9.251	51.370	7.283	232.100 (lbs)	350033	350036
	D 60	62.990 - 84.840	9.842	51.370	7.283	291.000 (lbs)	350033	350037
	D 60	78.340 - 95.660	10.030	51.370	7.283	374.400 (lbs)	350033	350038
	D 60	84.640 - 95.660	9.251	83.850	8.858	424.400 (lbs)	350034	350035
	D 60	84.640 - 106.500	10.230	83.850	8.858	462.100 (lbs)	350034	350036
	D 60	84.640 - 117.300	10.820	83.850	8.858	520.300 (lbs)	350034	350037
	D 60	84.640 - 128.150	11.020	83.850	8.858	604.100 (lbs)	350034	350038
m	D 60	500.00 - 780.00	160.00	480.00	130.00	24.20 (kg)	349031	349035
	D 60	950.00 - 1055.00	185.00	480.00	130.00	41.30 (kg)	349031	349036
	D 60	755.00 - 1055.00	185.00	755.00	155.00	42.50 (kg)	349032	349035
	D 60	1050.00 - 1330.00	210.00	755.00	155.00	59.60 (kg)	349032	349036
	D 60	1442.00 - 1605.00	225.00	755.00	155.00	86.30 (kg)	349032	349037
	D 60	1325.00 - 1605.00	210.00	1305.00	185.00	88.20 (kg)	349033	349035
	D 60	1325.00 - 1880.00	235.00	1305.00	185.00	105.30 (kg)	349033	349036
	D 60	1600.00 - 2155.00	250.00	1305.00	185.00	132.00 (kg)	349033	349037
	D 60	1990.00 - 2430.00	255.00	1305.00	185.00	169.80 (kg)	349033	349038
	D 60	2150.00 - 2430.00	235.00	2130.00	225.00	192.50 (kg)	349034	349035
	D 60	2150.00 - 2705.00	260.00	2130.00	225.00	209.60 (kg)	349034	349036
	D 60	2150.00 - 2980.00	275.00	2130.00	225.00	236.00 (kg)	349034	349037
	D 60	2150.00 - 3255.00	280.00	2130.00	225.00	274.00 (kg)	349034	349038



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

**WARNING** Exceeding weight capacity for machine tool spindle and tool changer can cause machine damage, and/or serious injury. To prevent:  
-Consult machine tool builder for machine's weight limitations.  
Factory technical assistance is also available for specific applications through our Application Engineering department. ext: 7611 | email: appeng@alliedmachine.com

**WARNING** Tool failure can cause serious injury. To prevent:  
-Do not exceed recommended 10xD length to diameter ratio or exceed 4 total components (including shank)  
-Refer to example on page B10-N: 8 for calculating length to diameter ratio  
Factory technical assistance is available for your specific applications through our Application Engineering department. ext: 7611 | email: appeng@alliedmachine.com

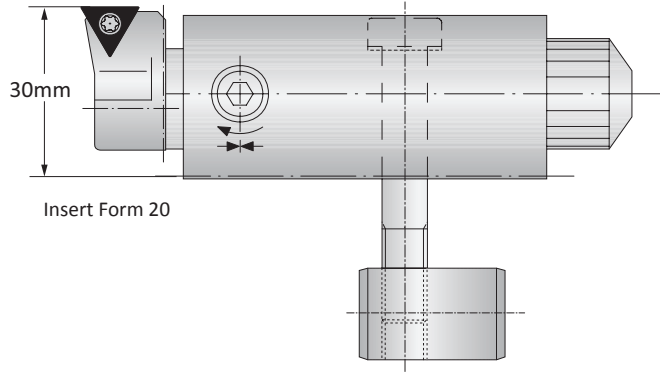
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### 338 (337) Cassettes

Diameter Range: 3.937" - 128.100" (100.00mm - 3255.00mm)



Insert Form 101



#### 338 (337) Cassette with Insert Holders and Clamping Pieces

Slide Type	Boring Range	Weight	Insert Form	Part No.		
				Insert Holder	Clamping Piece	Cassette
Serrated Tool Bodies	3.937 - 8.071	0.683 (lbs)	20	210020	137026	338037
	3.937 - 8.071	0.683 (lbs)	101	210063	137026	338037
	3.937 - 8.071	0.683 (lbs)	103	210064	137026	338037
Basic / Eco Slides	7.874 - 40.150	0.683 (lbs)	20	210020	137027	338037
	7.874 - 40.150	0.683 (lbs)	101	210063	137027	338037
	7.874 - 40.150	0.683 (lbs)	103	210064	137027	338037
Flex Slides	19.680 - 128.100	0.683 (lbs)	20	210020	137019	338037
	19.680 - 128.100	0.683 (lbs)	101	210063	137019	338037
	19.680 - 128.100	0.683 (lbs)	103	210064	137019	338037
Serrated Tool Bodies	100.00 - 205.00	0.31 (kg)	20	210020	137026	337017
	100.00 - 205.00	0.31 (kg)	101	210063	137026	337017
	100.00 - 205.00	0.31 (kg)	103	210064	137026	337017
Basic / Eco Slides	200.00 - 1020.00	0.31 (kg)	20	210020	137027	337017
	200.00 - 1020.00	0.31 (kg)	101	210063	137027	337017
	200.00 - 1020.00	0.31 (kg)	103	210064	137027	337017
Flex Slides	500.00 - 3255.00	0.31 (kg)	20	210020	137019	337017
	500.00 - 3255.00	0.31 (kg)	101	210063	137019	337017
	500.00 - 3255.00	0.31 (kg)	103	210064	137019	337017

Key on B10-E-1.1

B10-N: 10-13

B10-E: 22

B10-E: 16-19

B10-F

B10: xii-xiii

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:  
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 Factory technical assistance is also available for specific applications through our Application Engineering department. ext: 7611 | email: appeng@alliedmachine.com

**WARNING** Tool failure can cause serious injury. To prevent:  
 -Do not exceed recommended 10xD length to diameter ratio or exceed 4 total components (including shank)  
 -Refer to example on page B10-N: 8 for calculating length to diameter ratio  
 Factory technical assistance is available for your specific applications through our Application Engineering department. ext: 7611 | email: appeng@alliedmachine.com

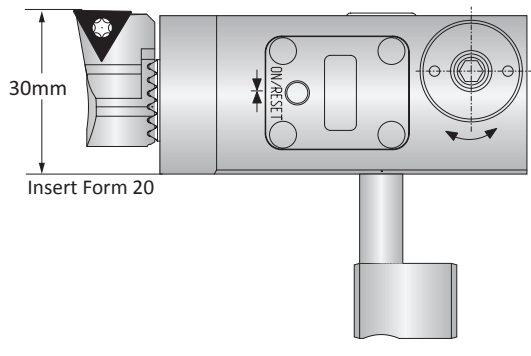
### 538 (537) Cassettes

Diameter Range: 3.937" - 128.100" (100.00mm - 3255.00mm)



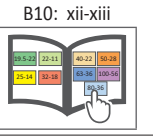
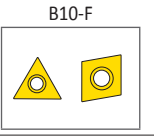
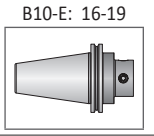
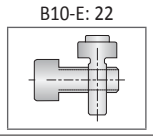
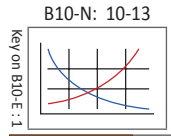
Insert Form 101

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



#### Digital 538 (537) Cassette with Insert Holders and Clamping Pieces

Slide Type	Boring Range	Weight	Insert Form	Part No.			
				Insert Holder	Clamping Pieces	Cassette	
Serrated Tool Bodies	3.937 - 8.071	0.816 (lbs)	20	210020	137026	538001	
	3.937 - 8.071	0.816 (lbs)	101	210063	137026	538001	
	3.937 - 8.071	0.816 (lbs)	103	210064	137026	538001	
Basic / Eco Slides	7.874 - 40.150	0.816 (lbs)	20	210020	137027	538001	
	7.874 - 40.150	0.816 (lbs)	101	210063	137027	538001	
	7.874 - 40.150	0.816 (lbs)	103	210064	137027	538001	
Flex Slides	19.680 - 128.100	0.816 (lbs)	20	210020	137019	538001	
	19.680 - 128.100	0.816 (lbs)	101	210063	137019	538001	
	19.680 - 128.100	0.816 (lbs)	103	210064	137019	538001	
Serrated Tool Bodies	100.00 - 205.00	0.37 (kg)	20	210020	137026	537001	
	100.00 - 205.00	0.37 (kg)	101	210063	137026	537001	
	100.00 - 205.00	0.37 (kg)	103	210064	137026	537001	
	Basic / Eco Slides	200.00 - 1020.00	0.37 (kg)	20	210020	137027	537001
		200.00 - 1020.00	0.37 (kg)	101	210063	137027	537001
		200.00 - 1020.00	0.37 (kg)	103	210064	137027	537001
	Flex Slides	500.00 - 3255.00	0.37 (kg)	20	210020	137019	537001
		500.00 - 3255.00	0.37 (kg)	101	210063	137019	537001
		500.00 - 3255.00	0.37 (kg)	103	210064	137019	537001



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

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 -Consult machine tool builder for machine's weight limitations.  
 Factory technical assistance is also available for specific applications through our Application Engineering department. ext: 7611 | email: appeng@alliedmachine.com

**WARNING** Tool failure can cause serious injury. To prevent:  
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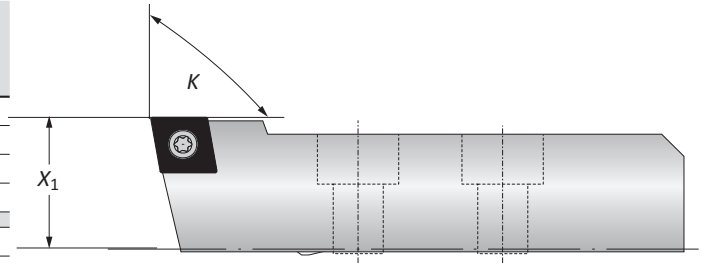
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## Insert Holders for Rough Machining

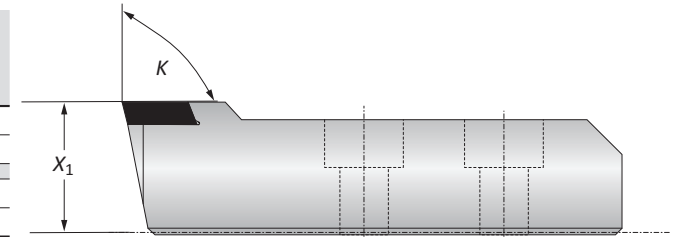
### 90° Insert Holders

Insert Holder		Weight	ISO Code	Insert Form	Part No.	
K	X <sub>1</sub>					
i	90°	1.180	1.322 (lbs)	CC..09T3..	103	149090
	90°	1.180	1.322 (lbs)	CC..1204..	104	149099
	90°	1.150	1.322 (lbs)	CC..1204..	104	149083
	90°	1.180	1.322 (lbs)	CC..1605..	105	149093
m	90°	30.00	0.60 (kg)	CC..09T3..	103	149090
	90°	30.00	0.60 (kg)	CC..1204..	104	149099
	90°	29.30	0.60 (kg)	CC..1204..	104	149083
	90°	30.00	0.60 (kg)	CC..1605..	105	149093



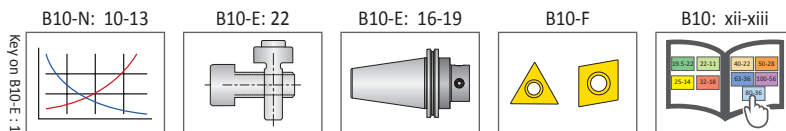
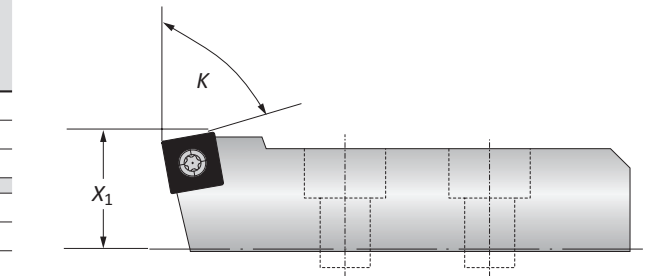
### 90° Tangential Insert Holders

Insert Holder		Weight	ISO Code	Insert Form	Part No.
K	X <sub>1</sub>				
i	90°	1.180	Tangential	05	149010
	90°	1.150	Tangential	05	149020
m	90°	30.00	Tangential	05	149010
	90°	29.30	Tangential	05	149020



### 80° Insert Holders

Insert Holder		Weight	ISO Code	Insert Form	Part No.
K	X <sub>1</sub>				
i	80°	1.180	SC..1204..	113	149089
	80°	1.180	SC..1505..	114	149094
	80°	1.180	SN..1506..	134	149096
m	80°	30.00	SC..1204..	113	149089
	80°	30.00	SC..1505..	114	149094
	80°	30.00	SN..1506..	134	149096



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

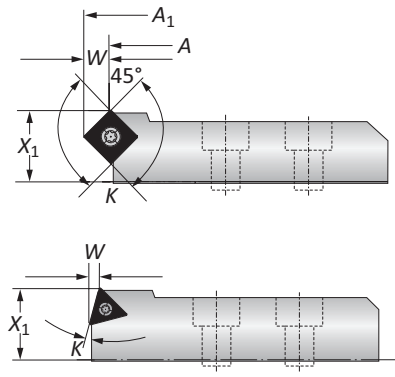
**WARNING** Exceeding weight capacity for machine tool spindle and tool changer can cause machine damage, and/or serious injury. To prevent:  
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## Insert Holders for Rough Machining | Boring Range Example

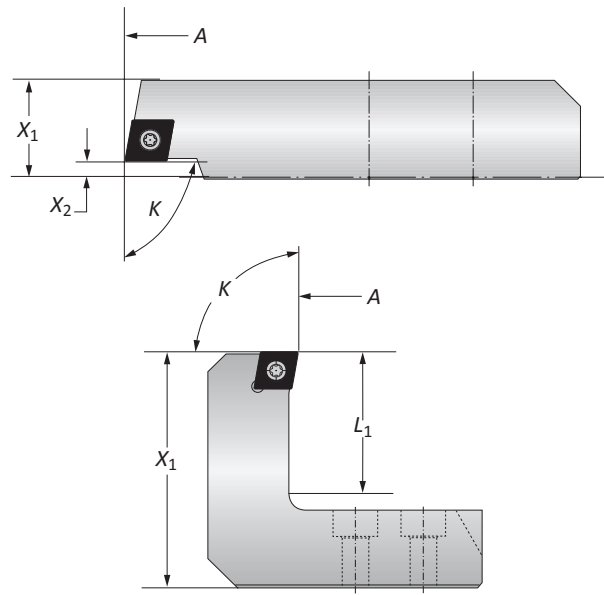
### Chamfering Insert Holders

Insert Holder								
	K	X <sub>1</sub>	A / A <sub>1</sub>	W	Weight	ISO Code	Insert Form	Part No.
i	15°	1.180	+0.275	0.157	1.322 (lbs)	TC..16T3..	163	201065
	20°	1.180	+0.354	0.208	1.322 (lbs)	TC..16T3..	163	201025
	30°	1.180	+0.551	0.303	1.322 (lbs)	TC..16T3..	163	201075
	45°	1.180	+0.787	0.389	1.322 (lbs)	SC..1505..	114	201015
m	15°	30.00	+7.00	4.00	0.60 (kg)	TC..16T3..	163	201065
	20°	30.00	+9.00	5.30	0.60 (kg)	TC..16T3..	163	201025
	30°	30.00	+14.00	7.70	0.60 (kg)	TC..16T3..	163	201075
	45°	30.00	+20.00	9.90	0.60 (kg)	SC..1505..	114	201015



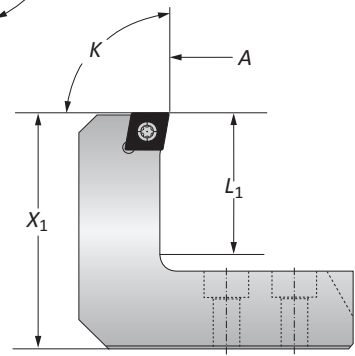
### Back-Boring Insert Holders

Insert Holder								
	K	X <sub>1</sub>	X <sub>2</sub>	A	Weight	ISO Code	Insert Form	Part No.
i	90°	3.540	0.196	+1.574	1.763 (lbs)	CC..1204..	104	251010
	90°	3.540	0.196	+2.952	1.984 (lbs)	CC..1204..	104	251011
m	90°	30.00	5.00	+40.00	0.80 (kg)	CC..1204..	104	251010
	90°	30.00	5.00	+75.00	0.90 (kg)	CC..1204..	104	251011



### OD Turning Insert Holders

Insert Holder								
	K	X <sub>1</sub>	L <sub>1</sub>	A	Weight	ISO Code	Insert Form	Part No.
i	90°	198.400	2.440	-1.968	2.204 (lbs)	CC..1204..	104	149040
m	90°	90.00	62.00	-50.00	1.00 (kg)	CC..1204..	104	149040



### Boring Range Example

Serrated Slide		Insert Holder			
Part No.	Bore Range	Part No.	Modified Bore Range	Total Bore Range	
i	350051	7.874 - 11.023	201065	+0.280	8.150 - 11.300
	350051	7.874 - 11.023	251010	+1.600	9.450 - 12.600
	350051	7.874 - 11.023	149040	-2.000	5.900 - 9.055
m	349051	200.00 - 280.00	201065	+7.00	207.00 - 287.00
	349051	200.00 - 280.00	251010	+40.00	240.00 - 320.00
	349051	200.00 - 280.00	149040	-50.00	150.00 - 230.00

**NOTE:** Boring range for serrated slides or base slides are found on pg. B10-E: 4 - 7  
**NOTE:** Additional insert holders available upon request

B10-N: 10-13

B10-E: 22

B10-E: 16-19

B10-F

B10: xii-xiii

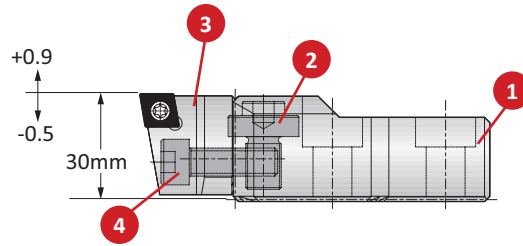
i = Imperial (in)  
m = Metric (mm)  
Inserts sold separately

**WARNING** Exceeding weight capacity for machine tool spindle and tool changer can cause machine damage, and/or serious injury. To prevent:  
 -Consult machine tool builder for machine's weight limitations.  
 Factory technical assistance is also available for specific applications through our Application Engineering department. ext: 7611 | email: appeng@alliedmachine.com

**WARNING** Tool failure can cause serious injury. To prevent:  
 -Do not exceed recommended 10xD length to diameter ratio or exceed 4 total components (including shank)  
 -Refer to example on page B10-N: 8 for calculating length to diameter ratio  
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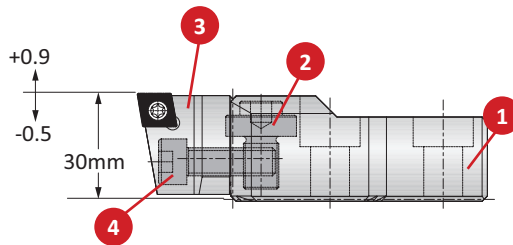
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## Insert Holders for Height Adjustments



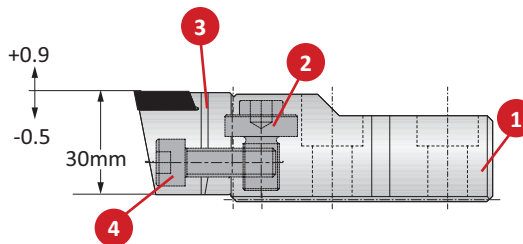
Insert Form 103

	1 Support		2 Adjusting Screw		3 Insert Holder		4 Fixing Screw		Complete Part No.
	Boring Range	Part No.	Part No.	Service Key	Insert Form	Part No.	Part No.	Service Key	
<b>i</b>	7.874 - 128.100	149055	315355	s6 / B	103	149058	070369	s6 / B	<b>149059</b>
<b>m</b>	200.00 - 3255.00	149055	315355	s6 / B	103	149058	070369	s6 / B	<b>149059</b>



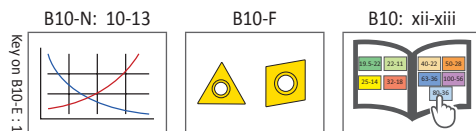
Insert Form 104

	1 Support		2 Adjusting Screw		3 Insert Holder		4 Fixing Screw		Complete Part No.
	Boring Range	Part No.	Part No.	Service Key	Insert Form	Part No.	Part No.	Service Key	
<b>i</b>	7.874 - 128.100	149055	315355	s6 / B	104	149056	070369	s6 / B	<b>149057</b>
<b>m</b>	200.00 - 3255.00	149055	315355	s6 / B	104	149056	070369	s6 / B	<b>149057</b>



Insert Form 05

	1 Support		2 Adjusting Screw		3 Insert Holder		4 Fixing Screw		Complete Part No.
	Boring Range	Part No.	Part No.	Service Key	Insert Form	Part No.	Part No.	Service Key	
<b>i</b>	7.874 - 128.100	149055	315355	s6 / B	05	149085	070369	s6 / B	<b>149086</b>
<b>m</b>	200.00 - 3255.00	149055	315355	s6 / B	05	149085	070369	s6 / B	<b>149086</b>



**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:

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Factory technical assistance is also available for specific applications through our Application Engineering department. ext: 7611 | email: [appeng@alliedmachine.com](mailto:appeng@alliedmachine.com)

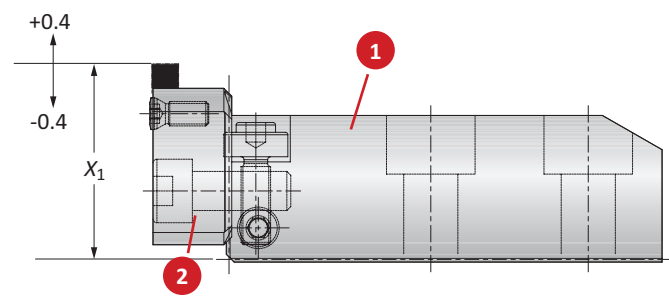
**WARNING** Tool failure can cause serious injury. To prevent:

-Do not exceed recommended 10xD length to diameter ratio or exceed 4 total components (including shank)

-Refer to example on page B10-N: 8 for calculating length to diameter ratio

Factory technical assistance is available for your specific applications through our Application Engineering department. ext: 7611 | email: [appeng@alliedmachine.com](mailto:appeng@alliedmachine.com)

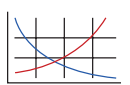
## Insert Holders for Axial Grooving



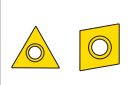
	Insert Holder	1 Support Module	2 Insert Holder			
	$X_1$	Part No.	Part No.	Weight	Insert Form	Complete Part No.
<b>i</b>	1.574	226014	226010	0.661 (lbs)	304	<b>226029</b>
<b>m</b>	40.00	226014	226010	0.30 (kg)	304	<b>226029</b>

Key on B10-E-1

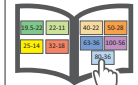
B10-N: 10-13



B10-F



B10: xii-xiii



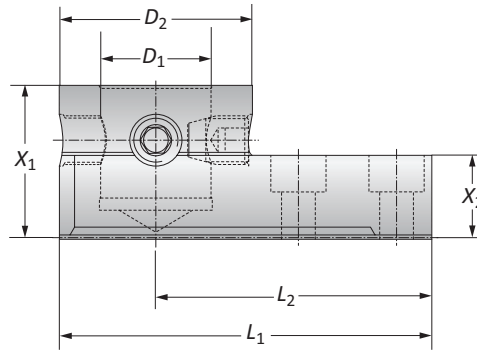
**i** = Imperial (in)  
**m** = Metric (mm)  
 Inserts sold separately

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



	MVS Connection	Mounting Adapters				Weight	Part No.
	$D_2$   $D_1$	$X_1$	$X_2$	$L_1$	$L_2$		
<b>i</b>	50 - 28	1.968	1.062	4.527	3.543	3.306 (lbs)	<b>349046</b>
<b>m</b>	50 - 28	50.00	27.00	115.00	90.00	1.50 (kg)	<b>349046</b>

## Outside Turning Example



### Inside Boring

Application: Longer Reach Inside Boring

Slide	Boring Heads	<b>i</b> ID Bore Range	<b>m</b> ID Bore Range
349/350051	320005/365045/565045	9.840 - 12.990	250.00 - 330.00
349/350052	320005/365045/565045	12.800 - 15.950	325.12 - 405.13
349/350053	320005/365045/565045	15.750 - 18.900	400.05 - 480.06
349/350054	320005/365045/565045	18.700 - 21.850	474.98 - 555.00
349/350005/350015	320005/365045/565045	20.280 - 31.300	515.10 - 795.02

### Outside Boring

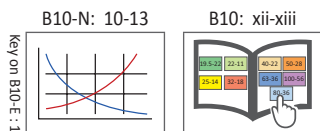
Application: OD Finish Turning Longer Reaches

Slide	Boring Heads	<b>i</b> OD Bore Range	<b>m</b> OD Bore Range
349/350051	320005/365045/565045	4.720 - 6.280	120.00 - 160.00
349/350052	320005/365045/565045	6.240 - 10.830	158.50 - 275.00
349/350053	320005/365045/565045	10.630 - 13.780	270.00 - 350.00
349/350054	320005/365045/565045	13.580 - 16.730	345.00 - 425.00
349/350005/350015	320005/365045/565045	15.160 - 26.180	385.00 - 665.00

NOTE: LH only spindle rotation

NOTE: Imperial item pictured

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



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

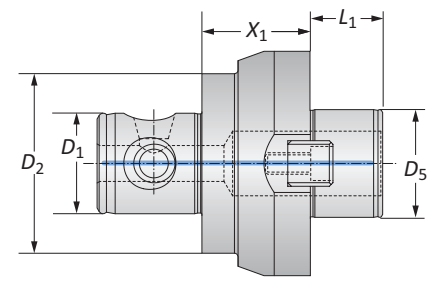
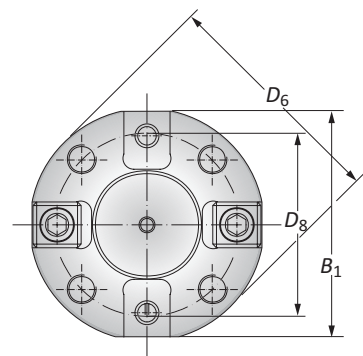
Inserts sold separately

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



	MVS Connection		Holding Arbor						Weight	Part No.
	$D_2$   $D_1$	Holding Arbor Connection	$X_1$	$L_1$	$D_5$	$D_6$	$D_8$	$B_1$		
<b>i</b>	80 - 36	D 40 Alu-Line	0.748	1.181	1.574	3.503	2.625	3.149	1.102 (lbs)	<b>309001</b>
	80 - 36	D 60	2.362	1.574	2.362	5.082	4.000	4.921	9.038 (lbs)	<b>209060</b>
	100 - 56	D 40 Alu-Line	1.181	1.181	1.574	3.503	2.625	3.149	2.204 (lbs)	<b>309041</b>
	100 - 56	D 60	2.362	1.574	2.362	5.082	4.000	4.921	13.880 (lbs)	<b>209043</b>
	100 - 56	D 60 Alu-Line	2.362	1.574	2.362	5.082	4.000	4.921	4.850 (lbs)	<b>309043</b>
<b>m</b>	80 - 36	D 40 Alu-Line	19.00	30.00	40.00	89.00	66.70	80.00	0.50 (kg)	<b>309001</b>
	80 - 36	D 60	60.00	40.00	60.00	129.10	101.60	125.00	4.10 (kg)	<b>209060</b>
	100 - 56	D 40 Alu-Line	30.00	30.00	40.00	89.00	66.70	80.00	1.00 (kg)	<b>309041</b>
	100 - 56	D 60	60.00	40.00	60.00	129.10	101.60	125.00	6.30 (kg)	<b>209043</b>
	100 - 56	D 60 Alu-Line	60.00	40.00	60.00	129.10	101.60	125.00	2.20 (kg)	<b>309043</b>

Key on B10-E-1

B10-N: 10-13

B10: xii-xiii

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

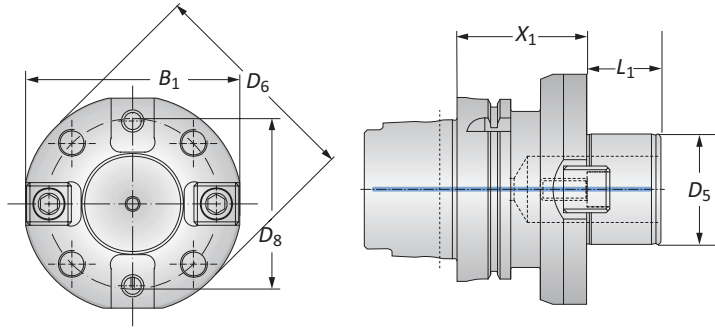
**! WARNING** Exceeding weight capacity for machine tool spindle and tool changer can cause machine damage, and/or serious injury. To prevent:  
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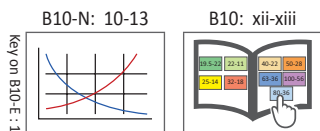
## Master Shanks D 40 / D 60

HSK-A (DIN 69 893) Shanks



HSK-A (DIN 69 893) Shanks

Taper Size	Connection	Shank							Weight	Part No.
		$X_1$	$L_1$	$D_5$	$D_6$	$D_8$	$B_1$			
i	63	D 40	2.362	1.181	1.570	3.504	2.626	3.150	4.200 (lbs)	358015
	100	D 40	2.362	1.181	1.570	3.504	2.626	3.150	7.900 (lbs)	258021
	100	D 60	2.756	1.570	2.362	5.083	4.000	4.921	11.500 (lbs)	258061
	100	D 60	2.756	1.570	2.362	5.083	4.000	4.331	11.000 (lbs)	258098
m	63	D 40	60.00	30.00	40.00	89.00	66.70	80.00	1.90 (kg)	358015
	100	D 40	60.00	30.00	40.00	89.00	66.70	80.00	3.60 (kg)	258021
	100	D 60	70.00	40.00	60.00	129.10	101.60	125.00	5.20 (kg)	258061
	100	D 60	70.00	40.00	60.00	129.10	101.60	110.00	5.00 (kg)	258098



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

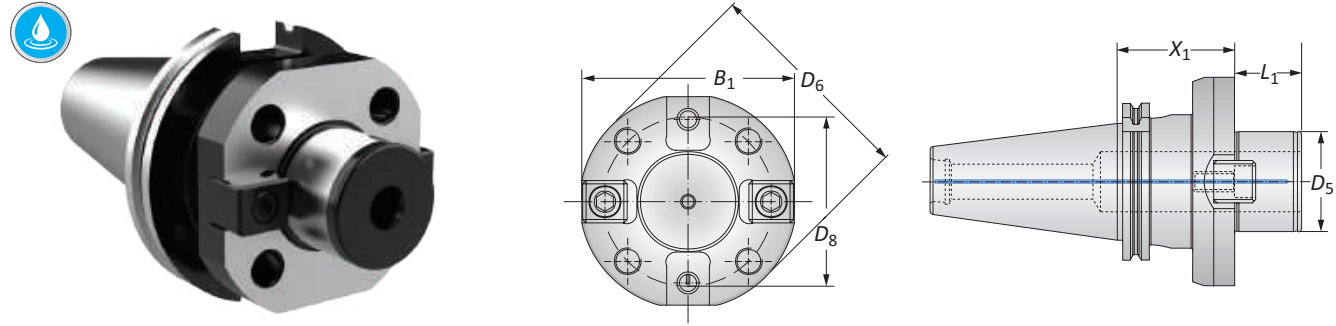
Inserts sold separately

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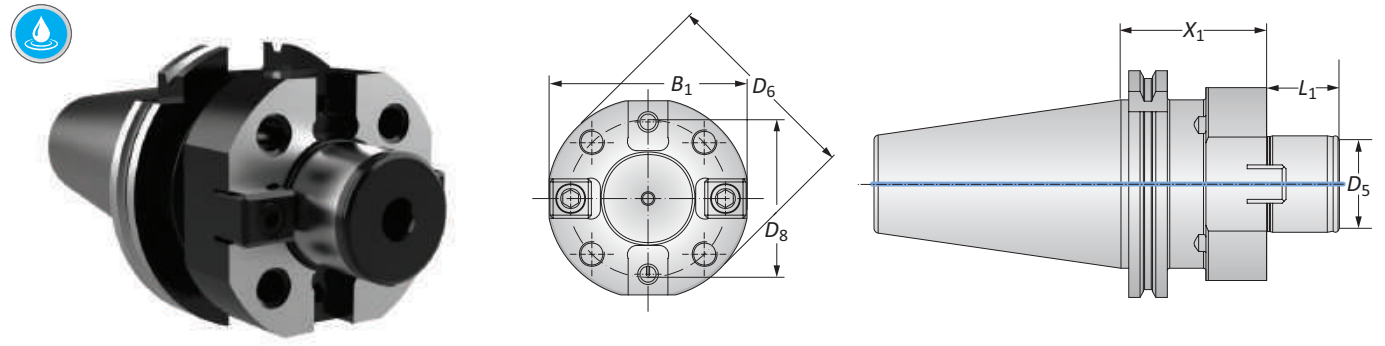
### Master Shanks D 40 / D 60

CAT 40 / 50 Shanks with Imperial Threads | CAT 50 Shank with Metric Threads



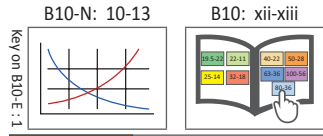
#### CAT 40 / 50 Shanks with Imperial Threads

Taper Size	Connection	Shank						Weight	Part No.	
		$X_1$	$L_1$	$D_5$	$D_6$	$D_8$	$B_1$			
i	40	D 40	1.970	1.181	1.570	3.504	2.626	3.150	4.000 (lbs)	357004
	50	D 40	1.970	1.181	1.570	3.504	2.626	3.150	8.400 (lbs)	357001
	50	D 60	2.756	1.570	2.362	5.083	4.000	4.331	11.700 (lbs)	357002
	50	D 60	2.756	1.570	2.362	5.083	4.000	4.921	12.100 (lbs)	357003



#### CAT 50 Shanks with Metric Threads

Taper Size	Connection	Shank						Weight	Part No.	
		$X_1$	$L_1$	$D_5$	$D_6$	$D_8$	$B_1$			
m	50	D 40	60.00	30.00	40.00	89.00	66.70	80.00	4.60 (kg)	326083



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

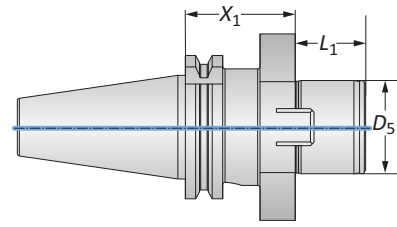
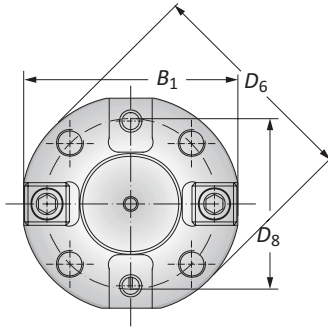
**WARNING** Exceeding weight capacity for machine tool spindle and tool changer can cause machine damage, and/or serious injury. To prevent:  
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## Master Shanks D 40 / D 60

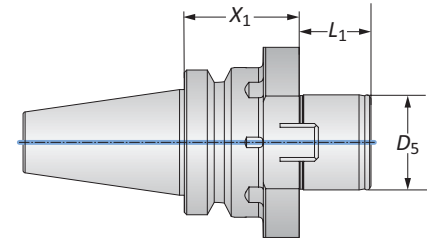
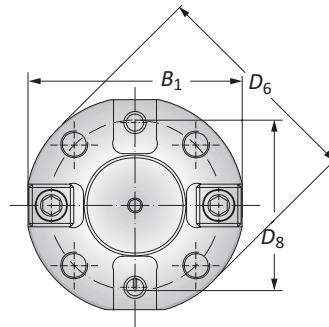
SK (DIN 69 871-AD/B) | BT / JIS B 6339 Shanks



### SK (DIN 69 871-AD/B) Shanks

Taper Size	Connection	Shank							Weight	Part No.
		$X_1$	$L_1$	$D_5$	$D_6$	$D_8$	$B_1$			
i	40	D 40	1.970	1.180	1.570	3.500	2.630	0.310	4.190 (lbs)	326080*
	50	D 40	1.970	1.180	1.570	3.500	2.630	0.310	9.040 (lbs)	326081
	50	D 60	2.760	1.570	2.360	5.080	4.000	4.920	12.790 (lbs)	198054T019539
	50	D 60	2.760	1.570	2.360	5.080	4.000	4.330	12.130 (lbs)	198081T019539
m	40	D 40	50.00	30.00	40.00	89.00	66.70	80.00	1.90 (kg)	326080*
	50	D 40	50.00	30.00	40.00	89.00	66.70	80.00	4.10 (kg)	326081
	50	D 60	70.00	40.00	60.00	129.10	101.60	125.00	5.80 (kg)	198054T019539
	50	D 60	70.00	40.00	60.00	129.10	101.60	110.00	5.50 (kg)	198081T019539

\*For light machining only

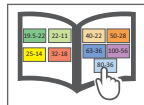
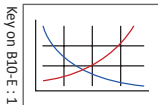


### BT / JIS B 6339 Shanks

Taper Size	Connection	Shank							Weight	Part No.
		$X_1$	$L_1$	$D_5$	$D_6$	$D_8$	$B_1$			
i	40	D 40	1.970	1.181	1.570	3.504	2.626	3.150	4.000 (lbs)	326084
	50	D 40	2.165	1.181	1.570	3.504	2.626	3.150	9.900 (lbs)	326082
	50	D 60	3.150	1.570	2.362	5.0833	4.000	-	17.600 (lbs)	326062
m	40	D 40	50.00	30.00	40.00	89.00	66.70	80.00	1.80 (kg)	326084
	50	D 40	55.00	30.00	40.00	89.00	66.70	80.00	4.50 (kg)	326082
	50	D 60	80.00	40.00	60.00	19.10	101.60	-	8.00 (kg)	326062

B10-N: 10-13

B10: xii-xiii



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

Inserts sold separately

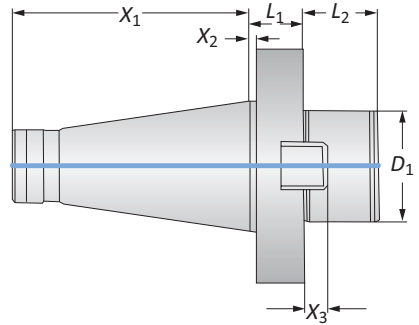
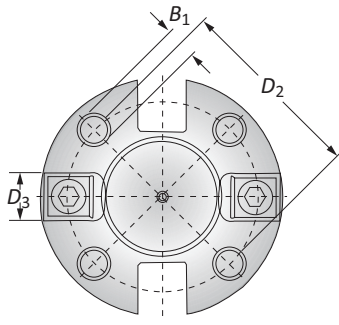
**WARNING** Exceeding weight capacity for machine tool spindle and tool changer can cause machine damage, and/or serious injury. To prevent:  
-Consult machine tool builder for machine's weight limitations.  
Factory technical assistance is also available for specific applications through our Application Engineering department. ext: 7611 | email: appeng@alliedmachine.com

**WARNING** Tool failure can cause serious injury. To prevent:  
-Do not exceed recommended 10xD length to diameter ratio or exceed 4 total components (including shank)  
-Refer to example on page B10-N: 8 for calculating length to diameter ratio  
Factory technical assistance is available for your specific applications through our Application Engineering department. ext: 7611 | email: appeng@alliedmachine.com



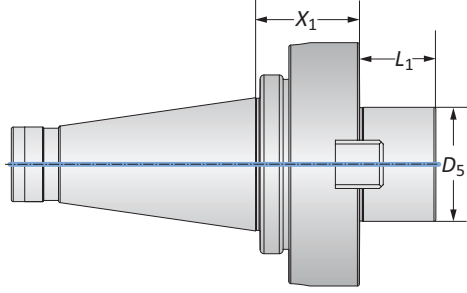
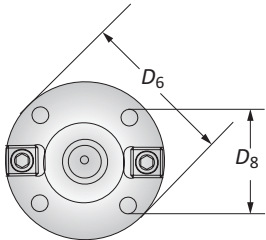
### Master Shanks D 40 / D 60

NMTB Shanks | DIN 2080 Shanks



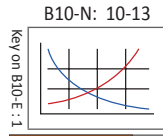
#### NMTB Shanks

	Taper Size	Connection	Shank								Weight	Part No.	
			$X_1$	$X_2$	$L_1$	$L_2$	$D_1$	$X_3$	$D_2$	$D_3$			$B_1$
<b>i</b>	50	D 60	4.992	0.125	1.141	1.574	2.362	0.492	4.000	1.000	M16	17.637 (lbs)	198051T004480
<b>m</b>	50	D 60	126.80	3.20	29.00	40.00	60.00	12.50	101.60	25.40	M16	8.00 (kg)	198051T004480



#### DIN 2080 Shanks

	Taper Size	Connection	Shank						Weight	Part No.
			$X_1$	$L_1$	$D_5$	$D_6$	$D_8$	$B_1$		
<b>i</b>	50	D 60	2.165	1.574	2.362	5.039	4.000	-	14.991 (lbs)	326035
<b>m</b>	50	D 60	55.00	40.00	60.00	128.00	101.60	-	6.80 (kg)	326035



**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:  
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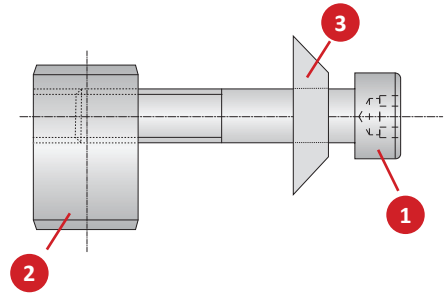


### 338 (337) / 538 (537) Accessories

Clamping Pieces | Counter Weights | Insert Holders for Abrasive Materials

#### 338 (337) and 538 (537) Clamping Pieces

	Boring Range	1 Cap Screw		2 Clamping Nut	3 Disk Spring	Complete Part No.
		Part No.	Service Key	Part No.	Part No.	
i	7.870 - 33.070	215101	s6 / B	140118	337105	137026
	7.870 - 40.160	215101	s6 / B	215105	337105	137027
	19.690 - 128.150	215101	s6 / B	215105	337105	137019
m	100.00 - 205.00	215101	s6 / B	140118	337105	137026
	200.00 - 1020.00	215102	s6 / B	215105	337105	137027
	500.00 - 3255.00	415900	s6 / B	215105	337105	137019

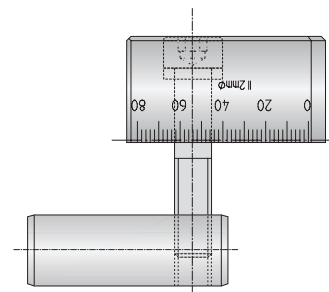


#### 338 (337) Counter Weights

	Boring Range	Part No.
i	7.870 - 33.070	338011
	7.870 - 40.160	338011
	19.690 - 128.150	338076
m	200.00 - 840.00	337011
	200.00 - 1020.00	337011
	500.00 - 3255.00	337076

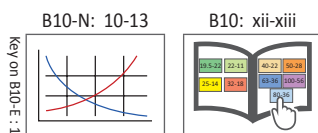
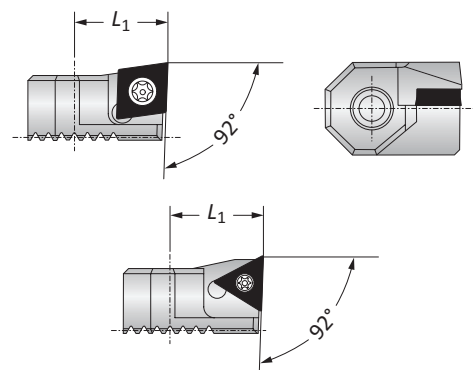
#### 538 (537) Counter Weights

	Boring Range	Part No.
i	7.870 - 33.070	538041
	7.870 - 40.160	538041
	19.690 - 128.150	538042
m	200.00 - 840.00	537041
	200.00 - 1020.00	537041
	500.00 - 3255.00	537042



#### Insert Holders for Abrasive Materials

	Boring Range	L <sub>1</sub>	Weight	Insert Form	Part No.
i	7.874 - 33.070	0.708	0.066 (lbs)	20	211061
	7.874 - 40.157	0.708	0.066 (lbs)	101	211063
	19.685 - 128.149	0.708	0.066 (lbs)	103	211065
m	200.00 - 840.00	18.00	0.03 (kg)	20	211061
	200.00 - 1020.00	18.00	0.03 (kg)	101	211063
	500.00 - 3255.00	18.00	0.03 (kg)	103	211065



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

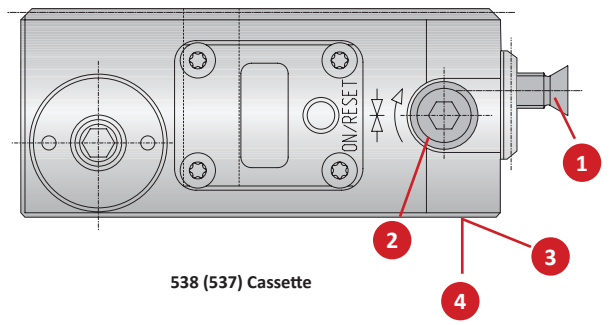
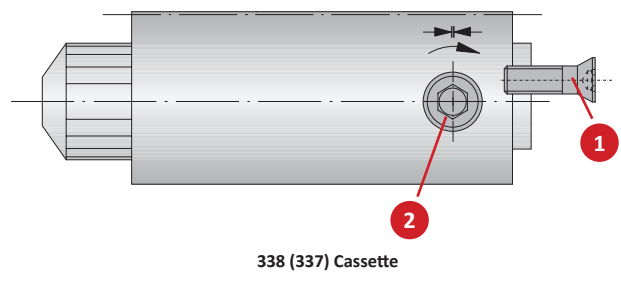
Inserts sold separately

**WARNING** Exceeding weight capacity for machine tool spindle and tool changer can cause machine damage, and/or serious injury. To prevent:  
-Consult machine tool builder for machine's weight limitations.  
Factory technical assistance is also available for specific applications through our Application Engineering department. ext: 7611 | email: appeng@alliedmachine.com

**WARNING** Tool failure can cause serious injury. To prevent:  
-Do not exceed recommended 10xD length to diameter ratio or exceed 4 total components (including shank)  
-Refer to example on page B10-N: 8 for calculating length to diameter ratio  
Factory technical assistance is available for your specific applications through our Application Engineering department. ext: 7611 | email: appeng@alliedmachine.com

### 338 (337) / 538 (537) Accessories

#### Clamping Pieces

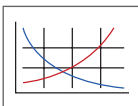


#### 338 (337) and 538 (537) Clamping Pieces

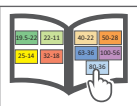
Cassette Part No.	1 Countersunk Screw		2 Clamping Screw		3 Battery Access Cover		4 Sealing Ring	*Battery	
	Part No.	Service Key	Part No.	Service Key	Part No.	Service Key	Part No.	Part No.	
i 338017	215462	T20 / H	136193	s4 / F	-	-	-	-	
	538001	415985	T20 / H	136193	s4 / F	501016	T20 / H	415895	415896
m 337017	215462	T20 / H	136193	s4 / F	-	-	-	-	
	537001	415985	T20 / H	136193	s4 / F	501016	T20 / H	415895	415896

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

B10-N: 10-13



B10: xii-xiii



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

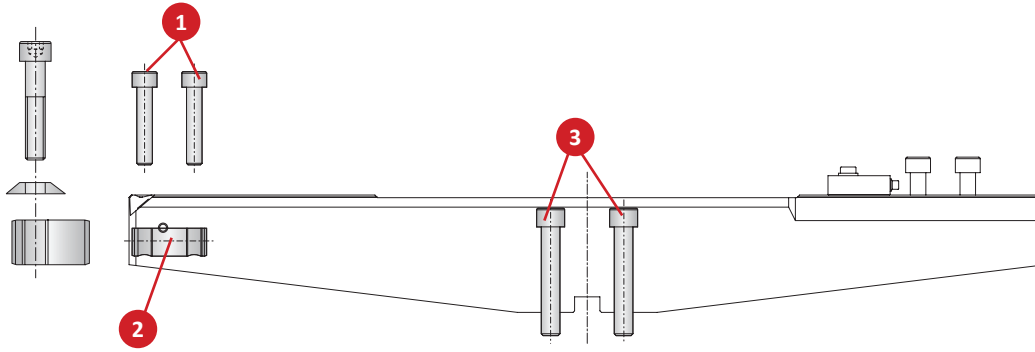
**WARNING** Exceeding weight capacity for machine tool spindle and tool changer can cause machine damage, and/or serious injury. To prevent:  
 -Consult machine tool builder for machine's weight limitations.  
 Factory technical assistance is also available for specific applications through our Application Engineering department. ext: 7611 | email: [appeng@alliedmachine.com](mailto:appeng@alliedmachine.com)

**WARNING** Tool failure can cause serious injury. To prevent:  
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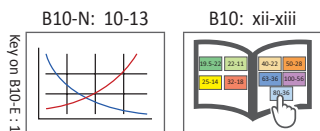
## Serrated Slide Basic D 40 Accessories

### Clamping Pieces



### Clamping Pieces

Connection	Serrated Slide Part No.	1 Cap Screw		2 Clamping Nut Part No.	3 Thread Pin		Cap Screw		
		Part No.	Service Key		Part No.	Service Key	Part No.	Service Key	
i	D 40	350021	115118	s8 / B	115669	349010	s4 / F	315186	s10 / C
	D 40	350022	115118	s8 / B	115669	349011	s4 / F	315186	s10 / C
	D 40	350023	115118	s8 / B	115669	349012	s4 / F	315186	s10 / C
	D 40	350024	115118	s8 / B	115669	349013	s4 / F	315186	s10 / C
m	D 40	349021	115118	s8 / B	115669	349010	s4 / F	315186	s10 / C
	D 40	349022	115118	s8 / B	115669	349011	s4 / F	315186	s10 / C
	D 40	349023	115118	s8 / B	115669	349012	s4 / F	315186	s10 / C
	D 40	349024	115118	s8 / B	115669	349013	s4 / F	315186	s10 / C



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

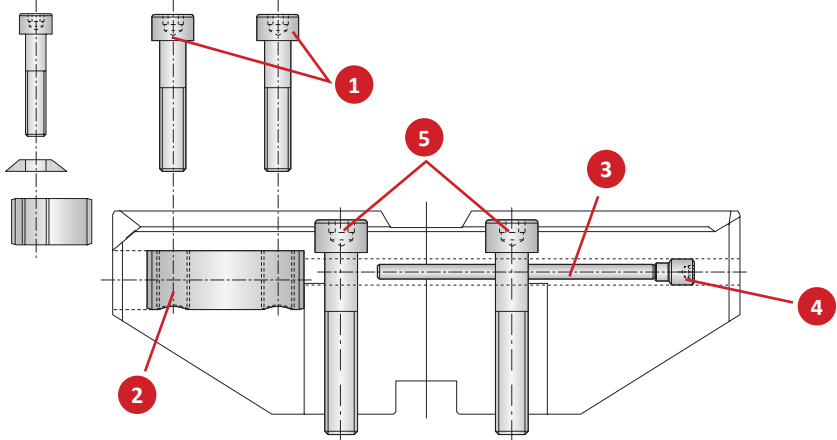
Inserts sold separately

**WARNING** Exceeding weight capacity for machine tool spindle and tool changer can cause machine damage, and/or serious injury. To prevent:  
-Consult machine tool builder for machine's weight limitations.  
Factory technical assistance is also available for specific applications through our Application Engineering department. ext: 7611 | email: appeng@alliedmachine.com

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Factory technical assistance is available for your specific applications through our Application Engineering department. ext: 7611 | email: appeng@alliedmachine.com

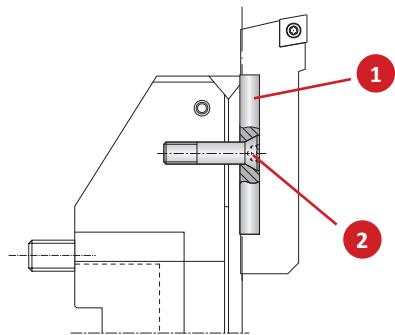
### Serrated Slide Basic D 60 Accessories

Clamping Pieces | Cover Plates



#### Clamping Pieces

Connection	Serrated Slide Part No.	1 Cap Screw		2 Clamping Nut Part No.	3 Adjustment Pin Part No.	4 Thread Pin		5 Cap Screw		
		Part No.	Service Key			Part No.	Service Key	Part No.	Service Key	
i	D 60	350051	115118	s8 / B	115669	114112	115196	s4 / F	115170	s14 / C
	D 60	350052	115118	s8 / B	115669	114113	115196	s4 / F	115170	s14 / C
	D 60	350053	115118	s8 / B	115669	114114	115196	s4 / F	115170	s14 / C
	D 60	350054	115118	s8 / B	115669	114115	115196	s4 / F	115170	s14 / C
m	D 60	349051	115118	s8 / B	115669	114112	115196	s4 / F	115170	s14 / C
	D 60	349052	115118	s8 / B	115669	114113	115196	s4 / F	115170	s14 / C
	D 60	349053	115118	s8 / B	115669	114114	115196	s4 / F	115170	s14 / C
	D 60	349054	115118	s8 / B	115669	114115	115196	s4 / F	115170	s14 / C



#### Cover Plates for Basic D 60 Serrated Slides

Connection	Serrated Slide Part No.	1 Cover Plate Part No.	2 Countersunk Screw		
			Part No.	Service Key	
i	D 60	350051	349016	063106-1	s4 / B
	D 60	350052	349017	063106-1	s4 / B
	D 60	350053	349017	063106-1	s4 / B
	D 60	350054	349017	063106-1	s4 / B
m	D 60	349051	349016	063106-1	s4 / B
	D 60	349052	349017	063106-1	s4 / B
	D 60	349053	349017	063106-1	s4 / B
	D 60	349054	349017	063106-1	s4 / B

B10-N: 10-13

B10: xii-xiii

Key on B10-E-1

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

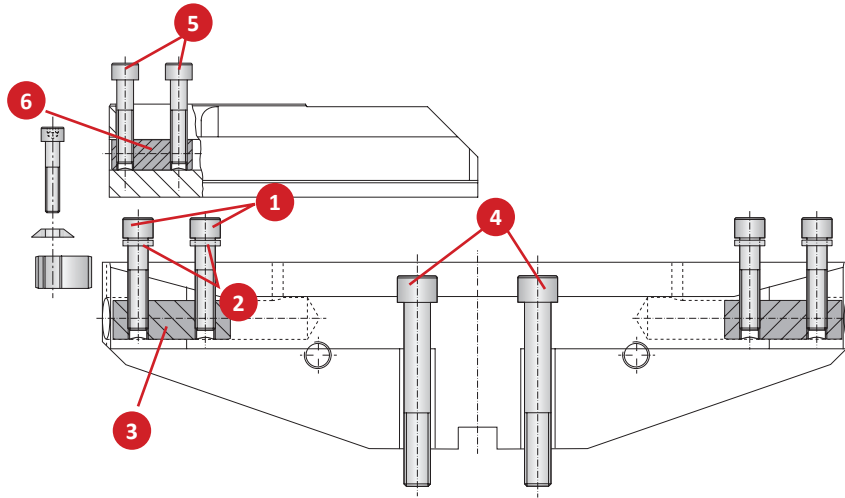
**WARNING** Exceeding weight capacity for machine tool spindle and tool changer can cause machine damage, and/or serious injury. To prevent:  
-Consult machine tool builder for machine's weight limitations.  
Factory technical assistance is also available for specific applications through our Application Engineering department. ext: 7611 | email: appeng@alliedmachine.com

**WARNING** Tool failure can cause serious injury. To prevent:  
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## Serrated Slide Eco D 60 Accessories

### Clamping Pieces

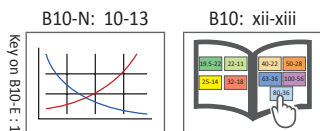


### Base Slide Clamping Pieces

Connection	Base Slide Part No.	1 Cap Screw		2 Disc Part No.	3 Clamping Nut Part No.	4 Cap Screw		
		Part No.	Service Key			Part No.	Service Key	
i	D 60	350005	115771	s10 / C	115737	415181	077128	s14 / C
	D 60	350006	115771	s10 / C	115737	415181	077128	s14 / C
m	D 60	349005	115771	s10 / C	115737	415181	077128	s14 / C
	D 60	349006	115771	s10 / C	115737	415181	077128	s14 / C

### Serrated Slide Clamping Pieces

Serrated Slide Part No.	Service Key	5 Cap Screw		6 Clamping Nut Part No.	
		Part No.	Service Key		
i	350014		115118	s8 / B	115669
	350015		115118	s8 / B	115669
m	349014		115118	s8 / B	115669
	349015		115118	s8 / B	115669



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

Inserts sold separately

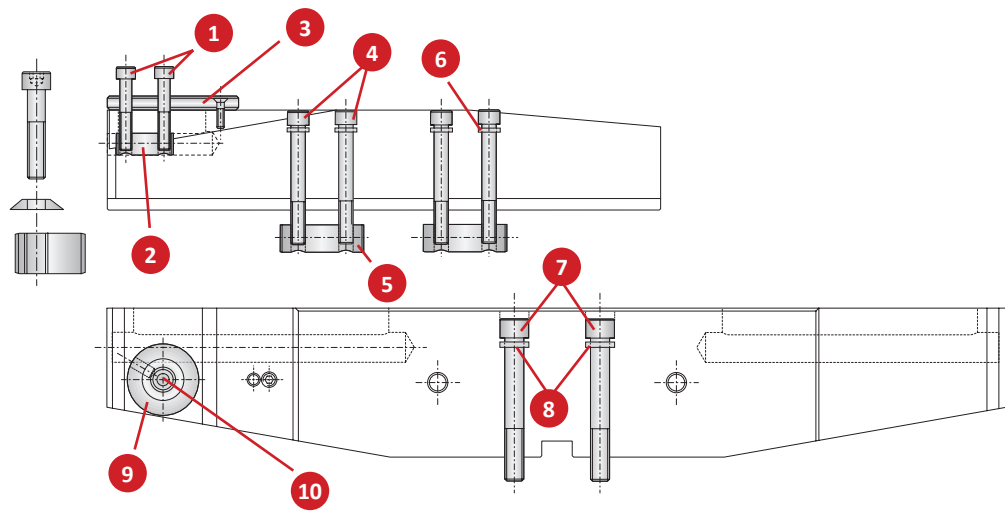
**WARNING** Exceeding weight capacity for machine tool spindle and tool changer can cause machine damage, and/or serious injury. To prevent:  
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## Serrated Slide Flex D 60 Accessories

### Clamping Pieces

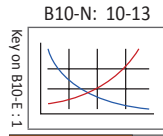


### Serrated Slide Clamping Pieces

Serrated Slide	1 Cap Screw		2 Clamping Nut		3 Adapter		4 Cap Screw		5 Clamping Nut		6 Disk	
	Part No.	Part No.	Service Key	Part No.	Part No.	Service Key	Part No.	Service Key	Part No.	Part No.	Part No.	Part No.
i	350035	115307	s8 / B	115669	349043	s4 / B	315186	s10 / C	349202	415181	115737	115737
	350036	115307	s8 / B	115669	349043	s4 / B	077110	s10 / C	349202	415181	115737	115737
	350037	115307	s8 / B	115669	349043	s4 / B	315403	s10 / C	349202	415181	115737	115737
	350038	115307	s8 / B	115669	349043	s4 / B	315415	s10 / C	349202	415181	115737	115737
m	349035	115307	s8 / B	115669	349043	s4 / B	315186	s10 / C	349202	415181	115737	115737
	349036	115307	s8 / B	115669	349043	s4 / B	077110	s10 / C	349202	415181	115737	115737
	349037	115307	s8 / B	115669	349043	s4 / B	315403	s10 / C	349202	415181	115737	115737
	349038	115307	s8 / B	115669	349043	s4 / B	315415	s10 / C	349202	415181	115737	115737

### Base Slide Clamping Pieces

Connection	Base Slide	7 Cap Screw		8 Disk	9 Injector	10 Countersunk Screw		
	Part No.	Part No.	Service Key	Part No.	Part No.	Part No.	Service Key	
i	D 60	350031	115736	s14 / C	068168	349201	415898	s6 / B
	D 60	350032	415913	s14 / C	068168	349201	415898	s6 / B
	D 60	350033	215509	s14 / C	068168	349201	415898	s6 / B
	D 60	350034	415636	s14 / C	068168	349201	415898	s6 / B
m	D 60	349031	115736	s14 / C	068168	349201	415898	s6 / B
	D 60	349032	415913	s14 / C	068168	349201	415898	s6 / B
	D 60	349033	215509	s14 / C	068168	349201	415898	s6 / B
	D 60	349034	415636	s14 / C	068168	349201	415898	s6 / B



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SECTION

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# B10-F

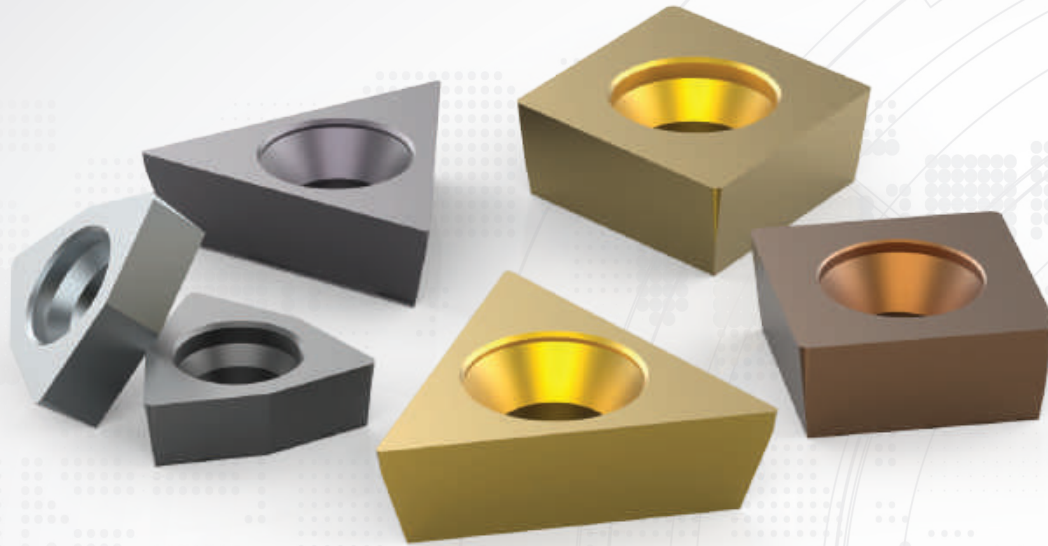
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Inserts



# Wohlhaupter™ Inserts

Replaceable Boring Inserts



## Cutting-Edge Technology

Wohlhaupter has the cutting-edge technology to achieve all of your boring applications. With precision in mind, our inserts are available in multiple insert geometries, coatings, and nose radii. Wohlhaupter inserts are offered in uncoated and coated carbide, cermet, as well as CBN and PCD materials.

Try our easy-to-use boring insert selector available online or download from the app store to find the perfect inserts for your boring applications.

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

## Applicable Industries



Aerospace



Agriculture



Automotive



Firearms



General  
Machining



Oil & Gas



Renewable  
Energy

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



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

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

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

### **WARNING**

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

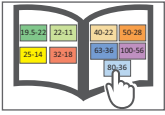
**NOTICE** means that failure to follow the precautions in this message could result in damage to the tool or machine but not result in personal injury.

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

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

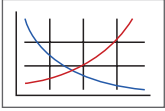
### Reference Icons

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



#### MVS Connection Color Guide

Detailed instructions and information regarding the MVS connection(s)



#### Recommended Cutting Data

Speed and feed recommendations for optimum and safe boring

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## WOHLHAUPTER®

### Boring Insert Selector

Find the best insert for your application.

- Generate the correct boring insert for your job in just six easy steps
- Choose type, shape, substrate, insert form, nose radius, and material
- Order easily by adding the item to your cart

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



## Wohlhaupter Insert Product Nomenclature

### Reference Key

Symbol	Insert Type
▼	Roughing - Main Application
▽	Roughing - Extended Application
▼▼	Universal - Main Application
▽▽	Universal - Extended Application
▼▼▼	Finishing - Main Application
▽▽▽	Finishing - Extended Application

### Reference Key

Symbol	Machining Conditions
●	Good - Main Application
○	Good - Extended Application
●	Average - Main Application
○	Average - Extended Application
⚙	Difficult - Main Application
⚙	Difficult - Extended Application

### Reference Key

Symbol	Wohlhaupter Insert Grades
<b>WHW</b>	Uncoated carbide (HW)
<b>WHC</b>	Coated carbide (HC)
<b>WHT</b>	Uncoated cermet (HT)
<b>WTC</b>	Coated cermet (HC)
<b>WCN</b>	Ceramic cutting material (CN)
<b>WBN</b>	Cubic boron nitride CBN (BN)
<b>WBC</b>	Coated CBN (BC)
<b>PCD</b>	Polycrystalline diamond PCD (DP)

### Wohlhaupter Inserts

<b>F101</b>	<b>04</b>	<b>M</b>	<b>N</b>	-	<b>158</b>	<b>W</b>
1	2	3	4		5	6

1. Wohlhaupter Insert Form	
211	262
20	264
161	112
163	113
47	114
101	04
103	05
104	89
105	90
123	91
124	304
39	325
75	

2. Corner Radius
<b>Metric (mm)</b>
<b>005</b> = 0.05mm
<b>01</b> = 0.10mm
<b>02</b> = 0.20mm
<b>03</b> = 0.30mm
<b>04</b> = 0.40mm
<b>06</b> = 0.60mm
<b>08</b> = 0.80mm
<b>12</b> = 1.20mm
<b>16</b> = 1.60mm
<b>20</b> = 2.00mm
<b>24</b> = 2.40mm

3. Tolerance Group		
	<b>Metric (mm)</b>	
	Length of edge	±0.025
<b>G</b>	IC	±0.025
	Thickness	±0.13
	Length of edge	±0.08-0.15*
<b>M</b>	IC	±0.05-0.10*
	Thickness	±0.13
	Length of edge	±0.013
<b>F</b>	IC	±0.005
	Thickness	±0.025
	Length of edge	±0.13
<b>C</b>	IC	±0.025
	Thickness	±0.025
*Varies upon insert size		

4. Machining Direction
<b>N</b> = Neutral
<b>L</b> = Left
<b>R</b> = Right

5. Geometry						
Carbide	Carbide	Tangential	Ceramic	PCD	CBN	
<b>108</b>	<b>155</b>	<b>880</b>	<b>711</b>	<b>530</b>	<b>538</b>	
<b>109</b>	<b>158</b>	<b>811</b>		<b>720</b>	<b>741</b>	
<b>112</b>	<b>161</b>			<b>730</b>	<b>742</b>	
<b>114</b>	<b>161</b>			<b>735</b>	<b>745</b>	
<b>117</b>	<b>174W</b>				<b>747</b>	
<b>121</b>	<b>192</b>				<b>748</b>	
<b>122</b>	<b>199</b>				<b>749</b>	
<b>126</b>	<b>200</b>				<b>768</b>	
<b>127</b>	<b>650</b>					
<b>128</b>	<b>840</b>					
<b>129</b>	<b>850</b>					
<b>145</b>	<b>860</b>					

6. Optional Information
<b>W</b> = Wiper Geometry

## ISO Insert Nomenclature

### DIN ISO 1832

<b>C</b>	<b>C</b>	<b>M</b>	<b>T</b>	<b>09</b>	<b>T3</b>	<b>02</b>
1	2	3	4	5	6	7

1. Basic Insert Form	2. Clearance Angle	3. Tolerance Group	4. Mounting Style
<b>C</b> = Rhomboid 80° <b>D</b> = Rhomboid 55° <b>L</b> = Rectangular <b>R</b> = Round <b>S</b> = Square <b>T</b> = Triangular <b>V</b> = Rhomboid 35° <b>W</b> = Trigon	<b>B</b> = 5° <b>C</b> = 7° <b>N</b> = 0° <b>P</b> = 11° <b>O</b> = 10°	<b>Metric (mm)</b> Length of edge ±0.025 <b>G</b> IC ±0.025 Thickness ±0.13 Length of edge ±0.08-0.15* <b>M</b> IC ±0.05-0.10* Thickness ±0.13 Length of edge ±0.013 <b>F</b> IC ±0.005 Thickness ±0.025 Length of edge ±0.13 <b>C</b> IC ±0.025 Thickness ±0.025 *Varies upon insert size	<b>T</b> = One sided countersunk Cylindrical fixing hole Countersunk 40° - 60° <b>H</b> = One sided chipbreaker Cylindrical fixing hole Countersunk 70° - 90° <b>W</b> = Without chipbreaker Cylindrical fixing hole Countersunk 40° - 60° <b>X</b> = Special design Special insert design <b>A</b> = Without chipbreaker Cylindrical fixing hole Without countersunk

5. Insert Size / Cutting Edge							
Metric (mm)	C	D	R	S	T	V	W
3.97mm					006		03
5.00mm					F20		
6.00mm					F21		
6.35mm	06				11	11	
7.94mm				07			
9.52mm	09	11		09	16	16	
10.00mm		10					
12.00mm	12	12					
12.70mm	16	15		12			
15.87mm			15	15			
16.00mm			16				
19.05mm		19		19			
20.00mm			20				
25.00mm			25				
25.40mm				25			

6. Insert Thickness
<b>Metric (mm)</b> <b>01</b> = 1.59mm <b>02</b> = 2.38mm <b>T2</b> = 2.78mm <b>03</b> = 3.18mm <b>T3</b> = 3.97mm <b>04</b> = 4.76mm <b>05</b> = 5.56mm <b>06</b> = 6.35mm <b>07</b> = 7.94mm

7. Corner Radius
<b>Metric (mm)</b> <b>005</b> = 0.05mm <b>01</b> = 0.10mm <b>02</b> = 0.20mm <b>03</b> = 0.30mm <b>04</b> = 0.40mm <b>06</b> = 0.60mm <b>08</b> = 0.80mm <b>12</b> = 1.20mm <b>16</b> = 1.60mm <b>20</b> = 2.00mm <b>24</b> = 2.40mm

## Wohlhaupter Insert Grades

### Uncoated Carbides

#### Uncoated Carbides

Cutting Material	Description	Material	ISO Application							
			05	10	15	20	25	30	35	40
WHW01 (HW)	<ul style="list-style-type: none"> <li>Fine-grain carbide</li> <li>Finishing &amp; light roughing</li> <li>Non-ferrous metals, cast materials &amp; difficult-to-machine alloys</li> </ul>	P								
		M								
		K								
		N								
		S								
WHW03 (HW)	<ul style="list-style-type: none"> <li>Fine-grain carbide</li> <li>Grooving &amp; roughing</li> <li>Non-ferrous metals, cast materials &amp; difficult-to-machine alloys</li> </ul>	P								
		M								
		K								
		N								
		S								
WHW16 (HW)	<ul style="list-style-type: none"> <li>Fine-grain carbide</li> <li>Finishing &amp; light roughing</li> <li>Non-ferrous metals, cast materials &amp; difficult-to-machine alloys</li> </ul>	P								
		M								
		K								
		N								
		S								
WHW20 (HW)	<ul style="list-style-type: none"> <li>Tough fine-grain carbide</li> <li>Finishing roughing &amp; grooving. Steel &amp; cast materials, cast steel</li> <li>Non-ferrous materials &amp; difficult-to-machine alloys</li> </ul>	P								
		M								
		K								
		N								
		S								



## Wohlhaupter Insert Grades

### Coated Carbides

#### Coated Carbides

Cutting Material	Description	Material	ISO Application							
			05	10	15	20	25	30	35	40
WHC05 (HC)	<ul style="list-style-type: none"> <li>PVD coating with nano-composite structure</li> <li>Finishing &amp; roughing</li> <li>Steels, stainless steels, cast materials, &amp; difficult-to-machine alloys</li> </ul>	P								
		M								
		K								
		N								
		S								
		H								
WHC18 (HC)	<ul style="list-style-type: none"> <li>PVD-TiB2 coating</li> <li>Finishing &amp; light roughing</li> <li>Non-ferrous metals</li> </ul>	P								
		M								
		K								
		N								
		S								
		H								
WHC19 (HC)	<ul style="list-style-type: none"> <li>Multi-layer PVD coating</li> <li>Finishing &amp; roughing</li> <li>Stainless steels</li> </ul>	P								
		M								
		K								
		N								
		S								
		H								
WHC20 (HC)	<ul style="list-style-type: none"> <li>Multi-layer CVD coating</li> <li>Finishing</li> <li>Steels &amp; stainless steels</li> </ul>	P								
		M								
		K								
		N								
		S								
		H								
WHC30 (HC)	<ul style="list-style-type: none"> <li>CVD coating</li> <li>Roughing</li> <li>Steel &amp; cast steel</li> </ul>	P								
		M								
		K								
		N								
		S								
		H								
WHC79 (HC)	<ul style="list-style-type: none"> <li>Multi-layer MT CVD coating</li> <li>Roughing &amp; finishing</li> <li>Steels, stainless steels &amp; cast materials</li> </ul>	P								
		M								
		K								
		N								
		S								
		H								
WHC98 (HC)	<ul style="list-style-type: none"> <li>PVD TiAlN coating</li> <li>Roughing &amp; finishing</li> <li>Steels, stainless steels &amp; difficult-to-machine materials</li> </ul>	P								
		M								
		K								
		N								
		S								
		H								

## Wohlhaupter Insert Grades

### Coated Carbides

#### Coated Carbides

Cutting Material	Description	Material	ISO Application							
			05	10	15	20	25	30	35	40
WHC110 (HC)	<ul style="list-style-type: none"> <li>Multi-layer PVD coating</li> <li>Finishing</li> <li>Steels &amp; stainless steels</li> </ul>	P								
		M								
		K								
		N								
		S								
WHC111 (HC)	<ul style="list-style-type: none"> <li>PVD TiAlN coating</li> <li>Finishing</li> <li>Machining of steels after heat treating with high Cr content up to 60 HRC</li> <li>Hard - soft transitions, difficult-to-machine alloys &amp; stainless steels</li> </ul>	P								
		M								
		K								
		N								
		S								
WHC114 (HC)	<ul style="list-style-type: none"> <li>Multi-layer PVD coating</li> <li>Finishing &amp; roughing</li> <li>Steels, stainless steels, &amp; difficult-to-machine materials</li> </ul>	P								
		M								
		K								
		N								
		S								
WHC136 (HC)	<ul style="list-style-type: none"> <li>Stronger PVD coating with improved coating adhesion</li> <li>High oxidation resistance allows a wide range of applications</li> </ul>	P								
		M								
		K								
		N								
		S								
WHC164 (HC)	<ul style="list-style-type: none"> <li>Thick MT-CVD coating with a dominant AC<sub>2</sub>O<sub>3</sub></li> <li>Primarily developed for the material groups P-K &amp; alternatively H</li> <li>Full &amp; discontinuous cut</li> <li>High cutting speeds possible</li> </ul>	P								
		M								
		K								
		N								
		S								
WHC168 (HC)	<ul style="list-style-type: none"> <li>Multi-layer MT CVD coating</li> <li>Excellent combination of toughness &amp; reliability</li> <li>Steels, cast materials &amp; alternatively for stainless steel</li> </ul>	P								
		M								
		K								
		N								
		S								
WHC198 (HC)	<ul style="list-style-type: none"> <li>Upgraded PVD grade with hard AlTiN coating</li> <li>Optimized cutting edge stability</li> <li>General machining of steel, stainless steel, high temperature resistant alloys, titanium, iron, cast iron, &amp; non-ferrous materials</li> </ul>	P								
		M								
		K								
		N								
		S								

## Wohlhaupter Insert Grades

Uncoated Cermet | Coated Cermet

### Uncoated Cermet

Cutting Material	Description	Material	ISO Application							
			05	10	15	20	25	30	35	40
WHT10 (HT)	<ul style="list-style-type: none"> <li>Uncoated cermet</li> <li>Finishing</li> <li>Steels, stainless steels &amp; cast materials</li> </ul>	P								
		M								
		K								
		N								
		S								
		H								
WHT12 (HC)	<ul style="list-style-type: none"> <li>Uncoated cermet</li> <li>Finishing</li> <li>Steels, cast materials, sintered metals, &amp; non-ferrous metals</li> </ul>	P								
		M								
		K								
		N								
		S								
		H								
WHT32 (HC)	<ul style="list-style-type: none"> <li>Uncoated cermet</li> <li>Finishing</li> <li>Steels &amp; cast materials</li> </ul>	P								
		M								
		K								
		N								
		S								
		H								

### Coated Cermet

Cutting Material	Description	Material	ISO Application							
			05	10	15	20	25	30	35	40
WTC15 (TC)	<ul style="list-style-type: none"> <li>New PVD brilliant coating</li> <li>Reduce friction coefficient in turning applications</li> <li>Coated cermet general purpose grade for material group</li> <li>Achieves excellent surface finish with excellent wear resistance</li> <li>Usable in stainless steels</li> </ul>	P								
		M								
		K								
		N								
		S								
		H								
WTC121 (TC)	<ul style="list-style-type: none"> <li>PVD coated cermet</li> <li>Finishing of steels &amp; stainless steels</li> </ul>	P								
		M								
		K								
		N								
		S								
		H								

## Wohlhaupter Insert Grades

Uncoated Cubic Boron Nitride | Coated Cubic Boron Nitride

### Uncoated Cubic Boron Nitride

Cutting Material	Description	Material	ISO Application							
			05	10	15	20	25	30	35	40
WBN150 (BN)	<ul style="list-style-type: none"> <li>Uncoated CBN grade</li> <li>Roughing &amp; finishing smooth &amp; slightly discontinuous cuts</li> <li>Hardened steels 58 - 64 HRC</li> <li>Grain size 2 µm</li> <li>CBN content: 50%</li> </ul>	P								
		M								
		K								
		N								
		S								
		H								
WBN200 (BN)	<ul style="list-style-type: none"> <li>Uncoated CBN grade</li> <li>Roughing &amp; finishing highly discontinuous cuts</li> <li>Hardened steels 58 - 64 HRC</li> <li>Grain size 3 µm</li> <li>CBN content: 65%</li> </ul>	P								
		M								
		K								
		N								
		S								
		H								
WBN300 (BN)	<ul style="list-style-type: none"> <li>Uncoated CBN grade</li> <li>Roughing &amp; finishing smooth cuts</li> <li>Hardened steels 58 - 64 HRC</li> <li>Grain size 0.5 - 1.0 µm</li> <li>CBN content: approximately 50%</li> </ul>	P								
		M								
		K								
		N								
		S								
		H								
WBN450 (BN)	<ul style="list-style-type: none"> <li>Uncoated CBN grade</li> <li>Roughing &amp; finishing smooth &amp; discontinuous cuts</li> <li>Pearlite gray cast iron &amp; sintered metals</li> <li>Grain size 2 µm</li> <li>CBN content: 90%</li> </ul>	P								
		M								
		K								
		N								
		S								
		H								

### Coated Cubic Boron Nitride

Cutting Material	Description	Material	ISO Application							
			05	10	15	20	25	30	35	40
WBC... (BC)	<ul style="list-style-type: none"> <li>Single and multiple assembled</li> <li>Different sizes &amp; designs available upon request. Please contact our Application Engineering Department</li> <li>email: <a href="mailto:appeng@alliedmachine.com">appeng@alliedmachine.com</a></li> <li>ext: 7611</li> </ul>	P								
		M								
		K								
		N								
		S								
		H								

## Wohlhaupter Insert Grades

Polycrystalline Diamond | Ceramic Cutting Material

### Polycrystalline Diamond

Cutting Material	Description	Material	ISO Application							
			05	10	15	20	25	30	35	40
PCD D30 (DP)	<ul style="list-style-type: none"> <li>PCD medium grain grade</li> <li>Finishing</li> <li>Al alloys &amp; Mg alloys up to 12% Si</li> <li>Grain size 10 µm</li> </ul>	P								
		M								
		K								
		N								
		S								
		H								
PCD D50 (DP)	<ul style="list-style-type: none"> <li>PCD mixed-grain grade</li> <li>Finishing</li> <li>CFRP, GRP, MMC, Al alloys over 12% Si</li> <li>Grain size 2 - 30 µm</li> </ul>	P								
		M								
		K								
		N								
		S								
		H								

### Ceramic Cutting Material











Cutting Material	Description	Material	ISO Application							
			05	10	15	20	25	30	35	40
WCN06 (CN)	<ul style="list-style-type: none"> <li>Uncoated silicon-nitride ceramic</li> <li>Roughing</li> <li>Pearlite gray cast-iron</li> </ul>	P								
		M								
		K								
		N								
		S								
		H								



## Wohlhaupter Insert Geometries

Cermet | Carbide

Cermet | Carbide

Geometry	Description	Application	Available Form
108 	<ul style="list-style-type: none"> <li>Sintered chip breaker for higher feeds</li> <li>Suitable for highly discontinuous cuts</li> </ul>	▼▼▼ ▼	F101, F103, F104, F112, F113
109 	<ul style="list-style-type: none"> <li>Sintered geometry with V-shaped chip breaker for roughing &amp; finishing</li> <li>Good chip control even for shallow depth of cut</li> </ul>	▼▼▼ ▼	F101, F103, F104
112 	<ul style="list-style-type: none"> <li>Sintered chip breaker</li> <li>Finishing &amp; light roughing</li> </ul>	▼▼▼ ▼	F101, F03
117 	<ul style="list-style-type: none"> <li>Sintered geometry for medium machining &amp; roughing</li> <li>Main application in material groups P, M, &amp; K</li> </ul>	▼▼▼ ▼	F75, F123, F124
121 	<ul style="list-style-type: none"> <li>Positive geometry with stable cutting edge</li> <li>Finishing in different material groups</li> <li>Good chip control</li> </ul>	▼▼▼	F20, F211
122 	<ul style="list-style-type: none"> <li>Sintered chip breaker</li> <li>Good chip control - even with long-chipping materials</li> </ul>	▼▼▼	F101, F103, F161
126 	<ul style="list-style-type: none"> <li>Sintered version with a wide range of applications</li> </ul>	▼	F105
127 	<ul style="list-style-type: none"> <li>Highly positive sintered geometry</li> <li>For non-ferrous metals &amp; cast iron</li> </ul>	▼▼▼ ▼	F39, F101, F103, F104, F112, F113, F262, F264
128 	<ul style="list-style-type: none"> <li>Highly positive sintered geometry</li> <li>Polished for finishing non-ferrous metals, cast iron, &amp; steel</li> </ul>	▼▼▼	F20
129 	<ul style="list-style-type: none"> <li>Highly positive chip breaking geometry</li> <li>Polished for non-ferrous metals, cast iron, &amp; steel</li> <li>Ideal for structural steel applications</li> </ul>	▼▼▼ ▼	F39, F101, F103, F262, F264
145 	<ul style="list-style-type: none"> <li>Geometry for finishing in smooth &amp; discontinuous cut</li> <li>Good chip control - even with long-chipping materials</li> </ul>	▼▼▼ ▼	F101, F103, F112, F113, F161

## Wohlhaupter Insert Geometries

Cermet | Carbide

Cermet | Carbide



Geometry	Description	Application	Available Form
155 	<ul style="list-style-type: none"> <li>Positive sintered geometry</li> <li>Special cutting edge design in combination with the chip breaker design enables exceptional chip control even at shallow cutting depths &amp; light feeds</li> </ul>		F20, F101, F103, F39, F264
158 	<ul style="list-style-type: none"> <li>Stable sintered geometry for roughing &amp; finishing with &amp; without discontinuous cuts</li> </ul>		F75, F101, F103, F104, F105, F113, F114, F123, F124, F163
161 	<ul style="list-style-type: none"> <li>Slightly positive &amp; stable geometry</li> <li>Main application material groups S &amp; M. Alternatively suitable for P &amp; K</li> <li>Roughing &amp; finishing in full &amp; interrupted cuts</li> </ul>		F75, F123
167 	<ul style="list-style-type: none"> <li>Positive sintered geometry with sharp cutting edges</li> <li>Finishing up to medium machining</li> <li>Excellent for M &amp; S materials</li> </ul>		F75, F123
174W 	<ul style="list-style-type: none"> <li>Wiper geometry for highly productive turning &amp; boring</li> <li>Can be used with pitch angle 92° - 95°</li> <li>Good chip breaking properties even at lower feed rates</li> </ul>		F101, F103
192 	<ul style="list-style-type: none"> <li>Sintered version for a variety of applications</li> <li>Low cutting pressure because of sharp cutting edge prep</li> </ul>		F39, F101, F103, F104, F112, F113, F163, F161, F262, F264
199 	<ul style="list-style-type: none"> <li>Positive sintered geometry for wide variety of applications</li> <li>Special chip breaker allows chip control with different radial depth of cut</li> </ul>		F101, F103, F104, F112, F113
200 	<ul style="list-style-type: none"> <li>Highly positive sintered geometry</li> <li>Applicable for various material groups for low cutting pressure</li> </ul>		F39, F101, F103, F104, F264
650 	<ul style="list-style-type: none"> <li>Obliquely ground chip breaker reduces cutting forces</li> <li>Finishing &amp; smooth interrupted cuts</li> </ul>		F20, F211
840 	<ul style="list-style-type: none"> <li>Parallel ground chip breaker</li> <li>For finish operations with stable cutting edge</li> </ul>		F20
850 	<ul style="list-style-type: none"> <li>Parallel ground chip breaker</li> <li>Good chip control with short to medium feeds</li> </ul>		F161
860 	<ul style="list-style-type: none"> <li>Parallel ground chip breaker reduces cutting forces</li> <li>Stable for a wide range of applications</li> </ul>		F101, F103, F104, F105, F325

A  
B  
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E  
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M  
N  
INDEX


## Wohlhaupter Insert Geometries

Tangential | Ceramic

### Tangential

Geometry	Description	Application	Available Form
880 	<ul style="list-style-type: none"> <li>Large parallel ground chip breaker with 10° rake angle for reduced cutting force</li> </ul>	▼	F04, F05
811 	<ul style="list-style-type: none"> <li>Smooth geometry without additional ground chip breaker</li> <li>Reinforced cutting edges provide stability</li> <li>Excellent for cast materials</li> </ul>	▼	F05









### Ceramic

Geometry	Description	Application	Available Form
711 	<ul style="list-style-type: none"> <li>Smooth geometry with 0° rake angle</li> <li>High cutting edge stability particularly in discontinuous cuts</li> </ul>	▼	F75, F103, F104, F123

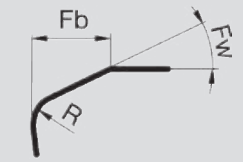
















## Wohlhaupter Insert Geometries

PCD | CBN

### PCD

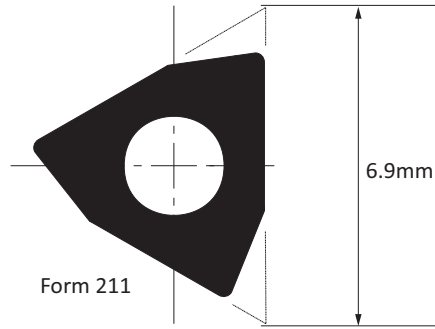
Geometry	Description	Application	Available Form
530 	<ul style="list-style-type: none"> <li>PCD-tipped cutting edge</li> </ul>		F101, F103
720 	<ul style="list-style-type: none"> <li>Smooth geometry in positive version with 7° rake angle for PCD</li> <li>Sharp cutting edge</li> </ul>		F20, F101, F103
730 	<ul style="list-style-type: none"> <li>Smooth geometry with 0° rake angle for PCD</li> <li>Sharp cutting edge</li> </ul>		F20, F39, F75, F101, F103, F123, F211, F262, F264
735 	<ul style="list-style-type: none"> <li>Smooth geometry</li> <li>Laser-cut chip breaker for PCD</li> <li>Suitable for long-chipping aluminum wrought alloys</li> </ul>		F20, F39, F101, F103, F211, F262, F264

### CBN

Geometry	Description				Application	Available Form
		R	Fb	Fw		
548 	<ul style="list-style-type: none"> <li>Smooth geometry with 0° rake angle for afforded CBN</li> <li>Rounded cutting edge - not for chamfering</li> <li>For cast materials</li> </ul>	0.015				F101, F103
741 	<ul style="list-style-type: none"> <li>Smooth geometry with 0° rake angle for CBN</li> <li>Rounded cutting edge with 30° chamfer</li> </ul>	0.015	0.15	30°		F20, F101, F103
742 	<ul style="list-style-type: none"> <li>Smooth geometry with 0° rake angle for CBN</li> <li>Rounded cutting edge with 15° chamfer</li> </ul>	0.015	0.1	15°		F20, F101, F103
745 	<ul style="list-style-type: none"> <li>Smooth geometry with 0° rake angle for CBN</li> <li>Rounded cutting edge with 30° chamfer</li> </ul>	0.015	0.05	30°		F20, F211
747 	<ul style="list-style-type: none"> <li>Smooth geometry with 0° rake angle for CBN</li> <li>Rounded cutting edge with a small 20° chamfer</li> </ul>	0.015	0.1	20°		F39, F104, F262, F264
748 	<ul style="list-style-type: none"> <li>Smooth geometry with 0° rake angle for CBN</li> <li>Rounded cutting edge</li> <li>No chamfer</li> </ul>	0.015	0.2	20°		F20, F101, F103, F211
749 	<ul style="list-style-type: none"> <li>Smooth geometry with 0° rake angle for CBN</li> <li>Rounded cutting edge with a large 20° chamfer</li> </ul>	0.015				F75, F123, F264
768 	<ul style="list-style-type: none"> <li>Smooth geometry with 7° rake angle for CBN</li> <li>Rounded cutting edge</li> </ul>	0.015				F20, F101, F103

# Insert Form 211

Cermet | Carbide



						Cermet						Carbide										
						Uncoated			Coated			Uncoated			Coated							
Material	Grade					WHT10	WHT12	WHT16	WHT32	WTC15	WTC121	WHW01	WHW16	WHC05	WHC18	WHC19	WHC79	WHC98	WHC111	WHC114	WHC136	WHC164
Steel	P					▼▼▼							▼▼▼	▼▼▼	▼▼▼	▼▼▼	▼▼▼	▼▼▼	▼▼▼	▼▼▼	▼▼▼	▼▼▼
Stainless Steel	M												▼▼▼	▼▼▼	▼▼▼	▼▼▼	▼▼▼	▼▼▼	▼▼▼	▼▼▼	▼▼▼	▼▼▼
Cast Iron	K					▽▽▽					▽▽▽		▼▼▼	▼▼▼	▼▼▼	▼▼▼	▼▼▼	▼▼▼	▼▼▼	▼▼▼	▼▼▼	▼▼▼
Non-Ferrous Materials	N					▽▽▽					▼▼▼		▼▼▼	▼▼▼	▼▼▼	▼▼▼	▼▼▼	▼▼▼	▼▼▼	▼▼▼	▼▼▼	▼▼▼
Titanium	S										▼▼▼		▼▼▼	▼▼▼	▼▼▼	▼▼▼	▼▼▼	▼▼▼	▼▼▼	▼▼▼	▼▼▼	▼▼▼
Hard Materials	H																	▼▼▼	▼▼▼	▼▼▼	▼▼▼	▼▼▼
Geometry	Radius		ISO Code	Description	Part No.	WHT10	WHT12	WHT16	WHT32	WTC15	WTC121	WHW01	WHW16	WHC05	WHC18	WHC19	WHC79	WHC98	WHC111	WHC114	WHC136	WHC164
121	0.004	0.10	WBGX030101	F21101GN121	397675											⚙			●			
121	0.008	0.20	WBGX030102	F21102GN121	397676											⚙			●			
650	0.004	0.10	WBGX030101	F21101GL650	097755		●					●		●	●							●
650	0.008	0.20	WBGX030102	F21102GL650	097454		●					●		●								●

**Reference Key**

Symbol	Insert Type
▼▼▼	Finishing - Main Application
▽▽▽	Finishing - Extended Application

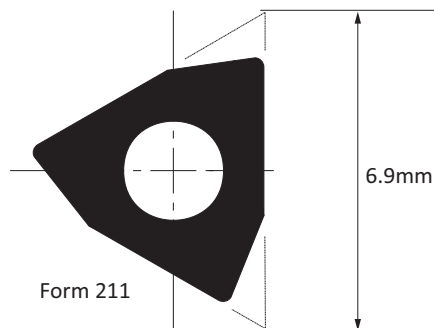
**Reference Key**

Symbol	Machining Conditions
●	Good - Main Application
◐	Average - Main Application
⚙	Difficult - Main Application



# Insert Form 211

CBN | PCD



						Ceramic		CBN				PCD		
						Uncoated	Coated	Uncoated		Coated				
Steel						P								
Stainless Steel						M								
Cast Iron						K				▼▼▼				
Non-Ferrous Materials						N						▼▼▼▼		
Titanium						S								
Hard Materials						H			▼▼▼					
Geometry	Radius		ISO Code	Description	Part No.			WBN150	WBN200	WBN300	WBN450			
	in	mm								PKDD30	PKDD50			
730	0.004	0.10	WBGX030101	F21101GN730	397763								●	
730	0.008	0.20	WBGX030102	F21102GN730	097557								● ●	
735	0.008	0.20	WBGX030102	F21102GN735	397237								● ●	
748	0.004	0.10	WBGX030101	F21101GN748	097486			●		●			●	
748	0.008	0.20	WBGX030102	F21102GN748	097552			●		●			●	

Reference Key

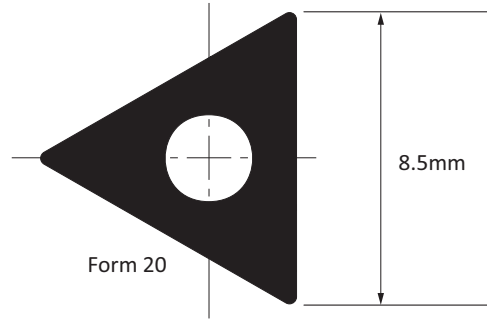
Symbol	Insert Type
▼▼▼	Finishing - Main Application

Reference Key

Symbol	Machining Conditions
●	Average - Main Application

### Insert Form 20

Cermet | Carbide



						Cermet						Carbide									
						Uncoated			Coated			Uncoated			Coated						
						WHT10	WHT12	WHT16	WHT32	WTC15	WTC121	WHW01	WHW16	WHC05	WHC18	WHC19	WHC79	WHC98	WHC111	WHC114	WHC136
Geometry	Radius		ISO Code	Description	Part No.																
	in	mm																			
Steel	P					▼▼▼	▼▼▼	▼▼▼	▼▼▼	▼▼▼	▼▼▼	▼▼▼	▼▼▼	▼▼▼	▼▼▼	▼▼▼	▼▼▼	▼▼▼	▼▼▼	▼▼▼	▼▼▼
Stainless Steel	M					▼▼▼	▼▼▼	▼▼▼	▼▼▼	▼▼▼	▼▼▼	▼▼▼	▼▼▼	▼▼▼	▼▼▼	▼▼▼	▼▼▼	▼▼▼	▼▼▼	▼▼▼	▼▼▼
Cast Iron	K					▼▼▼	▼▼▼	▼▼▼	▼▼▼	▼▼▼	▼▼▼	▼▼▼	▼▼▼	▼▼▼	▼▼▼	▼▼▼	▼▼▼	▼▼▼	▼▼▼	▼▼▼	▼▼▼
Non-Ferrous Materials	N					▼▼▼	▼▼▼	▼▼▼	▼▼▼	▼▼▼	▼▼▼	▼▼▼	▼▼▼	▼▼▼	▼▼▼	▼▼▼	▼▼▼	▼▼▼	▼▼▼	▼▼▼	▼▼▼
Titanium	S					▼▼▼	▼▼▼	▼▼▼	▼▼▼	▼▼▼	▼▼▼	▼▼▼	▼▼▼	▼▼▼	▼▼▼	▼▼▼	▼▼▼	▼▼▼	▼▼▼	▼▼▼	▼▼▼
Hard Materials	H					▼▼▼	▼▼▼	▼▼▼	▼▼▼	▼▼▼	▼▼▼	▼▼▼	▼▼▼	▼▼▼	▼▼▼	▼▼▼	▼▼▼	▼▼▼	▼▼▼	▼▼▼	▼▼▼
121	0.004	0.10	TOGX080201	F02001GN121	397672											●			●		
121	0.008	0.20	TOGX080202	F02002GN121	397673											●			●		
121	0.016	0.40	TOGX080204	F02004GN121	397674											●			●		
128	0.008	0.20	TOGX080202	F02002GN128	297541								●	●	●						
128	0.016	0.40	TOGX080204	F02004GN128	297542								●	●	●						
155	0.008	0.20	TOMX080202	F02002MN155	397688					●											
155	0.016	0.40	TOMX080204	F02004MN155	397689					●											
650	0.004	0.10	TOGX080201	F02001GL650	097153		●			●	●	●		●						●	
650	0.008	0.20	TOGX080202	F02002GL650	097546		●			●	●	●		●						●	
650	0.012	0.30	TOGX080203	F02003GL650	097154					●	●	●		●						●	
650	0.016	0.40	TOGX080204	F02004GL650	097599		●			●	●	●		●						●	
650	0.031	0.80	TOGX080208	F02008GL650	397764							●								●	
840	0.008	0.20	TOGX080202	F02002GR840	097701		●							●							

Reference Key

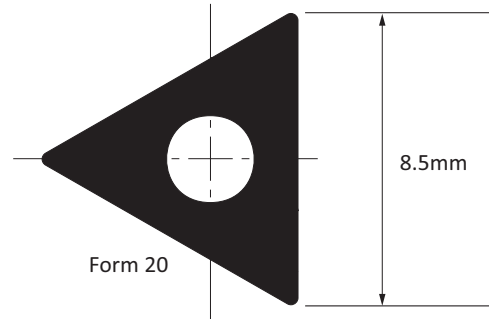
Reference Key

Symbol	Insert Type
▼▼▼	Finishing - Main Application
▼▼▼	Finishing - Extended Application

Symbol	Machining Conditions
●	Good - Main Application
●	Average - Main Application
●	Difficult - Main Application

# Insert Form 20

CBN | PCD



						CBN				PCD	
						Uncoated		Coated			
						WBN150	WBN200	WBN300	WBN450	PKDD30	PKDD50
Geometry	Radius		ISO Code	Description	Part No.						
	in	mm									
<b>Steel</b>	<b>P</b>										
<b>Stainless Steel</b>	<b>M</b>										
<b>Cast Iron</b>	<b>K</b>						▼▼	▼▼			
<b>Non-Ferrous Materials</b>	<b>N</b>									▼▼	▼▼
<b>Titanium</b>	<b>S</b>										
<b>Hard Materials</b>	<b>H</b>						▼▼	▼▼			
<b>720</b>	0.008	0.20	TOGX080202	F02002GN720	<b>297692</b>					●	
<b>720</b>	0.016	0.40	TOGX080204	F02004GN720	<b>297845</b>					●	
<b>730</b>	0.008	0.20	TOGX080202	F02002GN730	<b>097487</b>					●	●
<b>730</b>	0.016	0.40	TOGX080204	F02004GN730	<b>097686</b>					●	●
<b>730</b>	0.031	0.80	TOGX080208	F02008GN730	<b>097877</b>					●	
<b>735</b>	0.008	0.20	TOGX080202	F02002GN735	<b>397133</b>					●	
<b>735</b>	0.016	0.40	TOGX080204	F02004GN735	<b>397301</b>					●	
<b>741</b>	0.008	0.20	TOGX080202	F02002GN741	<b>297260</b>		●				
<b>741</b>	0.016	0.40	TOGX080204	F02004GN741	<b>297262</b>		●				
<b>742</b>	0.008	0.20	TOGX080202	F02002GN742	<b>297264</b>			●			
<b>742</b>	0.016	0.40	TOGX080204	F02004GN742	<b>397610</b>			●			
<b>745</b>	0.004	0.10	TOGX080201	F02001GN745	<b>297259</b>		●				
<b>748</b>	0.008	0.20	TOGX080202	F02002GN748	<b>297780</b>				●		
<b>748</b>	0.016	0.40	TOGX080204	F02004GN748	<b>297782</b>				●		
<b>768</b>	0.008	0.20	TOGX080202	F02002GN768	<b>397146</b>				●		
<b>768</b>	0.016	0.40	TOGX080204	F02004GN768	<b>397192</b>				●		

Reference Key

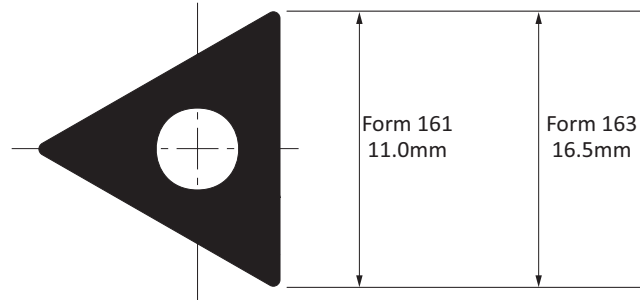
Symbol	Insert Type
▼▼	Finishing - Main Application

Reference Key

Symbol	Machining Conditions
●	Good - Main Application
◐	Average - Main Application

## Insert Forms 161, 163

Cermet | Carbide



						Cermet						Carbide													
						Uncoated			Coated			Uncoated			Coated										
						WHT10	WHT12	WHT16	WHT32	WTC15	WTC121	WHW01	WHW16	WHC05	WHC18	WHC19	WHC79	WHC110	WHC111	WHC114	WHC136	WHC164			
Geometry	Radius		ISO Code	Description	Part No.																				
	in	mm																							
Steel	P	▼▼▼																							
Stainless Steel	M	▼▼▼																							
Cast Iron	K	▽▽▽																							
Non-Ferrous Materials	N	▽▽▽																							
Titanium	S	▽▽▽																							
Hard Materials	H	▽▽▽																							
122	0.016	0.40	TCMT110204	F16104MN122	097953	●																			
129	0.008	0.20	TCGT110202	F16102GN129	397769							●	●												
129	0.016	0.40	TCGT110204	F16104GN129	397770							●	●												
129	0.016	0.40	TCGT16T304	F16304GN129	397771							●	●												
145	0.016	0.40	TCGT110204	F16104GN145	297993														●						
158	0.016	0.40	TCMT16T304	F16304MN158	297604																				
192	0.016	0.40	TCMT110204	F16104MN192	397663																				
192	0.016	0.40	TCMT16T304	F16304MN192	397654																		●		
192	0.031	0.80	TCMT16T308	F16308MN192	397772																		●		
850	0.008	0.20	TCGT110202	F16102GL850	097512		●																		

### Reference Key

Symbol	Insert Type
▼▼▼	Finishing - Main Application
▽▽▽	Finishing - Extended Application

### Reference Key

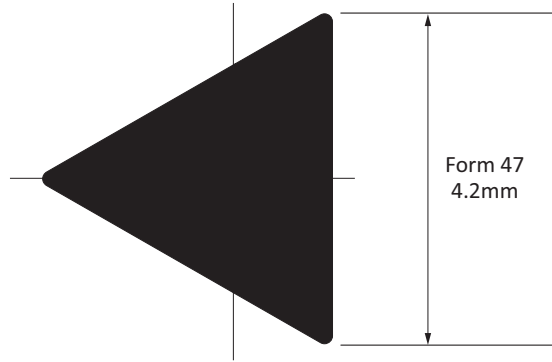
Symbol	Machining Conditions
●	Good - Main Application
●	Average - Main Application
⚙	Difficult - Main Application

## Insert Form 47

Cermet | Carbide



650 Geometry



						Carbide										
						Uncoated					Coated					
Steel						P					▽▽▽					
Stainless Steel						M					▽▽▽					
Cast Iron						K	▽▽▽				▽▽▽					
Non-Ferrous Materials						N	▽▽▽									
Titanium						S	▽▽▽									
Hard Materials						H										
Geometry	Radius		ISO Code	Description	Part No.	WHW01	WHW16	WHC05	WHC18	WHC20	WHC79	WHC110	WHC111	WHC114	WHC136	WHC164
	in	mm				●										
650	0.004	0.10	TOFX040101	F04701FL650	097832	●				●						
650	0.008	0.20	TOFX040102	F04702FL650	097833	●				●						

### Reference Key

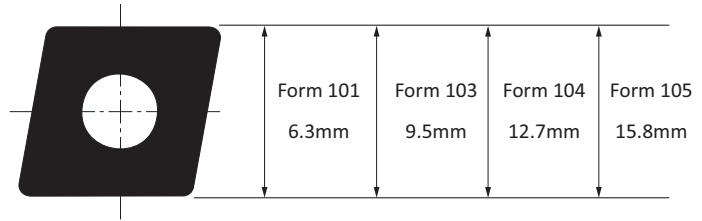
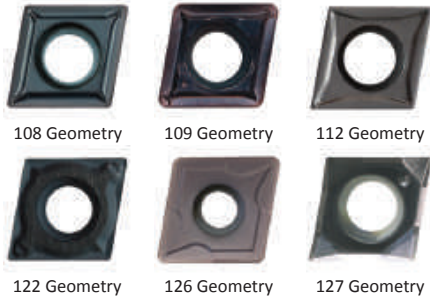
Symbol	Insert Type
▽▽▽	Finishing - Main Application

### Reference Key

Symbol	Machining Conditions
●	Good - Main Application

### Insert Forms 101, 103, 104, 105

Cermet | Carbide



						Cermet						Carbide										
						Uncoated			Coated			Uncoated			Coated							
Material	ISO	Symbol				WHT10	WHT12	WHT16	WHT32	WTC15	WTC121	WHW01	WHW16	WHC05	WHC18	WHC19	WHC79	WHC98	WHC111	WHC114	WHC136	WHC164
Geometry	Radius	ISO Description	Description	Part No.																		
	in	mm																				
Steel	P	▼▼▼	▼	▼▼▼														●			●	
Stainless Steel	M																	●			●	
Cast Iron	K	▼▼▼	▼	▼▼▼							▼							▼			▼	
Non-Ferrous Materials	N	▼▼▼	▼	▼▼▼							▼		▼									
Titanium	S										▼											▼
Hard Materials	H																					
108	0.008	0.20	CCMT060202	F10102MN108	297833													●				
108	0.016	0.40	CCMT060204	F10104MN108	297537													●				
108	0.016	0.40	CCMT09T304	F10304MN108	297891													●				
108	0.031	0.80	CCMT09T308	F10308MN108	397118													●				
108	0.016	0.40	CCMT120404	F10404MN108	297725													●				
108	0.031	0.80	CCMT120408	F10408MN108	297724													●				
109	0.008	0.20	CCMT060202	F10102MN109	397352																	●
109	0.016	0.40	CCMT060204	F10104MN109	397765																	●
109	0.016	0.40	CCMT09T304	F10304MN109	397354																	●
109	0.031	0.80	CCMT09T308	F10308MN109	397355																	●
109	0.016	0.40	CCMT120404	F10404MN109	397356																	●
109	0.031	0.80	CCMT120408	F10408MN109	397357																	●
112	0.008	0.20	CCGT060202	F10102GN112	297485				●													
112	0.016	0.40	CCMT060204	F10104MN112	297434				●													
112	0.008	0.20	CCGT09T302	F10302GN112	297534				●													
112	0.016	0.40	CCMT09T304	F10304MN112	297387				●													
122	0.008	0.20	CCMT060202	F10102MN122	097899	●																
122	0.016	0.40	CCMT060204	F10104MN122	097926	●																
122	0.008	0.20	CCMT09T302	F10302MN122	097862	●																
122	0.016	0.40	CCMT09T304	F10304MN122	097957	●																
126	0.031	0.80	CCMT160508	F10508MN126	297557																	●
126	0.047	1.20	CCMT160512	F10512MN126	297558																	●
127	0.008	0.20	CCGT060202	F10102GN127	097529							●		●								
127	0.016	0.40	CCGT060204	F10104GN127	097445							●		●								
127	0.008	0.20	CCGT09T302	F10302GN127	297550							●		●								
127	0.016	0.40	CCGT09T304	F10304GN127	097497							●		●								
127	0.016	0.40	CCGT120404	F10404GN127	097496							●		●								

Reference Key

Symbol	Insert Type
▼	Roughing - Main Application
▽	Roughing - Extended Application
▼▼▼	Finishing - Main Application
▽▽▽	Finishing - Extended Application

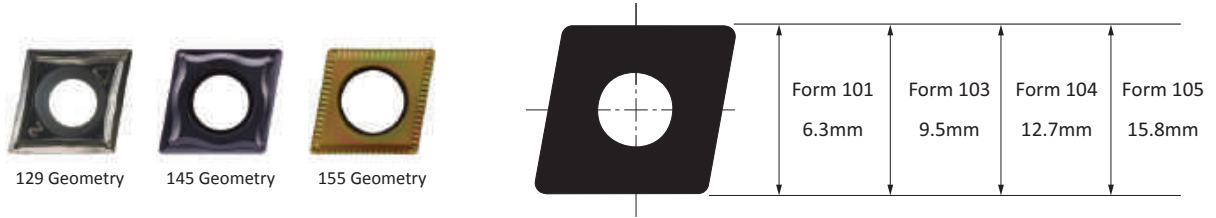
Reference Key

Symbol	Machining Conditions
●	Good - Main Application
◐	Average - Main Application



## Insert Forms 101, 103, 104, 105

Cermet | Carbide



						Cermet						Carbide										
						Uncoated			Coated			Uncoated			Coated							
Material	ISO	Part No.				WHT10	WHT12	WHT16	WHT32	WTC15	WTC121	WHW01	WHW16	WHC05	WHC18	WHC19	WHC79	WHC98	WHC111	WHC114	WHC136	WHC164
Steel	P								▼▼▼				▽					▼▼▼				
Stainless Steel	M								▽▽▽				▽▽▽					▼▼▼				
Cast Iron	K								▽▽▽			▽	▼▼▼					▼▼▼				
Non-Ferrous Materials	N											▼▼▼		▼▼▼								
Titanium	S											▽▽▽						▼▼▼				
Hard Materials	H																	▼▼▼				
Geometry	Radius	ISO Description	Description	Part No.																		
	in	mm																				
129	0.002	0.05	CCGT0602005	F101005GN129	397738							●	●									
129	0.004	0.10	CCGT060201	F10101GN129	397737							●	●									
129	0.008	0.20	CCGT060202	F10102GN129	297545							●	●	●								
129	0.016	0.40	CCGT060204	F10104GN129	297546							●	●	●								
129	0.008	0.20	CCGT09T302	F10302GN129	297547							●	●	●								
129	0.016	0.40	CCGT09T304	F10304GN129	297548							●	●	●								
145	0.016	0.40	CCGT060204	F10104GN145	297980														●			
145	0.031	0.80	CCGT060208	F10108GN145	397742														●			
145	0.016	0.40	CCGT09T304	F10304GN145	297994														●			
145	0.031	0.80	CCGT09T308	F10308GN145	297995														●			
155	0.008	0.20	CCMT060202	F10102MN155	397662					●												
155	0.016	0.40	CCMT060204	F10104MN155	397739					●												
155	0.016	0.40	CCMT09T304	F10304MN155	397740					●												

### Reference Key

Symbol	Insert Type
▼	Roughing - Main Application
▽	Roughing - Extended Application
▼▼▼	Finishing - Main Application
▽▽▽	Finishing - Extended Application

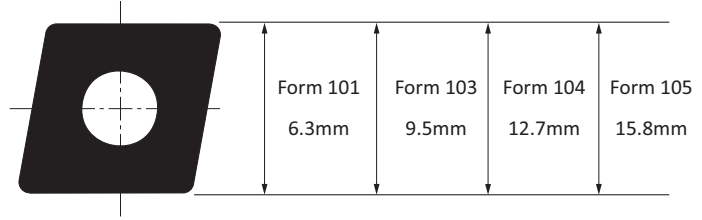
### Reference Key

Symbol	Machining Conditions
●	Good - Main Application
◐	Average - Main Application

A  
B  
C  
D  
E  
F  
G  
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## Insert Forms 101, 103, 104, 105

Carbide



						Carbide										
						Uncoated				Coated						
						WHW01	WHW16	WHC05	WHC18	WHC19	WHC79	WHC98	WHC111	WHC114	WHC136	WHC164
Geometry	Radius		ISO Code	Description	Part No.											
	in	mm														
Steel	P					▽▽▽		▽	▽▽▽	▽▽▽	▽▽▽		▽▽▽			▽▽▽
Stainless Steel	M						▽▽▽		▽▽▽	▽▽▽		▽▽▽				
Cast Iron	K					▽▽▽		▽	▽▽▽	▽▽▽		▽▽▽				▽▽▽
Non-Ferrous Materials	N															
Titanium	S								▽▽▽				▽▽▽			
Hard Materials	H											▽▽▽				▽▽▽
158	0.008	0.20	CCMT060202	F10102MN158	297248						●		●			
158	0.016	0.40	CCMT060204	F10104MN158	297377						●		●			
158	0.016	0.40	CCMT09T304	F10304MN158	297239						●		●			
158	0.031	0.80	CCMT09T308	F10308MN158	297240						●		●			
158	0.016	0.40	CCMT120404	F10404MN158	297242						●		●			
158	0.031	0.80	CCMT120408	F10408MN158	297241						●		●			
158	0.031	0.80	CCMT160508	F10508MN158	297559			●			●		●			
158	0.047	1.20	CCMT160512	F10512MN158	297560						●		●			
174W	0.016	0.40	CCMT060204	F10104MN174W	397766					⚙						⚙
174W	0.016	0.40	CCMT09T304	F10304MN174W	397767					⚙						⚙
174W	0.031	0.80	CCMT09T308	F10308MN174W	397768					⚙						⚙
192	0.008	0.20	CCMT060202	F10102MN192	297531					⚙						⚙
192	0.016	0.40	CCMT060204	F10104MN192	297658					⚙						⚙
192	0.031	0.80	CCMT060208	F10108MN192	297588					⚙						⚙
192	0.008	0.20	CCMT09T302	F10302MN192	297958					⚙						⚙
192	0.016	0.40	CCMT09T304	F10304MN192	297653					⚙						⚙
192	0.031	0.80	CCMT09T308	F10308MN192	397614					⚙						⚙
192	0.016	0.40	CCMT120404	F10404MN192	397666					⚙						⚙
192	0.031	0.80	CCMT120408	F10408MN192	297878					⚙						⚙
192	0.047	1.20	CCMT120412	F10412MN192	397632					⚙						⚙

### Reference Key

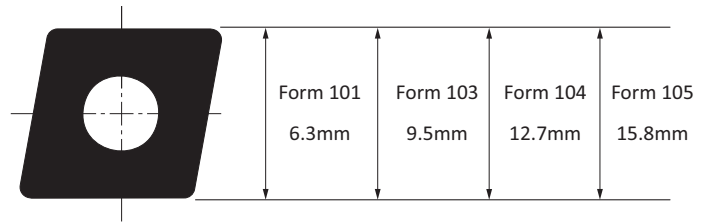
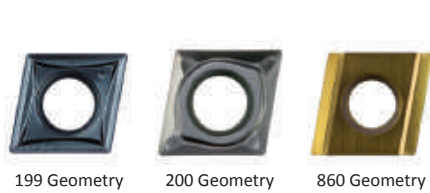
Symbol	Insert Type
▽	Roughing - Main Application
▽	Roughing - Extended Application
▽▽▽	Finishing - Main Application
▽▽▽	Finishing - Extended Application

### Reference Key

Symbol	Machining Conditions
●	Good - Main Application
●	Average - Main Application
⚙	Difficult - Main Application

## Insert Forms 101, 103, 104, 105

Cermet | Carbide



						Cermet						Carbide										
						Uncoated			Coated			Uncoated			Coated							
Material	ISO Code	Part No.				WHT10	WHT12	WHT16	WHT32	WTC15	WTC121	WHW01	WHW16	WHC05	WHC18	WHC19	WHC79	WHC98	WHC111	WHC114	WHC136	WHC164
Steel	P									▼▼				▼▼					▼▼	▼▼	▼▼	
Stainless Steel	M									▼▼				▼▼					▼▼	▼▼	▼▼	
Cast Iron	K									▼				▼					▼	▼	▼	
Non-Ferrous Materials	N									▼												
Titanium	S																		▼	▼	▼	
Hard Materials	H																		▼			
Geometry	Radius	ISO Code	Description	Part No.																		
	in	mm																				
199	0.008	0.20	CCMT060202	F10102MN199	397164																	
199	0.016	0.40	CCMT060204	F10104MN199	397165																●	
199	0.008	0.20	CCMT09T302	F10302MN199	397702																●	
199	0.016	0.40	CCMT09T304	F10304MN199	397166																●	
199	0.031	0.80	CCMT09T308	F10308MN199	397167																●	
199	0.016	0.40	CCMT120404	F10404MN199	397191																●	
199	0.031	0.80	CCMT120408	F10408MN199	397168																●	
200	0.008	0.20	CCGT060202	F10102GN200	397585														●			
200	0.016	0.40	CCGT060204	F10104GN200	397586														●			
200	0.008	0.20	CCGT09T302	F10302GN200	397587														●			
200	0.016	0.40	CCGT09T304	F10304GN200	397588														●			
200	0.016	0.40	CCGT120404	F10404GN200	397589														●			
860	0.004	0.10	CCGT060201	F10101GL860	097324					●	●		●								●	
860	0.008	0.20	CCGT060202	F10102GL860	097241					●	●		●								●	
860	0.016	0.40	CCGT060204	F10104GL860	097242					●	●		●								●	
860	0.008	0.20	CCGT09T302	F10302GL860	097245					●	●		●								●	
860	0.016	0.40	CCGT09T304	F10304GL860	097244					●	●		●								●	
860	0.016	0.40	CCGT120404	F10404GL860	097738					●	●		●								●	
860	0.031	0.80	CCGT120408	F10408GL860	097247					●	●		●								●	
860	0.031	0.80	CCMT160508	F10508ML860	097249					●	●		●								●	

### Reference Key

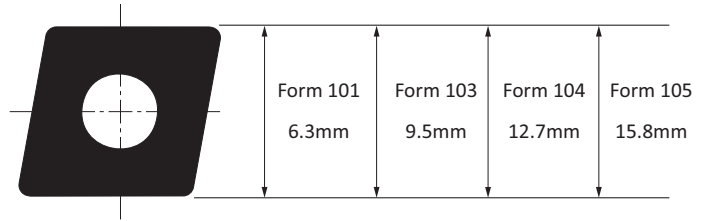
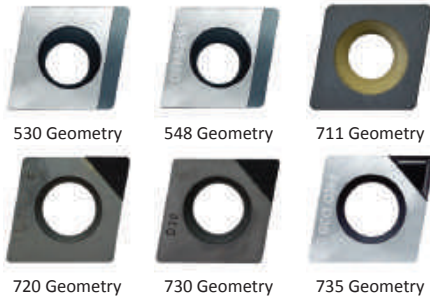
Symbol	Insert Type
▼	Roughing - Main Application
▽	Roughing - Extended Application
▼▼	Finishing - Main Application
▽▽	Finishing - Extended Application

### Reference Key

Symbol	Machining Conditions
●	Good - Main Application
◐	Average - Main Application

### Insert Forms 101, 103, 104, 104

Ceramic | CBN | PCD



						Ceramic		CBN				PCD	
						Uncoated	Coated	Uncoated		Coated			
Material	ISO Code	Part No.	Geometry	Radius		W	C	WB	WB	WB	WB	PK	PK
Steel	P		530	0.016	CCGW060204	F10104GL530	397207						
Stainless Steel	M		530	0.016	CCGW060204	F10104GR530	397242						
Cast Iron	K		530	0.016	CCGW09T304	F10304GL530	397249			▼			
Cast Iron	K		530	0.016	CCGW09T304	F10304GR530	397250			▼			
Non-Ferrous Materials	N		548	0.016	CCGW060204	F10104GL548	397245					▼	▼
Non-Ferrous Materials	N		548	0.016	CCGW060204	F10104GR548	397246					▼	▼
Non-Ferrous Materials	N		548	0.016	CCGW09T304	F10304GL548	397604						
Non-Ferrous Materials	N		548	0.016	CCGW09T304	F10304GR548	397605						
Titanium	S		711	0.016	CCGW09T304	F10304GN711	297561	⚙					
Titanium	S		711	0.031	CCGW09T308	F10308GN711	297192	⚙					
Titanium	S		711	0.031	CCGW120408	F10408GN711	297249	⚙					
Titanium	S		711	0.047	CCGW120412	F10412GN711	297234	⚙					
Hard Materials	H		720	0.008	CCGT060202	F10102GN720	297501						
Hard Materials	H		720	0.016	CCGT060204	F10104GN720	297502						
Hard Materials	H		720	0.008	CCGT09T302	F10302GN720	297578						
Hard Materials	H		720	0.016	CCGT09T304	F10304GN720	297483						
Hard Materials	H		730	0.008	CCGW060202	F10102GN730	097462						
Hard Materials	H		730	0.016	CCGW060204	F10104GN730	297164						
Hard Materials	H		730	0.031	CCGW060208	F10108GN730	297165						
Hard Materials	H		730	0.008	CCGW09T302	F10302GN730	397251						
Hard Materials	H		730	0.016	CCGW09T304	F10304GN730	297533						
Hard Materials	H		730	0.016	CCGW120404	F10404GN730	397257						
Hard Materials	H		730	0.031	CCGW120408	F10408GN730	297871						
Hard Materials	H		735	0.008	CCGT060202	F10102GN735	297872						
Hard Materials	H		735	0.016	CCGT060204	F10104GN735	397244						
Hard Materials	H		735	0.008	CCGT09T302	F10302GN735	397252						
Hard Materials	H		735	0.016	CCGT09T304	F10304GN735	297870						

Reference Key

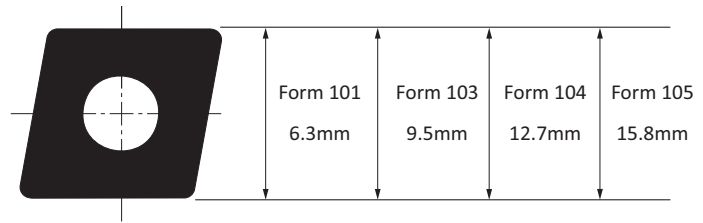
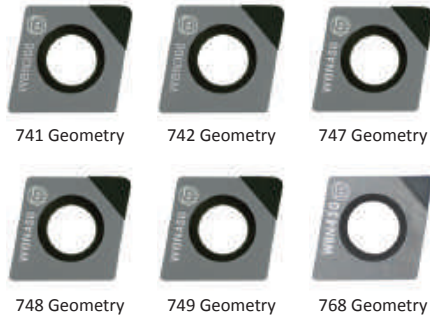
Symbol	Insert Type
▼	Roughing - Main Application
▽	Roughing - Extended Application
▼▼	Finishing - Main Application
▽▽	Finishing - Extended Application

Reference Key

Symbol	Machining Conditions
●	Good - Main Application
◐	Average - Main Application
⚙	Difficult - Main Application

## Insert Forms 101, 103, 104, 104

CBN



						CBN								
						Uncoated				Coated				
Steel						P								
Stainless Steel						M								
Cast Iron						K	▽▽▽	▽	▽▽▽	▽				
Non-Ferrous Materials						N								
Titanium						S								
Hard Materials						H	▽▽▽	▽	▽▽▽	▽				
Geometry	Radius		ISO Code	Description	Part No.	WBN150	WBN200	WBN300	WBN450					
	in	mm												
741	0.008	0.20	CCGW060202	F10102GN741	297290									
741	0.016	0.40	CCGW060204	F10104GN741	297291		●							
741	0.016	0.40	CCGW09T304	F10304GN741	297303		●							
742	0.008	0.20	CCGW060202	F10102GN742	297293			●						
742	0.016	0.40	CCGW060204	F10104GN742	297294			●						
742	0.016	0.40	CCGW09T304	F10304GN742	297306			●						
747	0.016	0.40	CCGW120404	F10404GN747	397260	●			●					
748	0.008	0.20	CCGW060202	F10102GN748	297787				●					
748	0.016	0.40	CCGW060204	F10104GN748	297788				●					
748	0.008	0.20	CCGW09T302	F10302GN748	297790				●					
748	0.016	0.40	CCGW09T304	F10304GN748	297419				●					
749	0.031	0.80	CCGW120408	F10408GN749	397261	●			●					
768	0.008	0.20	CCGT060202	F10102GN768	297486				●					
768	0.016	0.40	CCGT060204	F10104GN768	297659				●					
768	0.008	0.20	CCGT09T302	F10302GN768	397439				●					
768	0.016	0.40	CCGT09T304	F10304GN768	297660				●					

### Reference Key

Symbol	Insert Type
▽	Roughing - Main Application
▽	Roughing - Extended Application
▽▽▽	Finishing - Main Application
▽▽▽	Finishing - Extended Application

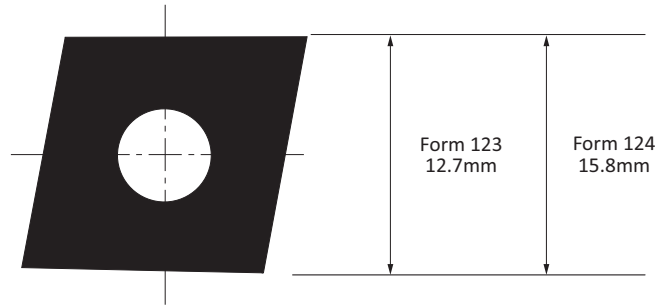
### Reference Key

Symbol	Machining Conditions
●	Good - Main Application
●	Average - Main Application

A  
B  
C  
D  
E  
F  
G  
H  
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J  
K  
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## Insert Forms 123, 124

Carbide



Carbide																		
						Uncoated							Coated					
Material	ISO Code					WHW01	WHW16	WHC05	WHC18	WHC19	WHC79	WHC98	WHC111	WHC114	WHC136	WHC164		
Steel	P									▽▽▽			▽▽▽		▽▽▽	▽▽▽		
Stainless Steel	M									▽▽▽			▽▽▽		▽▽▽			
Cast Iron	K									▽▽▽			▽▽▽		▽▽▽	▽▽▽		
Non-Ferrous Materials	N																	
Titanium	S									▽▽▽			▽▽▽		▽▽▽			
Hard Materials	H											▽▽▽				▽▽▽		
Geometry	Radius		ISO Code	Description	Part No.	WHW01	WHW16	WHC05	WHC18	WHC19	WHC79	WHC98	WHC111	WHC114	WHC136	WHC164		
	in	mm																
117	0.031	0.80	CNMG120408	F12308MN117	397683					⚙			●			●		
117	0.047	1.20	CNMG120412	F12312MN117	397777					⚙			●			●		
117	0.031	0.80	CNMG160608	F12408MN117	397608					⚙						●		
117	0.047	1.20	CNMG160612	F12412MN117	397778					⚙			●			●		
158	0.016	0.40	CNMG120404	F12304MN158	397799										●			
158	0.031	0.80	CNMG120408	F12308MN158	397800										●			
158	0.047	1.20	CNMG120412	F12312MN158	397801										●			
158	0.031	0.80	CNMG160608	F12408MN158	397802										●			
158	0.047	1.20	CNMG160612	F12412MN158	397803										●			
161	0.016	0.40	CNMG120404	F12304MN161	397758					⚙			●			●		
161	0.031	0.80	CNMG120408	F12308MN161	397759					⚙			●			●		
167	0.016	0.40	CNMG120404	F12304MN167	397756					⚙			●			●		
167	0.031	0.80	CNMG120408	F12308MN167	397757					⚙			●			●		

Reference Key

Symbol	Insert Type
▼	Roughing - Main Application
▽	Roughing - Extended Application
▽▽▽	Finishing - Extended Application

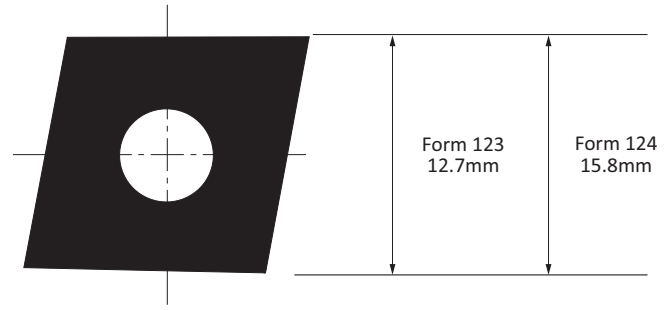
Reference Key

Symbol	Machining Conditions
●	Good - Main Application
●	Average - Main Application
⚙	Difficult - Main Application



## Insert Form 123

Ceramic | CBN | PCD



						Ceramic		CBN				PCD			
						Uncoated		Coated		Uncoated		Coated			
<b>Steel</b>						P									
<b>Stainless Steel</b>						M									
<b>Cast Iron</b>						K		▽▽▽		▽		▽▽▽		▽	
<b>Non-Ferrous Materials</b>						N									
<b>Titanium</b>						S									
<b>Hard Materials</b>						H		▽▽▽		▽					
Geometry	Radius		ISO Code	Description	Part No.	WCN06	WBN150	WBN200	WBN300	WBN450	PKDD30	PKDD50			
	in	mm													
711	0.031	0.80	CNGA120408	F12308GN711	397842	⚙️									
711	0.047	1.20	CNGA120412	F12312GN711	397843	⚙️									
730	0.031	0.80	CNGA120408	F12308GN730	397849							●			
749	0.031	0.80	CNGA120408	F12308GN749	397262		●		●						

### Reference Key

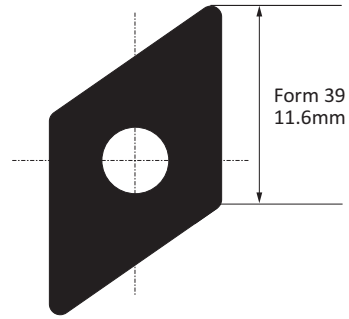
Symbol	Insert Type
▼	Roughing - Main Application
▽	Roughing - Extended Application
▽▽▽	Finishing - Main Application
▽▽	Finishing - Extended Application

### Reference Key

Symbol	Machining Conditions
●	Average - Main Application
⚙️	Difficult - Main Application

### Insert Form 39

Cermet | Carbide



						Cermet						Carbide										
						Uncoated			Coated			Uncoated			Coated							
Material	ISO Code					WHT10	WHT12	WHT16	WHT32	WTC15	WTC121	WHW01	WHW16	WHC05	WHC18	WHC19	WHC79	WHC98	WHC111	WHC114	WHC136	WHC164
Steel	P								▼▼▼				▼▼▼		▼▼▼			▼▼▼				▼▼▼
Stainless Steel	M								▽▽▽				▽▽▽		▽▽▽			▽▽▽				▽▽▽
Cast Iron	K								▽▽▽				▽▽▽		▽▽▽			▽▽▽				▽▽▽
Non-Ferrous Materials	N											▼▼▼										
Titanium	S											▽▽▽			▼▼▼			▼▼▼				▼▼▼
Hard Materials	H																				▽▽▽	
<b>Geometry</b>	<b>Radius</b>	<b>in</b>	<b>mm</b>	<b>ISO Code</b>	<b>Description</b>	<b>Part No.</b>																
121	0.008	0.20	DCMT11T302	F03902MN121	397787																	
121	0.016	0.40	DCMT11T304	F03904MN121	397788																	
127	0.008	0.20	DCGT11T302	F03902GN127	397235							●										
127	0.016	0.40	DCGT11T304	F03904GN127	097559							●										
129	0.008	0.20	DCGT11T302	F03902GN129	397816							●	●									
129	0.016	0.40	DCGT11T304	F03904GN129	397817							●	●									
155	0.008	0.20	DCMT11T302	F03902MN155	397809				●													
155	0.016	0.40	DCMT11T304	F03904MN155	397810				●													
192	0.008	0.20	DCMT11T302	F03902MN192	397783																●	
192	0.016	0.40	DCMT11T304	F03904MN192	297721																●	
192	0.031	0.80	DCMT11T308	F03908MN192	397784																●	
200	0.008	0.20	DCGT11T302	F03902GN200	397785															●		
200	0.016	0.40	DCGT11T304	F03904GN200	397786															●		

Reference Key

Symbol	Insert Type
▼	Roughing - Main Application
▽	Roughing - Extended Application
▼▼▼	Finishing - Main Application
▽▽▽	Finishing - Extended Application

Reference Key

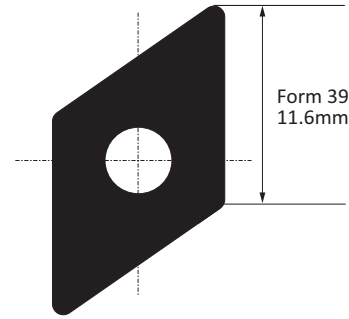
Symbol	Machining Conditions
●	Good - Main Application
●	Average - Main Application
⚙	Difficult - Main Application

# Insert Form 39

CBN | PCD



730 Geometry    735 Geometry    747 Geometry



						CBN					PCD		
						Uncoated			Coated				
						WB150	WB200	WB300	WB450	WB200		PKDD30	PKDD50
Geometry	Radius		ISO Code	Description	Part No.								
	in	mm											
Steel	P												
Stainless Steel	M												
Cast Iron	K					▽▽▽		▽▽▽					
Non-Ferrous Materials	N											▽▽▽	
Titanium	S												
Hard Materials	H					▽▽▽							
730	0.008	0.20	DCGW11T302	F03902GN730	397269							●	
730	0.016	0.40	DCGW11T304	F03904GN730	397270							●	
735	0.008	0.20	DCGT11T302	F03902GN735	397271							●	
735	0.016	0.40	DCGT11T304	F03904GN735	397272							●	
747	0.008	0.20	DCGW11T302	F03902GN747	397273	●			●				
747	0.016	0.40	DCGW11T304	F03904GN747	397274	●			●				

### Reference Key

Symbol	Insert Type
▽	Roughing - Main Application
▽	Roughing - Extended Application
▽▽▽	Finishing - Main Application
▽▽▽	Finishing - Extended Application

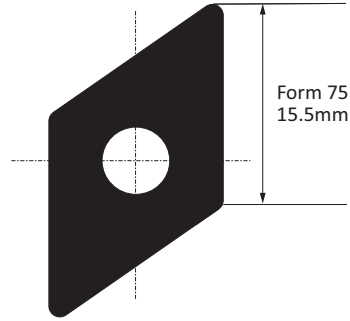
### Reference Key

Symbol	Machining Conditions
●	Average - Main Application
⚡	Difficult - Main Application

A  
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C  
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# Insert Form 75

Carbide



						Carbide										
						Uncoated				Coated						
Material	ISO Code					WHW01	WHW16	WHC05	WHC18	WHC19	WHC79	WHC98	WHC111	WHC114	WHC136	WHC164
Steel	P									▽▽▽			▽▽▽		▽▽▽	
Stainless Steel	M									▽▽▽			▽▽▽		▽▽▽	
Cast Iron	K												▽▽▽		▽▽▽	
Non-Ferrous Materials	N															
Titanium	S									▽▽▽			▽▽▽		▽▽▽	
Hard Materials	H												▽▽▽		▽▽▽	
Geometry	Radius	ISO Code	Description	Part No.												
	in   mm				WHW01	WHW16	WHC05	WHC18	WHC19	WHC79	WHC98	WHC111	WHC114	WHC136	WHC164	
117	0.031   0.80	DNMG150608	F07508MN117	397779					⚙						⚙	
158	0.016   0.40	DNMG150604	F07504MN158	397804										⚙		
158	0.031   0.80	DNMG150608	F07508MN158	397805										⚙		
158	0.047   1.20	DNMG150612	F07512MN158	397806										⚙		
161	0.016   0.40	DNMG150604	F07504MN161	397746					⚙			●			⚙	
161	0.031   0.80	DNMG150608	F07508MN161	397747					⚙			●			⚙	
161	0.047   1.20	DNMG150612	F07512MN161	397748					⚙			●			⚙	
167	0.016   0.40	DNMG150604	F07504MN167	397749					⚙			●			⚙	
167	0.031   0.80	DNMG150608	F07508MN167	397750					⚙			●			⚙	

Reference Key

Symbol	Insert Type
▼	Roughing - Main Application
▽	Roughing - Extended Application
▽▽▽	Finishing - Extended Application

Reference Key

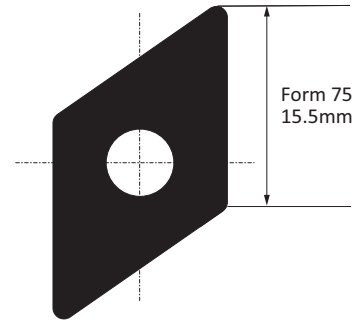
Symbol	Machining Conditions
●	Good - Main Application
⚙	Average - Main Application
⚙	Difficult - Main Application

## Insert Form 75

Ceramic | CBN | PCD



711 Geometry    730 Geometry    749 Geometry



						Ceramic		CBN					PCD			
						Uncoated	Coated	Uncoated			Coated					
Steel		P														
Stainless Steel		M														
Cast Iron		K				▽▽▽		▽		▽▽▽						
Non-Ferrous Materials		N												▽▽▽		
Titanium		S														
Hard Materials		H							▽▽▽							
Geometry	Radius		ISO Code	Description	Part No.	WCN06			WBN150	WBN200	WBN300	WBN450	WBN200		PKDD30	PKDD50
711	0.031	0.80	DNGA150608	F07508GN711	397840	⚙										
711	0.047	1.20	DNGA150612	F07512GN711	397841	⚙										
730	0.031	0.80	DNGA150608	F07508GN730	397276									●		
749	0.031	0.80	DNGA150608	F07508GN749	397277				●			●				

### Reference Key

Symbol	Insert Type
▼	Roughing - Main Application
▽	Roughing - Extended Application
▽▽▽	Finishing - Main Application
▽▽▽	Finishing - Extended Application

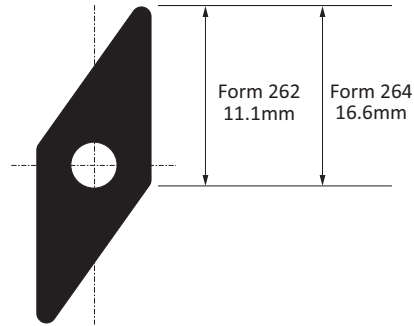
### Reference Key

Symbol	Machining Conditions
●	Average - Main Application
⚙	Difficult - Main Application

A  
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## Insert Forms 262, 264

Cermet | Carbide



						Cermet						Carbide										
						Uncoated			Coated			Uncoated			Coated							
Material	ISO Code					WHT10	WHT12	WHT16	WHT32	WTC15	WTC121	WHW01	WHW16	WHC05	WHC18	WHC19	WHC79	WHC98	WHC111	WHC114	WHC136	WHC164
Steel	P												▽		▽			▽				▽
Stainless Steel	M								▽				▽		▽			▽				▽
Cast Iron	K								▽				▽		▽			▽				▽
Non-Ferrous Materials	N												▽									
Titanium	S												▽		▽							
Hard Materials	H																					▽
Geometry	Radius	ISO Code	Description	Part No.																		
	in	mm																				
127	0.008	0.20	VCGT110302	F26202GN127	297146								●									
127	0.016	0.40	VCGT110304	F26204GN127	097954								●									
127	0.008	0.20	VCGT160402	F26402GN127	397813								●									
127	0.016	0.40	VCGT160404	F26404GN127	297900								●									
127	0.031	0.80	VCGT160408	F26408GN127	397179								●									
129	0.008	0.20	VCGT110302	F26202GN129	397811								●	●								
129	0.016	0.40	VCGT110304	F26204GN129	397812								●	●								
129	0.016	0.40	VCGT160404	F26404GN129	397814								●	●								
129	0.031	0.80	VCGT160408	F26408GN129	397815								●	●								
155	0.016	0.40	VCMT160404	F26404MN155	397807				●													
155	0.031	0.80	VCMT160408	F26408MN155	397808				●													
192	0.016	0.40	VCMT110304	F26204MN192	397628										⚙							●
192	0.031	0.80	VCMT110308	F26208MN192	397627										⚙							●
192	0.016	0.40	VCMT160404	F26404MN192	397611										⚙							●
192	0.031	0.80	VCMT160408	F26408MN192	397780										⚙							●
200	0.016	0.40	VCGT160404	F26404GN200	397782														●			
200	0.031	0.80	VCGT160408	F26408GN200	397781														●			

### Reference Key

Symbol	Insert Type
▽	Roughing - Main Application
▽	Roughing - Extended Application
▽▽	Finishing - Main Application
▽▽	Finishing - Extended Application

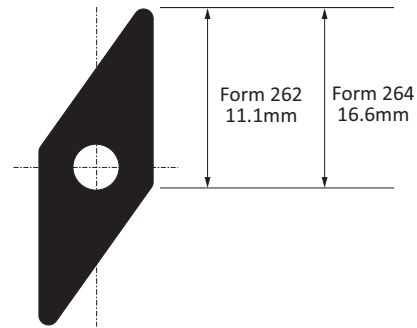
### Reference Key

Symbol	Machining Conditions
●	Good - Main Application
●	Average - Main Application
⚙	Difficult - Main Application



## Insert Forms 262, 264

CBN | PCD



						CBN				PCD					
						Uncoated		Coated							
Steel						P									
Stainless Steel						M									
Cast Iron						K		▽▽▽		▽▽▽					
Non-Ferrous Materials						N				▽▽▽					
Titanium						S									
Hard Materials						H		▽▽▽							
Geometry	Radius		ISO Code	Description	Part No.	WBN150	WBN200	WBN300	WBN450					PKDD30	PKDD50
	in	mm													
730	0.008	0.20	VCGW110302	F26202GN730	397284									●	
730	0.016	0.40	VCGW110304	F26204GN730	397285									●	
730	0.008	0.20	VCGW160402	F26402GN730	397407									●	
730	0.016	0.40	VCGW160404	F26404GN730	397278									●	
730	0.031	0.80	VCGW160408	F26408GN730	397279									●	
735	0.008	0.20	VCGW110302	F26202GN735	397818									●	
735	0.016	0.40	VCGW110304	F26204GN735	397286									●	
735	0.016	0.40	VCGT160404	F26404GN735	397280									●	
735	0.031	0.80	VCGT160408	F26408GN735	397281									●	
747	0.016	0.40	VCGW110304	F26204GN747	397287	●			●						
747	0.031	0.80	VCGW160408	F26408GN747	397283				●						
749	0.031	0.80	VCGW160408	F26408GN749	397282	●									

### Reference Key

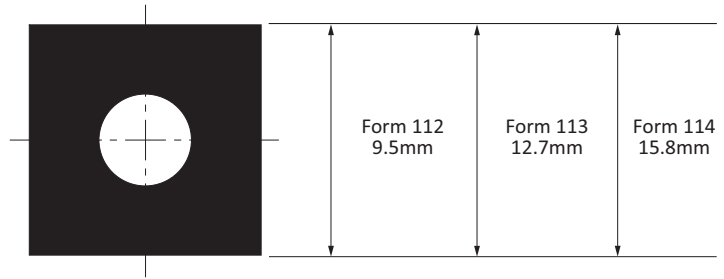
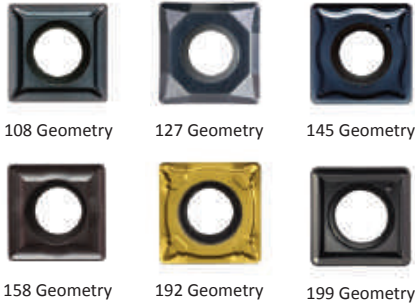
Symbol	Insert Type
▽	Roughing - Extended Application
▽▽▽	Finishing - Main Application
▽▽▽	Finishing - Extended Application

### Reference Key

Symbol	Machining Conditions
●	Average - Main Application
⊕	Difficult - Main Application

## Insert Forms 112, 113, 114

Carbide



						Carbide										
						Uncoated					Coated					
Material	ISO Code					WHW01	WHW16	WHC05	WHC19	WHC30	WHC79	WHC98	WHC111	WHC114	WHC136	WHC164
Steel	P								▽▽▽	▽▽	▽▽	▽▽	▽▽	▽▽		▽▽
Stainless Steel	M								▽▽▽	▽▽	▽▽	▽▽	▽▽			
Cast Iron	K						▽▽▽		▽▽	▽▽	▽▽	▽▽	▽▽	▽▽	▽▽	
Non-Ferrous Materials	N						▽▽▽									
Titanium	S						▽▽▽		▽▽	▽▽			▽▽	▽▽		
Hard Materials	H											▽▽▽			▽▽▽	
Geometry	Radius		ISO Code	Description	Part No.	WHW01	WHW16	WHC05	WHC19	WHC30	WHC79	WHC98	WHC111	WHC114	WHC136	WHC164
108	0.016	0.40	SCMT09T304	F11204MN108	297535							●				
108	0.031	0.80	SCMT120408	F11308MN108	397110							●				
127	0.016	0.40	SCGT09T304	F11204GN127	097539		●									
127	0.016	0.40	SCGT120404	F11304GN127	397590		●									
127	0.031	0.80	SCGT120408	F11308GN127	097566		●									
145	0.031	0.80	SCGT09T308	F11208GN145	297996								●			
145	0.031	0.80	SCGT120408	F11308GN145	297997								●			
158	0.031	0.80	SCMT120408	F11308MN158	297497						●					
158	0.047	1.20	SCMT150512	F11412MN158	097252					●						
192	0.016	0.40	SCMR09T304	F11204MN192	397741				●							●
192	0.031	0.80	SCMT09T308	F11208MN192	397640				●							●
192	0.031	0.80	SCMT120408	F11308MN192	397709				●							●
192	0.047	1.20	SCMT120412	F11312MN192	397710				●							●
199	0.016	0.40	SCMT09T304	F11204MN199	397703									●		
199	0.031	0.80	SCMT09T308	F11208MN199	397704									●		
199	0.031	0.80	SCMT120408	F11308MN199	397705									●		

Reference Key

Symbol	Insert Type
▽	Roughing - Main Application
▽	Roughing - Extended Application
▽▽▽	Finishing - Extended Application

Reference Key

Symbol	Machining Conditions
●	Good - Main Application
●	Average - Main Application
●	Difficult - Main Application

## Insert Forms 04, 05

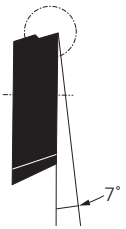
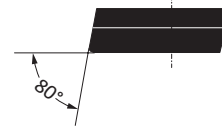
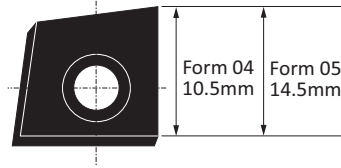
Carbide



880 Geometry



811 Geometry



						Carbide										
						Uncoated					Coated					
						WHW16	WHC05	WHC18	WHC19	WHC79	WHC98	WHC111	WHC114	WHC136	WHC168	WHC198
Steel	P														▼	▼
Stainless Steel	M														▽	▼
Cast Iron	K														▼	▼
Non-Ferrous Materials	N															▽
Titanium	S															▽
Hard Materials	H															
Geometry	Radius	ISO Code	Description	Part No.												
880	0.016 0.40	-	F00404ML880	397595												●
880	0.016 0.40	-	F00504ML880	397593											⚙	●
880	0.031 0.80	-	F00508ML880	397594											⚙	●
811	0.031 0.80	-	F00508ML811	397844											⚙	

Reference Key

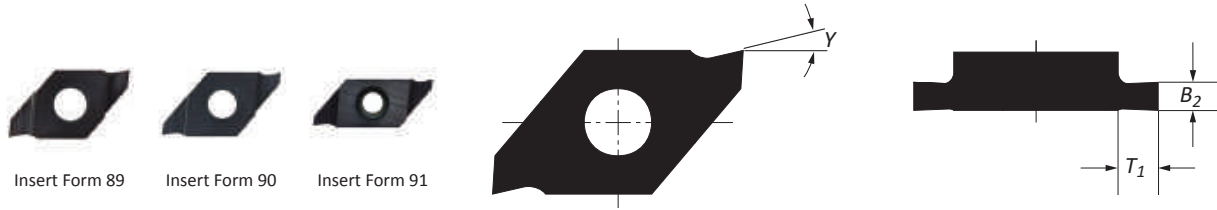
Symbol	Insert Type
▼	Roughing - Main Application
▽	Roughing - Extended Application

Reference Key

Symbol	Machining Conditions
●	Average - Main Application
⚙	Difficult - Main Application

# Radial Grooving Insert Forms 89, 90, 91

Carbide



						Carbide												
						Uncoated				Coated								
						WHW01	WHW03	WHW16	WHW20	WHC05	WHC18	WHC19	WHC79	WHC98	WHC111	WHC114	WHC136	WHC164
<b>Steel</b>	<b>P</b>																▼▼	
<b>Stainless Steel</b>	<b>M</b>																▽▽	
<b>Cast Iron</b>	<b>K</b>								▽▽								▼▼	
<b>Non-Ferrous Materials</b>	<b>N</b>								▼▼									
<b>Titanium</b>	<b>S</b>								▽▽								▼▼	
<b>Hard Materials</b>	<b>H</b>																	
Insert Form	B <sub>2</sub>	Y	T <sub>1</sub>	Circlip Width	Part No.	WHW01	WHW03	WHW16	WHW20	WHC05	WHC18	WHC19	WHC79	WHC98	WHC111	WHC114	WHC136	WHC164
89	0.048	13°	0.051	0.039	097257				●									●
89	0.056	13°	0.051	0.047	097258				●									●
89	0.068	13°	0.059	0.059	097259				●									●
90	0.078	9°	0.094	0.068	097256				●									●
90	0.090	9°	0.094	0.078	097253				●									●
<b>i</b> 90	0.109	9°	0.094	0.098	097254				●									●
90	0.129	9°	0.094	0.118	097255				●									●
91	0.109	9°	0.094	0.098	097260				●									●
91	0.129	9°	0.094	0.118	097261				●									●
91	0.168	9°	0.129	0.157	097262				●									●
91	0.208	9°	0.177	0.196	097294				●									●
<b>m</b> 89	1.24	13°	1.30	1.00	097257				●									●
89	1.44	13°	1.30	1.20	097258				●									●
89	1.74	13°	1.50	1.50	097259				●									●
90	1.99	9°	2.40	1.75	097256				●									●
90	2.29	9°	2.40	2.00	097253				●									●
90	2.79	9°	2.40	2.50	097254				●									●
90	3.29	9°	2.40	3.00	097255				●									●
91	2.79	9°	2.40	2.50	097260				●									●
91	3.29	9°	2.40	3.00	097261				●									●
91	4.29	9°	3.30	4.00	097262				●									●
91	5.29	9°	4.50	5.00	097294				●									●

Reference Key

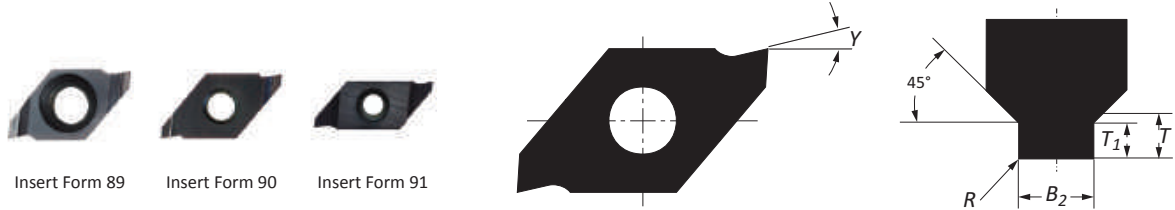
Symbol	Insert Type
▼▼	Universal - Main Application
▽▽	Universal - Extended Application

Reference Key

Symbol	Machining Conditions
●	Average - Main Application

# Radial Grooving Insert Forms 89, 90, 91

Carbide



									Carbide													
									Uncoated				Coated									
Steel		P																				
Stainless Steel		M																				
Cast Iron		K																				
Non-Ferrous Materials		N																				
Titanium		S																				
Hard Materials		H																				
Insert Form	Boring Ø	B <sub>2</sub>	Y	R	T <sub>1</sub>	T	Circlip Width	Part No.	WHW01	WHW03	WHW16	WHW20	WHC05	WHC18	WHC19	WHC79	WHC98	WHC111	WHC114	WHC136	WHC164	
i	89	0.944 - 1.023	0.056	13°	0.004	0.021	0.025	0.047	297937												▼▼	
	89	1.102 - 1.181	0.056	13°	0.004	0.025	0.029	0.047	297938												▼▼	
	89	1.220 - 1.259	0.056	13°	0.004	0.030	0.035	0.047	297939												▼▼	
	89	1.338	0.068	13°	0.004	0.030	0.035	0.059	297940												▼▼	
	89	1.377 - 1.496	0.068	13°	0.004	0.036	0.041	0.059	297941												▼▼	
	90	1.574 - 1.889	0.078	9°	0.006	0.046	0.051	0.068	297942												●	
	90	1.968 - 2.480	0.090	9°	0.006	0.056	0.062	0.078	297943												●	
	91	2.559 - 3.070	0.109	9°	0.008	0.056	0.062	0.098	297944												●	
	91	3.149 - 3.228	0.109	9°	0.008	0.066	0.072	0.098	297945												●	
	91	3.346 - 3.937	0.129	9°	0.008	0.066	0.072	0.118	297946												●	
	91	4.015 - 5.708	0.168	9°	0.008	0.076	0.084	0.157	297947												●	
	ii	89	24.00 - 26.00	1.44	13°	0.10	0.54	0.65	1.20	297937												●
89		28.00 - 30.00	1.44	13°	0.10	0.64	0.75	1.20	297938												●	
89		31.00 - 32.00	1.44	13°	0.10	0.78	0.91	1.20	297939												●	
89		34.00	1.74	13°	0.10	0.78	0.91	1.50	297940												●	
89		35.00 - 38.00	1.74	13°	0.10	0.93	1.06	1.50	297941												●	
90		40.00 - 48.00	1.99	9°	0.15	1.18	1.31	1.75	297942												●	
90		50.00 - 63.00	2.29	9°	0.15	1.43	1.58	2.00	297943												●	
91		65.00 - 78.00	2.79	9°	0.20	1.43	1.58	2.50	297944												●	
91		80.00 - 82.00	2.79	9°	0.20	1.68	1.84	2.50	297945												●	
91		85.00 - 100.00	3.29	9°	0.20	1.68	1.84	3.00	297946												●	
91		102.00 - 145.00	4.29	9°	0.20	1.94	2.14	4.00	297947												●	

Reference Key

Symbol	Insert Type
▼▼	Universal - Main Application
▽▽	Universal - Extended Application

Reference Key

Symbol	Machining Conditions
●	Average - Main Application

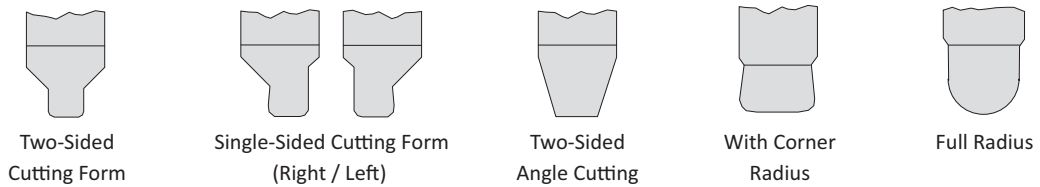
A  
B  
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# Axial Grooving Insert Blanks Form 304

Carbide



			Carbide												
			Uncoated				Coated								
Material	Symbol	Part No.	WHW01	WHW03	WHW16	WHW20	WHC05	WHC18	WHC19	WHC79	WHC98	WHC111	WHC114	WHC136	WHC164
Steel	P														
Stainless Steel	M														
Cast Iron Non-Ferrous Materials	K				▽										
Non-Ferrous Materials	N				▽										
Titanium	S				▽										
Hard Materials	H														
Geometry	S <sub>1</sub>	Part No.	WHW01	WHW03	WHW16	WHW20	WHC05	WHC18	WHC19	WHC79	WHC98	WHC111	WHC114	WHC136	WHC164
	0.137	297150				●									
	0.169	297151				●									
	0.208	297152				●									
	0.255	297154				●									
	0.295	297493				●									
	0.137	397850				●									
	0.169	397851				●									
	0.208	397852				●									
	0.255	397853				●									
	0.295	397854				●									
	3.50	297150				●									
	4.30	297151				●									
	5.30	297152				●									
	6.50	297154				●									
	7.50	297493				●									
	3.50	397850				●									
	4.30	397851				●									
	5.30	397852				●									
	6.50	397853				●									
	7.50	397854				●									



Reference Key

Symbol	Insert Type
▽	Universal - Main Application
▽	Universal - Extended Application

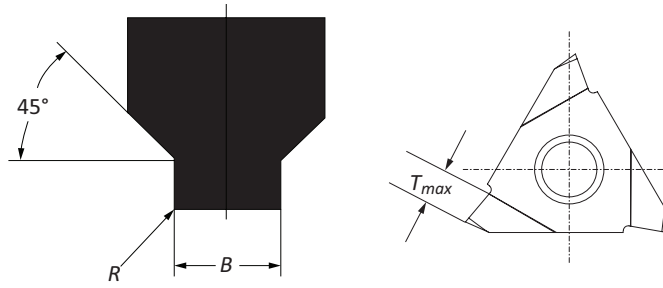
Reference Key



Symbol	Machining Conditions
●	Average - Main Application



## Axial Grooving O-Rings for Single Cutter Tools Insert Form 304

Carbide



								Carbide														
								Uncoated					Coated									
								WHW01	WHW03	WHW16	WHW20	WHC05	WHC18	WHC19	WHC79	WHC98	WHC111	WHC114	WHC136	WHC164		
Geometry	Boring Range	O-Ring Cross Section	$B \pm 0.05$	$B_{max}$	$T_{max}$	$R \pm 0.05$	Part No.															
Steel P																				▼▼		
Stainless Steel M																				▽▽		
Cast Iron Non-Ferrous Materials K																				▼▼		
Non-Ferrous Materials N																						
Titanium S																				▼▼		
Hard Materials H																						
i		0.787 - 2.125	0.039	0.059	0.059	0.064	0.008	297969														
		0.787 - 2.125	0.059	0.086	0.086	0.092	0.012	297970													●	
		0.787 - 2.125	0.078	0.114	0.114	0.124	0.016	297971														●
		0.787 - 2.125	0.098	0.137	0.137	0.151	0.020	297972														●
		0.787 - 2.125	0.118	0.161	0.161	0.175	0.024	297973														●
		0.787 - 2.125	0.157	0.212	0.212	0.194	0.031	297974														●
		0.787 - 2.125	0.196	0.267	0.267	0.194	0.031	297975														●
m		20 - 54	1.00	1.50	1.50	1.65	0.20	297969													●	
		20 - 54	1.50	2.20	2.20	2.35	0.30	297970													●	
		20 - 54	2.00	2.90	2.90	3.15	0.40	297971													●	
		20 - 54	2.50	3.50	3.50	3.85	0.50	297972													●	
		20 - 54	3.00	4.10	4.10	4.45	0.60	297973													●	
		20 - 54	4.00	5.40	5.40	4.95	0.80	297974													●	
		20 - 54	5.00	6.80	6.80	4.95	0.80	297975													●	

Reference Key

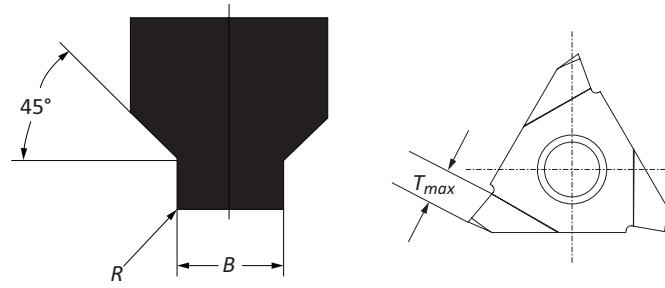
Symbol	Insert Type
▼▼	Universal - Main Application
▽▽	Universal - Extended Application

Reference Key

Symbol	Machining Conditions
●	Average - Main Application

## Axial Grooving O-Rings for Twin Cutter Tools Insert Form 304

Carbide



		Carbide																			
		Uncoated								Coated											
Material	Code	WHW01	WHW03	WHW16	WHW20	WHC05	WHC18	WHC19	WHC79	WHC98	WHC111	WHC114	WHC136	WHC164							
Steel	P														▼▼						
Stainless Steel	M														▽▽						
Cast Iron Non-Ferrous Materials	K														▼▼						
Non-Ferrous Materials	N																				
Titanium	S														▼▼						
Hard Materials	H																				
Geometry	Boring Range	O-Ring Cross Section	B + 0.05	B_max	T_max	R ± 0.05	Part No.	WHW01	WHW03	WHW16	WHW20	WHC05	WHC18	WHC19	WHC79	WHC98	WHC111	WHC114	WHC136	WHC164	
	2.086 - 39.37	0.039 - 0.059	0.059	0.098	0.064	0.008	297976														●
	2.086 - 39.37	0.039 - 0.059	0.086	0.145	0.092	0.012	297977														●
	2.086 - 39.37	0.039 - 0.059	0.133	0.224	0.261	0.020	297978														●
	2.086 - 39.37	0.039 - 0.059	0.212	0.358	0.194	0.031	297979														●
	53.00 - 1000.00	1.00 - 1.50	1.50	2.50	1.65	0.20	297976														●
	53.00 - 1000.00	1.50 - 2.40	2.20	3.70	2.35	0.30	297977														●
	53.00 - 1000.00	2.40 - 4.00	3.40	5.70	6.65	0.50	297978														●
	53.00 - 1000.00	4.00 - 5.50	5.40	9.10	4.95	0.80	297979														●

Reference Key

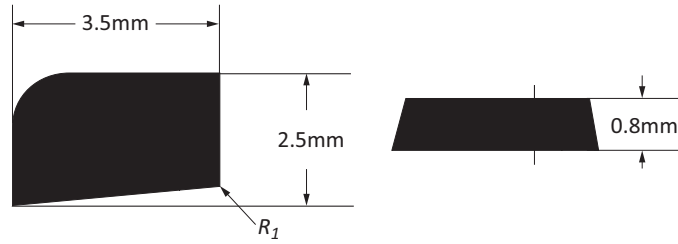
Symbol	Insert Type
▼▼	Universal - Main Application
▽▽	Universal - Extended Application

Reference Key

Symbol	Machining Conditions
●	Average - Main Application

## Insert Form 325

Carbide



				Carbide												
				Uncoated						Coated						
				WHW01	WHW03	WHW16	WHW20	WHC05	WHC18	WHC19	WHC79	WHC98	WHC111	WHC114	WHC136	WHC164
Geometry	Radius $R_1$	Description	Part No.													
<b>Steel</b>	P														▼▼	
<b>Stainless Steel</b>	M														▼▼	
<b>Cast Iron Non-Ferrous Materials</b>	K						▼▼								▼▼	
<b>Non-Ferrous Materials</b>	N						▼▼									
<b>Titanium</b>	S														▼▼	
<b>Hard Materials</b>	H															
<b>i</b>	860	0.004	F32501CN860	097831				☉							☉	
<b>m</b>	860	0.10	F32501CN860	097831				☉							☉	

### Reference Key

Symbol	Insert Type
▼▼	Finishing - Main Application
▼▼	Finishing - Extended Application

### Reference Key

Symbol	Machining Conditions
☉	Average - Main Application

## Insert Accessories

Countersunk Screws | Torque Drivers

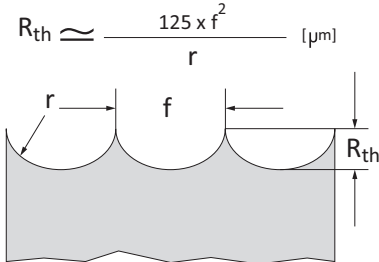

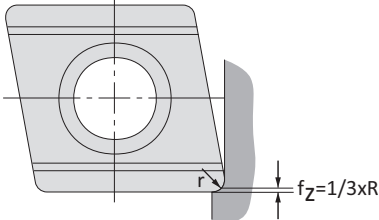
Insert Form	Countersunk Screw		Clamping Jaw	Torque Driver	Service Key	Technical Data	
						Torque	Key Size
04	<b>415977-1</b>	M4x7.9	–	<b>415510</b>	<b>115664</b>	3.0 Nm	T15
05	<b>415949-1</b>	M4x11	–	<b>415543</b>	<b>215150</b>	5.0 Nm	T20
20	<b>115535-1</b>	M2x5	–	<b>415508</b>	<b>115591</b>	0.9 Nm	T7
47	<b>315324-1</b>	M1.8x4	<b>315323</b>	–	<b>115537</b>	0.5 Nm	T6
89	<b>115676-1</b>	M2.5x5	–	<b>415514</b>	<b>115590</b>	1.2 Nm	T8
90	<b>115531-1</b>	M3x7.5	–	<b>415514</b>	<b>115590</b>	1.2 Nm	T8
91	<b>115802-1</b>	M3x12	–	<b>415514</b>	<b>115590</b>	1.2 Nm	T8
101	<b>115676-1</b>	M2.5x5	–	<b>415514</b>	<b>115590</b>	1.2 Nm	T8
103	<b>115672-1</b> (<Ø37mm)	M3.5x7.5	–	<b>415510</b>	<b>115664</b>	3.0 Nm	T15
103	<b>115673-1</b> (>Ø36mm)	M3.5x9	–	<b>415510</b>	<b>115664</b>	3.0 Nm	T15
104	<b>215149-1</b>	M4.5x11.5	–	<b>415543</b>	<b>215150</b>	5.0 Nm	T20
105	<b>215149-1</b>	M4.5x11.5	–	<b>415543</b>	<b>215150</b>	5.0 Nm	T20
111	<b>115531-1</b>	M3x7.5	–	<b>415514</b>	<b>115590</b>	1.2 Nm	T8
112	<b>115672-1</b> (<Ø37mm)	M3.5x7.5	–	<b>415510</b>	<b>115664</b>	3.0 Nm	T15
112	<b>115673-1</b> (>Ø36mm)	M3.5x9	–	<b>415510</b>	<b>115664</b>	3.0 Nm	T15
113	<b>215149-1</b>	M4.5x11.5	–	<b>415543</b>	<b>215150</b>	5.0 Nm	T20
114	<b>215149-1</b>	M4.5x11.5	–	<b>415543</b>	<b>215150</b>	5.0 Nm	T20
161	<b>115676-1</b>	M2.5x5	–	<b>415514</b>	<b>115590</b>	1.2 Nm	T8
163	<b>115673-1</b>	M3.5x9	–	<b>415510</b>	<b>115664</b>	3.0 Nm	T15
211	<b>215377-1</b>	M2x4	–	<b>415507</b>	<b>115537</b>	0.6 Nm	T6
304	<b>215392-1</b>	M5x12.9	–	<b>415543</b>	<b>215150</b>	5.0 Nm	T20
325	<b>315321-1</b>	M1.6x3	<b>315320</b>	–	<b>315322</b>	0.3 Nm	0.5x3
394	<b>215915-1</b>	M2.5x7	–	<b>415514</b>	<b>115590</b>	1.1 Nm	T8
395	<b>215985-1</b>	M3x7.5	–	<b>415514</b>	<b>115590</b>	1.2 Nm	T8
396	<b>415320-1</b>	M3.5x11	–	<b>415510</b>	<b>115664</b>	3.0 Nm	T15
397	<b>215149-1</b>	M4.5x11.5	–	<b>415543</b>	<b>215150</b>	5.0 Nm	T20

## Technical Information

### Surface Finish | General Formulas

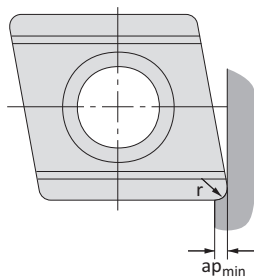
The corner radius of replaceable inserts is very important in finish machining. Large corner radii (0.031" (0.8mm) or higher) allow for high feed rates with good surface quality.

The expected surface quality can be estimated by using the function of corner radius and feed rate formula.

	<ol style="list-style-type: none"> <li>1. The larger the corner radius and the lighter the feed rate is, the better the surface quality.</li> </ol>
	<ol style="list-style-type: none"> <li>2. If the feed is approximately 1/3 of the corner radius, the better the machining time and surface finish will be in finish machining applications.</li> </ol>
	<ol style="list-style-type: none"> <li>3. A larger corner radius increases radial forces which can negatively affect dimensional accuracy. Large corner radii also require increased depth of cut.</li> </ol>



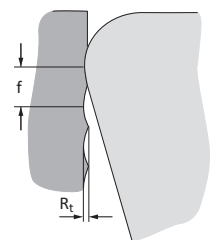
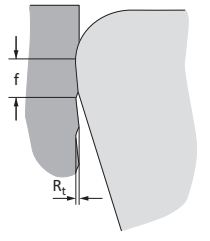
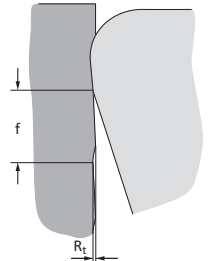
Minimum depth of cut ( $a_p$ ) should at least match the corner radius. This minimizes the radial forces.

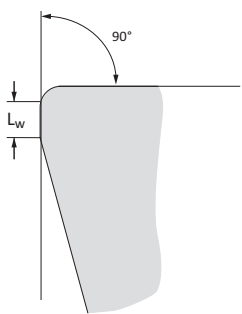


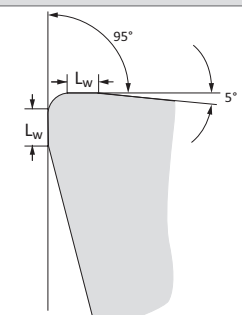
General Formulas		
Cutting Speed	$\frac{V_c = D \times \pi \times n}{1000}$	(m/min)
RPM	$\frac{n = V_c \times 1000}{D \times \pi}$	(min <sup>-1</sup> )
Feed Speed	$V_f = f \times n$	(mm/min)
	$D = \text{Machining } \varnothing$	(mm)
	$f = \text{Feed}$	(mm/u)
	$V_c = \text{Cutting Speed}$	(m/min)
	$n = \text{RPM}$	(min <sup>-1</sup> )

## Technical Information

### Wiper Geometries

Replaceable Inserts with Wiper Geometry	
Insert with conventional corner radius with feed (f)	
Insert with wiper geometry radius with same feed (f)	
Insert with wiper geometry with increased feed (f)	

Wiper Geometry for 90° Approach Angle	
<p>Replaceable inserts produce a right-angled step at the bottom of the hole. When used in a Wohlhaupter standard insert holder that has a 90° approach angle, the secondary wiper cutting edge is nearly parallel with the wall of the hole.</p> <p>Wiper geometry for 90° approach angle L<sub>w</sub> = length of the wiper secondary cutting edge</p>	

Wiper Geometry for 95° Approach Angle	
<p>Wiper inserts can also be used with 95° insert holders, which are included in the Wohlhaupter standard insert range.</p> <p>Wiper geometry for 95° approach angle (left and right cutting) L<sub>w</sub> = length of the secondary wiper cutting edge</p>	

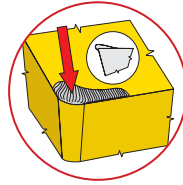


## Boring Insert Wear Patterns

### Built-up Edge

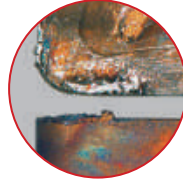
#### Potential Problem

- Machined material adheres to the cutting edge of insert
- When it breaks, the edge becomes brittle and cracks
- This can negatively affect machined surface



#### Possible Solution

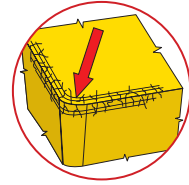
- Increase temperature by increasing speed or feed
- Use an insert with higher lubricity coating
- Choose a freer cutting insert geometry



### Comb Cracks

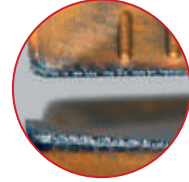
#### Potential Problem

- Caused by high stress on the cutting edge during interrupted cuts



#### Possible Solution

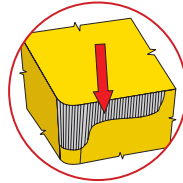
- Switch off coolant or increase coolant flow to obtain an even temperature level
- Reduce cutting speed
- Use tougher insert grade



### Flank Wear

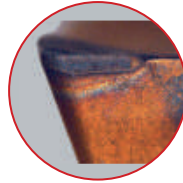
#### Potential Problem

- Caused by friction between the insert and machined material
- It cannot be fully eliminated, but it can be reduced



#### Possible Solution

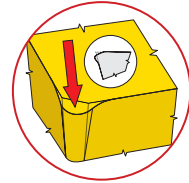
- Use a more wear-resistant grade
- Reduce cutting speed
- Use coolant or increase coolant flow to the cutting edge



### Plastic Deformation

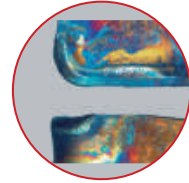
#### Potential Problem

- Caused by high thermal stress on the cutting edge from excessive feed rate and cutting speed



#### Possible Solution

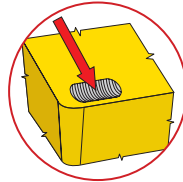
- Use a more wear-resistant grade
- Reduce cutting speed
- Reduce feed rate
- Use coolant or increase coolant flow to the cutting edge



### Cratering

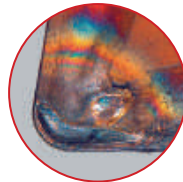
#### Potential Problem

- Appears when the geometry is too neutral or material is too hard for the substrate



#### Possible Solution

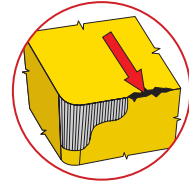
- Use a more wear-resistant grade
- Reduce cutting speed or feed
- Use coolant or increase coolant flow to the cutting edge



### Chipping of Cutting Edge (Out of Cut)

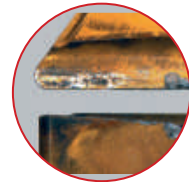
#### Potential Problem

- Caused by poor chip control
- Can damage the portion of the cutting edge that might not be engaged in the cut



#### Possible Solution

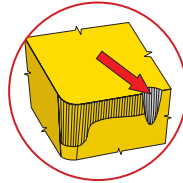
- Change feed rate to gain chip control
- Select a tool with a different approach angle
- Use an insert with a different geometry
- Use a tougher grade of carbide



### Notch Wear

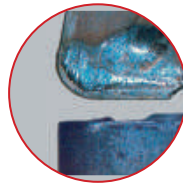
#### Potential Problem

- Occurs when cutting edge of insert comes in contact with surface of machined material
- Caused by hardening of surface layer of material and burrs
- Often appears on stainless austenitic steels and other high temperature alloy steels



#### Possible Solution

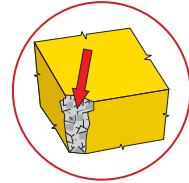
- Use a more wear-resistant grade (Al<sub>2</sub>O<sub>3</sub>)
- Select a tool with a smaller approach angle
- Vary the radial depth of cut
- Use coolant or increase coolant flow to the cutting edge



### Insert Fracture

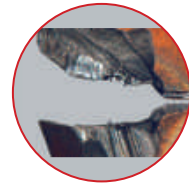
#### Potential Problem

- Caused by workpiece material, grade, condition, the rigidity of the machine-tool-workpiece, extent of wear, and cutting conditions



#### Possible Solution

- Use a tougher grade of carbide
- Reduce the feed and depth of cut
- Use an insert with a stronger chip breaker
- Use an insert with a bigger corner radius









SECTION

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# B10-G

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Intermediate Modules

# Wohlhaupter™ Intermediate Modules

Reducers | Extensions | NOVI<sup>TECH</sup>™



## Increase Tool Stability with Intermediate Modules

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

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.

## Applicable Industries



Aerospace



Agriculture



Automotive



Firearms



General  
Machining



Oil & Gas

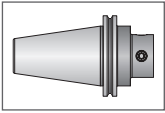


Renewable  
Energy



### Reference Icons

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



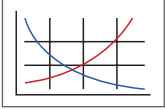
#### Shanks

A variety of shanks for different machines



#### MVS Connection Color Guide

Detailed instructions and information regarding the MVS connection(s)



#### Recommended Cutting Data

Speed and feed recommendations for optimum and safe boring

## Intermediate Modules Table of Contents

### Introduction

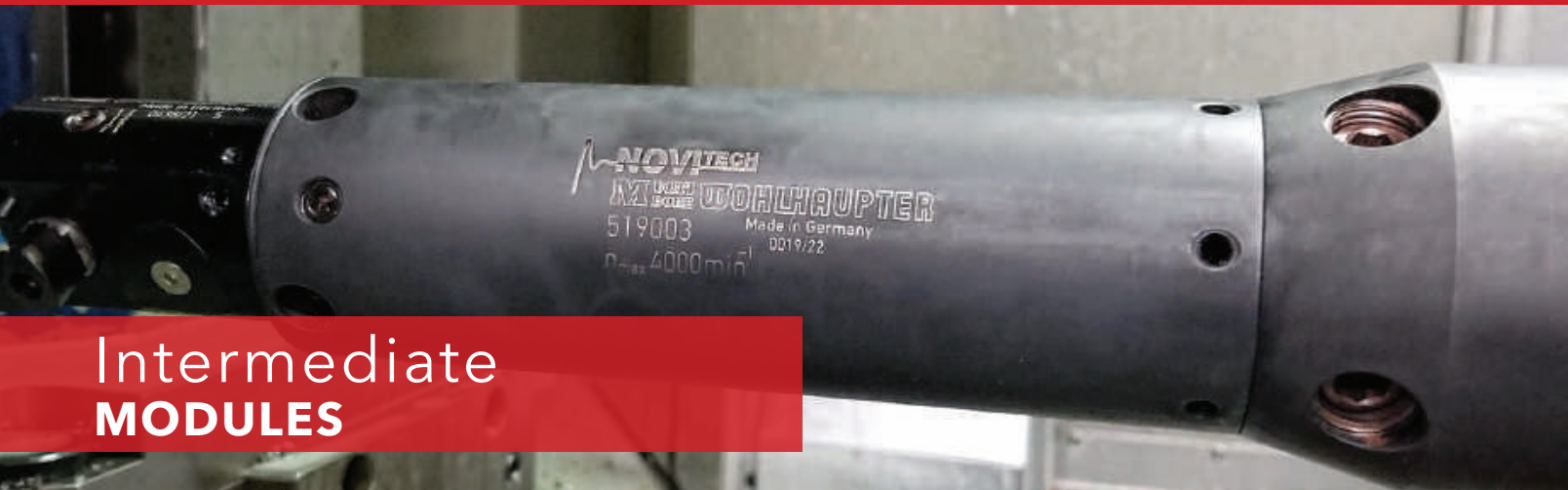
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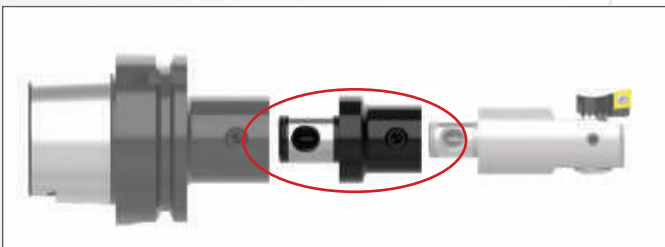
**NOVI<sup>TECH</sup>™ Vibration Dampening Modules . . . . . 13**

# Intermediate Modules Product Overview



## Intermediate MODULES

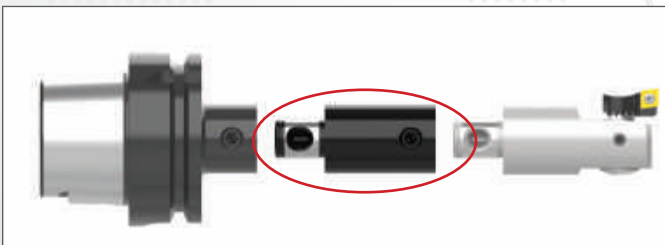
### Reducers



#### Features:

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

### Extensions



#### Features:

- ▶ Used to increase bore depth
- ▶ Connects quickly and easily with the MVS connection
- ▶ Aluminum components available to reduce stress on the spindle

# THE DEEP HOLE

## BORING SOLUTION

YOU'VE BEEN LOOKING FOR

### OUR SOLUTION

- ▶ Machine up to **10xD**
- ▶ Connect quickly and easily with the **MVS connection**
- ▶ Utilize existing **Wohlhaupter™ components**
- ▶ **Increase** your productivity, surface quality, and process reliability
- ▶ **Increase** your tool and spindle life

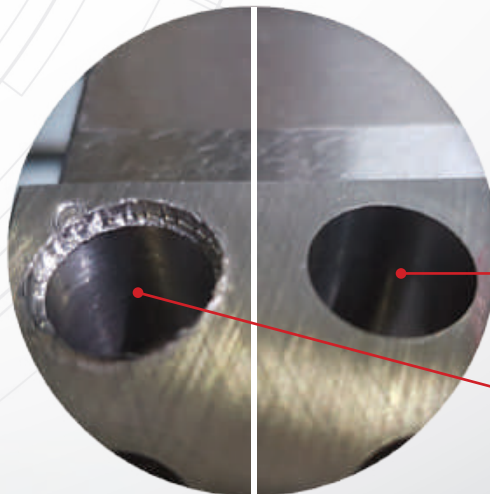
### YOUR ADVANTAGE



Damper module with viscoelastic bearing

Absorber mass

### THE SURFACE QUALITY TELLS IT ALL



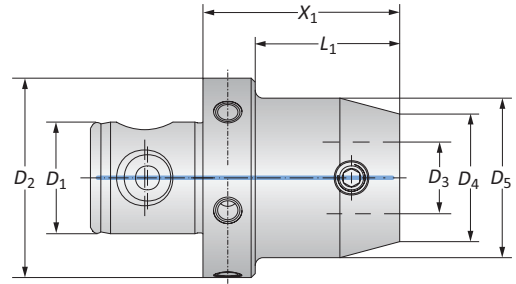
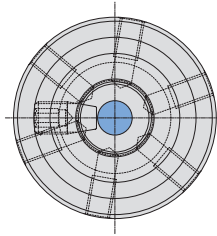
When machining alloy steel to 9xD, the NOVITECH™ provided reliable machining which achieved high surface quality (Ra = 32)

Wohlhaupter™ NOVITECH™ with VarioBore precision boring head

Standard tool construction with steel extension

## Reducers

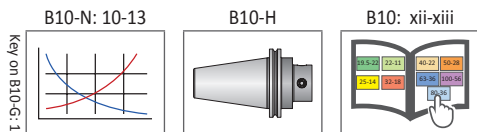
Imperial | Balanced



MVS Connection		Reducer				Weight	Thread Precision	Part No.
$D_2   D_1$	$D_4   D_3$	$X_1$	$L_1$	$D_5$				
25 - 14	19.5 - 11	1.181	0.827	0.768	0.220 (lbs)	-	219034	
25 - 14	22 - 11	1.181	0.827	0.866	0.440 (lbs)	-	219035	
32 - 18	22 - 11	0.472	0.020	0.866	0.220 (lbs)	-	219036	
32 - 18	25 - 14	1.181	0.827	0.984	0.220 (lbs)	-	219037	
40 - 22	22 - 11	0.472	0.020	0.866	0.440 (lbs)	-	219038	
40 - 22	25 - 14	1.181	0.827	0.984	0.440 (lbs)	-	219039	
40 - 22	32 - 18	1.181	-	1.575	1.102 (lbs)	-	219040	
50 - 28	19.5 - 11	2.126	1.614	0.768	0.881 (lbs)	M 6 x 10	219051	
50 - 28	22 - 11	0.551	0.020	0.866	0.661 (lbs)	M 6 x 10	219041	
50 - 28	22 - 11	2.126	1.614	0.866	0.881 (lbs)	M 6 x 10	219052	
50 - 28	25 - 14	0.551	0.020	0.984	0.661 (lbs)	M 6 x 7	119094	
50 - 28	25 - 14	2.323	1.811	0.984	0.881 (lbs)	M 6 x 10	119054	
50 - 28	25 - 14	2.323	1.811	1.260	1.102 (lbs)	M 6 x 10	119055	
50 - 28	25 - 14	4.685	4.173	1.260	2.204 (lbs)	M 6 x 10	119010	
50 - 28	25 - 14	4.685	4.173	1.417	1.322 (lbs)	M 6 x 10	219030*	
50 - 28	32 - 18	1.929	1.417	1.378	1.984 (lbs)	M 6 x 10	219085	
50 - 28	32 - 18	4.291	3.780	1.378	2.204 (lbs)	M 6 x 10	219086	
50 - 28	32 - 18	4.291	3.780	1.575	2.425 (lbs)	M 6 x 10	119012	
50 - 28	32 - 18	4.291	3.780	1.811	2.866 (lbs)	M 6 x 10	219032*	
50 - 28	40 - 22	1.575	1.063	-	1.102 (lbs)	M 6 x 10	219087	
50 - 28	40 - 22	3.937	3.425	1.850	2.866 (lbs)	M 6 x 10	219088	
50 - 28	63 - 36	1.969	-	2.480	2.204 (lbs)	M 6 x 10	119059	

\*Reinforced reducer

**NOTE:** Balance refers to a specific residual imbalance of  $\leq 10$  g mm/kg



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

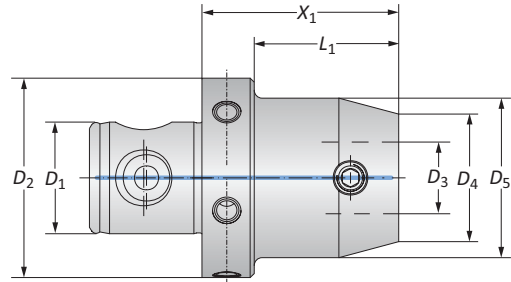
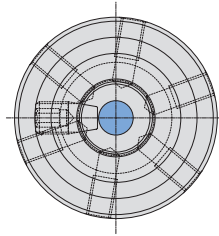
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## Reducers

Metric | Balanced

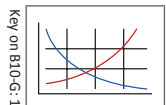


MVS Connection		Reducer			Weight	Thread Precision	Part No.
$D_2   D_1$	$D_4   D_3$	$X_1$	$L_1$	$D_5$			
25 - 14	19.5 - 11	30.00	21.00	19.50	0.10 (kg)	-	219034
25 - 14	22 - 11	30.00	21.00	22.00	0.20 (kg)	-	219035
32 - 18	22 - 11	12.00	0.50	22.00	0.10 (kg)	-	219036
32 - 18	25 - 14	30.00	21.00	25.00	0.10 (kg)	-	219037
40 - 22	22 - 11	12.00	0.50	22.00	0.20 (kg)	-	219038
40 - 22	25 - 14	30.00	21.00	25.00	0.20 (kg)	-	219039
40 - 22	32 - 18	30.00	-	40.00	0.50 (kg)	-	219040
50 - 28	19.5 - 11	54.00	41.00	19.50	0.40 (kg)	M 6 x 10	219051
50 - 28	22 - 11	14.00	0.50	22.00	0.30 (kg)	M 6 x 10	219041
50 - 28	22 - 11	54.00	41.00	22.00	0.40 (kg)	M 6 x 10	219052
50 - 28	25 - 14	14.00	0.50	25.00	0.30 (kg)	M 6 x 7	119094
50 - 28	25 - 14	59.00	46.00	25.00	0.40 (kg)	M 6 x 10	119054
50 - 28	25 - 14	59.00	46.00	32.00	0.50 (kg)	M 6 x 10	119055
50 - 28	25 - 14	119.00	106.00	32.00	1.00 (kg)	M 6 x 10	119010
50 - 28	25 - 14	119.00	106.00	36.00	0.60 (kg)	M 6 x 10	219030*
50 - 28	32 - 18	49.00	36.00	35.00	0.90 (kg)	M 6 x 10	219085
50 - 28	32 - 18	109.00	96.00	35.00	1.00 (kg)	M 6 x 10	219086
50 - 28	32 - 18	109.00	96.00	40.00	1.10 (kg)	M 6 x 10	119012
50 - 28	32 - 18	109.00	96.00	46.00	1.30 (kg)	M 6 x 10	219032*
50 - 28	40 - 22	40.00	27.00	-	0.50 (kg)	M 6 x 10	219087
50 - 28	40 - 22	100.00	87.00	47.00	1.30 (kg)	M 6 x 10	219088
50 - 28	63 - 36	50.00	-	63.00	1.00 (kg)	M 6 x 10	119059

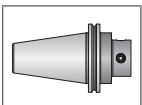
\*Reinforced reducer

**NOTE:** Balance refers to a specific residual imbalance of  $\leq 10$  g mm/kg

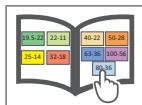
B10-N: 10-13



B10-H



B10: xii-xiii



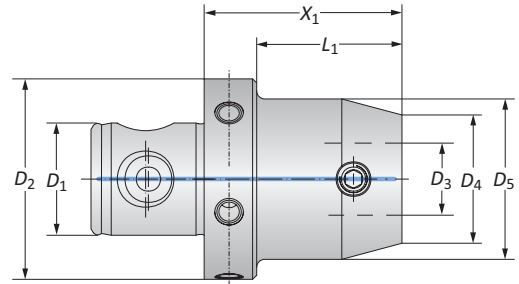
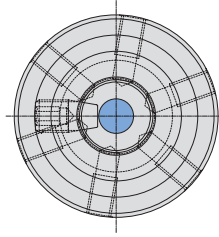
**i** = Imperial (in)  
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## Reducers

Imperial | Balanced



MVS Connection		Reducer			Weight	Thread Precision	Part No.
$D_2   D_1$	$D_4   D_3$	$X_1$	$L_1$	$D_5$			
63 - 36	19.5 - 11	2.126	1.614	0.768	1.322 (lbs)	M 6 x 10	219053
63 - 36	22 - 11	0.551	0.020	0.866	1.322 (lbs)	M 6 x 10	219042
63 - 36	22 - 11	2.126	1.614	0.866	1.543 (lbs)	M 6 x 10	219054
63 - 36	25 - 14	0.551	0.020	0.984	1.322 (lbs)	M 6 x 10	119095
63 - 36	25 - 14	2.323	1.811	0.984	1.543 (lbs)	M 6 x 10	119060
63 - 36	25 - 14	2.323	1.811	1.260	1.763 (lbs)	M 6 x 10	119061
63 - 36	25 - 14	4.685	4.173	1.260	2.425 (lbs)	M 6 x 15	119019
63 - 36	25 - 14	4.685	4.173	1.417	2.866 (lbs)	M 6 x 10	219031*
63 - 36	32 - 18	1.929	1.417	1.378	1.543 (lbs)	M 6 x 10	219089
63 - 36	32 - 18	4.291	3.780	1.378	2.645 (lbs)	M 6 x 10	219090
63 - 36	32 - 18	4.291	3.780	1.575	3.086 (lbs)	M 6 x 10	119021
63 - 36	32 - 18	4.291	3.780	1.811	3.527 (lbs)	M 6 x 10	219033*
63 - 36	40 - 22	1.575	1.063	-	1.763 (lbs)	M 6 x 10	219091
63 - 36	40 - 22	3.937	3.425	1.850	3.527 (lbs)	M 6 x 15	219092
63 - 36	40 - 22	5.906	5.394	1.969	5.291 (lbs)	M 6 x 15	119067
63 - 36	50 - 28	1.575	-	2.480	2.204 (lbs)	M 6 x 10	119064
63 - 36	50 - 28	1.575	1.063	1.969	1.763 (lbs)	M 6 x 10	119096**
63 - 36	50 - 28	3.937	-	2.480	5.291 (lbs)	M 6 x 15	119025
63 - 36	50 - 28	3.937	3.425	1.969	3.747 (lbs)	M 6 x 10	119097**
80 - 36	63 - 36	1.969	-	3.150	3.527 (lbs)	M 6 x 15	119098
100 - 56	80 - 36	2.756	2.047	3.150	7.936 (lbs)	M 8 x 20	219066

\* Reinforced reducer

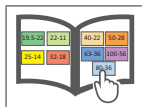
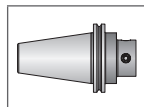
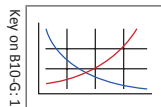
\*\*For milling applications

**NOTE:** Balance refers to a specific residual imbalance of  $\leq 10$  g mm/kg

B10-N: 10-13

B10-H

B10: xii-xiii



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

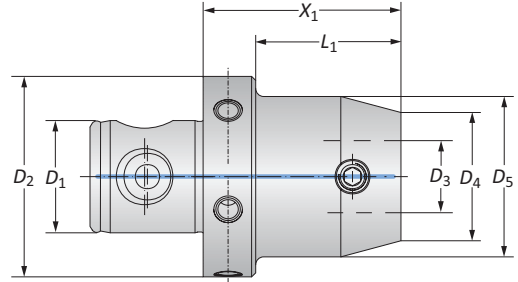
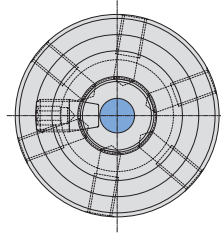
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## Reducers

Metric | Balanced



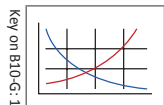
	MVS Connection		Reducer			Weight	Thread Precision	Part No.
	D <sub>2</sub>   D <sub>1</sub>	D <sub>4</sub>   D <sub>3</sub>	X <sub>1</sub>	L <sub>1</sub>	D <sub>5</sub>			
	63 - 36	19.5 - 11	54.00	41.00	19.50	0.60 (kg)	M 6 x 10	219053
	63 - 36	22 - 11	14.00	0.50	22.00	0.60 (kg)	M 6 x 10	219042
	63 - 36	22 - 11	54.00	41.00	22.00	0.70 (kg)	M 6 x 10	219054
	63 - 36	25 - 14	14.00	0.50	25.00	0.60 (kg)	M 6 x 10	119095
	63 - 36	25 - 14	59.00	46.00	25.00	0.70 (kg)	M 6 x 10	119060
	63 - 36	25 - 14	59.00	46.00	32.00	0.80 (kg)	M 6 x 10	119061
	63 - 36	25 - 14	119.00	106.00	32.00	1.10 (kg)	M 6 x 15	119019
	63 - 36	25 - 14	119.00	106.00	36.00	1.30 (kg)	M 6 x 10	219031*
	63 - 36	32 - 18	49.00	36.00	35.00	0.70 (kg)	M 6 x 10	219089
	63 - 36	32 - 18	109.00	96.00	35.00	1.20 (kg)	M 6 x 10	219090
	63 - 36	32 - 18	109.00	96.00	40.00	1.40 (kg)	M 6 x 10	119021
	63 - 36	32 - 18	109.00	96.00	46.00	1.60 (kg)	M 6 x 10	219033*
	63 - 36	40 - 22	40.00	27.00	-	0.80 (kg)	M 6 x 10	219091
	63 - 36	40 - 22	100.00	87.00	47.00	1.60 (kg)	M 6 x 15	219092
	63 - 36	40 - 22	150.00	137.00	50.00	2.40 (kg)	M 6 x 15	119067
	63 - 36	50 - 28	40.00	-	63.00	1.00 (kg)	M 6 x 10	119064
	63 - 36	50 - 28	40.00	27.00	50.00	0.80 (kg)	M 6 x 10	119096**
	63 - 36	50 - 28	100.00	-	63.00	2.40 (kg)	M 6 x 15	119025
	63 - 36	50 - 28	100.00	87.00	50.00	1.70 (kg)	M 6 x 10	119097**
	80 - 36	63 - 36	50.00	-	80.00	1.60 (kg)	M 6 x 15	119098
	100 - 56	80 - 36	70.00	52.00	80.00	3.60 (kg)	M 8 x 20	219066

\* Reinforced reducer

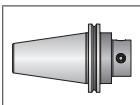
\*\*For milling applications

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

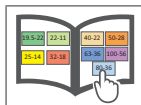
B10-N: 10-13



B10-H



B10: xii-xiii



 = Imperial (in)  
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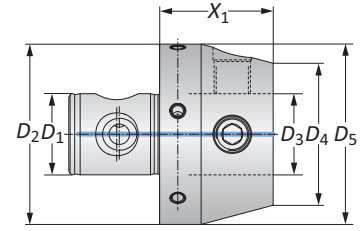
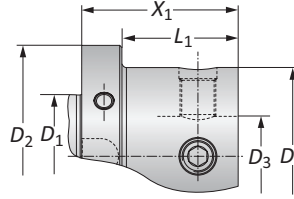
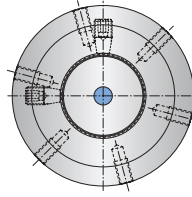
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## Reducer

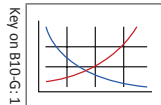
Balanced Alu-Line



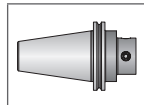
	MVS Connection		Reducer			Weight	Thread Precision	Part No.
	$D_2   D_1$	$D_4   D_3$	$X_1$	$L_1$	$D_5$			
<b>i</b>	100 - 56	80 - 36	2.756	2.047	–	2.866 (lbs)	M 8 x 20	<b>319013</b>
<b>m</b>	100 - 56	80 - 36	70.00	52.00	–	1.30 (kg)	M 8 x 20	<b>319013</b>

**NOTE:** Balance refers to a specific residual imbalance of  $\leq 10$  g mm/kg

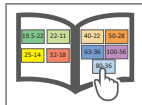
B10-N: 10-13



B10-H



B10: xii-xiii



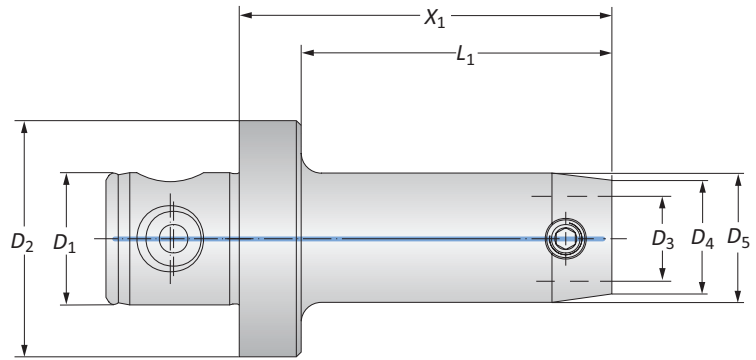
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## Heavy Metal Reducers

Vibration Reduction



MVS Connection		Heavy Metal Reducer			Weight	Part No.
$D_2   D_1$	$D_4   D_3$	$X_1$	$L_1$	$D_5$		
50 - 28	19.5 - 11	3.543	3.031	0.768	2.204 (lbs)	<b>219055</b>
50 - 28	22 - 11	4.331	3.819	0.906	2.866 (lbs)	<b>219056</b>
50 - 28	25 - 14	4.882	4.370	1.102	3.747 (lbs)	<b>219057</b>
50 - 28	25 - 14	5.669	5.157	1.260	5.070 (lbs)	<b>219058</b>
50 - 28	25 - 14	6.457	5.945	1.378	6.393 (lbs)	<b>219059</b>
50 - 28	32 - 18	6.063	5.551	1.457	6.393 (lbs)	<b>219093</b>
50 - 28	32 - 18	6.063	5.551	1.654	8.157 (lbs)	<b>219060</b>
<hr/>						
50 - 28	19.5 - 11	90.00	77.00	19.50	1.00 (kg)	<b>219055</b>
50 - 28	22 - 11	110.00	97.00	23.00	1.30 (kg)	<b>219056</b>
50 - 28	25 - 14	124.00	111.00	28.00	1.70 (kg)	<b>219057</b>
50 - 28	25 - 14	144.00	131.00	32.00	2.30 (kg)	<b>219058</b>
50 - 28	25 - 14	164.00	151.00	35.00	2.90 (kg)	<b>219059</b>
50 - 28	32 - 18	154.00	141.00	37.00	2.90 (kg)	<b>219093</b>
50 - 28	32 - 18	154.00	141.00	42.00	3.70 (kg)	<b>219060</b>

**NOTE:** Heavy metal reducers are used to reduce vibration when machining deep boring applications. When using heavy metal reducers, the maximum cutting speed ( $V_c$ ) is 200 m/min. If steel extensions are also used, reduce the cutting speed by 50% and use replaceable inserts where  $r = 0.10\text{mm}$ .

B10-N: 10-13

B10-H

B10: xii-xiii

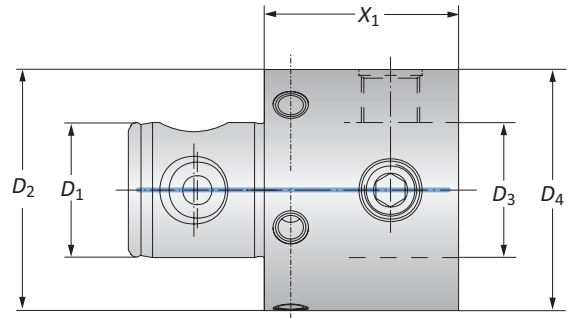
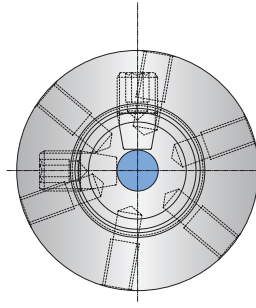
**i** = Imperial (in)  
**m** = Metric (mm)

**IMPORTANT:** Max spindle speed refers to maximum possible speed for an individual boring head and is not a recommended parameter. Refer to page B10-N: 10 for recommended application-specific parameters. Factory technical assistance is available for your specific applications through our Application Engineering department.  
ext: 7611 | email: [appeng@alliedmachine.com](mailto:appeng@alliedmachine.com)

**WARNING** Tool failure can cause serious injury. To prevent:  
-Do not exceed recommended 10xD length to diameter ratio or exceed 4 total components (including shank)  
-Refer to example on page B10-N: 8 for calculating length to diameter ratio  
Factory technical assistance is available for your specific applications through our Application Engineering department. ext: 7611 | email: [appeng@alliedmachine.com](mailto:appeng@alliedmachine.com)

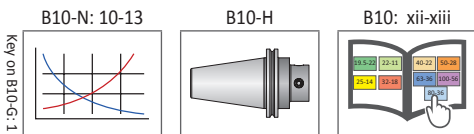
Extensions

Imperial | Balanced



MVS Connection		Extension	Weight	Thread Precision	Part No.
D <sub>2</sub>   D <sub>1</sub>	D <sub>4</sub>   D <sub>3</sub>				
19.5 - 11	19.5 - 11	1.575	0.220 (lbs)	-	219043
22 - 11	22 - 11	1.575	0.220 (lbs)	-	219044
25 - 14	25 - 14	0.984	0.220 (lbs)	-	219068
25 - 14	25 - 14	1.575	0.220 (lbs)	-	119001
32 - 18	32 - 18	1.575	0.440 (lbs)	-	119002
40 - 22	40 - 22	1.575	0.881 (lbs)	-	119003
50 - 28	50 - 28	1.575	1.322 (lbs)	M 6 x 10	119004
50 - 28	50 - 28	2.953	2.425 (lbs)	M 6 x 10	219097*
50 - 28	50 - 28	2.953	2.425 (lbs)	M 6 x 10	219082
50 - 28	50 - 28	3.937	3.306 (lbs)	M 6 x 10	119058
63 - 36	63 - 36	1.969	2.425 (lbs)	M 6 x 10	119005
63 - 36	63 - 36	2.953	3.747 (lbs)	M 6 x 15	219083
63 - 36	63 - 36	4.921	6.393 (lbs)	M 6 x 15	119065
80 - 36	80 - 36	1.969	4.188 (lbs)	M 6 x 15	119006
80 - 36	80 - 36	2.953	6.172 (lbs)	M 6 x 15	219084
80 - 36	80 - 36	4.921	10.580 (lbs)	M 8 x 15	119066
80 - 36	80 - 36	7.874	16.310 (lbs)	M 6 x 15	219094
80 - 36	80 - 36	10.827	22.260 (lbs)	M 8 x 21	119069
100 - 56	100 - 56	2.953	9.479 (lbs)	M 8 x 20	219095
100 - 56	100 - 56	3.937	12.340 (lbs)	M 8 x 20	219061
100 - 56	100 - 56	5.906	17.850 (lbs)	M 8 x 20	219096
100 - 56	100 - 56	7.874	22.480 (lbs)	M 8 x 20	219062
100 - 56	100 - 56	11.811	32.180 (lbs)	M 8 x 20	219063

\*D<sub>2</sub> / D<sub>4</sub> = 1.948" (49.50mm) for boring 1.968" (50.00mm) applications  
 NOTE: Balance refers to a specific residual imbalance of ≤ 10 g mm/kg



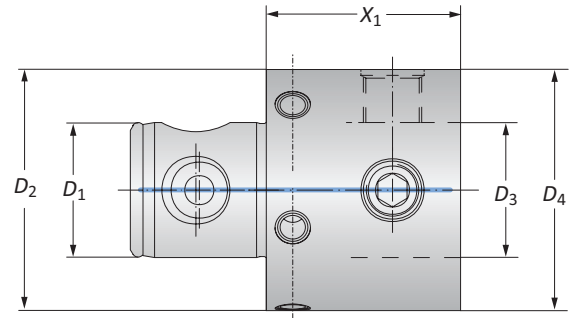
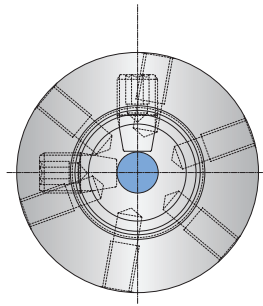
i = Imperial (in)  
 m = Metric (mm)

**IMPORTANT:** Max spindle speed refers to maximum possible speed for an individual boring head and is not a recommended parameter. Refer to page B10-N: 10 for recommended application-specific parameters. Factory technical assistance is available for your specific applications through our Application Engineering department.  
 ext: 7611 | email: [appeng@alliedmachine.com](mailto:appeng@alliedmachine.com)

**⚠ WARNING** Tool failure can cause serious injury. To prevent:  
 -Do not exceed recommended 10xD length to diameter ratio or exceed 4 total components (including shank)  
 -Refer to example on page B10-N: 8 for calculating length to diameter ratio  
 Factory technical assistance is available for your specific applications through our Application Engineering department. ext: 7611 | email: [appeng@alliedmachine.com](mailto:appeng@alliedmachine.com)

## Extensions

Metric | Balanced

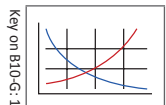


MVS Connection		Extension	Weight	Thread Precision	Part No.
$D_2   D_1$	$D_4   D_3$				
19.5 - 11	19.5 - 11	40.00	0.10 (kg)	-	219043
22 - 11	22 - 11	40.00	0.10 (kg)	-	219044
25 - 14	25 - 14	25.00	0.10 (kg)	-	219068
25 - 14	25 - 14	40.00	0.10 (kg)	-	119001
32 - 18	32 - 18	40.00	0.20 (kg)	-	119002
40 - 22	40 - 22	40.00	0.40 (kg)	-	119003
50 - 28	50 - 28	40.00	0.60 (kg)	M 6 x 10	119004
50 - 28	50 - 28	75.00	1.10 (kg)	M 6 x 10	219097*
50 - 28	50 - 28	75.00	1.10 (kg)	M 6 x 10	219082
50 - 28	50 - 28	100.00	1.50 (kg)	M 6 x 10	119058
63 - 36	63 - 36	50.00	1.10 (kg)	M 6 x 10	119005
63 - 36	63 - 36	75.00	1.70 (kg)	M 6 x 15	219083
63 - 36	63 - 36	125.00	2.90 (kg)	M 6 x 15	119065
80 - 36	80 - 36	50.00	1.90 (kg)	M 6 x 15	119006
80 - 36	80 - 36	75.00	2.80 (kg)	M 6 x 15	219084
80 - 36	80 - 36	125.00	4.80 (kg)	M 8 x 15	119066
80 - 36	80 - 36	200.00	7.40 (kg)	M 6 x 15	219094
80 - 36	80 - 36	275.00	10.10 (kg)	M 8 x 21	119069
100 - 56	100 - 56	75.00	4.30 (kg)	M 8 x 20	219095
100 - 56	100 - 56	100.00	5.60 (kg)	M 8 x 20	219061
100 - 56	100 - 56	150.00	8.10 (kg)	M 8 x 20	219096
100 - 56	100 - 56	200.00	10.20 (kg)	M 8 x 20	219062
100 - 56	100 - 56	300.00	14.60 (kg)	M 8 x 20	219063

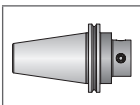
\* $D_2 / D_4 = 1.948"$  (49.50mm) for boring 1.968" (50.00mm) applications

**NOTE:** Balance refers to a specific residual imbalance of  $\leq 10$  g mm/kg

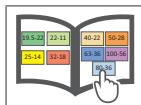
B10-N: 10-13



B10-H



B10: xii-xiii



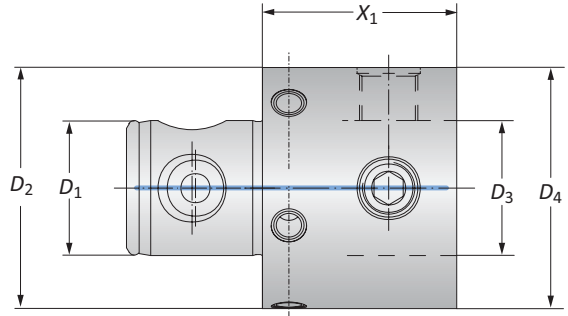
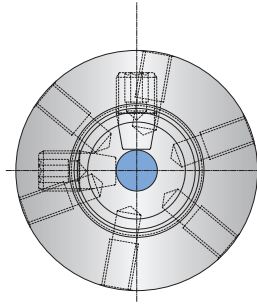
**i** = Imperial (in)  
**m** = Metric (mm)

**IMPORTANT:** Max spindle speed refers to maximum possible speed for an individual boring head and is not a recommended parameter. Refer to page B10-N: 10 for recommended application-specific parameters. Factory technical assistance is available for your specific applications through our Application Engineering department.  
ext: 7611 | email: [appeng@alliedmachine.com](mailto:appeng@alliedmachine.com)

**WARNING** Tool failure can cause serious injury. To prevent:  
-Do not exceed recommended 10xD length to diameter ratio or exceed 4 total components (including shank)  
-Refer to example on page B10-N: 8 for calculating length to diameter ratio  
Factory technical assistance is available for your specific applications through our Application Engineering department. ext: 7611 | email: [appeng@alliedmachine.com](mailto:appeng@alliedmachine.com)

Extensions

Balanced Alu-Line



MVS Connection		Modules		Weight	Thread Precision	Part No.
D <sub>2</sub>   D <sub>1</sub>	D <sub>4</sub>   D <sub>3</sub>	X <sub>1</sub>				
50 - 28	50 - 28	1.575	0.440 (lbs)	M 6 x 8	319021	
50 - 28	50 - 28	2.953	0.881 (lbs)	M 6 x 10	319022	
50 - 28	50 - 28	3.937	1.322 (lbs)	M 6 x 10	319023	
63 - 36	63 - 36	1.969	0.881 (lbs)	M 6 x 8	319002	
63 - 36	63 - 36	4.921	2.425 (lbs)	M 6 x 10	319003	
80 - 36	80 - 36	1.969	1.543 (lbs)	M 6 x 10	319004	
80 - 36	80 - 36	2.953	2.204 (lbs)	M 6 x 10	319016	
<b>i</b> 80 - 36	80 - 36	4.921	3.968 (lbs)	M 6 x 10	319005	
80 - 36	80 - 36	7.874	5.952 (lbs)	M 6 x 10	319017	
80 - 36	80 - 36	10.827	8.157 (lbs)	M 6 x 10	319006	
100 - 56	100 - 56	2.953	3.306 (lbs)	M 8 x 20	319019	
100 - 56	100 - 56	3.937	4.850 (lbs)	M 8 x 20	319007	
100 - 56	100 - 56	5.906	6.613 (lbs)	M 8 x 20	319018	
100 - 56	100 - 56	7.874	8.377 (lbs)	M 8 x 20	319008	
100 - 56	100 - 56	11.811	11.900 (lbs)	M 8 x 20	319009	
<hr/>						
50 - 28	50 - 28	40.00	0.20 (kg)	M 6 x 8	319021	
50 - 28	50 - 28	75.00	0.40 (kg)	M 6 x 10	319022	
50 - 28	50 - 28	100.00	0.60 (kg)	M 6 x 10	319023	
63 - 36	63 - 36	50.00	0.40 (kg)	M 6 x 8	319002	
63 - 36	63 - 36	125.00	1.10 (kg)	M 6 x 10	319003	
80 - 36	80 - 36	50.00	0.70 (kg)	M 6 x 10	319004	
80 - 36	80 - 36	75.00	1.00 (kg)	M 6 x 10	319016	
<b>m</b> 80 - 36	80 - 36	125.00	1.80 (kg)	M 6 x 10	319005	
80 - 36	80 - 36	200.00	2.70 (kg)	M 6 x 10	319017	
80 - 36	80 - 36	275.00	3.70 (kg)	M 6 x 10	319006	
100 - 56	100 - 56	75.00	1.50 (kg)	M 8 x 20	319019	
100 - 56	100 - 56	100.00	2.20 (kg)	M 8 x 20	319007	
100 - 56	100 - 56	150.00	3.00 (kg)	M 8 x 20	319018	
100 - 56	100 - 56	200.00	3.80 (kg)	M 8 x 20	319008	
100 - 56	100 - 56	300.00	5.40 (kg)	M 8 x 20	319009	

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

B10-N: 10-13

Key on B10-G: 1

B10-H

B10: xii-xiii

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

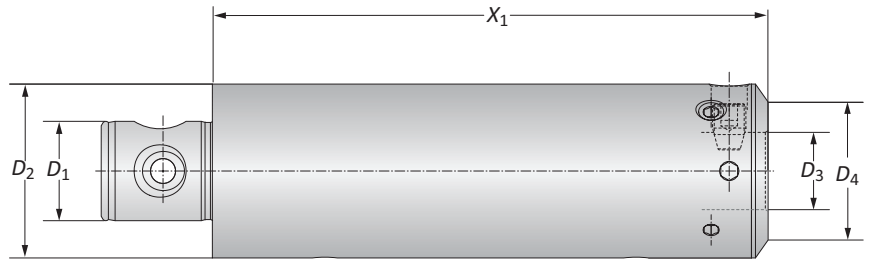
**IMPORTANT:** Max spindle speed refers to maximum possible speed for an individual boring head and is not a recommended parameter. Refer to page B10-N: 10 for recommended application-specific parameters. Factory technical assistance is available for your specific applications through our Application Engineering department.  
ext: 7611 | email: [appeng@alliedmachine.com](mailto:appeng@alliedmachine.com)

**⚠ WARNING** Tool failure can cause serious injury. To prevent:  
-Do not exceed recommended 10xD length to diameter ratio or exceed 4 total components (including shank)  
-Refer to example on page B10-N: 8 for calculating length to diameter ratio  
Factory technical assistance is available for your specific applications through our Application Engineering department. ext: 7611 | email: [appeng@alliedmachine.com](mailto:appeng@alliedmachine.com)



## NOVI<sup>TECH</sup>™ Vibration Dampened Modules

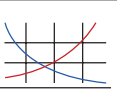
Machining Diameter: 1.968" - 8.070" (50.00mm - 205.00mm)



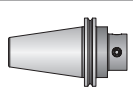
MVS Connection		NOVI <sup>TECH</sup>		
$D_2   D_1$	$D_4   D_3$	$X_1$	Weight	Part No.
50 - 28	40 - 22	7.874	6.172 (lbs)	519002*
63 - 36	50 - 28	7.874	12.560 (lbs)	519003
80 - 36	63 - 36	7.874	16.530 (lbs)	519004
80 - 36	80 - 36	7.874	16.530 (lbs)	519005
<hr/>				
50 - 28	40 - 22	200.00	2.80 (kg)	519002
63 - 36	50 - 28	200.00	5.70 (kg)	519003
80 - 36	63 - 36	200.00	7.50 (kg)	519004
80 - 36	80 - 36	200.00	7.50 (kg)	519005

\* $D_2 = 49.50\text{mm}$

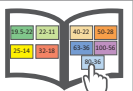
B10-N: 10-13



B10-H



B10: xii-xiii



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

**IMPORTANT:** Max spindle speed refers to maximum possible speed for an individual boring head and is not a recommended parameter. Refer to page B10-N: 10 for recommended application-specific parameters. Factory technical assistance is available for your specific applications through our Application Engineering department.  
ext: 7611 | email: [appeng@alliedmachine.com](mailto:appeng@alliedmachine.com)

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SECTION

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# B10-H

---

Master Shanks

# Wohlhaupter™ Master Shanks



## The MVS Connection

Wohlhaupter MVS connection shanks provide a high level of accuracy when building or replacing components. Our master shanks adapt to any machine tool spindle, making it easy to find the shank you need.

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



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

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

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

### **WARNING**

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

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

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

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

## Applicable Industries



Aerospace



Agriculture



Automotive



Firearms



General  
Machining



Oil & Gas

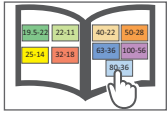


Renewable  
Energy

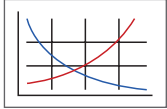


### Reference Icons

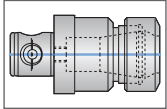
The following icons will appear throughout the catalog to help you navigate between products.



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



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

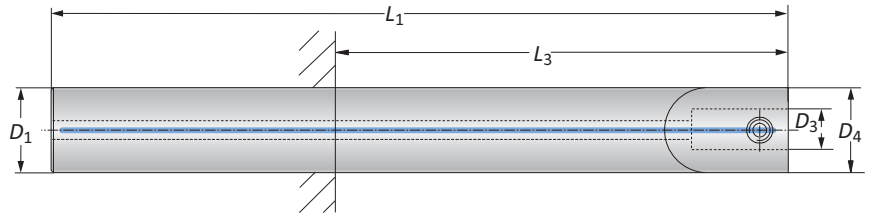


**Clamping Elements**  
Collet chucks for carbide shanks

## Master Shanks Table of Contents

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<b>CAT Shanks with Imperial Threads</b> . . . . .	7
<b>CAT Shanks with Metric Threads</b> . . . . .	8
<b>Dual Contact SK Shanks (DIN 69871-AD / BD)</b> . . . . .	9
<b>SK Shanks (DIN 69871-AD / B-D)</b> . . . . .	10
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## Carbide Shanks

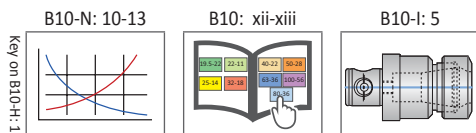


Connection	Shank			L <sub>3</sub> min				Weight	Part No.
	D <sub>4</sub>   D <sub>3</sub>	L <sub>1</sub>	D <sub>1</sub>	L <sub>3</sub> max	SK 40	SK 50	HSK-A 63		
18 - 11	6.102	0.709	4.213	1.535	1.024	2.362	2.638	1.102 (lbs)	299009*
22 - 11	5.512	0.866	3.622	1.102	1.102	1.772	2.047	1.543 (lbs)	299001*
22 - 11	7.480	0.866	5.591	2.913	2.205	3.740	4.016	1.984 (lbs)	299002*
22 - 11	9.049	0.866	7.205	4.528	3.819	5.354	5.630	2.425 (lbs)	299003*
<b>i</b> 25 - 14	6.496	0.984	4.606	1.929	1.417	2.756	3.031	2.205 (lbs)	299004*
25 - 14	8.465	0.984	6.575	3.898	3.189	4.724	5.000	2.866 (lbs)	299005*
32 - 18	8.268	1.260	-	5.354	5.354	5.572	5.394	4.630 (lbs)	299006
32 - 18	10.236	1.260	-	7.323	7.323	7.441	7.362	5.732 (lbs)	299007**
40 - 22	16.399	1.575	-	-	13.110	-	13.110	11.460 (lbs)	299008**
18 - 11	155.00	18.00	107.00	39.00	26.00	60.00	67.00	0.50 (kg)	299009*
22 - 11	140.00	22.00	92.00	28.00	28.00	45.00	52.00	0.70 (kg)	299001*
22 - 11	190.00	22.00	142.00	74.00	56.00	95.00	102.00	0.90 (kg)	299002*
22 - 11	231.00	22.00	183.00	115.00	97.00	136.00	143.00	1.10 (kg)	299003*
<b>m</b> 25 - 14	165.00	25.00	117.00	49.00	36.00	70.00	77.00	1.00 (kg)	299004*
25 - 14	215.00	25.00	167.00	99.00	81.00	120.00	127.00	1.30 (kg)	299005*
32 - 18	210.00	32.00	-	136.00	136.00	139.00	137.00	2.10 (kg)	299006**
32 - 18	260.00	32.00	-	186.00	186.00	189.00	187.00	2.60 (kg)	299007**
40 - 22	415.00	40.00	-	-	333.00	-	333.00	5.20 (kg)	299008**

**NOTE:** Adapter shanks are used for extensions up to 10xD

\*Recommended clamping element: collet chuck ISO 15488 (DIN 6499-B) (pg. B10-I: 5)

\*\*Recommended clamping element: collet chuck ISO 10897 (DIN 6388) (pg. B10-I: 5)



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

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

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

Factory technical assistance is also available for specific applications through our Application Engineering department. ext: 7611 | email: [appeng@alliedmachine.com](mailto:appeng@alliedmachine.com)

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

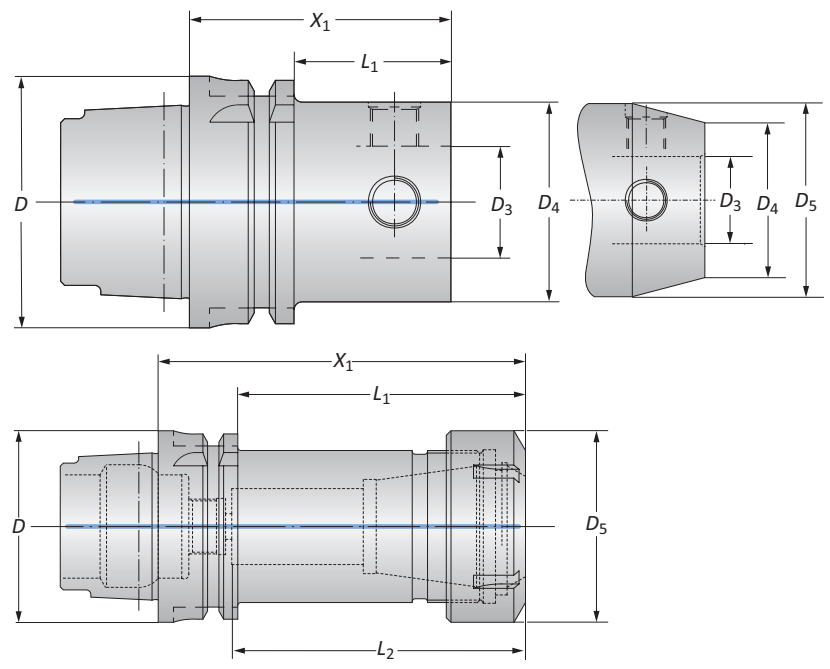
-Do not exceed recommended 10xD length to diameter ratio or exceed 4 total components (including shank)

-Refer to example on page B10-N: 8 for calculating length to diameter ratio

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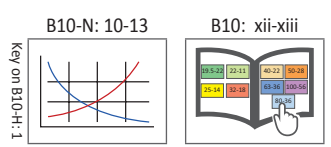
# HSK Shanks (DIN 69893)

Imperial | Balanced



Taper Size	Connection	Shank				Weight	Part No.
$D$	$D_4   D_3$	$X_1$	$L_1$	$L_2$	$D_5$		
40	40 - 22	2.205	-	-	-	0.881 (lbs)	246016
40	50 - 28	2.756	-	-	-	1.543 (lbs)	246004
50	40 - 22	2.205	1.181	-	-	1.322 (lbs)	246015
50	50 - 28	2.559	1.535	-	-	1.763 (lbs)	245011
63	25 - 14	1.811	0.787	-	-	1.543 (lbs)	246012
63	32 - 18	2.205	1.181	-	-	1.763 (lbs)	246013
63	40 - 22	2.205	1.181	-	-	1.984 (lbs)	246014
63	50 - 28	2.559	1.535	-	-	3.527 (lbs)	245012
63	63 - 36	3.150	-	-	-	3.306 (lbs)	245013
63	80 - 36	3.150	-	-	-	4.629 (lbs)	246009
63	ER 40	4.724	3.700	3.740	2.480	3.747 (lbs)	252090*
100	50 - 28	2.559	1.417	-	-	5.291 (lbs)	245014
100	50 - 28	7.087	5.944	-	2.362	11.020 (lbs)	246020
100	50 - 28	7.087	5.944	-	1.948	6.393 (lbs)	246021
100	63 - 36	3.150	2.007	-	-	6.393 (lbs)	246015
100	63 - 36	8.071	6.929	-	3.070	17.190 (lbs)	246019
100	63 - 36	8.071	6.929	-	-	17.190 (lbs)	246022
100	80 - 36	3.150	2.007	-	-	8.157 (lbs)	245016
100	80 - 36	10.03	8.897	-	3.543	27.770 (lbs)	246018
100	80 - 36	10.03	8.897	-	-	22.920 (lbs)	246023
100	100 - 56	3.937	-	-	-	11.020 (lbs)	246010
100	100 - 56	11.810	8.700	-	-	38.580 (lbs)	246017
100	ER 40	4.724	3.582	3.464	2.480	7.716 (lbs)	252091*

**NOTE:** Balanced refers to a specific residual imbalance of  $\leq 4.00$  gmm/kg  
 \*Balanced without clamping nut



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

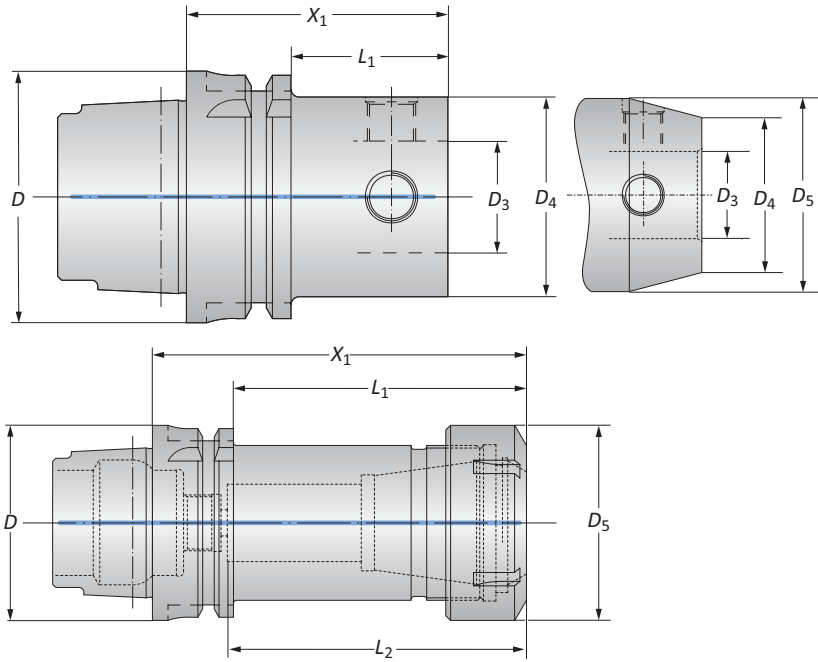
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# HSK Shanks (DIN 69893)

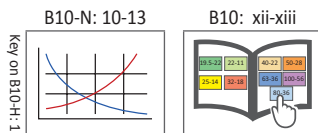
Metric | Balanced



Taper Size	Connection	Shank				Weight	Part No.		
		D	D <sub>4</sub>   D <sub>3</sub>	X <sub>1</sub>	L <sub>1</sub>			L <sub>2</sub>	D <sub>5</sub>
40	40 - 22	40	22	56.00	-	-	-	0.40 (kg)	246016
40	50 - 28	40	28	70.00	-	-	-	0.70 (kg)	246004
50	40 - 22	50	22	56.00	30.00	-	-	0.60 (kg)	246015
50	50 - 28	50	28	65.00	39.00	-	-	0.80 (kg)	245011
63	25 - 14	63	14	46.00	20.00	-	-	0.70 (kg)	246012
63	32 - 18	63	18	56.00	30.00	-	-	0.80 (kg)	246013
63	40 - 22	63	22	56.00	30.00	-	-	0.90 (kg)	246014
63	50 - 28	63	28	65.00	39.00	-	-	1.60 (kg)	245012
63	63 - 36	63	36	80.00	-	-	-	1.50 (kg)	245013
63	80 - 36	63	36	80.00	-	-	-	2.10 (kg)	246009
63	ER 40	63	ER 40	120.00	94.00	95.00	63.00	1.70 (kg)	252090*
100	50 - 28	100	28	65.00	36.00	-	-	2.40 (kg)	245014
100	50 - 28	100	28	180.00	151.00	-	60.00	5.00 (kg)	246020
100	50 - 28	100	28	180.00	151.00	-	49.50	4.00 (kg)	246021
100	63 - 36	100	36	80.00	51.00	-	-	2.90 (kg)	246015
100	63 - 36	100	36	205.00	176.00	-	78.00	7.80 (kg)	246019
100	63 - 36	100	36	205.00	176.00	-	-	7.80 (kg)	246022
100	80 - 36	100	36	80.00	51.00	-	-	3.70 (kg)	245016
100	80 - 36	100	36	255.00	226.00	-	90.00	12.60 (kg)	246018
100	80 - 36	100	36	255.00	226.00	-	-	10.40 (kg)	246023
100	100 - 56	100	56	100.00	-	-	-	5.00 (kg)	246010
100	100 - 56	100	56	300.00	221.00	-	-	17.50 (kg)	246017
100	ER 40	100	ER 40	120.00	91.00	88.00	63.00	3.50 (kg)	252091*

**NOTE:** Balanced refers to a specific residual imbalance of ≤4.00 gmm/kg

\*Balanced without clamping nut



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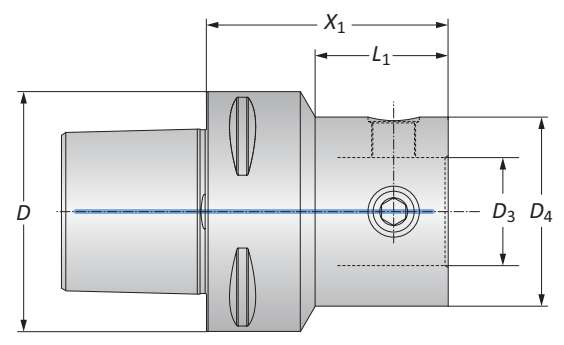
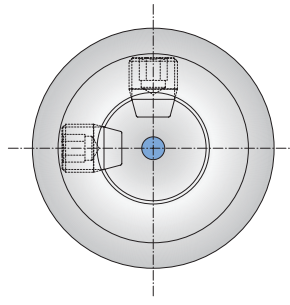
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## Polygon Shaft Shanks (PSC) (ISO 26623-1)

Balanced



PSC	Connection	Shank		Weight	Part No.	
		D	D <sub>4</sub>   D <sub>3</sub>			X <sub>1</sub>
i	50	40 - 22	2.126	1.224	1.543 (lbs)	227014
	50	50 - 28	2.559	-	2.205 (lbs)	227001
	50	63 - 36	3.150	-	3.527 (lbs)	227002
	50	80 - 36	3.150	-	5.512 (lbs)	227012
	63	25 - 14	2.126	0.838	2.205 (lbs)	227010
	63	32 - 28	2.126	0.917	2.205 (lbs)	227009
	63	40 - 22	2.559	1.433	2.425 (lbs)	227008
	63	50 - 28	2.559	1.555	2.866 (lbs)	227003
	63	63 - 36	3.150	-	4.189 (lbs)	227004
	63	80 - 36	3.150	-	5.952 (lbs)	227005
	80	50 - 28	2.559	1.047	5.071 (lbs)	227011
	80	63 - 36	3.150	1.783	5.952 (lbs)	227006
	80	80 - 36	3.150	-	7.496 (lbs)	227007
	m	50	40 - 22	54.00	31.10	0.70 (kg)
50		50 - 28	65.00	-	1.00 (kg)	227001
50		63 - 36	80.00	-	1.60 (kg)	227002
50		80 - 36	80.00	-	2.50 (kg)	227012
63		25 - 14	54.00	21.10	1.00 (kg)	227010
63		32 - 28	54.00	23.00	1.00 (kg)	227009
63		40 - 22	65.00	36.40	1.10 (kg)	227008
63		50 - 28	65.00	39.00	1.30 (kg)	227003
63		63 - 36	80.00	-	1.90 (kg)	227004
63		80 - 36	80.00	-	2.70 (kg)	227005
80		50 - 28	65.00	25.00	2.30 (kg)	227011
80		63 - 36	80.00	45.10	2.70 (kg)	227006
80		80 - 36	80.00	-	3.40 (kg)	227007

NOTE: Balanced refers to a specific residual imbalance of ≤4.00 gmm/kg

B10-N: 10-13

B10: xii-xiii

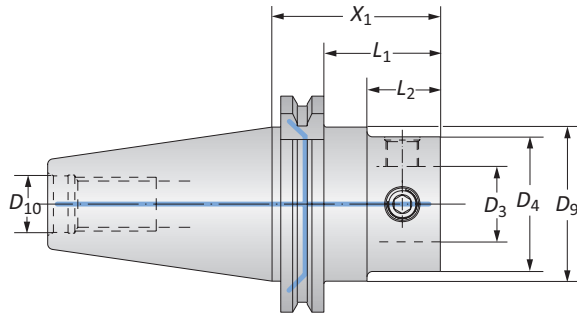
i = Imperial (in)  
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## Dual Contact CAT Shanks with Imperial Threads



Taper Size	Connection		Shank				Weight	Part No.
	$D_4$   $D_3$	$X_1$	$L_1$	$L_2$	$D_9$	$D_{10}$		
40	50 - 28	2.440	1.688	1.062	1.752	5/8 - 11	2.645 (lbs)	353062
40	50 - 28	5.394	4.642	4.016	1.752	5/8 - 11	5.292 (lbs)	353076
40	63 - 36	3.228	2.440	1.850	1.752	5/8 - 11	3.747 (lbs)	353063
50	50 - 28	2.440	1.964	1.062	2.752	1 - 8	7.054 (lbs)	353061
50	50 - 28	7.953	7.201	6.575	2.752	1 - 8	11.687 (lbs)	353077
<b>i</b> 50	63 - 36	2.835	2.083	1.457	2.752	1 - 8	7.938 (lbs)	353078
50	63 - 36	8.740	7.988	7.362	2.752	1 - 8	15.656 (lbs)	353079
50	80 - 36	2.834	2.082	1.456	2.752	1 - 8	8.818 (lbs)	353060
50	80 - 36	10.709	9.957	9.331	2.752	1 - 8	26.240 (lbs)	353080
50	100 - 56	4.134	3.382	2.756	2.752	1 - 8	13.230 (lbs)	353081
50	100 - 56	12.008	11.256	10.630	2.752	1 - 8	39.470 (lbs)	353082
40	50 - 28	62.00	42.90	27.00	44.50	5/8 - 11	1.20 (kg)	353062
40	50 - 28	137.00	117.90	102.00	44.50	5/8 - 11	2.40 (kg)	353076
40	63 - 36	82.00	62.90	47.00	44.50	5/8 - 11	1.70 (kg)	353063
50	50 - 28	62.00	49.90	27.00	69.90	1 - 8	3.20 (kg)	353061
50	50 - 28	202.00	182.90	167.00	69.90	1 - 8	5.30 (kg)	353077
<b>m</b> 50	63 - 36	72.00	52.90	37.00	69.90	1 - 8	3.60 (kg)	353078
50	63 - 36	222.00	202.90	187.00	69.90	1 - 8	7.10 (kg)	353079
50	80 - 36	72.00	52.90	37.00	69.90	1 - 8	4.00 (kg)	353060
50	80 - 36	272.00	252.90	237.00	69.90	1 - 8	11.90 (kg)	353080
50	100 - 56	105.00	85.90	70.00	69.90	1 - 8	6.00 (kg)	353081
50	100 - 56	305.00	258.90	270.00	69.90	1 - 8	17.90 (kg)	353082

B10-N: 10-13      B10: xii-xiii

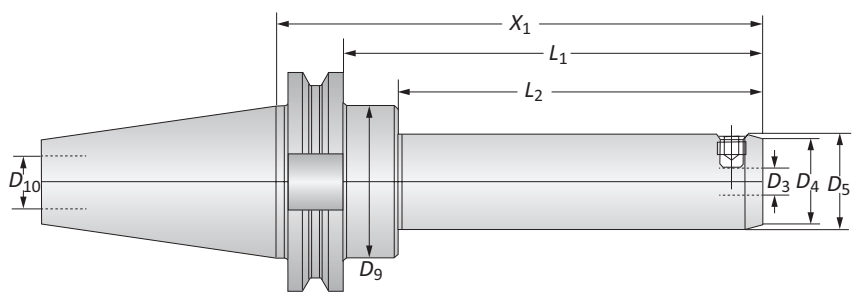
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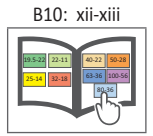
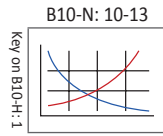


## CAT Shanks with Imperial Threads



Taper Size	Connection $D_4   D_3$	Shank						Weight	Part No.
		$X_1$	$L_1$	$L_2$	$D_5$	$D_9$	$D_{10}$		
30	40 - 22	2.362	1.610	-	-	-	1/2 - 13	1.322 (lbs)	353001
30	50 - 28	2.755	2.000	-	-	-	1/2 - 13	1.763 (lbs)	353002
40	25 - 14	2.165	1.413	0.787	0.984	1.751	5/8 - 11	2.204 (lbs)	353011
40	25 - 14	5.551	4.803	4.173	1.102	1.751	5/8 - 11	3.306 (lbs)	353012
40	32 - 18	2.559	1.964	1.181	1.259	1.751	5/8 - 11	2.425 (lbs)	353013
40	32 - 18	6.732	5.944	5.354	1.377	1.751	5/8 - 11	4.188 (lbs)	353014
40	40 - 22	2.165	1.410	0.787	-	1.751	5/8 - 11	2.491 (lbs)	353003
40	40 - 22	6.377	5.590	5.000	1.850	1.751	5/8 - 11	5.511 (lbs)	353015
40	50 - 28	2.440	1.690	-	-	1.751	5/8 - 11	2.821 (lbs)	353004
40	50 - 28	5.393	4.606	4.015	1.968	1.751	5/8 - 11	5.291 (lbs)	353016
40	63 - 36	3.228	2.480	-	-	1.751	5/8 - 11	4.034 (lbs)	353005
40	63 - 36	6.181	5.393	4.803	2.480	1.751	5/8 - 11	7.936 (lbs)	353017
50	40 - 22	1.811	1.410	0.787	-	2.750	1 - 8	7.297 (lbs)	353006
50	40 - 22	6.377	5.590	5.000	1.850	2.751	1 - 8	9.920 (lbs)	353018
50	50 - 28	2.440	1.690	-	1.063	2.751	1 - 8	7.583 (lbs)	353007
50	50 - 28	7.952	7.165	6.574	1.948	2.751	1 - 8	11.680 (lbs)	353025
50	50 - 28	7.952	7.165	6.574	2.362	2.751	1 - 8	14.100 (lbs)	353019
50	63 - 36	2.834	2.080	-	1.457	2.751	1 - 8	8.223 (lbs)	353008
50	63 - 36	8.740	7.952	7.362	2.480	2.751	1 - 8	15.650 (lbs)	353023
50	63 - 36	8.740	7.952	7.362	3.070	2.751	1 - 8	20.500 (lbs)	353020
50	80 - 36	2.834	2.080	-	-	2.751	1 - 8	9.413 (lbs)	353009
50	80 - 36	10.700	9.921	9.330	3.149	2.751	1 - 8	26.230 (lbs)	353024
50	80 - 36	10.700	9.921	9.330	3.543	2.751	1 - 8	31.300 (lbs)	353021
50	100 - 56	4.133	3.350	-	-	2.751	1 - 8	13.600 (lbs)	353010
50	100 - 56	12.000	11.220	10.620	3.937	2.751	1 - 8	39.460 (lbs)	353022

**i**



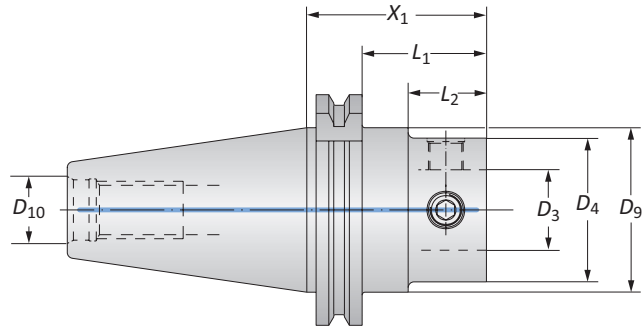
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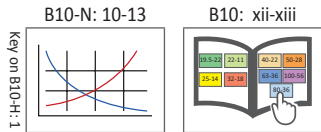
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## CAT Shanks with Metric Threads



Taper Size	Connection		Shank					Weight	Part No.
	$D_4$   $D_3$	$X_1$	$L_1$	$L_2$	$D_9$	$D_{10}$			
m	40	50 - 28	62.00	42.90	-	44.45	M16	1.70 (kg)	132022T016960
	40	63 - 36	82.00	62.90	-	44.45	M16	2.00 (kg)	132066T016960
	50	50 - 28	62.00	42.90	27.00	69.85	M16	3.50 (kg)	132022T016962
	50	63 - 36	72.00	52.90	37.00	69.85	M16	3.80 (kg)	132066T016962
	50	80 - 86	72.00	52.90	-	69.85	M16	4.30 (kg)	132088T016962
	50	100 - 56	105.00	85.00	-	69.85	M16	5.20 (kg)	132076T016962

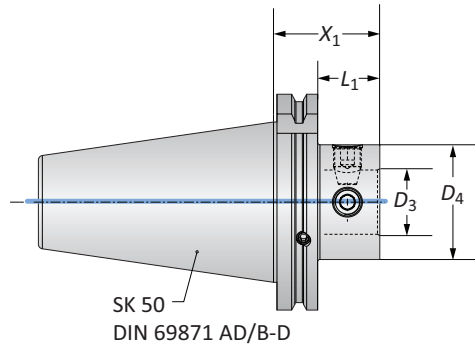


i = Imperial (in)  
m = Metric (mm)

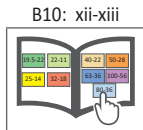
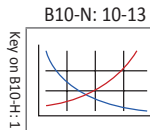
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## Dual Contact SK Shanks (DIN 69871-AD / B-D)



	Taper Size	Connection $D_4   D_3$	Shank		Weight	Part No.
			$X_1$	$L_1$		
i	40	50 - 28	1.811	1.059	2.426 (lbs)	353064
	40	63 - 36	2.598	1.846	6.395 (lbs)	353065
	50	50 - 28	1.811	1.059	6.395 (lbs)	353066
	50	63 - 36	2.205	1.453	7.056 (lbs)	353067
	50	80 - 36	2.205	1.453	8.159 (lbs)	353068
	50	100 - 56	3.543	2.791	11.687 (lbs)	353069
m	40	50 - 28	46.00	26.90	1.10 (kg)	353064
	40	63 - 36	66.00	46.90	1.50 (kg)	353065
	50	50 - 28	46.00	26.90	2.90 (kg)	353066
	50	63 - 36	56.00	36.90	3.20 (kg)	353067
	50	80 - 36	56.00	36.90	3.70 (kg)	353068
	50	100 - 56	90.00	70.90	5.30 (kg)	353069



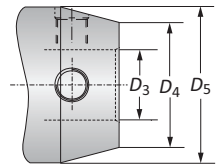
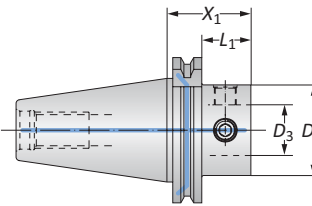
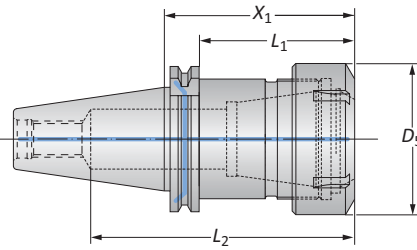
i = Imperial (in)  
m = Metric (mm)

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 -Consult machine tool builder for machine's weight limitations.  
 Factory technical assistance is also available for specific applications through our Application Engineering department. ext: 7611 | email: [appeng@alliedmachine.com](mailto:appeng@alliedmachine.com)

**⚠ WARNING** Tool failure can cause serious injury. To prevent:  
 -Do not exceed recommended 10xD length to diameter ratio or exceed 4 total components (including shank)  
 -Refer to example on page B10-N: 8 for calculating length to diameter ratio  
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## SK Shanks (DIN 69871-AD / B-D)

Balanced



Taper Size	Connection	Shank				Weight	Part No.
		$X_1$	$L_1$	$L_2$	$D_5$		
30	40 - 22	1.811	1.059	-	-	1.103 (lbs)	327001
30	50 - 28	2.283	-	-	-	1.764 (lbs)	327002
40	32 - 18	2.165	1.413	-	1.575	2.426 (lbs)	327003
40	40 - 22	1.811	1.059	-	-	2.205 (lbs)	327004
40	50 - 28	1.811	1.059	-	-	2.426 (lbs)	327005
40	63 - 36	2.598	1.846	-	-	3.087 (lbs)	327006
40	80 - 36	2.598	-	-	-	4.190 (lbs)	327007
40	ER 40	3.149	2.397	4.566	2.480	2.860 (lbs)	259079*
50	50 - 28	1.811	1.059	-	-	6.395 (lbs)	327017
i	50	50 - 28	7.323	6.571	-	13.230 (lbs)	327025
	50	50 - 28	7.323	6.571	-	10.805 (lbs)	327033
	50	63 - 36	2.205	1.453	-	7.056 (lbs)	327018
	50	63 - 36	8.110	7.358	-	19.625 (lbs)	327026
	50	63 - 36	8.110	7.358	-	15.215 (lbs)	327034
	50	80 - 36	2.205	1.453	-	8.159 (lbs)	327010
	50	80 - 36	10.079	9.327	-	29.988 (lbs)	327027
	50	100 - 56	3.543	-	-	11.687 (lbs)	327011
	50	100 - 56	11.417	10.665	-	37.706 (lbs)	327028
	50	ER 40	3.149	2.173	5.275	6.834 (lbs)	259080*
<hr/>							
	30	40 - 22	46.00	26.90	-	0.50 (kg)	327001
	30	50 - 28	58.00	-	-	0.80 (kg)	327002
	40	32 - 18	55.00	35.90	-	1.10 (kg)	327003
	40	40 - 22	46.00	26.90	-	1.00 (kg)	327004
	40	50 - 28	46.00	26.90	-	1.10 (kg)	327005
	40	63 - 36	66.00	46.90	-	1.40 (kg)	327006
	40	80 - 36	66.00	-	-	1.90 (kg)	327007
	40	ER 40	80.00	60.90	116.00	1.30 (kg)	259079*
	50	50 - 28	46.00	26.90	-	2.90 (kg)	327017
m	50	50 - 28	186.00	166.90	-	6.00 (kg)	327025
	50	50 - 28	186.00	166.90	-	4.90 (kg)	327033
	50	63 - 36	56.00	36.90	-	3.20 (kg)	327018
	50	63 - 36	206.00	186.90	-	8.90 (kg)	327026
	50	63 - 36	206.00	186.90	-	6.90 (kg)	327034
	50	80 - 36	56.00	36.90	-	3.70 (kg)	327010
	50	80 - 36	256.00	236.90	-	13.60 (kg)	327027
	50	100 - 56	90.00	-	-	5.30 (kg)	327011
	50	100 - 56	290.00	270.90	-	17.10 (kg)	327028
	50	ER 40	80.00	55.20	134.00	3.10 (kg)	259080*

NOTE: Balanced refers to a specific residual imbalance of  $\leq 4.00$  gmm/kg

\*Balanced without clamping nut

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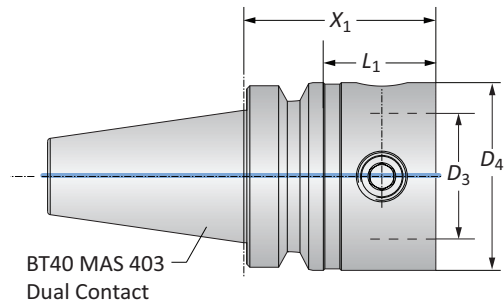
**⚠ WARNING** Tool failure can cause serious injury. To prevent:

-Do not exceed recommended 10xD length to diameter ratio or exceed 4 total components (including shank)

-Refer to example on page B10-N: 8 for calculating length to diameter ratio

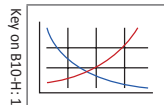
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## Dual Contact BT Shanks (JIS B 6339)



	Taper Size	Connection $D_4$   $D_3$	Shank		Weight	Part No.
			$X_1$	$L_1$		
<b>i</b>	40	50 - 28	2.126	1.063	2.646 (lbs)	353070
	40	63 - 36	2.520	1.457	3.308 (lbs)	353071
	50	50 - 28	2.559	1.055	8.820 (lbs)	353072
	50	63 - 36	2.953	1.449	9.261 (lbs)	353073
	50	80 - 36	2.953	1.449	10.584 (lbs)	353074
	50	100 - 56	3.543	-	12.128 (lbs)	353075
<b>m</b>	40	50 - 28	54.00	27.00	1.20 (kg)	353070
	40	63 - 36	64.00	37.00	1.50 (kg)	353071
	50	50 - 28	65.00	26.80	4.00 (kg)	353072
	50	63 - 36	75.00	36.80	4.20 (kg)	353073
	50	80 - 36	75.00	36.80	4.80 (kg)	353074
	50	100 - 56	90.00	-	5.50 (kg)	353075

B10-N: 10-13



B10: xii-xiii



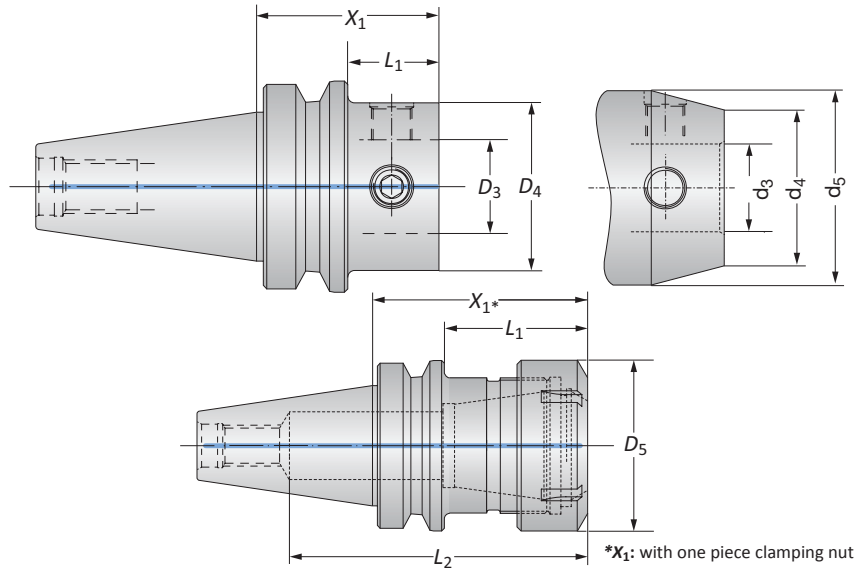
**i** = Imperial (in)  
**m** = Metric (mm)

**⚠ WARNING** Exceeding weight capacity for machine tool spindle and tool changer can cause machine damage, and/or serious injury. To prevent:  
-Consult machine tool builder for machine's weight limitations.  
Factory technical assistance is also available for specific applications through our Application Engineering department. ext: 7611 | email: [appeng@alliedmachine.com](mailto:appeng@alliedmachine.com)

**⚠ WARNING** Tool failure can cause serious injury. To prevent:  
-Do not exceed recommended 10xD length to diameter ratio or exceed 4 total components (including shank)  
-Refer to example on page B10-N: 8 for calculating length to diameter ratio  
Factory technical assistance is available for your specific applications through our Application Engineering department. ext: 7611 | email: [appeng@alliedmachine.com](mailto:appeng@alliedmachine.com)

## BT Shanks (JIS B 6339)

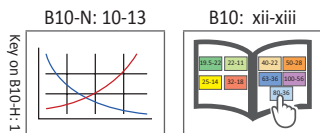
Balanced



Taper Size	Connection	Shank				Weight	Part No.
		$D_4$   $D_3$	$X_1$	$L_1$	$L_2$		
30	40 - 22	1.575	0.710	-	-	1.764 (lbs)	327012
30	50 - 28	1.811	-	-	-	1.764 (lbs)	327013
40	40 - 22	1.811	0.750	-	-	2.425 (lbs)	327016
40	50 - 28	2.126	1.060	-	-	3.087 (lbs)	327019
40	63 - 36	2.520	-	-	-	3.528 (lbs)	327020
40	ER 40	2.755	1.692	4.094	2.480	2.645 (lbs)	259081*
50	50 - 28	2.559	1.060	-	-	8.599 (lbs)	327021
50	63 - 36	2.953	1.450	-	-	9.261 (lbs)	327022
50	80 - 36	2.953	1.450	-	-	10.363 (lbs)	327023
50	100 - 56	3.543	-	-	-	12.127 (lbs)	327024
50	ER 40	3.149	1.645	5.314	2.480	8.377 (lbs)	259082*
30	40 - 22	40.00	18.00	-	-	0.80 (kg)	327012
30	50 - 28	46.00	-	-	-	0.80 (kg)	327013
40	40 - 22	46.00	19.00	-	-	1.10 (kg)	327016
40	50 - 28	54.00	27.00	-	-	1.40 (kg)	327019
40	63 - 36	64.00	-	-	-	1.60 (kg)	327020
40	ER 40	70.00	43.00	104.00	63.00	1.20 (kg)	259081*
50	50 - 28	65.00	26.80	-	-	3.90 (kg)	327021
50	63 - 36	75.00	36.80	-	-	4.20 (kg)	327022
50	80 - 36	75.00	36.80	-	-	4.70 (kg)	327023
50	100 - 56	90.00	-	-	-	5.50 (kg)	327024
50	ER 40	80.00	41.80	135.00	63.00	3.80 (kg)	259082*

NOTE: Balanced refers to a specific residual imbalance of  $\leq 4.00$  gmm/kg

\*Balanced without clamping nut



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

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

Factory technical assistance is also available for specific applications through our Application Engineering department. ext: 7611 | email: [appeng@alliedmachine.com](mailto:appeng@alliedmachine.com)

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

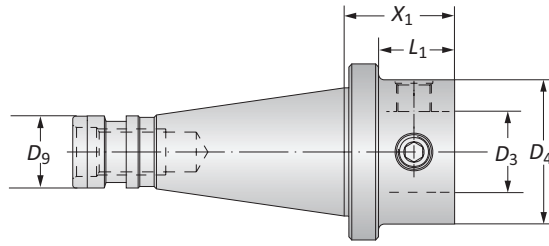
-Do not exceed recommended 10xD length to diameter ratio or exceed 4 total components (including shank)

-Refer to example on page B10-N: 8 for calculating length to diameter ratio

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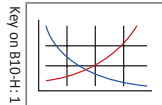


## NMTB Shanks

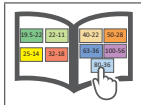


	Taper Size	Connection	Shank			Weight	Part No.
		D <sub>4</sub>   D <sub>3</sub>	X <sub>1</sub>	L <sub>1</sub>	D <sub>9</sub>		
i	40	50 - 28	1.496	1.030	5/8 - 11	2.900 (lbs)	132022T004498
	40	63 - 36	1.890	1.430	5/8 - 11	3.300 (lbs)	132066T004498
	50	50 - 28	1.654	1.060	1 - 8	6.600 (lbs)	132022T004480
	50	63 - 36	2.047	1.450	1 - 8	7.700 (lbs)	132066T004480
	50	80 - 36	2.047	1.450	1 - 8	8.800 (lbs)	132088T004480
	50	100 - 56	3.543	-	1 - 8	10.800 (lbs)	132076T004480
m	40	50 - 28	38.00	26.20	5/8 - 11	1.30 (kg)	132022T004498
	40	63 - 36	48.00	36.20	5/8 - 11	1.50 (kg)	132066T004498
	50	50 - 28	42.00	26.80	1 - 8	3.00 (kg)	132022T004480
	50	63 - 36	52.00	36.80	1 - 8	3.50 (kg)	132066T004480
	50	80 - 36	52.00	36.80	1 - 8	4.00 (kg)	132088T004480
	50	100 - 56	90.00	-	1 - 8	4.90 (kg)	132076T004480

B10-N: 10-13



B10: xii-xiii

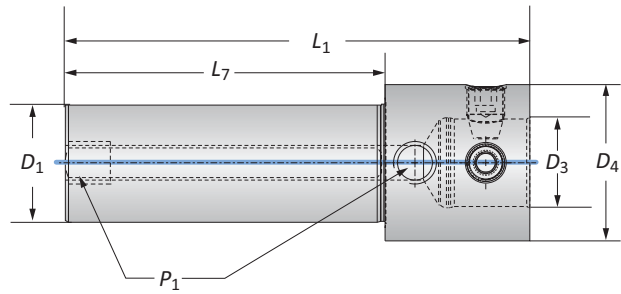


i = Imperial (in)  
m = Metric (mm)

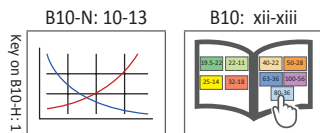
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 -Do not exceed recommended 10xD length to diameter ratio or exceed 4 total components (including shank)  
 -Refer to example on page B10-N: 8 for calculating length to diameter ratio  
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## Imperial Straight Shanks



	Connection	Shank				Weight	Part No.
		$D_4   D_3$	$L_7$	$D_1$	$P_1$		
i	40 - 22	3-½	1-¼	¼-27 NPTF	5.080	1.764 (lbs)	K71547
	50 - 28	4	1-½	¼-18 NPTF	5.810	3.086 (lbs)	K71548
	63 - 36	4-½	2	¼-18 NPTF	6.700	5.952 (lbs)	K71549
	80 - 36	4-½	2	¼-18 NPTF	6.700	7.716 (lbs)	K71550
m	40 - 22	3-½	1-¼	¼-27 NPTF	129.03	0.80 (kg)	K71547
	50 - 28	4	1-½	¼-18 NPTF	147.57	1.39 (kg)	K71548
	63 - 36	4-½	2	¼-18 NPTF	170.18	2.69 (kg)	K71549
	80 - 36	4-½	2	¼-18 NPTF	170.18	3.49 (kg)	K71550

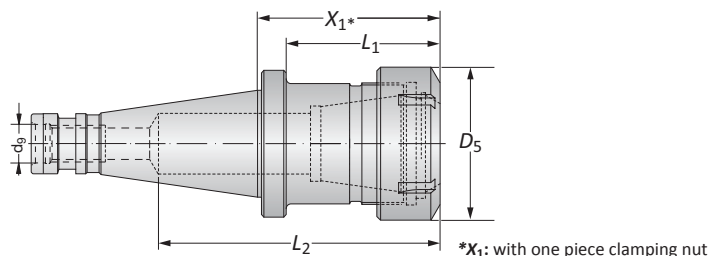
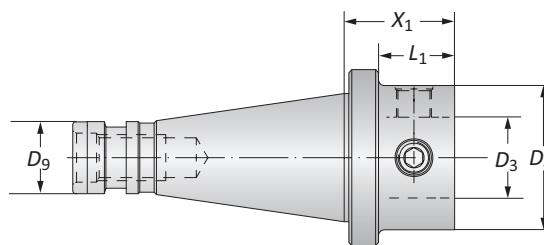


i = Imperial (in)  
m = Metric (mm)

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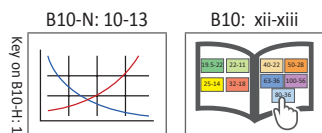
**⚠ WARNING** Tool failure can cause serious injury. To prevent:  
-Do not exceed recommended 10xD length to diameter ratio or exceed 4 total components (including shank)  
-Refer to example on page B10-N: 8 for calculating length to diameter ratio  
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## DIN 2080 Shanks



Taper Size	Connection $D_4   D_3$	Shank					Weight	Part No.	
		$X_1$	$L_1$	$L_2$	$D_5$	$D_9$			
i	40	50 - 28	1.496	1.031	-	-	M16	2.866 (lbs)	132022T010299
	40	63 - 36	1.889	1.425	-	-	M16	3.306 (lbs)	132066T010299
	50	50 - 28	1.653	1.055	-	-	M24	6.613 (lbs)	132022T003704
	50	63 - 36	2.047	1.448	-	-	M24	7.716 (lbs)	132066T003704
	50	80 - 36	2.047	1.448	-	-	M24	8.818 (lbs)	132088T003704
	50	100 - 56	3.543	-	-	-	M24	10.800 (lbs)	132076T003704
	50	ER 40	3.149	1.645	5.314	2.480	M24	7.275 (lbs)	259084
m	40	50 - 28	38.00	26.20	-	-	M16	1.30 (kg)	132022T010299
	40	63 - 36	48.00	36.20	-	-	M16	1.50 (kg)	132066T010299
	50	50 - 28	42.00	26.80	-	-	M24	3.00 (kg)	132022T003704
	50	63 - 36	52.00	36.80	-	-	M24	3.50 (kg)	132066T003704
	50	80 - 36	52.00	36.80	-	-	M24	4.00 (kg)	132088T003704
	50	100 - 56	90.00	-	-	-	M24	4.90 (kg)	132076T003704
	50	ER 40	80.00	41.80	135.00	63.00	M24	3.30 (kg)	259084

\*Balanced without clamping nut

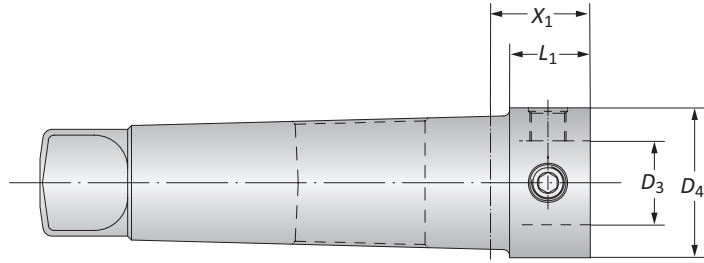


i = Imperial (in)  
m = Metric (mm)

**WARNING** Exceeding weight capacity for machine tool spindle and tool changer can cause machine damage, and/or serious injury. To prevent:  
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**WARNING** Tool failure can cause serious injury. To prevent:  
 -Do not exceed recommended 10xD length to diameter ratio or exceed 4 total components (including shank)  
 -Refer to example on page B10-N: 8 for calculating length to diameter ratio  
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## DIN 1806 Morse Taper Shanks

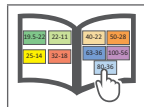
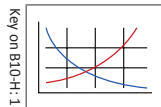


### DIN 1806 Master Shanks

	Morse Taper Size	Connection $D_4   D_3$	Shank		Weight	Part No.
			$X_1$	$L_1$		
i	4	50 - 28	1.693	1.440	2.425 (lbs)	132022T003590
	5	50 - 28	1.299	1.050	3.968 (lbs)	132022T003920
	5	63 - 36	2.087	1.840	4.850 (lbs)	132066T003920
m	4	50 - 28	43.00	36.50	1.09 (kg)	132022T003590
	5	50 - 28	33.00	26.70	1.79 (kg)	132022T003920
	5	63 - 36	53.00	46.70	2.19 (kg)	132066T003920

B10-N: 10-13

B10: xii-xiii



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

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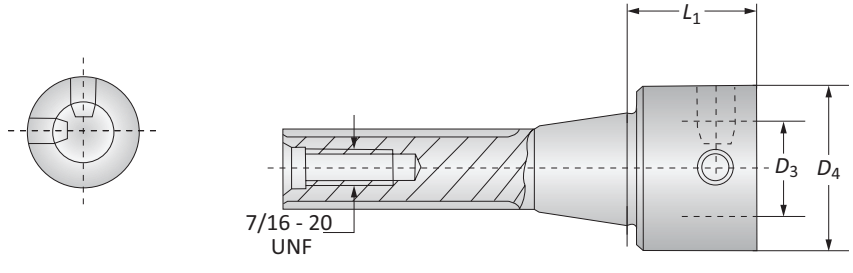
**WARNING** Tool failure can cause serious injury. To prevent:

-Do not exceed recommended 10xD length to diameter ratio or exceed 4 total components (including shank)

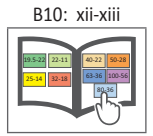
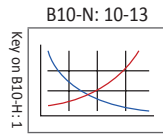
-Refer to example on page B10-N: 8 for calculating length to diameter ratio

Factory technical assistance is available for your specific applications through our Application Engineering department. ext: 7611 | email: [appeng@alliedmachine.com](mailto:appeng@alliedmachine.com)

## R8 Shanks



	Connection		Shank		Weight	Part No.
	$D_4$   $D_3$		$L_1$			
<b>i</b>	50 - 28		1.770		2.204 (lbs)	132022T007166
	63 - 36		2.362		2.866 (lbs)	132066T007166
<b>m</b>	50 - 28		45.00		1.00 (kg)	132022T007166
	63 - 36		60.00		1.30 (kg)	132066T007166



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

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**⚠ WARNING** Tool failure can cause serious injury. To prevent:  
 -Do not exceed recommended 10xD length to diameter ratio or exceed 4 total components (including shank)  
 -Refer to example on page B10-N: 8 for calculating length to diameter ratio  
 Factory technical assistance is available for your specific applications through our Application Engineering department. ext: 7611 | email: [appeng@alliedmachine.com](mailto:appeng@alliedmachine.com)

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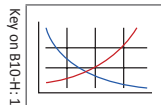
## Mounting Fixtures



Mounting Fixture		
Code	Type	Part No.
Basic Body*	-	098060
Adapter	30 Taper	098073
Adapter	40 Taper	098061
Adapter	50 Taper	098062
Adapter	HSK-A 32	098063
Adapter	HSK-A 40	098064
Adapter	HSK-A 50	098065
Adapter	HSK-A 63	098066
Adapter	HSK-A 80	098067
Adapter	HSK-A 100	098068
Adapter	PSC 50	098069
Adapter	PSC 63	098070
Adapter	PSC 80	098071

\*Basic body and adapters sold separately

B10-N: 10-13



B10: xii-xiii



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

**WARNING** Exceeding weight capacity for machine tool spindle and tool changer can cause machine damage, and/or serious injury. To prevent:  
-Consult machine tool builder for machine's weight limitations.  
Factory technical assistance is also available for specific applications through our Application Engineering department. ext: 7611 | email: [appeng@alliedmachine.com](mailto:appeng@alliedmachine.com)

**WARNING** Tool failure can cause serious injury. To prevent:  
-Do not exceed recommended 10xD length to diameter ratio or exceed 4 total components (including shank)  
-Refer to example on page B10-N: 8 for calculating length to diameter ratio  
Factory technical assistance is available for your specific applications through our Application Engineering department. ext: 7611 | email: [appeng@alliedmachine.com](mailto:appeng@alliedmachine.com)







SECTION

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# B10-I

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Clamping Tools

# Wohlhaupter™ Clamping Tools

Adapter Sleeves | Drill Chucks | Collet Chucks | Milling Arbors | Holding Arbors | Hydraulic Clamping Chucks  
Tapping Chucks | Boring Bar Blanks



## Clamping Tools with MVS Connection

Wohlhaupter offers a complete range of tool holders that incorporates the MVS connection. Our clamping tools allow for smaller MVS tools to connect and provide a quick and inexpensive alternative to special tooling. The clamping tools also feature coolant through capabilities.

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



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

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

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

### **WARNING**

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

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

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

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

## Applicable Industries



Aerospace



Agriculture



Automotive



Firearms



General  
Machining



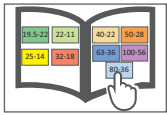
Oil & Gas



Renewable  
Energy

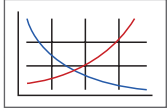
### Reference Icons

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



#### MVS Connection Color Guide

Detailed instructions and information regarding the MVS connection(s)



#### Recommended Cutting Data

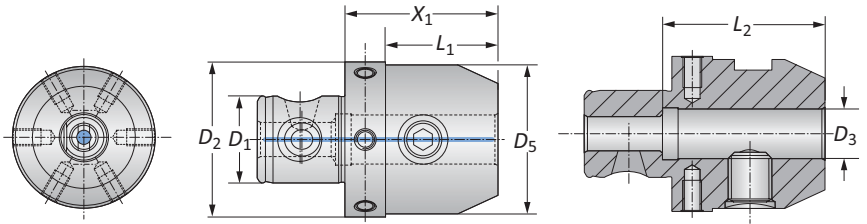
Speed and feed recommendations for optimum and safe boring

## Clamping Tools Table of Contents

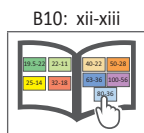
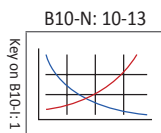
<b>Adapter Sleeves for Cylindrical Shanks</b> . . . . .	2 - 3
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<b>Clamping Chucks</b> . . . . .	8
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## Imperial | Adapter Side Lock for Cylindrical Shanks DIN 1835B

Clamping Diameter Range: 0.236" - 1.575" (6.00mm - 40.00mm)



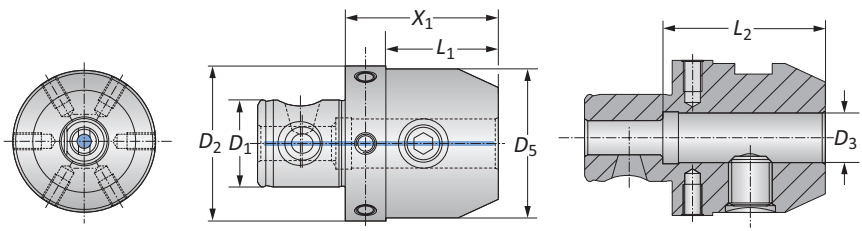
MVS Connection	Clamping Range	Adapter Sleeve				Weight	Thread Precision	Part No.
		$D_2$   $D_1$	$D_3$	$X_1$	$L_1$			
	0.236	1.417	0.906	1.575	0.984	0.441 (lbs)	M 5x6	228022
	0.315	1.417	0.906	1.575	1.102	0.441 (lbs)	M 5x6	228023
	0.394	1.890	-	1.732	1.378	0.661 (lbs)	M 5x6	228024
	0.472	2.047	-	1.929	1.654	1.102 (lbs)	M 5x8	228025
	0.551	2.126	-	1.929	1.732	1.323 (lbs)	M 5x8	228026
	0.236	1.417	0.906	1.575	0.984	0.882 (lbs)	M 6x10	162015
	0.315	1.417	0.906	1.575	1.102	0.882 (lbs)	M 6x10	162015
<b>i</b>	0.394	1.732	1.220	1.732	1.378	1.102 (lbs)	M 6x10	162017
	0.472	1.732	1.220	1.929	1.654	1.102 (lbs)	M 6x10	162018
	0.630	1.929	1.417	2.047	1.890	2.205 (lbs)	M 6x10	162019
	0.709	1.929	1.417	2.047	1.890	2.205 (lbs)	M 6x10	228014
	0.787	2.362	-	2.126	2.047	2.646 (lbs)	M 6x10	162020
	0.787	1.929	1.417	2.126	2.047	2.425 (lbs)	M 6x10	161024
	0.984	2.953	-	2.323	2.480	4.189 (lbs)	M 6x15	161026
	1.260	2.953	-	2.480	2.835	4.851 (lbs)	M 6x15	161027
	1.575	3.346	-	2.874	3.150	5.512 (lbs)	M 6x15	161028



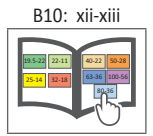
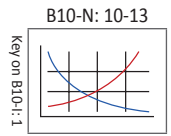
**i** = Imperial (in)  
**m** = Metric (mm)



Metric | Adapter Side Lock for Cylindrical Shanks DIN 1835E



MVS Connection	Clamping Range	Adapter Sleeve				Weight	Thread Precision	Part No.	
		$D_2$   $D_1$	$D_3$	$X_1$	$L_1$				$L_2$
m	32 - 18	6.00	36.00	23.00	40.00	25.00	0.20 (kg)	M 5x6	228022
	32 - 18	8.00	36.00	23.00	40.00	28.00	0.20 (kg)	M 5x6	228023
	32 - 18	10.00	48.00	-	44.00	35.00	0.30 (kg)	M 5x6	228024
	40 - 22	12.00	52.00	-	49.00	42.00	0.50 (kg)	M 5x8	228025
	40 - 22	14.00	54.00	-	49.00	44.00	0.60 (kg)	M 5x8	228026
	50 - 28	6.00	36.00	23.00	40.00	25.00	0.40 (kg)	M 6x10	162015
	50 - 28	8.00	36.00	23.00	40.00	28.00	0.40 (kg)	M 6x10	162015
	50 - 28	10.00	44.00	31.00	44.00	35.00	0.50 (kg)	M 6x10	162017
	50 - 28	12.00	44.00	31.00	49.00	42.00	0.50 (kg)	M 6x10	162018
	50 - 28	16.00	49.00	36.00	52.00	48.00	1.00 (kg)	M 6x10	162019
	50 - 28	18.00	49.00	36.00	52.00	48.00	1.00 (kg)	M 6x10	228014
	50 - 28	20.00	60.00	-	54.00	52.00	1.20 (kg)	M 6x10	162020
	63 - 36	20.00	49.00	36.00	54.00	52.00	1.10 (kg)	M 6x10	161024
	63 - 36	25.00	75.00	-	59.00	63.00	1.90 (kg)	M 6x15	161026
	63 - 36	32.00	75.00	-	63.00	72.00	2.20 (kg)	M 6x15	161027
80 - 36	40.00	85.00	-	73.00	80.00	2.50 (kg)	M 6x15	161028	

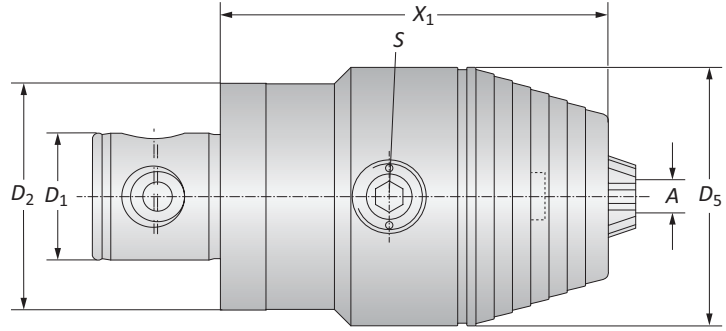


**i** = Imperial (in)  
**m** = Metric (mm)

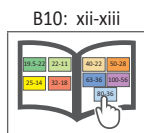
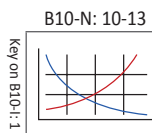
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## Drill Chucks for Clockwise & Counterclockwise Rotation

Clamping Diameter Range: 0.019" - 0.629" (0.50mm - 16.00mm)



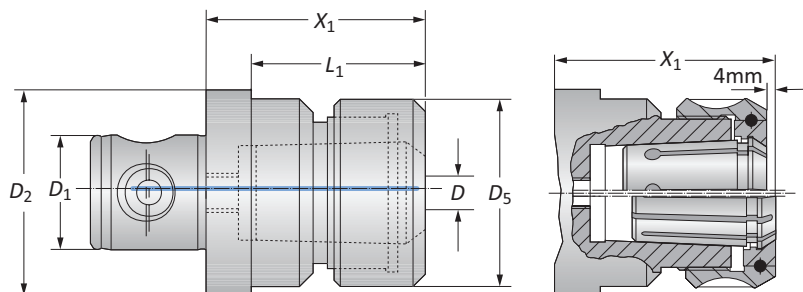
	MVS Connection	Clamping Range	Drill Chuck			Weight	Part No.
	$D_2 \mid D_1$	A	$X_1$	$D_5$	S		
i	50 - 28	0.019 - 0.511	3.150	1.969	s6 / B	2.425 (lbs)	209088
	50 - 28	0.098 - 0.629	3.346	2.244	s6 / B	2.866 (lbs)	209089
	63 - 36	0.019 - 0.511	3.150	1.969	s6 / B	2.866 (lbs)	209090
	63 - 36	0.098 - 0.629	3.346	2.244	s6 / B	3.307 (lbs)	209091
m	50 - 28	0.50 - 13.00	80.00	50.00	s6 / B	1.10 (kg)	209088
	50 - 28	2.50 - 16.00	85.00	57.00	s6 / B	1.30 (kg)	209089
	63 - 36	0.50 - 13.00	80.00	50.00	s6 / B	1.30 (kg)	209090
	63 - 36	2.50 - 16.00	85.00	57.00	s6 / B	1.50 (kg)	209091



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

## Collet Chucks ISO 10898 (DIN 6388) | ISO 15488 (DIN 6499)

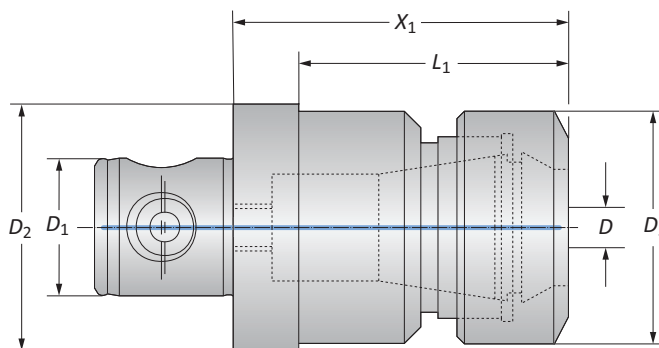
Clamping Diameter Range: 0.078" - 1.259" (2.00mm - 32.00mm)



### Collet Chucks ISO 10897 (DIN 6388) | Diameter Range: 0.078" - 1.259" (2.00mm - 32.00mm)

	MVS Connection	Clamping Range	Nominal Size	Collet Chuck			Weight	Part No.
	D <sub>2</sub>   D <sub>1</sub>			D	X <sub>1</sub> *	L <sub>1</sub>		
i	40 - 22	0.078 - 0.629	16	2.520	-	1.693	1.102 (lbs)	209082
	50 - 28	0.078 - 0.629	16	2.480	1.968	1.693	1.984 (lbs)	162011
	50 - 28	0.078 - 0.984	25	2.913	-	2.362	2.205 (lbs)	209083
	63 - 36	0.078 - 0.984	25	2.913	-	2.362	3.087 (lbs)	161016
	63 - 36	0.157 - 1.259	32	3.504	-	2.835	3.969 (lbs)	161098
m	40 - 22	2.00 - 16.00	16	64.00	-	43.00	0.50 (kg)	209082
	50 - 28	2.00 - 16.00	16	63.00	50.00	43.00	0.90 (kg)	162011
	50 - 28	2.00 - 25.00	25	74.00	-	60.00	1.00 (kg)	209083
	63 - 36	2.00 - 25.00	25	74.00	-	60.00	1.40 (kg)	161016
	63 - 36	4.00 - 32.00	32	89.00	-	72.00	1.80 (kg)	161098

\*X<sub>1</sub> Clamping nut with ball-bearing



### Collet Chucks ISO 15488 (DIN 6499) | Diameter Range: 0.039" - 1.023" (1.00mm - 26.00mm)

	MVS Connection	Clamping Range	Nominal Size	Collet Chuck			Weight	Part No.
	D <sub>2</sub>   D <sub>1</sub>			D	X <sub>1</sub> *	L <sub>1</sub>		
i	32 - 18	0.039 - 0.393	ER 16	2.125	1.614	1.102	0.441 (lbs)	228020
	40 - 22	0.078 - 0.629	ER 25	2.953	-	1.654	1.323 (lbs)	228021
	50 - 28	0.078 - 0.629	ER 25	2.953	2.441	1.654	1.764 (lbs)	228003
	50 - 28	0.078 - 0.787	ER 32	2.992	-	1.969	1.764 (lbs)	228004
	63 - 36	0.078 - 0.787	ER 32	2.992	2.480	1.969	2.646 (lbs)	228007
	63 - 36	0.157 - 1.023	ER 40	3.465	-	2.480	2.646 (lbs)	228006
m	32 - 18	1.00 - 10.00	ER 16	54.00	4100	28.00	0.20 (kg)	228020
	40 - 22	2.00 - 16.00	ER 25	75.00	-	42.00	0.60 (kg)	228021
	50 - 28	2.00 - 16.00	ER 25	75.00	62.00	42.00	0.80 (kg)	228003
	50 - 28	2.00 - 20.00	ER 32	76.00	-	50.00	0.80 (kg)	228004
	63 - 36	2.00 - 20.00	ER 32	76.00	63.00	50.00	1.20 (kg)	228007
	63 - 36	4.00 - 26.00	ER 40	88.00	-	63.00	1.20 (kg)	228006

\*X<sub>1</sub> Clamping nut with sliding ring

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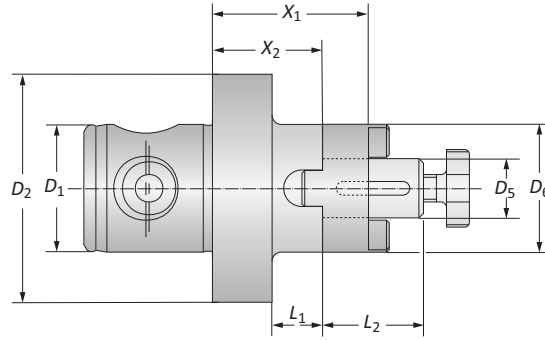
B10: xii-xiii

Key on B10-I: 1

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

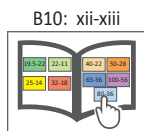
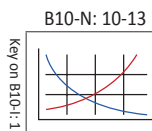
## Milling Machine Arbors

For Milling Cutters with Longitudinal or Transverse Drive | Shell Mill Adapter Range: 0.512" - 1.575" (13.00mm - 40.00mm)



	MVS Connection	Adapter Range	Milling Arbor					Weight	Part No.
	$D_2   D_1$	$D_5$	$X_1$	$X_2$	$L_1$	$L_2$	$D_6$		
i	50 - 28	0.512	1.339	0.945	0.433	0.866	1.024	0.882 (lbs)	162002
	50 - 28	0.630	1.575	1.181	0.669	1.063	1.260	1.102 (lbs)	162003
	50 - 28	0.866	1.575	1.102	0.591	1.220	1.575	1.323 (lbs)	162004
	63 - 36	0.630	1.575	1.181	0.669	1.063	1.260	1.764 (lbs)	161002
	63 - 36	0.866	1.575	1.102	0.591	1.220	1.575	1.984 (lbs)	161003
	63 - 36	1.063	1.575	1.102	0.591	1.299	1.890	2.425 (lbs)	161004
	63 - 36	1.260	1.575	1.024	0.512	1.496	2.283	2.866 (lbs)	161005
	80 - 36	1.575	2.087	1.535	-	1.614	2.756*	5.733 (lbs)	161006
m	50 - 28	13.00	34.00	24.00	11.00	22.00	26.00	0.40 (kg)	162002
	50 - 28	16.00	40.00	30.00	17.00	27.00	32.00	0.50 (kg)	162003
	50 - 28	22.00	40.00	28.00	15.00	31.00	40.00	0.60 (kg)	162004
	63 - 36	16.00	40.00	30.00	17.00	27.00	32.00	0.80 (kg)	161002
	63 - 36	22.00	40.00	28.00	15.00	31.00	40.00	0.90 (kg)	161003
	63 - 36	27.00	40.00	28.00	15.00	33.00	48.00	1.10 (kg)	161004
	63 - 36	32.00	40.00	26.00	13.00	38.00	58.00	1.30 (kg)	161005
	80 - 36	40.00	53.00	39.00	-	41.00	70.00*	2.60 (kg)	161006

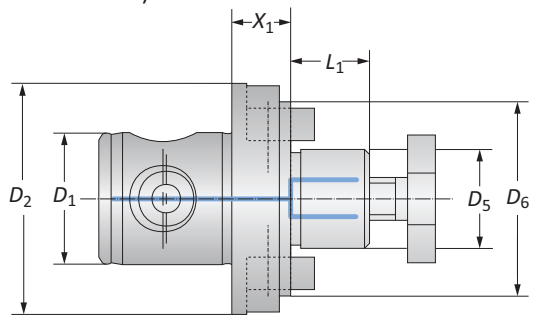
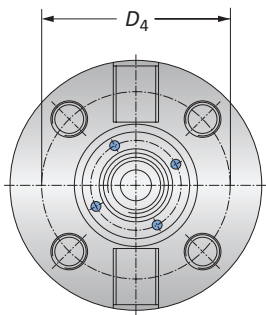
\*Ø 2.756" (70.00mm) with clutch drive ring



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

## Holding Arbors for Milling Cutters

Central Coolant Feed | Shell Mill Adapter Range: 0.630" - 1.575" (16.00mm - 40.00mm)



	MVS Connection	Adapter Range	Holding Arbor				Weight	Part No.
	$D_2$   $D_1$		$D_5$	$X_1$	$L_1$	$D_4$		
<b>i</b>	50 - 28	0.630	0.630	0.669	-	1.575	0.882 (lbs)	162032
	50 - 28	0.866	0.630	0.748	-	1.969	1.102 (lbs)	162033
	63 - 36	1.063	0.630	0.827	-	2.362	1.764 (lbs)	161082
	80 - 36	1.260	0.630	0.945	-	3.071	2.425 (lbs)	209080
	80 - 36	1.575	0.748	1.063	2.626	3.504	3.307 (lbs)	209081
<b>m</b>	50 - 28	16.00	16.00	17.00	-	40.00	0.40 (kg)	162032
	50 - 28	22.00	16.00	19.00	-	50.00	0.50 (kg)	162033
	63 - 36	27.00	16.00	21.00	-	60.00	0.80 (kg)	161082
	80 - 36	32.00	16.00	24.00	-	78.00	1.10 (kg)	209080
	80 - 36	40.00	19.00	27.00	66.70	89.00	1.50 (kg)	209081

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Key on B10-I: 1

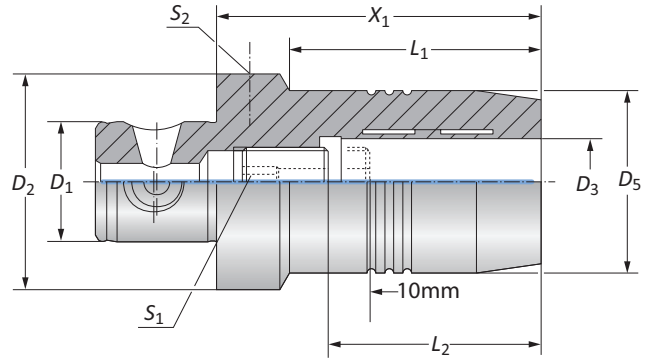
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**i** = Imperial (in)  
**m** = Metric (mm)

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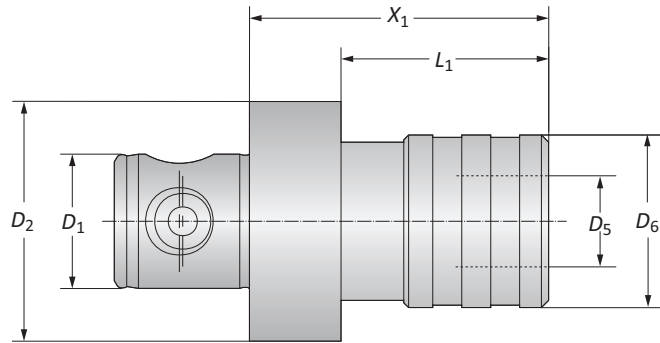
## Clamping Chucks | Tapping Chucks

Clamping Range: 0.787" (20.00mm)



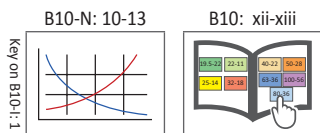
### Coolant Through Hydraulic Clamping Chucks

	MVS Connection	Clamping Range	Clamping Chuck						Weight	Part No.
	$D_2   D_1$	$D_3$	$X_1$	$D_5$	$L_1$	$L_2$	$S_1$	$S_2$		
i	50 - 28	0.787	2.953	1.654	2.283	2.008	s6	s5	1.764 (lbs)	209044
	63 - 36	0.787	2.953	1.654	2.283	2.008	s5	s5	2.425 (lbs)	209045
m	50 - 28	20.00	75.00	42.00	58.00	51.00	s6	s5	0.80 (kg)	209044
	63 - 36	20.00	75.00	42.00	58.00	51.00	s5	s5	1.10 (kg)	209045



### Tapping Chucks (Non-Coolant)

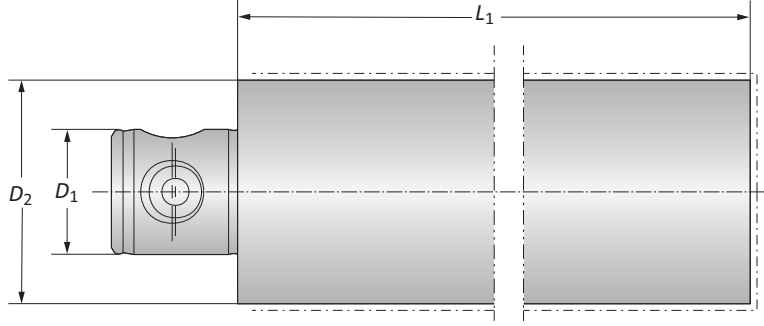
	MVS Connection	Quick Change Adapters		Tapping Chucks				Length Compensation		Weight	Part No.
	$D_2   D_1$	For Taps	Nominal Size	$X_1$	$L_1$	$D_5$	$D_6$	Pressure	Tension		
i	50 - 28	M 3 - M 12	1	2.441	1.929	0.748	1.634	0.295	0.295	1.543 (lbs)	209098
	50 - 28	M 6 - M 20	2	3.701	-	1.220	2.374	0.394	0.394	2.425 (lbs)	209099
	63 - 36	M 3 - M 12	1	2.205	1.693	0.748	1.634	0.295	0.295	1.764 (lbs)	231005
	80 - 36	M 6 - M 20	2	3.150	2.638	1.220	2.374	0.394	0.394	2.866 (lbs)	231006
	80 - 36	M 14 - M 33	3	5.984	-	1.890	3.386	0.689	0.689	9.040 (lbs)	231007
m	50 - 28	M 3 - M 12	1	62.00	49.00	19.00	41.50	7.50	7.50	0.70 (kg)	209098
	50 - 28	M 6 - M 20	2	94.00	-	31.00	60.30	10.00	10.00	1.10 (kg)	209099
	63 - 36	M 3 - M 12	1	56.00	43.00	19.00	41.50	7.50	7.50	0.80 (kg)	231005
	80 - 36	M 6 - M 20	2	80.00	67.00	31.00	60.30	10.00	10.00	1.30 (kg)	231006
	80 - 36	M 14 - M 33	3	152.00	-	48.00	86.00	17.50	17.50	4.10 (kg)	231007



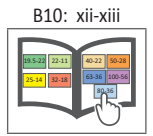
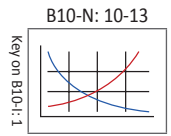
i = Imperial (in)  
m = Metric (mm)



## Boring Bar Blanks



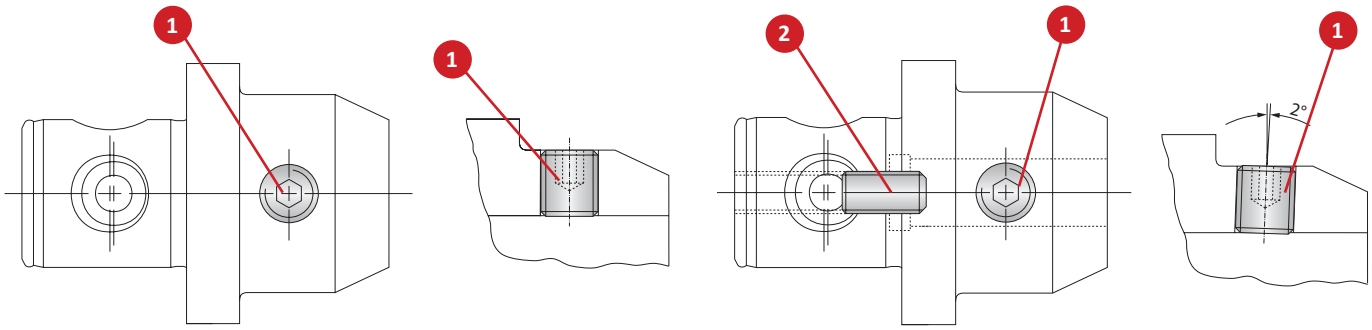
MVS Connection		Boring Bar Blanks	Weight	Part No.
$D_2   D_1$		$L_1$		
<b>i</b>	50 - 28	6.299	5.733 (lbs)	<b>166103</b>
	63 - 36	6.299	9.261 (lbs)	<b>166104</b>
	80 - 36	6.299	14.550 (lbs)	<b>166105</b>
<b>m</b>	50 - 28	160.00	2.60 (kg)	<b>166103</b>
	63 - 36	160.00	4.20 (kg)	<b>166104</b>
	80 - 36	160.00	6.60 (kg)	<b>166105</b>



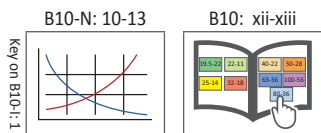
**i** = Imperial (in)  
**m** = Metric (mm)

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## Accessories for Adapter Sleeves



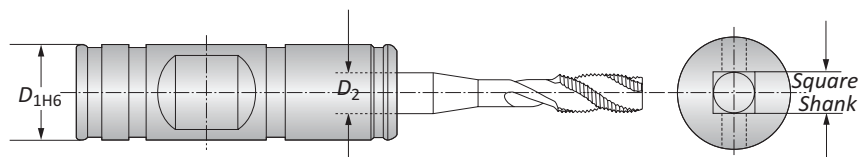
Clamping Diameter	1 Thread Pin		2 Thread Pin		
	Part No.	Service Key	Part No.	Service Key	Thread
0.236	115680	s3 / B	415562	s2.5 / B	M 5
0.315	115681	s4 / B	215863	s3 / B	M 6
0.394	115682	s5 / B	215863	s3 / B	M 6
0.472	115683	s6 / B	415563	s4 / B	M 8
0.551	115683	s6 / B	415563	s4 / B	M 8
0.630	115684	s6 / B	215849	s5 / B	M 10
0.709	115684	s6 / B	215849	s5 / B	M 10
i 0.787	115685	s8 / B	215849	s5 / B	M 10
0.787	115685	s8 / B	215865	s8 / B	M 16
0.984	115686	s10 / B	215527	s5 / B	M 10
0.984	115686	s10 / B	215865	s8 / B	M 16
1.260	115687	s10 / B	215527	s5 / B	M 10
1.260	115687	s10 / B	215865	s8 / B	M 16
1.575	115687	s10 / B	215527	s5 / B	M 10
1.575	115687	s10 / B	215865	s8 / B	M 16
<hr/>					
6.00	115680	s3 / B	415562	s2.5 / B	M 5
8.00	115681	s4 / B	215863	s3 / B	M 6
10.00	115682	s5 / B	215863	s3 / B	M 6
12.00	115683	s6 / B	415563	s4 / B	M 8
14.00	115683	s6 / B	415563	s4 / B	M 8
16.00	115684	s6 / B	215849	s5 / B	M 10
18.00	115684	s6 / B	215849	s5 / B	M 10
m 20.00	115685	s8 / B	215849	s5 / B	M 10
20.00	115685	s8 / B	215865	s8 / B	M 16
25.00	115686	s10 / B	215527	s5 / B	M 10
25.00	115686	s10 / B	215865	s8 / B	M 16
32.00	115687	s10 / B	215527	s5 / B	M 10
32.00	115687	s10 / B	215865	s8 / B	M 16
40.00	115687	s10 / B	215527	s5 / B	M 10
40.00	115687	s10 / B	215865	s8 / B	M 16



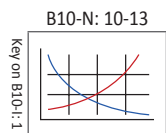
i = Imperial (in)  
m = Metric (mm)

## Accessories for Adapter Sleeves

Adapter Sleeve for Tap Shanks Suitable for Reduction Sleeves



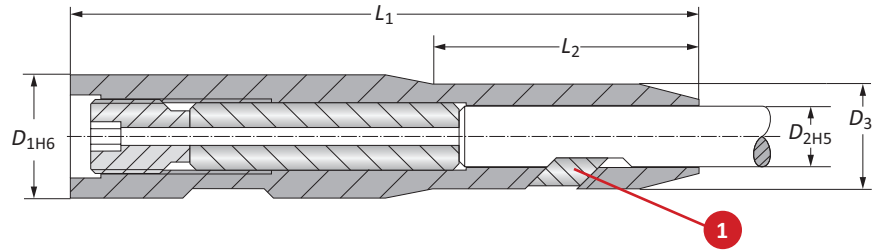
Adapter Sleeves			
$D_{1H6}$	$D_2 \times$ Square Shank	Part No.	
i	0.315	0.082 x 0.098	271190
	0.315	0.082 x 0.110	271191
	0.394	0.106 x 0.137	271192
	0.394	0.118 x 0.157	271193
	0.394	0.133 x 0.177	271194
	0.472	0.192 x 0.236	271195
	0.551	0.216 x 0.275	271196
	0.551	0.244 x 0.314	271197
	0.630	0.275 x 0.354	271198
	0.630	0.314 x 0.393	271199
	0.709	0.354 x 0.433	271200
	0.787	0.354 x 0.472	271201
	0.984	0.433 x 0.551	271202
	0.984	0.472 x 0.629	271203
	1.260	0.570 x 0.708	271204
	1.260	0.629 x 0.787	271205
	1.260	0.708 x 0.866	271206
	1.575	0.866 x 0.984	271207
	1.575	0.866 x 1.102	271208
	1.969	0.944 x 1.259	271209
1.969	1.141 x 1.417	271210	
1.969	1.259 x 1.574	271211	
m	8.00	2.10 x 2.50	271190
	8.00	2.10 x 2.80	271191
	10.00	2.70 x 3.50	271192
	10.00	3.00 x 4.00	271193
	10.00	3.40 x 4.50	271194
	12.00	4.90 x 6.00	271195
	14.00	5.50 x 7.00	271196
	14.00	6.20 x 8.00	271197
	16.00	7.00 x 9.00	271198
	16.00	8.00 x 10.00	271199
	18.00	9.00 x 11.00	271200
	20.00	9.00 x 12.00	271201
	25.00	11.00 x 14.00	271202
	25.00	12.00 x 16.00	271203
	32.00	14.50 x 18.00	271204
	32.00	16.00 x 20.00	271205
	32.00	18.00 x 22.00	271206
	40.00	22.00 x 25.00	271207
	40.00	22.00 x 28.00	271208
	50.00	24.00 x 32.00	271209
50.00	29.00 x 36.00	271210	
50.00	32.00 x 40.00	271211	



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

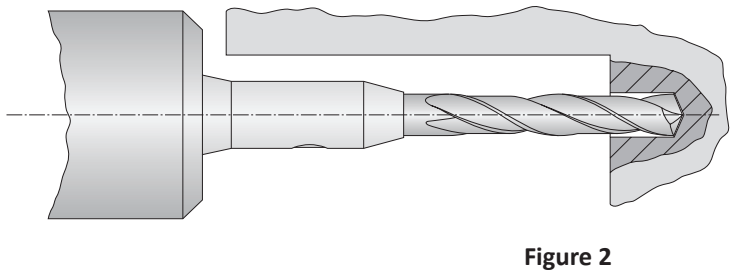
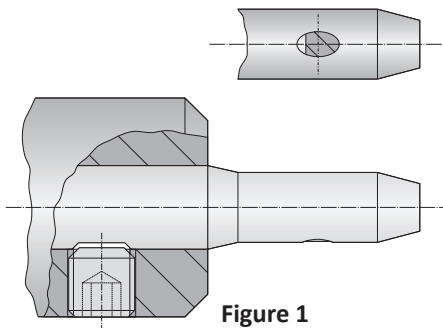
## Accessories for Adapter Sleeves

### Micro Clamping Chucks Suitable for Reduction Sleeves



Micro Clamping Chuck						1 Clamping Wedge	
$D_{1H6}$	$D_{2H5}$	$D_3$	$L_1$	$L_2$	Part No.	Part No.	
0.630	0.236	0.472	3.937	1.575	<b>219170</b>	<b>219070</b>	
0.630	0.315	0.551	3.937	1.772	<b>219171</b>	<b>219071</b>	
0.787	0.394	0.669	3.937	1.693	<b>219172</b>	<b>219072</b>	
0.984	0.472	0.787	4.331	1.535	<b>219173</b>	<b>219073</b>	
0.984	0.551	0.866	4.331	1.811	<b>219174</b>	<b>219074</b>	
1.260	0.630	0.984	4.921	1.772	<b>219174</b>	<b>219075</b>	
1.260	0.709	1.063	5.118	2.126	<b>219174</b>	<b>219076</b>	
1.260	0.787	1.181	5.118	2.441	<b>219175</b>	<b>219077</b>	
<b>i</b>							
16.00	6.00	12.00	100.00	40.00	<b>219170</b>	<b>219070</b>	
16.00	8.00	14.00	100.00	45.00	<b>219171</b>	<b>219071</b>	
20.00	10.00	17.00	100.00	43.00	<b>219172</b>	<b>219072</b>	
25.00	12.00	20.00	110.00	39.00	<b>219173</b>	<b>219073</b>	
25.00	14.00	22.00	110.00	46.00	<b>219174</b>	<b>219074</b>	
32.00	16.00	25.00	125.00	45.00	<b>219174</b>	<b>219075</b>	
32.00	18.00	27.00	130.00	54.00	<b>219174</b>	<b>219076</b>	
32.00	20.00	30.00	130.00	62.00	<b>219175</b>	<b>219077</b>	
<b>m</b>							

**NOTE:** Clamping chucks are used in reduction sleeves for clamping tools with cylindrical shanks to DIN 1835-B (Fig. 1). The chucks' design allows the use of standard tools versus ordering special tools (Fig. 2).



B10-N: 10-13      B10: xii-xiii

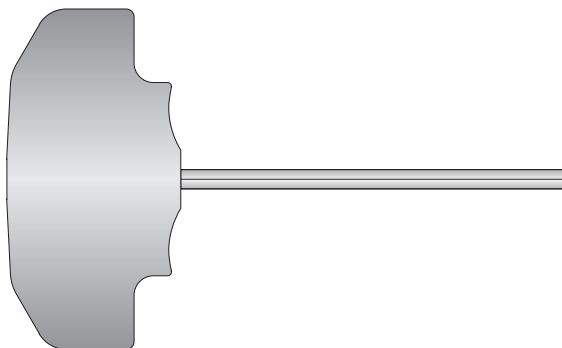
Key on B10-I: 1

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

## Accessories for Drill Chucks

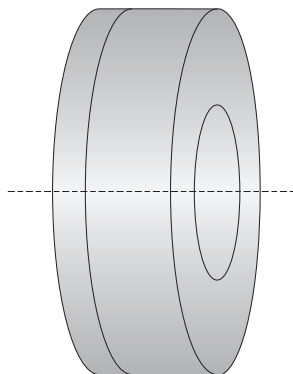
### Service Keys for Drill Chucks

Service Key		Tightening Torque Nm	Part No.
Service Key	Type		
2.50	B	15	415577
6.00	B	15	115578



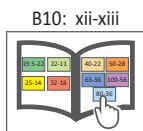
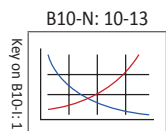
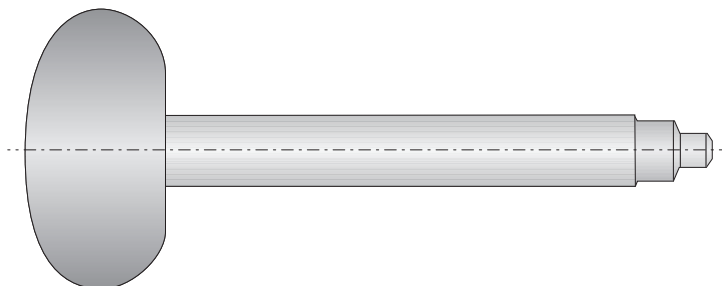
### Gaskets for Drill Chucks

	Gasket		Part No.
	Gasket Diameter	Clamping Diameter	
<b>i</b>	0.118 - 0.236	0.019 - 0.511	387113
	0.236 - 0.511	0.019 - 0.511	387114
	0.118 - 0.236	0.098 - 0.629	387115
	0.236 - 0.629	0.098 - 0.629	387116
<b>m</b>	3.00 - 6.00	0.50 - 13.00	387113
	6.00 - 13.00	0.50 - 13.00	387114
	3.00 - 6.00	2.50 - 16.00	387115
	6.00 - 16.00	2.50 - 16.00	387116



### Assembly Tool for Gasket

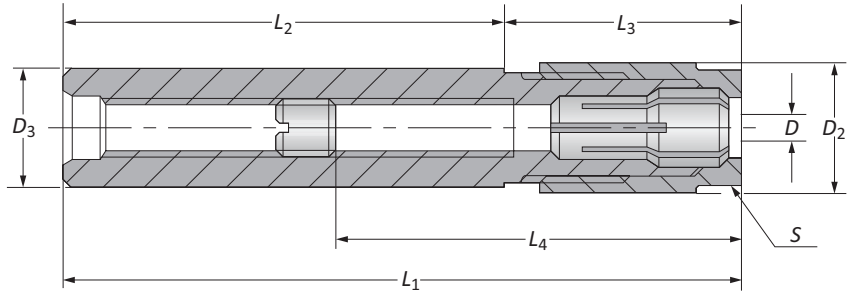
Part No.
387112



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

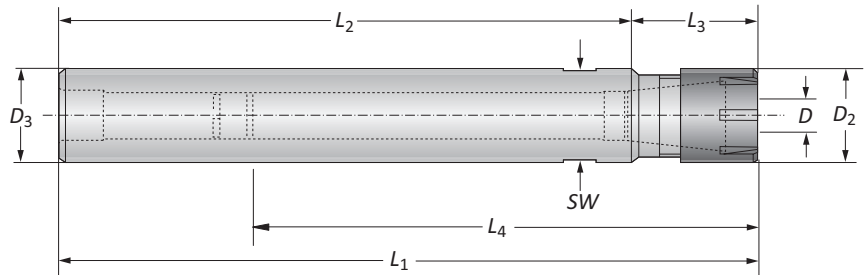
## Collet Chucks for Erickson System | Cylindrical Collet Chucks for ISO 15488 (DIN 6499) Collets

Diameter Range: 0.039" - 0.393" (1.00mm - 10.00mm)



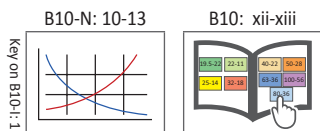
### Collet Chucks for Erickson System

Nominal Size	Clamping Range	Collet Chuck								Service Key	Weight	Part No.
		D	D <sub>2</sub>	D <sub>3</sub>	L <sub>1</sub>	L <sub>2</sub>	L <sub>3</sub>	L <sub>4</sub> Min	L <sub>4</sub> Max			
i	6	0.039 - 0.255	0.551	0.492	4.409	2.992	1.417	1.654	3.976	13	0.441 (lbs)	162080
	6	0.039 - 0.255	0.551	0.492	6.929	5.512	1.417	1.654	4.016	13	0.441 (lbs)	162081
	10	0.039 - 0.393	0.827	0.787	4.724	2.992	1.732	1.535	4.213	19	0.661 (lbs)	162082
	10	0.039 - 0.393	0.827	0.787	7.244	5.512	1.732	1.535	4.685	19	0.661 (lbs)	162083
m	6	1.00 - 6.50	14.00	12.50	112.00	76.00	36.00	42.00	101.00	13	0.20 (kg)	162080
	6	1.00 - 6.50	14.00	12.50	176.00	140.00	36.00	42.00	102.00	13	0.20 (kg)	162081
	10	1.00 - 10.00	21.00	20.00	120.00	76.00	44.00	39.00	107.00	19	0.30 (kg)	162082
	10	1.00 - 10.00	21.00	20.00	184.00	140.00	44.00	39.00	119.00	19	0.30 (kg)	162083



### Cylindrical Collet Chucks for ISO 15488 (DIN 6499) Collets

Nominal Size	Collet Chuck									Hex Size	Part No.
	D	D <sub>2</sub>	D <sub>3</sub>	L <sub>1</sub>	L <sub>2</sub>	L <sub>3</sub>	L <sub>4</sub> Min	L <sub>4</sub> Max	SW		
i	ER 8	0.039 - 0.196	0.472	0.315	4.961	3.937	1.024	1.437	1.437	09	209054
	ER 8	0.039 - 0.196	0.472	0.472	6.535	5.512	1.024	1.437	1.437	09	209055
	ER 11	0.039 - 0.275	0.630	0.630	4.193	3.150	1.043	0.906	2.559	11	209056
	ER 11	0.039 - 0.275	0.630	0.630	6.555	5.512	1.043	0.906	2.559	11	209057
	ER 16	0.039 - 0.393	0.866	0.787	4.665	3.150	1.516	1.299	4.016	17	209058
	ER 16	0.039 - 0.393	0.866	0.787	7.028	5.512	1.516	1.299	4.843	17	209059
m	ER 8	1.00 - 5.00	12.00	8.00	126.00	100.00	26.00	36.50	36.50	09	209054
	ER 8	1.00 - 5.00	12.00	12.00	166.00	140.00	26.00	36.50	36.50	09	209055
	ER 11	1.00 - 7.00	16.00	16.00	106.50	80.00	26.50	23.00	65.00	11	209056
	ER 11	1.00 - 7.00	16.00	16.00	166.50	140.00	26.50	23.00	65.00	11	209057
	ER 16	1.00 - 10.00	22.00	20.00	118.50	80.00	38.50	33.00	102.00	17	209058
	ER 16	1.00 - 10.00	22.00	20.00	178.50	140.00	38.50	33.00	123.00	17	209059

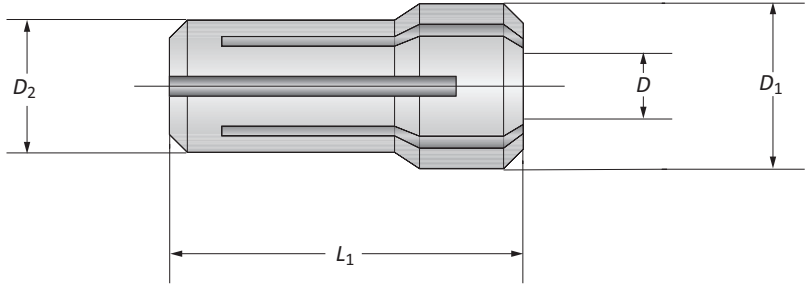


i = Imperial (in)  
m = Metric (mm)



### Accessories for Collet Chucks

Diameter Range: 0.019" - 0.393" (0.50mm - 10.00mm)



#### Collet Sets for Erickson System

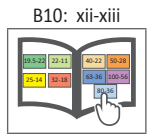
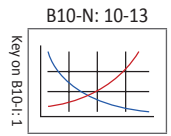
Nominal Size	Standard-No.	Set				Part No.	
		D <sub>1</sub>	D <sub>2</sub>	L <sub>1</sub>	D		
i	6	416 E	0.374	0.300	1.004	0.019 - 0.236	071016
	10	417 E	0.531	0.450	1.197	0.019 - 0.393	071017
m	6	416 E	9.50	7.62	25.50	0.50 - 6.00	071016
	10	417 E	13.50	11.43	30.40	0.50 - 10.00	071017

#### Collets for Erickson System

Collet Nominal Size	Diameter Range D	Part No.
6	0.039 - 0.059	071356
6	0.059 - 0.079	071357
6	0.079 - 0.098	071358
6	0.098 - 0.118	071359
6	0.118 - 0.138	071360
6	0.138 - 0.157	071361
6	0.157 - 0.177	071362
6	0.177 - 0.197	071363
6	0.197 - 0.217	071364
6	0.217 - 0.236	071365
10	0.020 - 0.039	071368
10	0.039 - 0.059	071369
10	0.059 - 0.079	071370
10	0.079 - 0.098	071371
10	0.098 - 0.118	071372
10	0.118 - 0.138	071373
10	0.139 - 0.157	071374
10	0.157 - 0.177	071375
10	0.177 - 0.197	071376
10	0.197 - 0.217	071377
10	0.217 - 0.236	071378
10	0.236 - 0.256	071379
10	0.256 - 0.276	071380
10	0.276 - 0.295	071381
10	0.295 - 0.315	071382
10	0.315 - 0.335	071383
10	0.335 - 0.354	071384
10	0.354 - 0.374	071385
10	0.374 - 0.394	071681

#### Collets for Erickson System

Collet Nominal Size	Diameter Range D	Part No.
6	1.00 - 1.50	071356
6	1.50 - 2.00	071357
6	2.00 - 2.50	071358
6	2.50 - 3.00	071359
6	3.00 - 3.50	071360
6	3.50 - 4.00	071361
6	4.00 - 4.50	071362
6	4.50 - 5.00	071363
6	5.00 - 5.50	071364
6	5.50 - 6.00	071365
10	0.50 - 1.00	071368
10	1.00 - 1.50	071369
10	1.50 - 2.00	071370
10	2.00 - 2.50	071371
10	2.50 - 3.00	071372
10	3.00 - 3.50	071373
10	3.50 - 4.00	071374
10	4.00 - 4.50	071375
10	4.50 - 5.00	071376
10	5.00 - 5.50	071377
10	5.50 - 6.00	071378
10	6.00 - 6.50	071379
10	6.50 - 7.00	071380
10	7.00 - 7.50	071381
10	7.50 - 8.00	071382
10	8.00 - 8.50	071383
10	8.50 - 9.00	071384
10	9.00 - 9.50	071385
10	9.50 - 10.00	071681

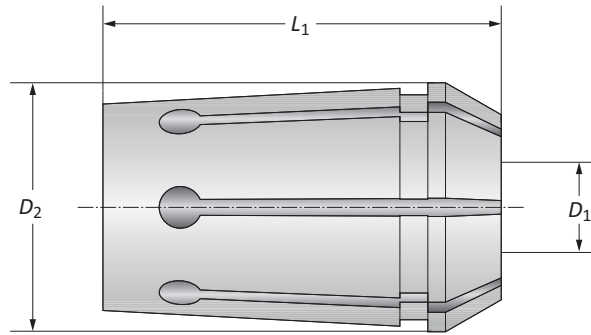


i = Imperial (in)  
m = Metric (mm)

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## Accessories for Collet Chucks

ISO 10897-A (DIN 6388-A)



### Collet Sets

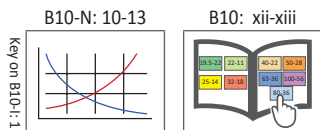
Nominal Size	Standard-No.	Set			Part No.
		$D_2$	$L_1$	$D_1$	
A 16	410 E	0.891	1.574	0.078 - 0.629	071003
A 25	444 E	1.295	2.047	0.078 - 0.984	071004
A 32	450 E	1.625	2.362	0.157 - 1.259	071019
<hr/>					
A 16	410 E	22.65	40.00	2.00 - 16.00	071003
A 25	444 E	32.90	52.00	2.00 - 25.00	071004
A 32	450 E	41.30	60.00	4.00 - 32.00	071019

### Collets

Nominal Size	Diameter $D_1$	Part No.
A 16	0.079	071140
A 16	0.098	071141
A 16	0.118	071142
A 16	0.138	071143
A 16	0.157	071144
A 16	0.177	071145
A 16	0.197	071146
A 16	0.217	071147
A 16	0.236	071148
A 16	0.256	071149
A 16	0.276	071150
A 16	0.295	071151
A 16	0.315	071152
A 16	0.335	071153
A 16	0.354	071154
A 16	0.374	071155
A 16	0.394	071156
A 16	0.413	071157
A 16	0.433	071158
A 16	0.453	071159
A 16	0.472	071160
A 16	0.492	071161
A 16	0.512	071162
A 16	0.531	071163
A 16	0.551	071164
A 16	0.571	071165
A 16	0.591	071166
A 16	0.610	071167
A 16	0.630	071168

### Collets

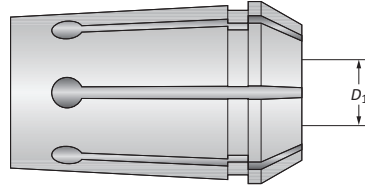
Nominal Size	Diameter $D_1$	Part No.
A 16	2.00	071140
A 16	2.50	071141
A 16	3.00	071142
A 16	3.50	071143
A 16	4.00	071144
A 16	4.50	071145
A 16	5.00	071146
A 16	5.50	071147
A 16	6.00	071148
A 16	6.50	071149
A 16	7.00	071150
A 16	7.50	071151
A 16	8.00	071152
A 16	8.50	071153
A 16	9.00	071154
A 16	9.50	071155
A 16	10.00	071156
A 16	10.50	071157
A 16	11.00	071158
A 16	11.50	071159
A 16	12.00	071160
A 16	12.50	071161
A 16	13.00	071162
A 16	13.50	071163
A 16	14.00	071164
A 16	14.50	071165
A 16	15.00	071166
A 16	15.50	071167
A 16	16.00	071168



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

## Accessories for Collet Chucks

ISO 10897-A (DIN 6388-A)



Collets

Nominal Size	Diameter $D_1$	Part No.
A 25	0.078	071169
A 25	0.118	071170
A 25	0.157	071171
A 25	0.196	071172
A 25	0.236	071173
A 25	0.275	071174
A 25	0.315	071175
A 25	0.354	071176
A 25	0.393	071177
A 25	0.433	071178
A 25	0.472	071179
A 25	0.511	071180
A 25	0.551	071181
A 25	0.590	071182
A 25	0.629	071183
A 25	0.669	071184
A 25	0.708	071185
A 25	0.748	071186
A 25	0.787	071187
A 25	0.826	071188
A 25	0.866	071189
A 25	0.905	071190
A 25	0.944	071191
A 25	0.984	071192
A 32	0.157	071612
A 32	0.196	071419
A 32	0.236	071420
A 32	0.275	071613
A 32	0.315	071421
A 32	0.354	071614
A 32	0.393	071422
A 32	0.433	071666
A 32	0.472	071423
A 32	0.511	071667
A 32	0.551	071668
A 32	0.590	071669
A 32	0.629	071424
A 32	0.669	071670
A 32	0.708	071665
A 32	0.748	071671
A 32	0.787	071416
A 32	0.826	071672
A 32	0.866	071673
A 32	0.905	071674
A 32	0.944	071675
A 32	0.984	071417
A 32	1.023	071676
A 32	1.063	071677
A 32	1.102	071678
A 32	1.141	071679
A 32	1.181	071633
A 32	1.220	071680
A 32	1.259	071418

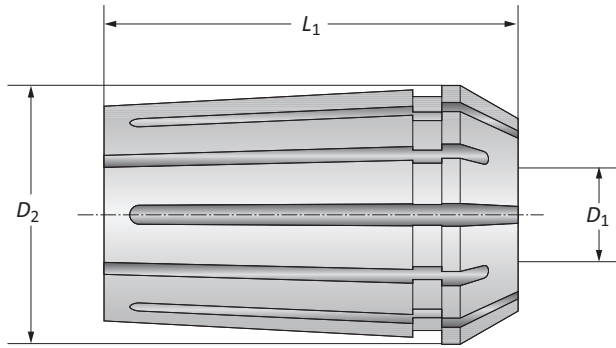
Collets

Nominal Size	Diameter $D_1$	Part No.
A 25	2.00	071169
A 25	3.00	071170
A 25	4.00	071171
A 25	5.00	071172
A 25	6.00	071173
A 25	7.00	071174
A 25	8.00	071175
A 25	9.00	071176
A 25	10.00	071177
A 25	11.00	071178
A 25	12.00	071179
A 25	13.00	071180
A 25	14.00	071181
A 25	15.00	071182
A 25	16.00	071183
A 25	17.00	071184
A 25	18.00	071185
A 25	19.00	071186
A 25	20.00	071187
A 25	21.00	071188
A 25	22.00	071189
A 25	23.00	071190
A 25	24.00	071191
A 25	25.00	071192
A 32	4.00	071612
A 32	5.00	071419
A 32	6.00	071420
A 32	7.00	071613
A 32	8.00	071421
A 32	9.00	071614
A 32	10.00	071422
A 32	11.00	071666
A 32	12.00	071423
A 32	13.00	071667
A 32	14.00	071668
A 32	15.00	071669
A 32	16.00	071424
A 32	17.00	071670
A 32	18.00	071665
A 32	19.00	071671
A 32	20.00	071416
A 32	21.00	071672
A 32	22.00	071673
A 32	23.00	071674
A 32	24.00	071675
A 32	25.00	071417
A 32	26.00	071676
A 32	27.00	071677
A 32	28.00	071678
A 32	29.00	071679
A 32	30.00	071633
A 32	31.00	071680
A 32	32.00	071418

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## Accessories for Collet Chucks

ISO 10897-B (DIN 6388-B)



### Collet Sets

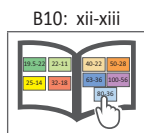
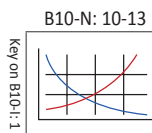
i	Nominal Size	Standard-No.	Set			Part No.
			$D_2$	$L_1$	$D_1$	
	B 16	415 E	0.892	1.575	0.059 - 0.630	071005
	B 16	462 E	1.295	2.047	0.138 - 0.984	071006
	B 16	467 E	1.626	2.362	0.217 - 1.260	071022
	B 16	415 E	22.65	40.00	1.50 - 16.00	071005
	B 16	462 E	32.90	52.00	3.50 - 25.00	071006
	B 16	467 E	41.30	60.00	5.50 - 32.00	071022

### Collets

Nominal Size	Diameter	
	$D_1$	Part No.
B 16	0.059 - 0.079	071625
B 16	0.079 - 0.098	071626
B 16	0.098 - 0.118	071621
B 16	0.118 - 0.138	071622
B 16	0.138 - 0.157	071193
B 16	0.157 - 0.177	071194
B 16	0.177 - 0.197	071195
B 16	0.197 - 0.217	071196
B 16	0.217 - 0.236	071197
B 16	0.236 - 0.256	071198
B 16	0.256 - 0.276	071199
B 16	0.276 - 0.295	071200
B 16	0.295 - 0.315	071201
B 16	0.315 - 0.335	071202
B 16	0.335 - 0.354	071203
B 16	0.354 - 0.374	071204
B 16	0.374 - 0.394	071205
B 16	0.394 - 0.413	071206
B 16	0.413 - 0.433	071207
B 16	0.433 - 0.453	071208
B 16	0.453 - 0.472	071209
B 16	0.472 - 0.492	071210
B 16	0.492 - 0.512	071211
B 16	0.512 - 0.531	071212
B 16	0.531 - 0.551	071213
B 16	0.551 - 0.571	071214
B 16	0.571 - 0.591	071215
B 16	0.591 - 0.610	071216
B 16	0.610 - 0.630	071217

### Collets

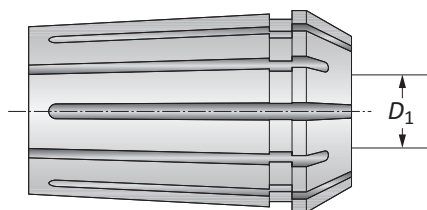
Nominal Size	Diameter	
	$D_1$	Part No.
B 16	1.50 - 2.00	071625
B 16	2.00 - 2.50	071626
B 16	2.50 - 3.00	071621
B 16	3.00 - 3.50	071622
B 16	3.50 - 4.00	071193
B 16	4.00 - 4.50	071194
B 16	4.50 - 5.00	071195
B 16	5.00 - 5.50	071196
B 16	5.50 - 6.00	071197
B 16	6.00 - 6.50	071198
B 16	6.50 - 7.00	071199
B 16	7.00 - 7.50	071200
B 16	7.50 - 8.00	071201
B 16	8.00 - 8.50	071202
B 16	8.50 - 9.00	071203
B 16	9.00 - 9.50	071204
B 16	9.50 - 10.00	071205
B 16	10.00 - 10.50	071206
B 16	10.50 - 11.00	071207
B 16	11.00 - 11.50	071208
B 16	11.50 - 12.00	071209
B 16	12.00 - 12.50	071210
B 16	12.50 - 13.00	071211
B 16	13.00 - 13.50	071212
B 16	13.50 - 14.00	071213
B 16	14.00 - 14.50	071214
B 16	14.50 - 15.00	071215
B 16	15.00 - 15.50	071216
B 16	15.50 - 16.00	071217



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

## Accessories for Collet Chucks

ISO 10897-B (DIN 6388-B)



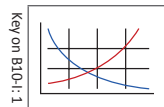
Collets

Nominal Size	Diameter $D_1$	Part No.
B 25	0.138 - 0.157	071627
B 25	0.157 - 0.177	071628
B 25	0.177 - 0.197	071218
B 25	0.197 - 0.217	071219
B 25	0.217 - 0.236	071220
B 25	0.236 - 0.256	071221
B 25	0.256 - 0.276	071222
B 25	0.276 - 0.295	071223
B 25	0.295 - 0.315	071224
B 25	0.315 - 0.335	071225
B 25	0.335 - 0.354	071226
B 25	0.354 - 0.374	071227
B 25	0.374 - 0.394	071228
B 25	0.394 - 0.413	071229
B 25	0.413 - 0.433	071230
B 25	0.433 - 0.453	071231
B 25	0.453 - 0.472	071232
B 25	0.472 - 0.492	071233
B 25	0.492 - 0.512	071234
B 25	0.512 - 0.531	071235
B 25	0.531 - 0.551	071236
<b>i</b> B 25	0.551 - 0.571	071237
B 25	0.571 - 0.591	071238
B 25	0.591 - 0.610	071239
B 25	0.610 - 0.630	071240
B 25	0.630 - 0.650	071241
B 25	0.650 - 0.669	071242
B 25	0.669 - 0.689	071243
B 25	0.689 - 0.709	071244
B 25	0.709 - 0.728	071245
B 25	0.728 - 0.748	071246
B 25	0.748 - 0.768	071247
B 25	0.768 - 0.787	071248
B 25	0.787 - 0.807	071249
B 25	0.807 - 0.827	071250
B 25	0.827 - 0.846	071251
B 25	0.846 - 0.866	071252
B 25	0.866 - 0.866	071253
B 25	0.866 - 0.906	071254
B 25	0.906 - 0.925	071255
B 25	0.925 - 0.945	071256
B 25	0.945 - 0.965	071257
B 25	0.965 - 0.984	071258

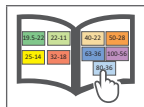
Collets

Nominal Size	Diameter $D_1$	Part No.
B 25	3.50 - 4.00	071627
B 25	4.00 - 4.50	071628
B 25	4.50 - 5.00	071218
B 25	5.00 - 5.50	071219
B 25	5.50 - 6.00	071220
B 25	6.00 - 6.50	071221
B 25	6.50 - 7.00	071222
B 25	7.00 - 7.50	071223
B 25	7.50 - 8.00	071224
B 25	8.00 - 8.50	071225
B 25	8.50 - 9.00	071226
B 25	9.00 - 9.50	071227
B 25	9.50 - 10.00	071228
B 25	10.00 - 10.50	071229
B 25	10.50 - 11.00	071230
B 25	11.00 - 11.50	071231
B 25	11.50 - 12.00	071232
B 25	12.00 - 12.50	071233
B 25	12.50 - 13.00	071234
B 25	13.00 - 13.50	071235
B 25	13.50 - 14.00	071236
<b>m</b> B 25	14.00 - 14.50	071237
B 25	14.50 - 15.00	071238
B 25	15.00 - 15.50	071239
B 25	15.50 - 16.00	071240
B 25	16.00 - 16.50	071241
B 25	16.50 - 17.00	071242
B 25	17.00 - 17.50	071243
B 25	17.50 - 18.00	071244
B 25	18.00 - 18.50	071245
B 25	18.50 - 19.00	071246
B 25	19.00 - 19.50	071247
B 25	19.50 - 20.00	071248
B 25	20.00 - 20.50	071249
B 25	20.50 - 21.00	071250
B 25	21.00 - 21.50	071251
B 25	21.50 - 22.00	071252
B 25	22.00 - 22.50	071253
B 25	22.50 - 23.00	071254
B 25	23.00 - 23.50	071255
B 25	23.50 - 24.00	071256
B 25	24.00 - 24.50	071257
B 25	24.50 - 25.00	071258

B10-N: 10-13



B10: xii-xiii

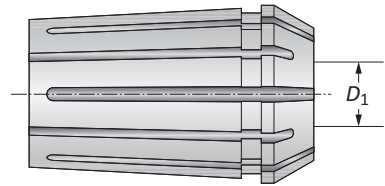


**i** = Imperial (in)  
**m** = Metric (mm)

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## Accessories for Collet Chucks

ISO 10897-B (DIN 6388-B)



Collets

Nominal Size	Diameter $D_1$	Part No.
B 32	0.217 - 0.236	071686
B 32	0.236 - 0.256	071687
B 32	0.256 - 0.276	071688
B 32	0.276 - 0.295	071689
B 32	0.295 - 0.315	071690
B 32	0.315 - 0.335	071691
B 32	0.335 - 0.354	071692
B 32	0.354 - 0.374	071693
B 32	0.374 - 0.394	071542
B 32	0.394 - 0.413	071543
B 32	0.413 - 0.433	071544
B 32	0.433 - 0.453	071545
B 32	0.453 - 0.472	071546
B 32	0.472 - 0.492	071547
B 32	0.492 - 0.512	071548
B 32	0.512 - 0.531	071549
B 32	0.531 - 0.551	071550
B 32	0.551 - 0.571	071551
B 32	0.571 - 0.591	071552
B 32	0.591 - 0.610	071553
B 32	0.610 - 0.630	071554
B 32	0.630 - 0.650	071555
B 32	0.650 - 0.669	071556
B 32	0.669 - 0.689	071557
B 32	0.689 - 0.709	071558
B 32	0.709 - 0.728	071559
<b>i</b> B 32	0.728 - 0.748	071560
B 32	0.748 - 0.768	071561
B 32	0.768 - 0.787	071562
B 32	0.787 - 0.807	071563
B 32	0.807 - 0.827	071564
B 32	0.827 - 0.846	071565
B 32	0.846 - 0.866	071566
B 32	0.866 - 0.866	071567
B 32	0.866 - 0.906	071568
B 32	0.906 - 0.925	071569
B 32	0.925 - 0.945	071570
B 32	0.945 - 0.965	071571
B 32	0.965 - 0.984	071572
B 32	0.984 - 1.004	071573
B 32	1.004 - 1.024	071574
B 32	1.024 - 1.043	071575
B 32	1.043 - 1.063	071576
B 32	1.063 - 1.083	071577
B 32	1.083 - 1.102	071578
B 32	1.102 - 1.122	071579
B 32	1.122 - 1.142	071580
B 32	1.142 - 1.161	071581
B 32	1.161 - 1.181	071582
B 32	1.181 - 1.201	071583
B 32	1.201 - 1.220	071584
B 32	1.220 - 1.240	081585
B 32	1.240 - 1.260	071586

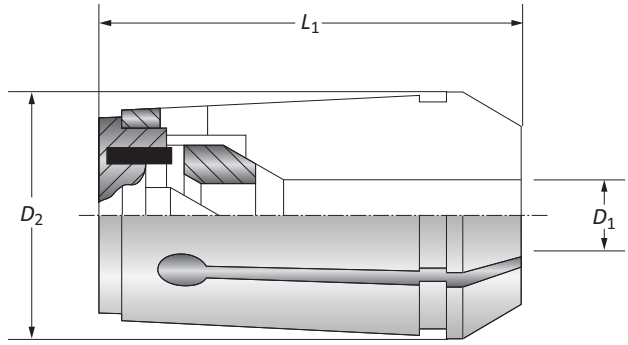
Collets

Nominal Size	Diameter $D_1$	Part No.
B 32	5.50 - 6.00	071686
B 32	6.00 - 6.50	071687
B 32	6.50 - 7.00	071688
B 32	7.00 - 7.50	071689
B 32	7.50 - 8.00	071690
B 32	8.00 - 8.50	071691
B 32	8.50 - 9.00	071692
B 32	9.00 - 9.50	071693
B 32	9.50 - 10.00	071542
B 32	10.00 - 10.50	071543
B 32	10.50 - 11.00	071544
B 32	11.00 - 11.50	071545
B 32	11.50 - 12.00	071546
B 32	12.00 - 12.50	071547
B 32	12.50 - 13.00	071548
B 32	13.00 - 13.50	071549
B 32	13.50 - 14.00	071550
B 32	14.00 - 14.50	071551
B 32	14.50 - 15.00	071552
B 32	15.00 - 15.50	071553
B 32	15.50 - 16.00	071554
B 32	16.00 - 16.50	071555
B 32	16.50 - 17.00	071556
B 32	17.00 - 17.50	071557
B 32	17.50 - 18.00	071558
B 32	18.00 - 18.50	071559
<b>m</b> B 32	18.50 - 19.00	071560
B 32	19.00 - 19.50	071561
B 32	19.50 - 20.00	071562
B 32	20.00 - 20.50	071563
B 32	20.50 - 21.00	071564
B 32	21.00 - 21.50	071565
B 32	21.50 - 22.00	071566
B 32	22.00 - 22.50	071567
B 32	22.50 - 23.00	071568
B 32	23.00 - 23.50	071569
B 32	23.50 - 24.00	071570
B 32	24.00 - 24.50	071571
B 32	24.50 - 25.00	071572
B 32	25.00 - 25.50	071573
B 32	25.50 - 26.00	071574
B 32	26.00 - 26.50	071575
B 32	26.50 - 27.00	071576
B 32	27.00 - 27.50	071577
B 32	27.50 - 28.00	071578
B 32	28.00 - 28.50	071579
B 32	28.50 - 29.00	071580
B 32	29.00 - 29.50	071581
B 32	29.50 - 30.00	071582
B 32	30.00 - 30.50	071583
B 32	30.50 - 31.00	071584
B 32	31.00 - 31.50	081585
B 32	31.50 - 32.00	071586



### Accessories for Collet Chucks

ISO 10897-A (DIN 6388-A)



#### Collet Sets for Clarkson System

	Nominal Size	Standard-No.	Sets			Part No.
			$D_2$	$L_1$	$D_1$	
<b>i</b>	A 16	421 E	0.892	1.654	0.236 - 0.472	<b>071013</b>
	A 25	459 E	1.295	2.047	0.236 - 0.984	<b>071014</b>
	A 32	460 E	1.626	2.480	0.236 - 1.260	<b>071020</b>
<b>m</b>	A 16	421 E	22.65	42.00	6.00 - 12.00	<b>071013</b>
	A 25	459 E	32.90	52.00	6.00 - 25.00	<b>071014</b>
	A 32	460 E	41.30	63.00	6.00 - 32.00	<b>071020</b>

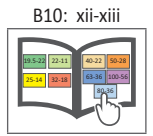
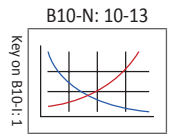
**NOTE:** Recommended to use clamping nuts with ball-bearings to lock collets

#### Collets for Clarkson System

	Nominal Size	Diameter	Part No.
		$D_1$	
<b>i</b>	A 16	0.236	<b>071304</b>
	A 16	0.315	<b>071305</b>
	A 16	0.394	<b>071306</b>
	A 16	0.472	<b>071307</b>
	A 25	0.236	<b>071308</b>
	A 25	0.315	<b>071309</b>
	A 25	0.394	<b>071310</b>
	A 25	0.472	<b>071311</b>
	A 25	0.630	<b>071312</b>
	A 25	0.787	<b>071313</b>
	A 25	0.984	<b>071684</b>
	A 32	0.236	<b>071427</b>
	A 32	0.315	<b>071428</b>
	A 32	0.394	<b>071429</b>
	A 32	0.472	<b>071430</b>
	A 32	0.630	<b>071431</b>
	A 32	0.787	<b>071432</b>
	A 32	0.984	<b>071433</b>
A 32	1.260	<b>071685</b>	

#### Collets for Clarkson System

	Nominal Size	Diameter	Part No.
		$D_1$	
<b>m</b>	A 16	6.00	<b>071304</b>
	A 16	8.00	<b>071305</b>
	A 16	10.00	<b>071306</b>
	A 16	12.00	<b>071307</b>
	A 25	6.00	<b>071308</b>
	A 25	8.00	<b>071309</b>
	A 25	10.00	<b>071310</b>
	A 25	12.00	<b>071311</b>
	A 25	16.00	<b>071312</b>
	A 25	20.00	<b>071313</b>
	A 25	25.00	<b>071684</b>
	A 32	6.00	<b>071427</b>
	A 32	8.00	<b>071428</b>
	A 32	10.00	<b>071429</b>
	A 32	12.00	<b>071430</b>
	A 32	16.00	<b>071431</b>
	A 32	20.00	<b>071432</b>
	A 32	25.00	<b>071433</b>
A 32	32.00	<b>071685</b>	

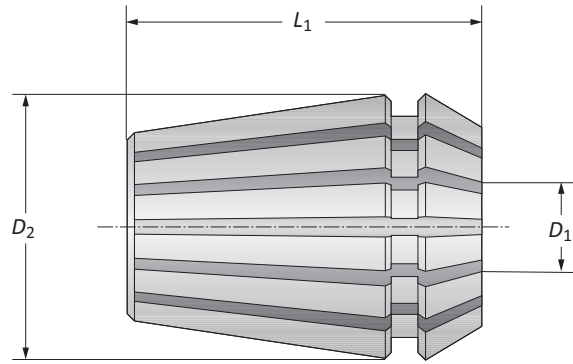


**i** = Imperial (in)  
**m** = Metric (mm)

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## Accessories for Collet Chucks

ISO 15488-B (DIN 6499-B)



### Collet Sets

	Nominal Size	Standard-No.	Diameter		Collet Set	Part No.
			$D_1$	$D_2$		
i	ER 8	4004 E	0.039 - 0.197	0.335	0.531	071034
	ER 11	4008 E	0.039 - 0.276	0.433	0.709	071028
	ER 16	426 E	0.020 - 0.394	0.630	1.083	071029
	ER 25	403 E	0.059 - 0.630	0.984	1.339	071031
	ER 32	470 E	0.079 - 0.787	1.260	1.575	071032
	ER 40	472 E	0.118 - 1.024	1.575	1.811	071033
m	ER 8	4004 E	1.00 - 5.00	8.50	13.50	071034
	ER 11	4008 E	1.00 - 7.00	11.00	18.00	071028
	ER 16	426 E	0.50 - 10.00	16.00	27.50	071029
	ER 25	403 E	1.50 - 16.00	25.00	34.00	071031
	ER 32	470 E	2.00 - 20.00	32.00	40.00	071032
	ER 40	472 E	3.00 - 26.00	40.00	46.00	071033

### Collets

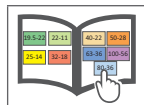
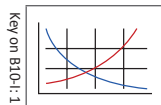
Nominal Size	Diameter $D_1$	Part No.
ER 8	0.039	071986
ER 8	0.059	071987
ER 8	0.079	071988
ER 8	0.098	071989
ER 8	0.102 - 0.118	071990
ER 8	0.122 - 0.138	071991
ER 8	0.142 - 0.157	071992
ER 8	0.161 - 0.177	071993
ER 8	0.181 - 0.197	071994
ER 11	0.039	071700
ER 11	0.059	071701
ER 11	0.079	071702
ER 11	0.098	071703
ER 11	0.102 - 0.118	071704
ER 11	0.122 - 0.138	071705
ER 11	0.142 - 0.157	071706
ER 11	0.161 - 0.177	071707
ER 11	0.181 - 0.197	071708
ER 11	0.201 - 0.217	071709
ER 11	0.220 - 0.354	071710
ER 11	0.240 - 0.256	071711
ER 11	0.260 - 0.276	071712

### Collets

Nominal Size	Diameter $D_1$	Part No.
ER 8	1.00	071986
ER 8	1.50	071987
ER 8	2.00	071988
ER 8	2.50	071989
ER 8	2.60 - 3.00	071990
ER 8	3.10 - 3.50	071991
ER 8	3.60 - 4.00	071992
ER 8	4.10 - 4.50	071993
ER 8	4.60 - 5.00	071994
ER 11	1.00	071700
ER 11	1.50	071701
ER 11	2.00	071702
ER 11	2.50	071703
ER 11	2.60 - 3.00	071704
ER 11	3.10 - 3.50	071705
ER 11	3.60 - 4.00	071706
ER 11	4.10 - 4.50	071707
ER 11	4.60 - 5.00	071708
ER 11	5.10 - 5.50	071709
ER 11	5.60 - 6.00	071710
ER 11	6.10 - 6.50	071711
ER 11	6.60 - 7.00	071712

B10-N: 10-13

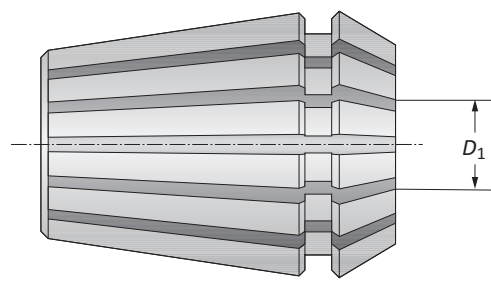
B10: xii-xiii



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

## Accessories for Collet Chucks

ISO 15488-B (DIN 6499-B)



### Collets

	Nominal Size	Diameter	
		$D_1$	Part No.
<b>i</b>	ER 16	0.020 - 0.039	<b>071713</b>
	ER 16	0.039 - 0.059	<b>071714</b>
	ER 16	0.039 - 0.079	<b>071715</b>
	ER 16	0.079 - 0.098	<b>071716</b>
	ER 16	0.098 - 0.118	<b>071717</b>
	ER 16	0.118 - 0.138	<b>071718</b>
	ER 16	0.138 - 0.157	<b>071719</b>
	ER 16	0.157 - 0.177	<b>271132</b>
	ER 16	0.157 - 0.197	<b>071720</b>
	ER 16	0.197 - 0.217	<b>271133</b>
	ER 16	0.217 - 0.236	<b>071721</b>
	ER 16	0.236 - 0.256	<b>271134</b>
	ER 16	0.236 - 0.276	<b>071722</b>
	ER 16	0.276 - 0.295	<b>271135</b>
	ER 16	0.295 - 0.315	<b>071723</b>
	ER 16	0.315 - 0.335	<b>271136</b>
	ER 16	0.335 - 0.354	<b>071724</b>
ER 16	0.354 - 0.374	<b>271137</b>	
ER 16	0.354 - 0.394	<b>071725</b>	
<b>m</b>	ER 16	0.50 - 1.00	<b>071713</b>
	ER 16	1.00 - 1.50	<b>071714</b>
	ER 16	1.00 - 2.00	<b>071715</b>
	ER 16	2.00 - 2.50	<b>071716</b>
	ER 16	2.50 - 3.00	<b>071717</b>
	ER 16	3.00 - 3.50	<b>071718</b>
	ER 16	3.50 - 4.00	<b>071719</b>
	ER 16	4.00 - 4.50	<b>271132</b>
	ER 16	4.00 - 5.00	<b>071720</b>
	ER 16	5.00 - 5.50	<b>271133</b>
	ER 16	5.50 - 6.00	<b>071721</b>
	ER 16	6.00 - 6.50	<b>271134</b>
	ER 16	6.00 - 7.00	<b>071722</b>
	ER 16	7.00 - 7.50	<b>271135</b>
	ER 16	7.5 - 8.00	<b>071723</b>
	ER 16	8.00 - 8.50	<b>271136</b>
	ER 16	8.50 - 9.00	<b>071724</b>
ER 16	9.00 - 9.50	<b>271137</b>	
ER 16	9.00 - 10.00	<b>071725</b>	

**B10-N: 10-13**  
Key on B10-I: 1

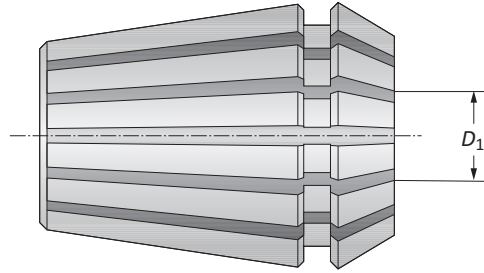
**B10: xii-xiii**

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

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## Accessories for Collet Chucks

ISO 15488-B (DIN 6499-B)

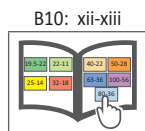
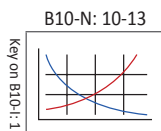


### Collets

Nominal Size	Diameter $D_1$	Part No.
ER 25	0.059 - 0.079	071743
ER 25	0.079 - 0.098	071744
ER 25	0.098 - 0.118	071745
ER 25	0.118 - 0.138	271128
ER 25	0.138 - 0.157	071746
ER 25	0.157 - 0.177	271129
ER 25	0.177 - 0.197	071747
ER 25	0.197 - 0.217	271130
ER 25	0.217 - 0.236	071748
ER 25	0.236 - 0.256	271131
ER 25	0.256 - 0.276	071749
ER 25	0.276 - 0.315	071750
ER 25	0.315 - 0.354	071751
ER 25	0.354 - 0.394	071752
ER 25	0.394 - 0.433	071753
ER 25	0.433 - 0.472	071754
ER 25	0.472 - 0.512	071755
ER 25	0.512 - 0.551	071756
ER 25	0.551 - 0.591	071757
ER 25	0.591 - 0.630	071758
<b>i</b> ER 32	0.079 - 0.118	071761
ER 32	0.118 - 0.157	071762
ER 32	0.157 - 0.197	071763
ER 32	0.197 - 0.236	071764
ER 32	0.236 - 0.276	071765
ER 32	0.276 - 0.315	071766
ER 32	0.315 - 0.354	071767
ER 32	0.354 - 0.394	071768
ER 32	0.394 - 0.433	071769
ER 32	0.433 - 0.472	071770
ER 32	0.472 - 0.512	071771
ER 32	0.512 - 0.551	071772
ER 32	0.551 - 0.591	071773
ER 32	0.591 - 0.630	071774
ER 32	0.630 - 0.669	071775
ER 32	0.669 - 0.709	071776
ER 32	0.709 - 0.748	071777
ER 32	0.748 - 0.787	071778
ER 32	0.669 - 0.709	071776
ER 32	0.709 - 0.748	071777
ER 32	0.748 - 0.787	071778

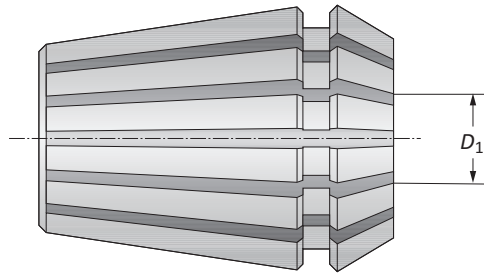
### Collets

Nominal Size	Diameter $D_1$	Part No.
ER 25	1.50 - 2.00	071743
ER 25	2.00 - 2.50	071744
ER 25	2.50 - 3.00	071745
ER 25	3.00 - 3.50	271128
ER 25	3.50 - 4.00	071746
ER 25	4.00 - 4.50	271129
ER 25	4.50 - 5.00	071747
ER 25	5.00 - 5.50	271130
ER 25	5.50 - 6.00	071748
ER 25	6.00 - 6.50	271131
ER 25	6.50 - 7.00	071749
ER 25	7.00 - 8.00	071750
ER 25	8.00 - 9.00	071751
ER 25	9.00 - 10.00	071752
ER 25	10.00 - 11.00	071753
ER 25	11.00 - 12.00	071754
ER 25	12.00 - 13.00	071755
ER 25	13.00 - 14.00	071756
ER 25	14.00 - 15.00	071757
ER 25	15.00 - 16.00	071758
<b>m</b> ER 32	2.00 - 3.00	071761
ER 32	3.00 - 4.00	071762
ER 32	4.00 - 5.00	071763
ER 32	5.00 - 6.00	071764
ER 32	6.00 - 7.00	071765
ER 32	7.00 - 8.00	071766
ER 32	8.00 - 9.00	071767
ER 32	9.00 - 10.00	071768
ER 32	10.00 - 11.00	071769
ER 32	11.00 - 12.00	071770
ER 32	12.00 - 13.00	071771
ER 32	13.00 - 14.00	071772
ER 32	14.00 - 15.00	071773
ER 32	15.00 - 16.00	071774
ER 32	16.00 - 17.00	071775
ER 32	17.00 - 18.00	071776
ER 32	18.00 - 19.00	071777
ER 32	19.00 - 20.00	071778
ER 32	17.00 - 18.00	071776
ER 32	18.00 - 19.00	071777
ER 32	19.00 - 20.00	071778



## Accessories for Collet Chucks

ISO 15488-B (DIN 6499-B)



Nominal Size	Diameter $D_1$	Part No.
ER 40	0.118 - 0.157	071779
ER 40	0.157 - 0.197	071780
ER 40	0.197 - 0.236	071781
ER 40	0.236 - 0.276	071782
ER 40	0.276 - 0.315	071783
ER 40	0.315 - 0.354	071784
ER 40	0.354 - 0.394	071785
ER 40	0.394 - 0.433	071786
ER 40	0.433 - 0.472	071787
ER 40	0.472 - 0.512	071788
ER 40	0.512 - 0.551	071789
ER 40	0.551 - 0.591	071790
ER 40	0.591 - 0.630	071791
ER 40	0.630 - 0.669	071792
ER 40	0.669 - 0.709	071793
ER 40	0.709 - 0.748	071794
ER 40	0.748 - 0.787	071795
ER 40	0.787 - 0.827	071796
ER 40	0.827 - 0.866	071797
ER 40	0.866 - 0.906	071798
ER 40	0.906 - 0.945	071799
ER 40	0.945 - 0.984	071800
ER 40	0.984 - 1.024	071801
<hr/>		
ER 40	3.00 - 4.00	071779
ER 40	4.00 - 5.00	071780
ER 40	5.00 - 6.00	071781
ER 40	6.00 - 7.00	071782
ER 40	7.00 - 8.00	071783
ER 40	8.00 - 9.00	071784
ER 40	9.00 - 10.00	071785
ER 40	10.00 - 11.00	071786
ER 40	11.00 - 12.00	071787
ER 40	12.00 - 13.00	071788
ER 40	13.00 - 14.00	071789
ER 40	14.00 - 15.00	071790
ER 40	15.00 - 16.00	071791
ER 40	16.00 - 17.00	071792
ER 40	17.00 - 18.00	071793
ER 40	18.00 - 19.00	071794
ER 40	19.00 - 20.00	071795
ER 40	20.00 - 21.00	071796
ER 40	21.00 - 22.00	071797
ER 40	22.00 - 23.00	071798
ER 40	23.00 - 24.00	071799
ER 40	24.00 - 25.00	071800
ER 40	25.00 - 26.00	071801

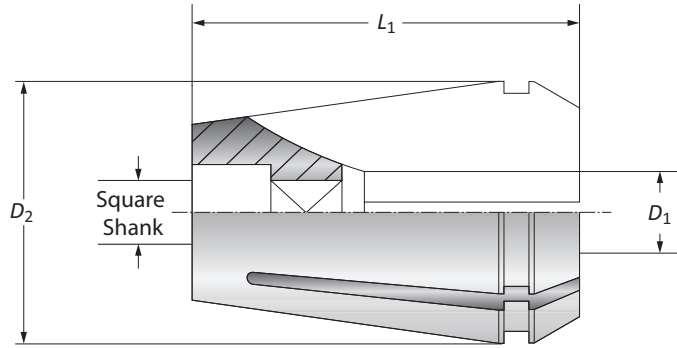
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## Accessories for Collet Sets for Taps DIN 371/374/376

ISO 15488-B (DIN 6499-B)

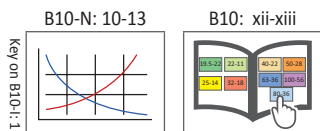


### Collet Sets

	Nominal Size	Standard-No.	Clamping Range		Collet Set		Part No.
			$D_1$	$D_2$	$D_2$	$L_1$	
i	ER 16	426 EGB	0.177 - 0.276	0.630	1.083	<b>071045</b>	
	ER 25	430 EGB	0.177 - 0.472	0.984	1.339	<b>071047</b>	
	ER 32	470 EGB	0.177 - 0.630	1.260	1.575	<b>071048</b>	
	ER 40	472 EGB	0.276 - 0.787	1.575	1.811	<b>071049</b>	
m	ER 16	426 EGB	4.50 - 7.00	16.00	27.50	<b>071045</b>	
	ER 25	430 EGB	4.50 - 12.00	25.00	34.00	<b>071047</b>	
	ER 32	470 EGB	4.50 - 16.00	32.00	40.00	<b>071048</b>	
	ER 40	472 EGB	7.00 - 20.00	40.00	46.00	<b>071049</b>	

### Taps

	Shank		Tap		
	$D_1$	Square Shank	DIN 371	DIN 374	DIN 376
i	0.177	0.134	M 4	M 6 x...	M 6
	0.217	0.169	-	M 7 x...	M 7
	0.236	0.193	M 4,5/5/6	M 8 x...	M 8
	0.276	0.217	M 7	M 9/10 x...	M 9/10
	0.315	0.244	M 8	M 6 x...	M 11
	0.354	0.276	M 9	M 6 x...	M 12
	0.394	0.315	M 10	-	-
	0.433	0.354	-	M 14 x...	M 14
	0.472	0.354	M 12	M 16 x...	M 16
	0.551	0.433	-	M 18 x...	M 18
m	0.630	0.472	-	M 20 x...	M 20
	0.709	0.551	-	M 22/24 x...	M 22/24
	0.787	0.630	-	M 27 x...	M 27
	4.50	3.40	M 4	M 6 x...	M 6
	5.50	4.30	-	M 7 x...	M 7
	6.00	4.90	M 4,5/5/6	M 8 x...	M 8
	7.00	5.50	M 7	M 9/10 x...	M 9/10
	8.00	6.20	M 8	M 6 x...	M 11
	9.00	7.00	M 9	M 6 x...	M 12
	10.00	8.00	M 10	-	-
11.00	9.00	-	M 14 x...	M 14	
12.00	9.00	M 12	M 16 x...	M 16	
14.00	11.00	-	M 18 x...	M 18	
16.00	12.00	-	M 20 x...	M 20	
18.00	14.00	-	M 22/24 x...	M 22/24	
20.00	16.00	-	M 27 x...	M 27	

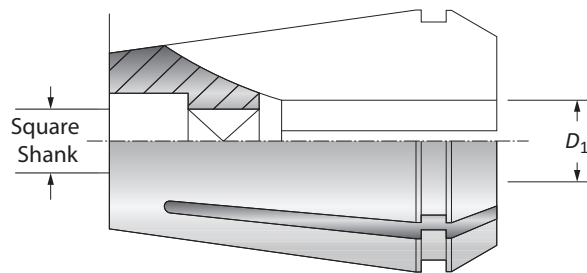


i = Imperial (in)  
m = Metric (mm)



## Accessories for Collet Sets for Taps DIN 371/374/376

ISO 15488-B (DIN 6499-B)



Nominal Size	Suitable Taps		Part No.
	$D_1$	Square Shank	
ER 16	0.177	0.134	<b>071901</b>
ER 16	0.217	0.169	<b>071902</b>
ER 16	0.236	0.193	<b>071903</b>
ER 16	0.276	0.217	<b>071904</b>
ER 25	0.177	0.134	<b>071912</b>
ER 25	0.217	0.169	<b>071913</b>
ER 25	0.236	0.193	<b>071914</b>
ER 25	0.276	0.217	<b>071915</b>
ER 25	0.315	0.244	<b>071916</b>
ER 25	0.354	0.276	<b>071917</b>
ER 25	0.394	0.315	<b>071918</b>
ER 25	0.433	0.354	<b>071919</b>
ER 25	0.472	0.354	<b>071920</b>
ER 32	0.177	0.134	<b>071921</b>
ER 32	0.217	0.169	<b>071922</b>
ER 32	0.236	0.193	<b>071923</b>
ER 32	0.276	0.217	<b>071924</b>
ER 32	0.315	0.244	<b>071925</b>
ER 32	0.354	0.276	<b>071926</b>
ER 32	0.394	0.315	<b>071927</b>
ER 32	0.433	0.354	<b>071928</b>
ER 32	0.472	0.354	<b>071929</b>
ER 32	0.551	0.433	<b>071930</b>
ER 32	0.630	0.472	<b>071931</b>
ER 40	0.276	0.217	<b>071932</b>
ER 40	0.315	0.244	<b>071933</b>
ER 40	0.354	0.276	<b>071934</b>
ER 40	0.394	0.315	<b>071935</b>
ER 40	0.433	0.354	<b>071936</b>
ER 40	0.472	0.354	<b>071937</b>
ER 40	0.551	0.433	<b>071938</b>
ER 40	0.630	0.472	<b>071939</b>
ER 40	0.709	0.571	<b>071940</b>
ER 40	0.787	0.630	<b>071941</b>

Nominal Size	Suitable Taps		Part No.
	$D_1$	Square Shank	
ER 16	4.50	3.40	<b>071901</b>
ER 16	5.50	4.30	<b>071902</b>
ER 16	6.00	4.90	<b>071903</b>
ER 16	7.00	5.50	<b>071904</b>
ER 25	4.50	3.40	<b>071912</b>
ER 25	5.50	4.30	<b>071913</b>
ER 25	6.00	4.90	<b>071914</b>
ER 25	7.00	5.50	<b>071915</b>
ER 25	8.00	6.20	<b>071916</b>
ER 25	9.00	7.00	<b>071917</b>
ER 25	10.00	8.00	<b>071918</b>
ER 25	11.00	9.00	<b>071919</b>
ER 25	12.00	9.00	<b>071920</b>
ER 32	4.50	3.40	<b>071921</b>
ER 32	5.50	4.30	<b>071922</b>
ER 32	6.00	4.90	<b>071923</b>
ER 32	7.00	5.50	<b>071924</b>
ER 32	8.00	6.20	<b>071925</b>
ER 32	9.00	7.00	<b>071926</b>
ER 32	10.00	8.00	<b>071927</b>
ER 32	11.00	9.00	<b>071928</b>
ER 32	12.00	9.00	<b>071929</b>
ER 32	14.00	11.00	<b>071930</b>
ER 32	16.00	12.00	<b>071931</b>
ER 40	7.00	5.50	<b>071932</b>
ER 40	8.00	6.20	<b>071933</b>
ER 40	9.00	7.00	<b>071934</b>
ER 40	10.00	8.00	<b>071935</b>
ER 40	11.00	9.00	<b>071936</b>
ER 40	12.00	9.00	<b>071937</b>
ER 40	14.00	11.00	<b>071938</b>
ER 40	16.00	12.00	<b>071939</b>
ER 40	18.00	14.50	<b>071940</b>
ER 40	20.00	16.00	<b>071941</b>

**i**

**iii**

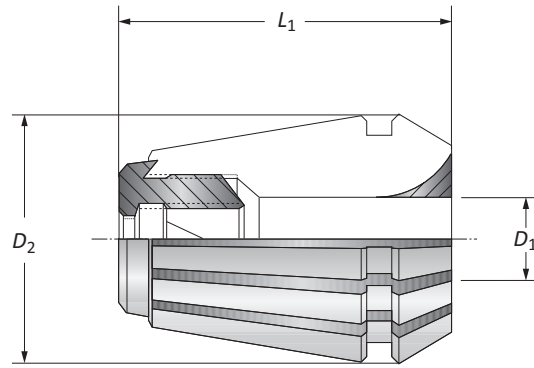
B10-N: 10-13  
Key on B10-I: 1

B10: xii-xiii

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

## Accessories for Collet Chucks: ISO 15488-B (DIN 6499-B)

### Collets

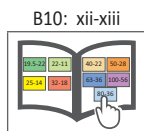
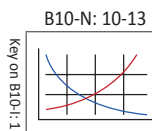


### Collets for Mill Cutters with Pull Thread System

	Nominal Size	Standard-No.	Clamping Range $D_2$	Collet		Part No.
				$L_1$	$D_1$	
i	ER 32	470 ECL	1.260	1.811	0.236 - 0.630	071052
	ER 40	472 ECL	1.575	2.047	0.236 - 0.984	071053
m	ER 32	470 ECL	32.00	46.00	6.00 - 16.00	071052
	ER 40	472 ECL	40.00	52.00	6.00 - 25.00	071053

### Collets

	Nominal Size	Collet	
		$D_1$	Part No.
i	ER 32	0.236	071826
	ER 32	0.315	071827
	ER 32	0.394	071828
	ER 32	0.472	071829
	ER 32	0.630	071830
	ER 32	0.236	071831
	ER 32	0.315	071832
	ER 32	0.394	071833
	ER 32	0.472	071834
	ER 32	0.630	071835
	ER 32	0.787	071836
	ER 32	0.984	071837
	m	ER 32	6.00
ER 32		8.00	071827
ER 32		10.00	071828
ER 32		12.00	071829
ER 32		16.00	071830
ER 32		6.00	071831
ER 32		8.00	071832
ER 32		10.00	071833
ER 32		12.00	071834
ER 32		16.00	071835
ER 32		20.00	071836
ER 32		25.00	071837



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

## Collet Kit Set Accessories for Collet Chucks

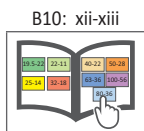
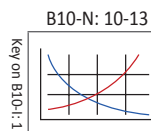


Collet Kit: ISO 15488 (DIN 6499)

	Nominal Size	Kit				Part No.
		Width	Depth	Height	Collet Space	
<b>i</b>	ER 16	5.512	2.835	1.772	0.394	099049
	ER 25	7.717	4.409	1.969	0.591	099050
	ER 32	9.882	5.512	2.205	0.709	099051
<b>m</b>	ER 16	140.00	72.00	45.00	10.00	099049
	ER 25	196.00	112.00	50.00	15.00	099050
	ER 32	251.00	140.00	56.00	18.00	099051

Collet Kit: ISO 10897 (DIN 6388)

	Nominal Size	Kit				Part No.
		Width	Depth	Height	Collet Space	
<b>i</b>	ER 16	8.898	6.339	3.346	0.591	099053
	ER 25	13.110	7.913	3.346	0.945	099054
	ER 32	12.598	8.268	3.346	0.591	099055
<b>m</b>	ER 16	226.00	161.00	85.00	15.00	099053
	ER 25	333.00	201.00	85.00	24.00	099054
	ER 32	320.00	210.00	85.00	15.00	099055



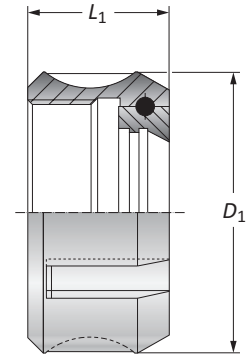
**i** = Imperial (in)  
**m** = Metric (mm)

## Accessories for Collet Chucks: ISO 10897 (DIN 6388)

### Clamping Nuts

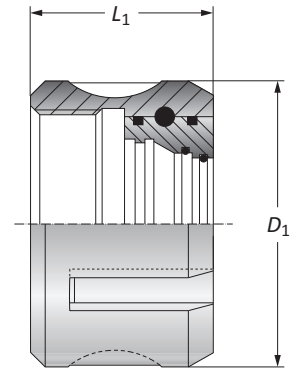
#### Clamping Nuts: DIN 6388 / ISO 10897 - 1:10

		Clamping Nut				
Nominal Size		$D_1$	$L_1$	Clamping Range	Torque	Part No.
i	16	1.693	0.945	0.079 - 0.630	100	068048
	25	2.362	1.181	0.079 - 0.984	180	068052
	32	2.835	1.319	0.157 - 1.260	220	161099
m	16	43.00	24.00	2.00 - 16.00	100	068048
	25	60.00	30.00	2.00 - 25.00	180	068052
	32	72.00	33.50	4.00 - 32.00	220	161099



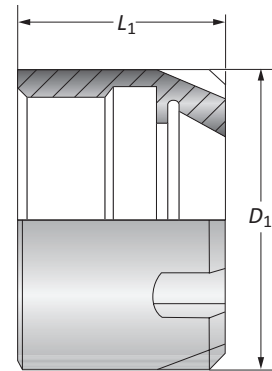
#### Clamping Nuts for Sealing Discs: DIN 6388 / ISO 10897 - 1:10

		Clamping Nut				
Nominal Size		$D_1$	$L_1$	Clamping Range	Torque	Part No.
i	16	1.693	1.240	0.079 - 0.591	100	275001
	25	2.362	1.496	0.079 - 0.984	180	275003
	32	2.835	1.654	0.157 - 1.260	220	276001
m	16	43.00	31.50	2.00 - 15.00	100	275001
	25	60.00	38.00	2.00 - 25.00	180	275003
	32	72.00	42.00	4.00 - 32.00	220	276001



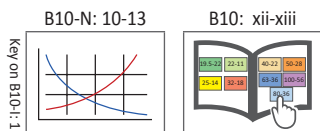
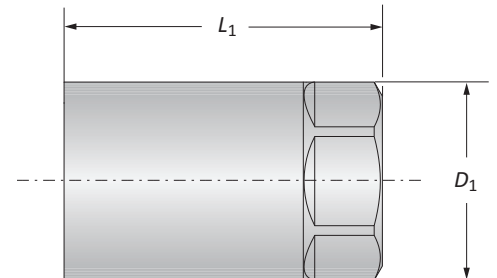
#### Mini Clamping Nuts

		Clamping Nut				
Nominal Size		$D_1$	$L_1$	Clamping Range	Torque	Part No.
i	ER 08	0.472	0.425	0.039 - 0.157	8	415357
	ER 11	0.630	0.472	0.039 - 0.276	16	415358
	ER 16	0.866	0.709	0.039 - 0.394	25	415359
m	ER 08	12.00	10.80	1.00 - 4.00	8	415357
	ER 11	16.00	12.00	1.00 - 7.00	16	415358
	ER 16	22.00	18.00	1.00 - 10.00	25	415359



#### Clamping Nuts for Erickson Collet Chuck System

		Clamping Nut			
Nominal Size		$D_1$	$L_1$	Clamping Range	Part No.
i	6	0.551	1.102	0.039 - 0.256	162095
	10	0.827	1.417	0.039 - 0.394	162093
m	6	14.00	28.00	1.00 - 6.50	162095
	10	21.00	36.00	1.00 - 10.00	162093



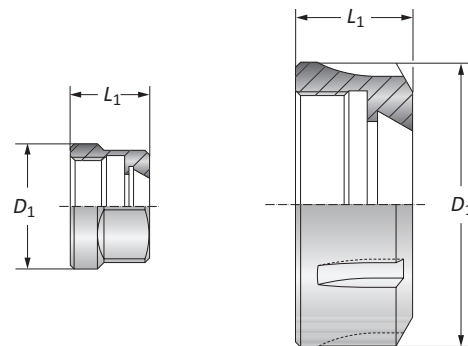
i = Imperial (in)  
m = Metric (mm)

## Accessories for Collet Chucks: ISO 15488 (DIN 6499)

### Clamping Nuts

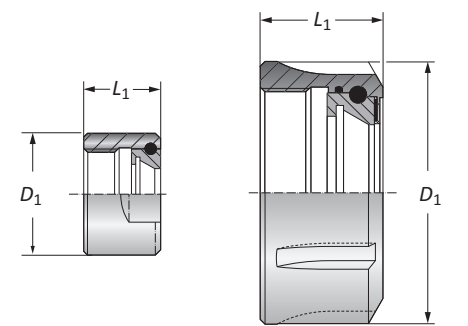
#### One Piece Clamping Nuts: DIN 6499 / ISO 15488 - 8°

		Clamping Nut				
		$D_1$	$L_1$	Clamping Range	Torque	Part No.
<b>i</b>	ER 16	1.102	0.689	0.039 - 0.394	60	215922
	ER 25	1.654	0.787	0.079 - 0.630	100	215924
	ER 32	1.969	0.886	0.079 - 0.787	140	215925
	ER 40	2.480	1.004	0.157 - 1.024	180	215926
<b>m</b>	ER 16	28.00	17.50	1.00 - 10.00	60	215922
	ER 25	42.00	20.00	2.00 - 16.00	100	215924
	ER 32	50.00	22.50	2.00 - 20.00	140	215925
	ER 40	63.00	25.50	4.00 - 26.00	180	215926



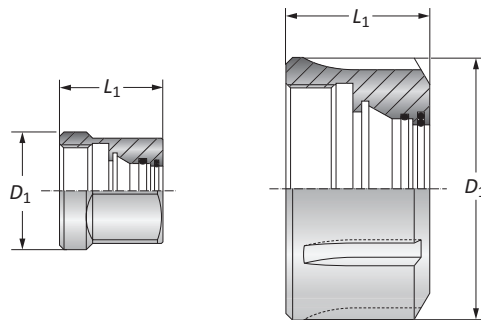
#### Clamping Nuts with Sliding Ring: DIN 6499 / ISO 15488 - 8°

		Clamping Nut				
		$D_1$	$L_1$	Clamping Range	Torque	Part No.
<b>i</b>	ER 16	1.102	0.984	0.039 - 0.394	60	277001
	ER 25	1.654	1.083	0.079 - 0.630	100	277005
	ER 32	1.969	1.201	0.079 - 0.787	140	277007
	ER 40	2.480	1.339	0.157 - 1.024	180	278001
<b>m</b>	ER 16	28.00	25.00	1.00 - 10.00	60	277001
	ER 25	42.00	27.50	2.00 - 16.00	100	277005
	ER 32	50.00	30.50	2.00 - 20.00	140	277007
	ER 40	63.00	34.00	4.00 - 26.00	180	278001



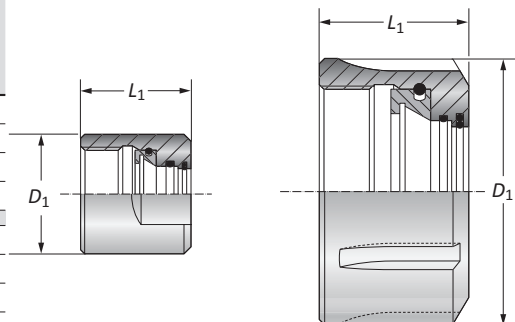
#### One Piece Clamping Nuts: DIN 6499 / ISO 15488 - 8°

		Clamping Nut				
		$D_1$	$L_1$	Clamping Range	Torque	Part No.
<b>i</b>	ER 16	1.102	0.984	0.039 - 0.394	60	315015
	ER 25	1.654	1.083	0.079 - 0.630	100	315016
	ER 32	1.969	1.201	0.079 - 0.787	140	315017
	ER 40	2.480	1.339	0.157 - 1.024	180	315018
<b>m</b>	ER 16	28.00	20.30	1.00 - 10.00	60	315015
	ER 25	42.00	22.40	2.00 - 16.00	100	315016
	ER 32	50.00	25.00	2.00 - 20.00	140	315017
	ER 40	63.00	28.30	4.00 - 26.00	180	315018



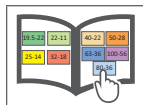
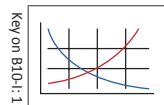
#### Clamping Nuts: DIN 6499 / ISO 15488 - 8°

		Clamping Nuts : ISO 15488 (DIN 6499)				
		$D_1$	$L_1$	Clamping Range	Torque	Part No.
<b>i</b>	ER 16	1.102	0.984	0.039 - 0.394	60	277002
	ER 25	1.654	1.122	0.079 - 0.630	100	277006
	ER 32	1.969	1.240	0.079 - 0.787	140	277008
	ER 40	2.480	1.378	0.157 - 1.024	180	278002
<b>m</b>	ER 16	28.00	25.00	1.00 - 10.00	60	277002
	ER 25	42.00	28.50	2.00 - 16.00	100	277006
	ER 32	50.00	31.50	2.00 - 20.00	140	277008
	ER 40	63.00	35.00	4.00 - 26.00	180	278002



B10-N: 10-13

B10: xii-xiii

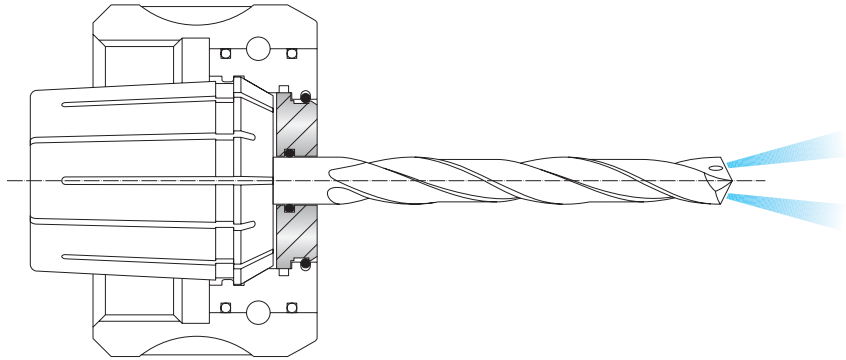


**i** = Imperial (in)  
**m** = Metric (mm)

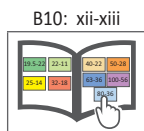
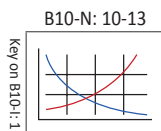
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B  
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## Sealing Disks for Collet Chucks: ISO 10897 (DIN 6388)

Imperial



Nominal Size	Sealing Disk		Sealing Disk		Sealing Disk		Sealing Disk	
	Diameter	Part No.	Diameter	Part No.	Diameter	Part No.	Diameter	Part No.
16	0.098 - 0.118	<b>275010</b>	0.236 - 0.256	<b>275017</b>	0.374 - 0.394	<b>275024</b>	0.512 - 0.531	<b>275031</b>
16	0.118 - 0.138	<b>275011</b>	0.256 - 0.276	<b>275018</b>	0.394 - 0.413	<b>275025</b>	0.531 - 0.551	<b>275032</b>
16	0.138 - 0.157	<b>275012</b>	0.276 - 0.295	<b>275019</b>	0.413 - 0.433	<b>275026</b>	0.551 - 0.571	<b>275033</b>
16	0.157 - 0.177	<b>275013</b>	0.295 - 0.315	<b>275020</b>	0.433 - 0.453	<b>275027</b>	0.571 - 0.591	<b>275034</b>
16	0.177 - 0.197	<b>275014</b>	0.315 - 0.335	<b>275021</b>	0.453 - 0.472	<b>275028</b>	0.591 - 0.610	<b>275035</b>
16	0.197 - 0.217	<b>275015</b>	0.335 - 0.354	<b>275022</b>	0.472 - 0.492	<b>275029</b>	0.610 - 0.630	<b>275036</b>
16	0.217 - 0.236	<b>275016</b>	0.354 - 0.374	<b>275023</b>	0.492 - 0.512	<b>275030</b>	-	-
25	0.098 - 0.118	<b>275040</b>	0.335 - 0.354	<b>275052</b>	0.571 - 0.591	<b>275064</b>	0.807 - 0.827	<b>275076</b>
25	0.118 - 0.138	<b>275041</b>	0.354 - 0.374	<b>275053</b>	0.591 - 0.610	<b>275065</b>	0.807 - 0.846	<b>275077</b>
25	0.138 - 0.157	<b>275042</b>	0.374 - 0.394	<b>275054</b>	0.610 - 0.630	<b>275066</b>	0.846 - 0.866	<b>275078</b>
25	0.157 - 0.177	<b>275043</b>	0.394 - 0.413	<b>275055</b>	0.630 - 0.650	<b>275067</b>	0.866 - 0.886	<b>275079</b>
25	0.177 - 0.197	<b>275044</b>	0.413 - 0.433	<b>275056</b>	0.650 - 0.669	<b>275068</b>	0.886 - 0.906	<b>275080</b>
25	0.197 - 0.217	<b>275045</b>	0.433 - 0.453	<b>275057</b>	0.669 - 0.689	<b>275069</b>	0.906 - 0.925	<b>275081</b>
25	0.217 - 0.236	<b>275046</b>	0.453 - 0.472	<b>275058</b>	0.689 - 0.709	<b>275070</b>	0.925 - 0.945	<b>275082</b>
25	0.236 - 0.256	<b>275047</b>	0.472 - 0.492	<b>275059</b>	0.709 - 0.728	<b>275071</b>	0.945 - 0.965	<b>275083</b>
25	0.256 - 0.276	<b>275048</b>	0.492 - 0.512	<b>275060</b>	0.728 - 0.748	<b>275072</b>	0.965 - 0.984	<b>275084</b>
<b>i</b> 25	0.276 - 0.295	<b>275049</b>	0.512 - 0.531	<b>275061</b>	0.748 - 0.768	<b>275073</b>	-	-
<b>i</b> 25	0.295 - 0.315	<b>275050</b>	0.531 - 0.551	<b>275062</b>	0.768 - 0.787	<b>275074</b>	-	-
<b>i</b> 25	0.315 - 0.335	<b>275051</b>	0.551 - 0.571	<b>275063</b>	0.787 - 0.807	<b>275075</b>	-	-
32	0.138 - 0.157	<b>276005</b>	0.433 - 0.453	<b>276020</b>	0.728 - 0.748	<b>276035</b>	1.024 - 1.043	<b>276050</b>
32	0.157 - 0.177	<b>276006</b>	0.453 - 0.472	<b>276021</b>	0.748 - 0.768	<b>276036</b>	1.043 - 1.063	<b>276051</b>
32	0.177 - 0.197	<b>276007</b>	0.472 - 0.492	<b>276022</b>	0.768 - 0.787	<b>276037</b>	1.063 - 1.102	<b>276052</b>
32	0.197 - 0.217	<b>276008</b>	0.492 - 0.512	<b>276023</b>	0.787 - 0.807	<b>276038</b>	1.063 - 1.102	<b>276053</b>
32	0.217 - 0.236	<b>276009</b>	0.512 - 0.531	<b>276024</b>	0.807 - 0.827	<b>276039</b>	1.102 - 1.102	<b>276054</b>
32	0.236 - 0.256	<b>276010</b>	0.531 - 0.551	<b>276025</b>	0.827 - 0.846	<b>276040</b>	1.122 - 1.142	<b>276055</b>
32	0.256 - 0.276	<b>276011</b>	0.551 - 0.571	<b>276026</b>	0.846 - 0.866	<b>276041</b>	1.142 - 1.161	<b>276056</b>
32	0.276 - 0.295	<b>276012</b>	0.571 - 0.591	<b>276027</b>	0.866 - 0.886	<b>276042</b>	1.161 - 1.181	<b>276057</b>
32	0.295 - 0.315	<b>276013</b>	0.591 - 0.610	<b>276028</b>	0.886 - 0.906	<b>276043</b>	1.181 - 1.201	<b>276085</b>
32	0.315 - 0.335	<b>276014</b>	0.610 - 0.630	<b>276029</b>	0.906 - 0.925	<b>276044</b>	1.201 - 1.220	<b>276059</b>
32	0.335 - 0.354	<b>276015</b>	0.630 - 0.650	<b>276030</b>	0.925 - 0.945	<b>276045</b>	1.220 - 1.240	<b>276060</b>
32	0.354 - 0.374	<b>276016</b>	0.650 - 0.669	<b>276031</b>	0.945 - 0.965	<b>276046</b>	1.240 - 1.260	<b>276061</b>
32	0.374 - 0.394	<b>276017</b>	0.669 - 0.689	<b>276032</b>	0.965 - 0.984	<b>276047</b>	-	-
32	0.394 - 0.413	<b>276018</b>	0.669 - 0.709	<b>276033</b>	0.984 - 1.004	<b>276048</b>	-	-
32	0.413 - 0.433	<b>276019</b>	0.709 - 0.728	<b>276034</b>	1.004 - 1.024	<b>276049</b>	-	-

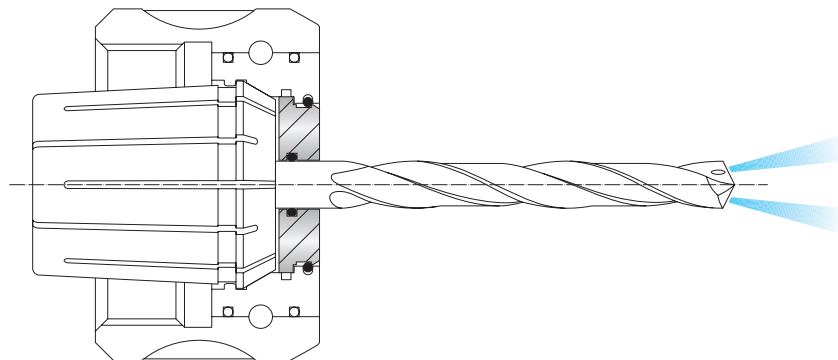


**i** = Imperial (in)  
**m** = Metric (mm)



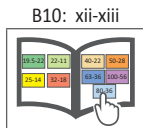
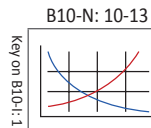
## Sealing Disks for Collet Chucks: ISO 10897 (DIN 6388)

Metric



Nominal Size	Sealing Disk		Sealing Disk		Sealing Disk		Sealing Disk	
	Diameter	Part No.	Diameter	Part No.	Diameter	Part No.	Diameter	Part No.
16	2.50 - 3.00	<b>275010</b>	6.00 - 6.50	<b>275017</b>	9.50 - 10.00	<b>275024</b>	13.00 - 13.50	<b>275031</b>
16	3.00 - 3.50	<b>275011</b>	6.50 - 7.00	<b>275018</b>	10.00 - 10.50	<b>275025</b>	13.50 - 14.00	<b>275032</b>
16	3.50 - 4.00	<b>275012</b>	7.00 - 7.50	<b>275019</b>	10.50 - 11.00	<b>275026</b>	14.00 - 14.50	<b>275033</b>
16	4.00 - 4.50	<b>275013</b>	7.50 - 8.00	<b>275020</b>	11.00 - 11.50	<b>275027</b>	14.50 - 15.00	<b>275034</b>
16	4.50 - 5.00	<b>275014</b>	8.00 - 8.50	<b>275021</b>	11.50 - 12.00	<b>275028</b>	15.00 - 15.50	<b>275035</b>
16	5.00 - 5.50	<b>275015</b>	8.50 - 9.00	<b>275022</b>	12.00 - 12.50	<b>275029</b>	15.50 - 16.00	<b>275036</b>
16	5.50 - 6.00	<b>275016</b>	9.00 - 9.50	<b>275023</b>	12.50 - 13.00	<b>275030</b>	-	-
25	2.50 - 3.00	<b>275040</b>	8.50 - 9.00	<b>275052</b>	14.50 - 15.00	<b>275064</b>	20.50 - 21.00	<b>275076</b>
25	3.00 - 3.50	<b>275041</b>	9.00 - 9.50	<b>275053</b>	15.00 - 15.50	<b>275065</b>	21.00 - 21.50	<b>275077</b>
25	3.50 - 4.00	<b>275042</b>	9.50 - 10.00	<b>275054</b>	15.50 - 16.00	<b>275066</b>	21.50 - 22.00	<b>275078</b>
25	4.00 - 4.50	<b>275043</b>	10.00 - 10.50	<b>275055</b>	16.00 - 16.50	<b>275067</b>	22.00 - 22.50	<b>275079</b>
25	4.50 - 5.00	<b>275044</b>	10.50 - 11.00	<b>275056</b>	16.50 - 17.00	<b>275068</b>	22.50 - 23.00	<b>275080</b>
25	5.00 - 5.50	<b>275045</b>	11.00 - 11.50	<b>275057</b>	17.00 - 17.50	<b>275069</b>	23.00 - 23.50	<b>275081</b>
25	5.50 - 6.00	<b>275046</b>	11.50 - 12.00	<b>275058</b>	17.50 - 18.00	<b>275070</b>	23.50 - 24.00	<b>275082</b>
25	6.00 - 6.50	<b>275047</b>	12.00 - 12.50	<b>275059</b>	18.00 - 18.50	<b>275071</b>	24.00 - 24.50	<b>275083</b>
25	6.50 - 7.00	<b>275048</b>	12.50 - 13.00	<b>275060</b>	18.50 - 19.00	<b>275072</b>	24.50 - 25.00	<b>275084</b>
25	7.00 - 7.50	<b>275049</b>	13.00 - 13.50	<b>275061</b>	19.00 - 19.50	<b>275073</b>	-	-
25	7.50 - 8.00	<b>275050</b>	13.50 - 14.00	<b>275062</b>	19.50 - 20.00	<b>275074</b>	-	-
25	8.00 - 8.50	<b>275051</b>	14.00 - 14.50	<b>275063</b>	20.00 - 20.50	<b>275075</b>	-	-
32	3.50 - 4.00	<b>276005</b>	11.00 - 11.50	<b>276020</b>	18.50 - 19.00	<b>276035</b>	26.00 - 26.50	<b>276050</b>
32	4.00 - 4.50	<b>276006</b>	11.50 - 12.00	<b>276021</b>	19.00 - 19.50	<b>276036</b>	26.50 - 27.00	<b>276051</b>
32	4.50 - 5.00	<b>276007</b>	12.00 - 12.50	<b>276022</b>	19.50 - 20.00	<b>276037</b>	27.50 - 28.00	<b>276052</b>
32	5.00 - 5.50	<b>276008</b>	12.50 - 13.00	<b>276023</b>	20.00 - 20.50	<b>276038</b>	27.50 - 28.00	<b>276053</b>
32	5.50 - 6.00	<b>276009</b>	13.00 - 13.50	<b>276024</b>	20.50 - 21.00	<b>276039</b>	28.00 - 28.50	<b>276054</b>
32	6.00 - 6.50	<b>276010</b>	13.50 - 14.00	<b>276025</b>	21.00 - 21.50	<b>276040</b>	28.50 - 29.00	<b>276055</b>
32	6.50 - 7.00	<b>276011</b>	14.00 - 14.50	<b>276026</b>	21.50 - 22.00	<b>276041</b>	29.00 - 29.50	<b>276056</b>
32	7.00 - 7.50	<b>276012</b>	14.50 - 15.00	<b>276027</b>	22.00 - 22.50	<b>276042</b>	29.50 - 30.00	<b>276057</b>
32	7.50 - 8.00	<b>276013</b>	15.00 - 15.50	<b>276028</b>	22.50 - 23.00	<b>276043</b>	30.00 - 30.50	<b>276085</b>
32	8.00 - 8.50	<b>276014</b>	15.50 - 16.00	<b>276029</b>	23.00 - 23.50	<b>276044</b>	30.50 - 31.00	<b>276059</b>
32	8.50 - 9.00	<b>276015</b>	16.00 - 16.50	<b>276030</b>	23.50 - 24.00	<b>276045</b>	31.00 - 31.50	<b>276060</b>
32	9.00 - 9.50	<b>276016</b>	16.50 - 17.00	<b>276031</b>	24.00 - 24.50	<b>276046</b>	31.50 - 32.00	<b>276061</b>
32	9.50 - 10.00	<b>276017</b>	17.00 - 17.50	<b>276032</b>	24.50 - 25.00	<b>276047</b>	-	-
32	10.00 - 10.50	<b>276018</b>	17.50 - 18.00	<b>276033</b>	25.00 - 25.50	<b>276048</b>	-	-
32	10.50 - 11.00	<b>276019</b>	18.00 - 18.50	<b>276034</b>	25.50 - 26.00	<b>276049</b>	-	-

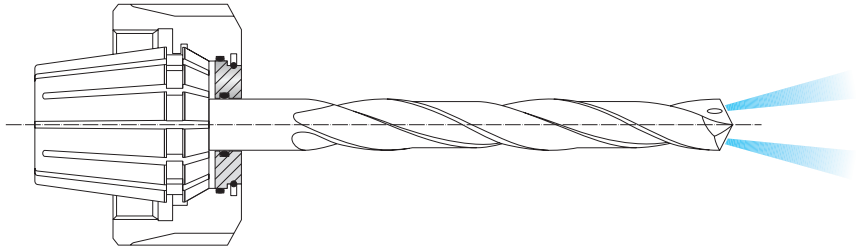
Ⓜ



Ⓜ = Imperial (in)  
Ⓜ = Metric (mm)

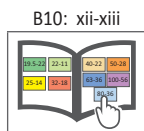
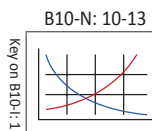
## Sealing Disks Collet Chucks: ISO 15488 (DIN 6499)

Imperial



Nominal Size	Sealing Disk		Sealing Disk		Sealing Disk		Sealing Disk	
	Diameter	Part No.	Diameter	Part No.	Diameter	Part No.	Diameter	Part No.
ER 16	0.098 - 0.118	277010	0.177 - 0.197	277014	0.256 - 0.276	277018	0.335 - 0.354	277022
ER 16	0.117 - 0.138	277011	0.197 - 0.217	277015	0.276 - 0.295	277019	0.354 - 0.374	277023
ER 16	0.138 - 0.157	277012	0.217 - 0.236	277016	0.295 - 0.315	277020	0.374 - 0.394	277024
ER 16	0.157 - 0.177	277013	0.236 - 0.256	277017	0.315 - 0.335	277021	-	-
ER 25	0.098 - 0.118	277025	0.236 - 0.256	277032	0.374 - 0.394	277039	0.512 - 0.531	277046
ER 25	0.118 - 0.138	277026	0.256 - 0.276	277033	0.394 - 0.413	277040	0.531 - 0.551	277047
ER 25	0.138 - 0.157	277027	0.276 - 0.295	277034	0.413 - 0.433	277041	0.551 - 0.571	277048
ER 25	0.157 - 0.177	277028	0.295 - 0.315	277035	0.433 - 0.453	277042	0.571 - 0.591	277049
ER 25	0.177 - 0.197	277029	0.315 - 0.335	277036	0.453 - 0.472	277043	0.591 - 0.610	277050
ER 25	0.197 - 0.217	277030	0.335 - 0.354	277037	0.472 - 0.492	277044	0.610 - 0.630	277051
ER 25	0.217 - 0.236	277031	0.354 - 0.374	277038	0.492 - 0.512	277045	-	-
ER 32	0.098 - 0.118	277055	0.276 - 0.295	277064	0.453 - 0.472	277073	0.630 - 0.650	277082
ER 32	0.118 - 0.138	277056	0.295 - 0.315	277065	0.472 - 0.492	277074	0.650 - 0.669	277083
ER 32	0.138 - 0.157	277057	0.315 - 0.335	277066	0.492 - 0.512	277075	0.669 - 0.689	277084
ER 32	0.157 - 0.177	277058	0.335 - 0.354	277067	0.512 - 0.531	277076	0.689 - 0.709	277085
ER 32	0.177 - 0.197	277059	0.354 - 0.374	277068	0.531 - 0.551	277077	0.709 - 0.728	277086
ER 32	0.197 - 0.217	277060	0.374 - 0.394	277069	0.551 - 0.571	277078	0.728 - 0.748	277087
ER 32	0.217 - 0.236	277061	0.394 - 0.413	277070	0.571 - 0.591	277079	0.748 - 0.768	277088
ER 32	0.236 - 0.256	277062	0.413 - 0.433	277071	0.591 - 0.610	277080	0.768 - 0.787	277089
ER 32	0.256 - 0.276	277063	0.433 - 0.453	277072	0.610 - 0.630	277081	-	-
ER 40	0.098 - 0.118	278005	0.335 - 0.354	278017	0.571 - 0.591	278029	0.807 - 0.827	278041
ER 40	0.118 - 0.138	278006	0.354 - 0.374	278018	0.591 - 0.610	278030	0.827 - 0.846	278042
ER 40	0.138 - 0.157	278007	0.374 - 0.394	278019	0.610 - 0.630	278031	0.846 - 0.866	278043
ER 40	0.157 - 0.177	278008	0.394 - 0.413	278020	0.630 - 0.650	278032	0.866 - 0.886	278044
ER 40	0.177 - 0.197	278009	0.413 - 0.433	278021	0.650 - 0.669	278033	0.866 - 0.906	278045
ER 40	0.197 - 0.217	278010	0.433 - 0.453	278022	0.669 - 0.689	278034	0.906 - 0.925	278046
ER 40	0.217 - 0.236	278011	0.453 - 0.472	278023	0.689 - 0.709	278035	0.925 - 0.945	278047
ER 40	0.236 - 0.256	278012	0.472 - 0.492	278024	0.709 - 0.728	278036	0.945 - 0.965	278048
ER 40	0.256 - 0.276	278013	0.492 - 0.512	278025	0.728 - 0.748	278037	0.965 - 0.984	278049
ER 40	0.276 - 0.295	278014	0.512 - 0.531	278026	0.748 - 0.768	278038	0.984 - 1.004	278050
ER 40	0.295 - 0.315	278015	0.531 - 0.551	278027	0.768 - 0.787	278039	1.004 - 1.024	278051
ER 40	0.315 - 0.335	278016	0.551 - 0.571	278028	0.787 - 0.807	278040	-	-

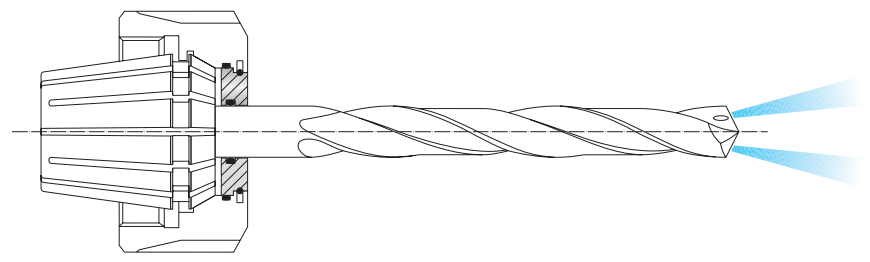
i



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

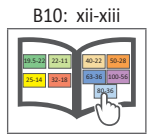
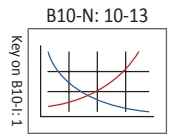
## Sealing Disks Collet Chucks: ISO 15488 (DIN 6499)

Metric



Nominal Size	Sealing Disk		Sealing Disk		Sealing Disk		Sealing Disk	
	Diameter	Part No.	Diameter	Part No.	Diameter	Part No.	Diameter	Part No.
ER 16	2.50 - 3.00	<b>277010</b>	4.50 - 5.00	<b>277014</b>	6.50 - 7.00	<b>277018</b>	8.50 - 9.00	<b>277022</b>
ER 16	3.00 - 3.50	<b>277011</b>	5.00 - 5.50	<b>277015</b>	7.00 - 7.50	<b>277019</b>	9.00 - 9.50	<b>277023</b>
ER 16	3.50 - 4.00	<b>277012</b>	5.50 - 6.00	<b>277016</b>	7.50 - 8.00	<b>277020</b>	9.50 - 10.00	<b>277024</b>
ER 16	4.00 - 4.50	<b>277013</b>	6.00 - 6.50	<b>277017</b>	8.00 - 8.50	<b>277021</b>	-	-
ER 25	2.50 - 3.00	<b>277025</b>	6.00 - 6.50	<b>277032</b>	9.50 - 10.00	<b>277039</b>	13.00 - 13.50	<b>277046</b>
ER 25	3.00 - 3.50	<b>277026</b>	6.50 - 7.00	<b>277033</b>	10.00 - 10.50	<b>277040</b>	13.50 - 14.00	<b>277047</b>
ER 25	3.50 - 4.00	<b>277027</b>	7.00 - 7.50	<b>277034</b>	10.50 - 11.00	<b>277041</b>	14.00 - 14.50	<b>277048</b>
ER 25	4.00 - 4.50	<b>277028</b>	7.50 - 8.00	<b>277035</b>	11.00 - 11.50	<b>277042</b>	14.50 - 15.00	<b>277049</b>
ER 25	4.50 - 5.00	<b>277029</b>	8.00 - 8.50	<b>277036</b>	11.50 - 12.00	<b>277043</b>	15.00 - 15.50	<b>277050</b>
ER 25	5.00 - 5.50	<b>277030</b>	8.50 - 9.00	<b>277037</b>	12.00 - 12.50	<b>277044</b>	15.50 - 16.00	<b>277051</b>
ER 25	5.50 - 6.00	<b>277031</b>	9.00 - 9.50	<b>277038</b>	12.50 - 13.00	<b>277045</b>	-	-
ER 32	2.50 - 3.00	<b>277055</b>	7.00 - 7.50	<b>277064</b>	11.50 - 12.00	<b>277073</b>	16.00 - 16.50	<b>277082</b>
ER 32	3.00 - 3.50	<b>277056</b>	7.50 - 8.00	<b>277065</b>	12.00 - 12.50	<b>277074</b>	16.50 - 17.00	<b>277083</b>
ER 32	3.50 - 4.00	<b>277057</b>	8.00 - 8.50	<b>277066</b>	12.50 - 13.00	<b>277075</b>	17.00 - 17.50	<b>277084</b>
ER 32	4.00 - 4.50	<b>277058</b>	8.50 - 9.00	<b>277067</b>	13.00 - 13.50	<b>277076</b>	17.50 - 18.00	<b>277085</b>
ER 32	4.50 - 5.00	<b>277059</b>	9.00 - 9.50	<b>277068</b>	13.50 - 14.00	<b>277077</b>	18.00 - 18.50	<b>277086</b>
ER 32	5.00 - 5.50	<b>277060</b>	9.50 - 10.00	<b>277069</b>	14.00 - 14.50	<b>277078</b>	18.50 - 19.00	<b>277087</b>
ER 32	5.50 - 6.00	<b>277061</b>	10.00 - 10.50	<b>277070</b>	14.50 - 15.00	<b>277079</b>	19.00 - 19.50	<b>277088</b>
ER 32	6.00 - 6.50	<b>277062</b>	10.50 - 11.00	<b>277071</b>	15.00 - 15.50	<b>277080</b>	19.50 - 20.00	<b>277089</b>
ER 32	6.50 - 7.00	<b>277063</b>	11.00 - 11.50	<b>277072</b>	15.50 - 16.00	<b>277081</b>	-	-
ER 40	2.50 - 3.00	<b>278005</b>	8.50 - 9.00	<b>278017</b>	14.50 - 15.00	<b>278029</b>	20.50 - 21.00	<b>278041</b>
ER 40	3.00 - 3.50	<b>278006</b>	9.00 - 9.50	<b>278018</b>	15.00 - 15.50	<b>278030</b>	21.00 - 21.50	<b>278042</b>
ER 40	3.50 - 4.00	<b>278007</b>	9.50 - 10.00	<b>278019</b>	15.50 - 16.00	<b>278031</b>	21.50 - 22.00	<b>278043</b>
ER 40	4.00 - 4.50	<b>278008</b>	10.00 - 10.50	<b>278020</b>	16.00 - 16.50	<b>278032</b>	22.00 - 22.50	<b>278044</b>
ER 40	4.50 - 5.00	<b>278009</b>	10.50 - 11.00	<b>278021</b>	16.50 - 17.00	<b>278033</b>	22.50 - 23.00	<b>278045</b>
ER 40	5.00 - 5.50	<b>278010</b>	11.00 - 11.50	<b>278022</b>	17.00 - 17.50	<b>278034</b>	23.00 - 23.50	<b>278046</b>
ER 40	5.50 - 6.00	<b>278011</b>	11.50 - 12.00	<b>278023</b>	17.50 - 18.00	<b>278035</b>	23.50 - 24.00	<b>278047</b>
ER 40	6.00 - 6.50	<b>278012</b>	12.00 - 12.50	<b>278024</b>	18.00 - 18.50	<b>278036</b>	24.00 - 24.50	<b>278048</b>
ER 40	6.50 - 7.00	<b>278013</b>	12.50 - 13.00	<b>278025</b>	18.50 - 19.00	<b>278037</b>	24.50 - 25.00	<b>278049</b>
ER 40	7.00 - 7.50	<b>278014</b>	13.00 - 13.50	<b>278026</b>	19.00 - 19.50	<b>278038</b>	25.00 - 25.50	<b>278050</b>
ER 40	7.50 - 8.00	<b>278015</b>	13.50 - 14.00	<b>278027</b>	19.50 - 20.00	<b>278039</b>	25.50 - 26.00	<b>278051</b>
ER 40	8.00 - 8.50	<b>278016</b>	14.00 - 14.50	<b>278028</b>	20.00 - 20.50	<b>278040</b>	-	-

Ⓜ



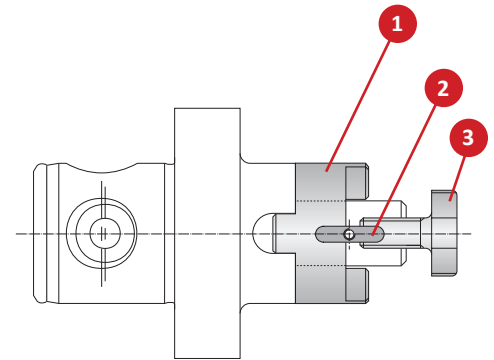
Ⓜ = Imperial (in)  
Ⓜ = Metric (mm)

A  
B  
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H  
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INDEX

## Accessories for Milling Machine Arbors

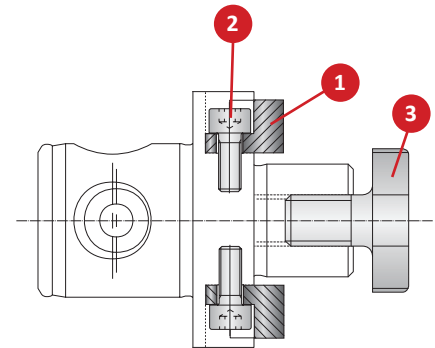
### Accessories for Milling Machine Arbors

Shell-Mill Adapter	Part No.		
	1 Clutch Drive Ring	2 Axial Drive Key	3 Retaining Screw
13	115708	115709	115707
16	115696	215608	115697
22	115341	215609	115345
27	115342	215610	115346
32	115343	215611	115347
40	115344	215612	115348



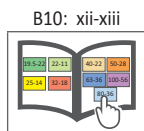
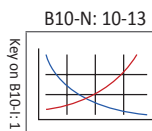
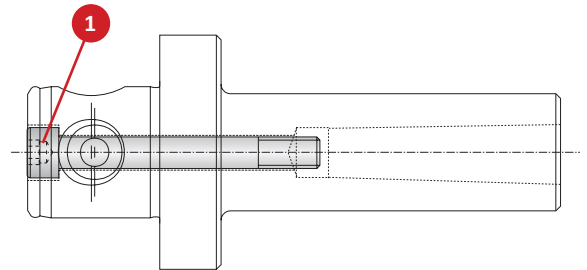
### Accessories for Milling Machine Arbors

Shell-Mill Adapter	Part No.		
	1 Drive Key	2 Cap Screw	3 Retaining Screw
16	215701	115566-1	115697
22	215702	108109-1	115345
27	215703	109109	115346
32	215704	115147	115347
40	215705	116152	115348
60	115643	115237	-



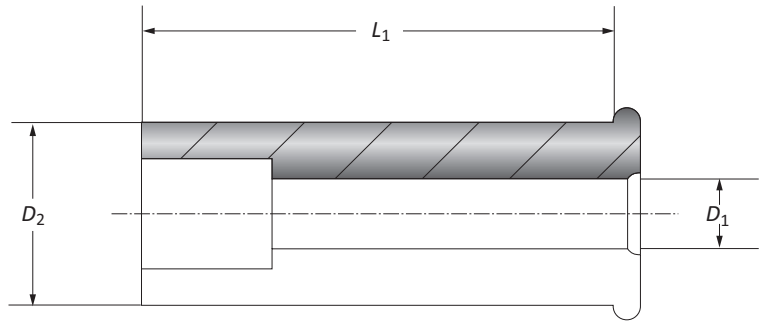
### Accessories for Holding Arbors

Adapter Sleeves	Part No.	
	1 Cap Screw	Service Key
209022	115929	s5
209023	115930	s7
209024	115932	s8
209025	115933	s5
209026	115169-1	s8
209027	115934	s10
209028	115936	s12

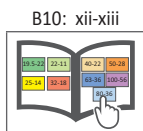
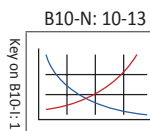


**i** = Imperial (in)  
**m** = Metric (mm)

## Reducing Sleeves for Hydraulic Clamping Chucks

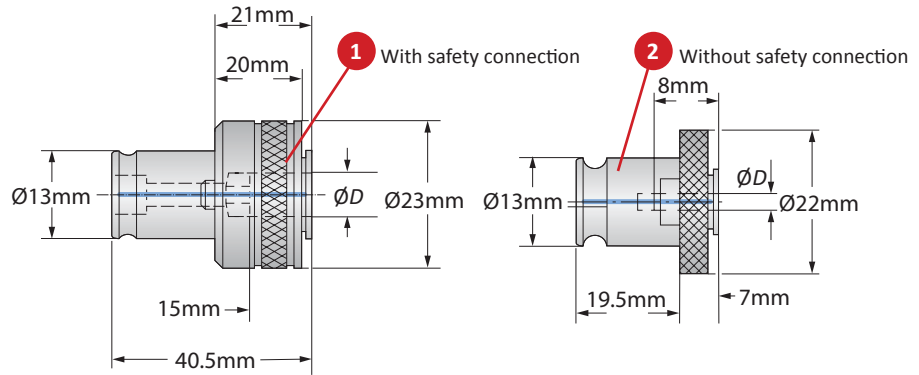


	Nominal Size	Reducing Sleeve		Part No.
	$D_2$	$D_1$	$L_1$	
<b>i</b>	0.787	0.118	1.988	271067
	0.787	0.157	1.988	271068
	0.787	0.197	1.988	271069
	0.787	0.236	1.988	271070
	0.787	0.276	1.988	271049
	0.787	0.315	1.988	271071
	0.787	0.354	1.988	271050
	0.787	0.394	1.988	271072
	0.787	0.433	1.988	271051
	0.787	0.472	1.988	271073
	0.787	0.512	1.988	271052
	0.787	0.551	1.988	271074
	0.787	0.591	1.988	271018
	0.787	0.630	1.988	271008
<b>m</b>	20.00	3.00	50.50	271067
	20.00	4.00	50.50	271068
	20.00	5.00	50.50	271069
	20.00	6.00	50.50	271070
	20.00	7.00	50.50	271049
	20.00	8.00	50.50	271071
	20.00	9.00	50.50	271050
	20.00	10.00	50.50	271072
	20.00	11.00	50.50	271051
	20.00	12.00	50.50	271073
	20.00	13.00	50.50	271052
	20.00	14.00	50.50	271074
	20.00	15.00	50.50	271018
	20.00	16.00	50.50	271008

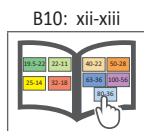
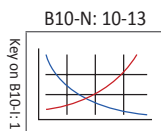


**i** = Imperial (in)  
**m** = Metric (mm)

# Quick Change Adapters



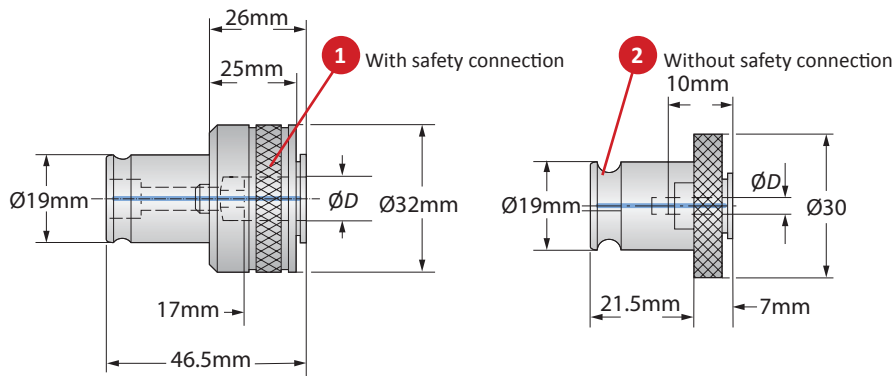
Shank Dimensions		Quick Change Adapter									Part No.	
Nominal Size	D x Square Shank	DIN 352	DIN 353	DIN 371	DIN 374	DIN 376	DIN 2182	DIN 2183	Torque Setting	1	2	
i	0	0.083 x 0.098	M 1	-	M 1	-	M 3.5	1/16"	-	1.5 - 2	233070	K24358
	0	0.083 x 0.110	M 2	-	M 2	M 4	M 4	3/32"	5/32"	2 - 3	233071	K24276
	0	0.106 x 0.138	M 3	-	M 3	M 5	M 5	1/8"	-	4 - 6	233072	K24277
	0	0.118 x 0.157	M 3.5	-	M 3.5	-	-	-	-	1.5 - 2	233073	K24278
	0	0.138 x 0.177	M 4	-	M 4	M 6	M 6	5/32"	1/4"	6 - 9	233074	K24279
	0	0.193 x 0.236	M 8	-	-	M 8	M 8	-	-	16 - 21	233075	K24280
	0	0.217 x 0.276	M 10	G 1/8"	-	M 10	M 10	1/4"	3/8"	27 - 32	233076	K24281
	0	0.244 x 0.315	-	-	M 8	-	-	5/16"	7/16"	16 - 21	233077	K24391
m	0	2.10 x 2.50	M 1	-	M 1	-	M 3.5	1/16"	-	1.5 - 2	233070	K24358
	0	2.10 x 2.80	M 2	-	M 2	M 4	M 4	3/32"	5/32"	2 - 3	233071	K24276
	0	2.70 x 3.50	M 3	-	M 3	M 5	M 5	1/8"	-	4 - 6	233072	K24277
	0	3.00 x 4.00	M 3.5	-	M 3.5	-	-	-	-	1.5 - 2	233073	K24278
	0	3.40 x 4.50	M 4	-	M 4	M 6	M 6	5/32"	1/4"	6 - 9	233074	K24279
	0	4.90 x 6.00	M 8	-	-	M 8	M 8	-	-	16 - 21	233075	K24280
	0	5.50 x 7.00	M 10	G 1/8"	-	M 10	M 10	1/4"	3/8"	27 - 32	233076	K24281
	0	6.20 x 8.00	-	-	M 8	-	-	5/16"	7/16"	16 - 21	233077	K24391



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

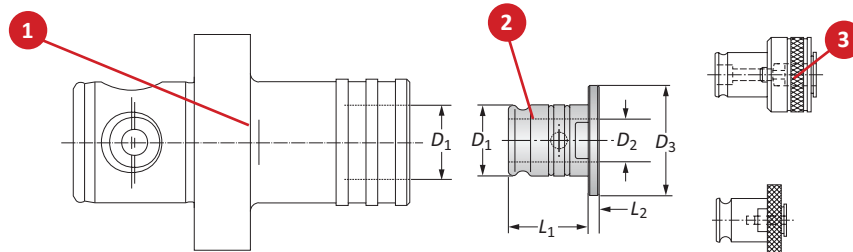


## Quick Change Adapters



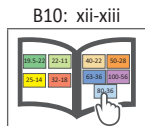
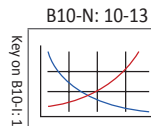
### Quick Change Adapters

	Shank Dimensions		Quick Change Adapter							Part No.		
	Nominal Size	D x Square Shank	DIN 352	DIN 353	DIN 371	DIN 374	DIN 376	DIN 2182	DIN 2183	Torque Setting	1	2
i	1	0.083 x 0.110	M 2	-	M 2.8	M 4	M 4	3/32"	5/32"	2 - 3	K17847	K23259
	1	0.106 x 0.138	M 3	-	M 3.5	M 5	M 5	1/8"	-	4 - 6	233001	K18455
	1	0.118 x 0.157	M 3.5	-	M 3.5	-	-	-	-	1.5 - 2	233002	K22439
	1	0.134 x 0.177	M 4	-	M 4	M 6	M 6	5/32"	1/4"	6 - 9	233003	K16414
	1	0.193 x 0.236	M 8	-	-	M 8	M 8	-	-	16 - 21	233004	K16415
	1	0.217 x 0.276	M 10	-	-	M 10	M 10	1/4"	3/8"	27 - 32	233005	K16418
	1	0.244 x 0.315	-	G 1/8"	M 8	-	-	5/16"	7/16"	16 - 21	233006	K16416
	1	0.276 x 0.354	M 12	-	-	M 12	M 12	3/8"	1/2"	37 - 44	233007	K18454
	1	0.315 x 0.394	-	-	M 10	-	-	-	-	27 - 32	233008	K16417
	1	0.354 x 0.433	M 14	G 1/4"	-	M 14	M 14	-	9/16"	50 - 53	233009	K22440
m	1	2.10 x 2.80	M 2	-	M 2.8	M 4	M 4	3/32"	5/32"	2 - 3	K17847	K23259
	1	2.70 x 3.50	M 3	-	M 3.5	M 5	M 5	1/8"	-	4 - 6	233001	K18455
	1	3.00 x 4.00	M 3.5	-	M 3.5	-	-	-	-	1.5 - 2	233002	K22439
	1	3.40 x 4.50	M 4	-	M 4	M 6	M 6	5/32"	1/4"	6 - 9	233003	K16414
	1	4.90 x 6.00	M 8	-	-	M 8	M 8	-	-	16 - 21	233004	K16415
	1	5.50 x 7.00	M 10	-	-	M 10	M 10	1/4"	3/8"	27 - 32	233005	K16418
	1	6.20 x 8.00	-	G 1/8"	M 8	-	-	5/16"	7/16"	16 - 21	233006	K16416
	1	7.00 x 9.00	M 12	-	-	M 12	M 12	3/8"	1/2"	37 - 44	233007	K18454
	1	8.00 x 10.00	-	-	M 10	-	-	-	-	27 - 32	233008	K16417
	1	9.00 x 11.00	M 14	G 1/4"	-	M 14	M 14	-	9/16"	50 - 53	233009	K22440



### Reducers for Quick Change Adapters

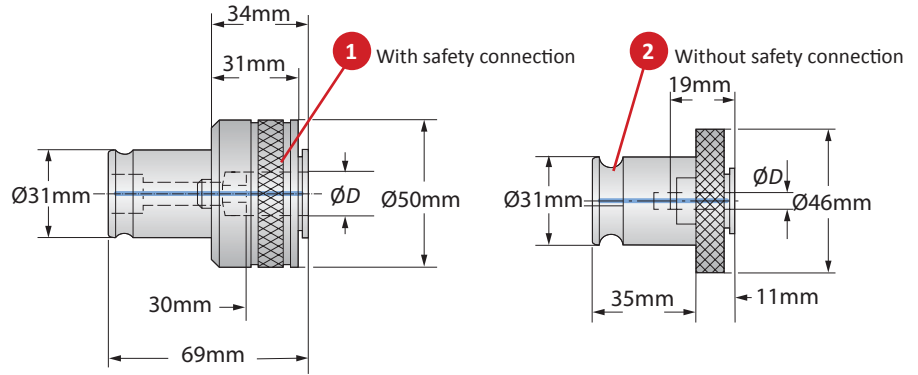
	1 Tapping Chuck		2 Quick Change Adapter		3. Reducer					Weight	Part No.
	Nominal Size	D <sub>1</sub>	Nominal Size	D <sub>1</sub>	D <sub>1</sub>	D <sub>2</sub>	D <sub>3</sub>	L <sub>1</sub>	L <sub>2</sub>		
i	1	0.748	0	0.512	0.748	0.512	1.181	0.846	0.157	0.264 (lbs)	161038
	2	1.220	1	0.748	1.220	0.748	1.890	1.378	0.197	1.058 (lbs)	162094
m	1	19.00	0	13.00	19.00	13.00	30.00	21.50	4.00	0.12 (kg)	161038
	2	31.00	1	19.00	31.00	19.00	48.00	35.00	5.00	0.48 (kg)	162094



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

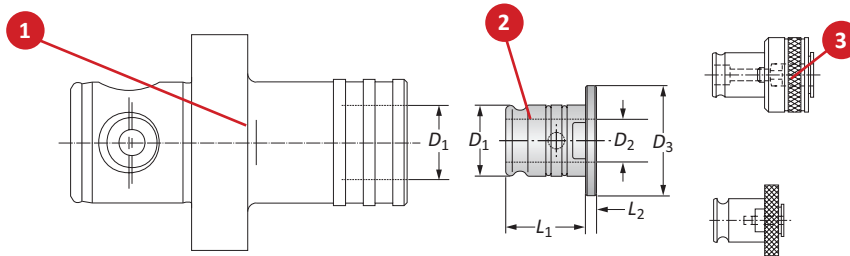
A  
B  
C  
D  
E  
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H  
I  
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M  
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INDEX

## Quick Change Adapters



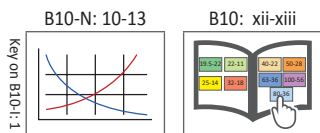
### Quick Change Adapters

Shank Dimensions		Quick Change Adapter									Part No.	
Nominal Size	D x Square Shank	DIN 352	DIN 353	DIN 371	DIN 374	DIN 376	DIN 2182	DIN 2183	Torque Setting	1	2	
2	0.217 x 0.276	M 10	G 1/8"	-	M 10	M 10	1/4"	3/8"	24 - 32	233020	K15282	
2	0.244 x 0.315	-	-	M 8	-	-	5/16"	7/16"	16 - 21	233021	K15283	
2	0.276 x 0.354	M 12	-	-	M 12	M 12	3/8"	1/2"	37 - 44	233022	K15284	
2	0.315 x 0.394	-	-	M 10	-	-	-	-	27 - 32	233023	K18456	
<b>i</b> 2	0.354 x 0.433	M 14	G 1/4"	-	M 14	M 14	-	9/16"	50 - 53	233024	K16419	
2	0.354 x 0.472	M 16	G 3/8"	-	M 16	M 16	-	5/8"	55 - 58	233025	K15285	
2	0.433 x 0.551	M 18	-	-	M 18	M 18	-	11/16"	85 - 90	233026	K16420	
2	0.472 x 0.630	M 20	G 1/2"	-	M 20	M 20	-	13/16"	110 - 115	233027	K15286	
2	0.571 x 0.709	M 24	-	-	M 24	M 24	-	15/16"	110 - 115	233028	K18457	
<hr/>												
2	5.50 x 7.00	M 10	G 1/8"	-	M 10	M 10	1/4"	3/8"	24 - 32	233020	K15282	
2	6.20 x 8.00	-	-	M 8	-	-	5/16"	7/16"	16 - 21	233021	K15283	
2	7.00 x 9.00	M 12	-	-	M 12	M 12	3/8"	1/2"	37 - 44	233022	K15284	
2	8.00 x 10.00	-	-	M 10	-	-	-	-	27 - 32	233023	K18456	
<b>m</b> 2	9.00 x 11.00	M 14	G 1/4"	-	M 14	M 14	-	9/16"	50 - 53	233024	K16419	
2	9.00 x 12.00	M 16	G 3/8"	-	M 16	M 16	-	5/8"	55 - 58	233025	K15285	
2	11.00 x 14.00	M 18	-	-	M 18	M 18	-	11/16"	85 - 90	233026	K16420	
2	12.00 x 16.00	M 20	G 1/2"	-	M 20	M 20	-	13/16"	110 - 115	233027	K15286	
2	14.50 x 18.00	M 24	-	-	M 24	M 24	-	15/16"	110 - 115	233028	K18457	



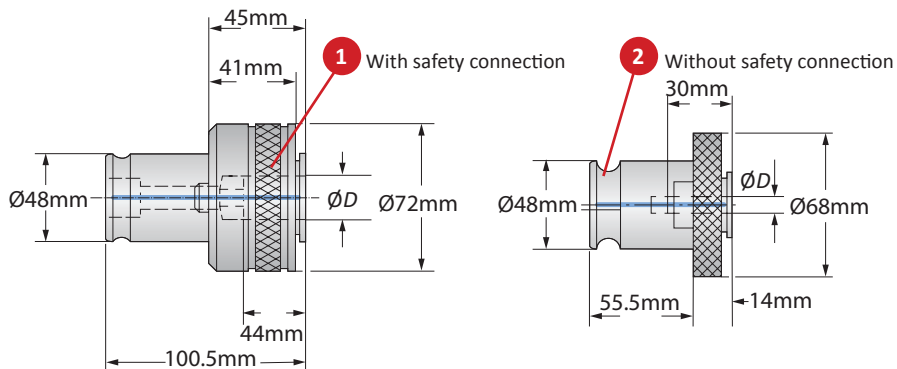
### Reducers for Quick Change Adapters

1 Tapping Chuck		2 Quick Change Adapter		3 Reducer						Weight	Part No.
Nominal Size	D <sub>1</sub>	Nominal Size	D <sub>1</sub>	D <sub>1</sub>	D <sub>2</sub>	D <sub>3</sub>	L <sub>1</sub>	L <sub>2</sub>			
<b>i</b> 1	0.748	0	0.512	0.748	0.512	1.181	0.846	0.157	0.264 (lbs)	161038	
2	1.220	1	0.748	1.220	0.748	1.890	1.378	0.197	1.058 (lbs)	162094	
<hr/>											
<b>m</b> 1	19.00	0	13.00	19.00	13.00	30.00	21.50	4.00	0.12 (kg)	161038	
2	31.00	1	19.00	31.00	19.00	48.00	35.00	5.00	0.48 (kg)	162094	

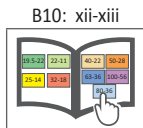
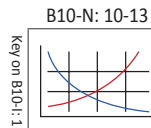


**i** = Imperial (in)  
**m** = Metric (mm)

## Quick Change Adapters



Shank Dimensions		Quick Change Adapters								Part No.		
Nominal Size	D x Square Shank	DIN 352	DIN 353	DIN 371	DIN 374	DIN 376	DIN 2182	DIN 2183	Torque Setting	1	2	
i	3	0.354 x 0.433	M 14	G ¼"	-	M 14	M 14	-	9/16"	50 - 53	233040	K22434
	3	0.354 x 0.472	M 16	G ⅜"	-	M 16	M 16	-	¾"	55 - 58	233041	K22435
	3	0.433 x 0.551	M 18	-	-	M 18	M 18	-	1 1/16"	85 - 90	233042	K22436
	3	0.472 x 0.630	M 20	G ½"	-	M 20	M 20	-	1 3/8"	100 - 106	233043	K22437
	3	0.571 x 0.709	M 24	-	-	M 24	M 24	-	1 5/16"	140 - 150	233044	K16421
	3	0.650 x 0.787	M 27	G ¾"	-	M 27	M 27	-	1"	150 - 160	233045	K16422
	3	0.709 x 0.866	M 30	G ⅞"	-	M 30	M 30	-	1 1/8"	240 - 250	233046	K16423
	3	0.866 x 0.984	M 33	G 1"	-	M 33	M 33	-	1 1/4"	260 - 270	233047	K16424
m	3	0.866 x 1.102	M 36	G 1 1/8"	-	M 36	M 36	-	1 3/8"	260 - 270	233048	K22438
	3	9.00 x 11.00	M 14	G ¼"	-	M 14	M 14	-	9/16"	50 - 53	233040	K22434
	3	9.00 x 12.00	M 16	G ⅜"	-	M 16	M 16	-	5/8"	55 - 58	233041	K22435
	3	11.00 x 14.00	M 18	-	-	M 18	M 18	-	1 1/16"	85 - 90	233042	K22436
	3	12.00 x 16.00	M 20	G ½"	-	M 20	M 20	-	1 3/8"	100 - 106	233043	K22437
	3	14.50 x 18.00	M 24	-	-	M 24	M 24	-	1 5/16"	140 - 150	233044	K16421
	3	16.50 x 20.00	M 27	G ¾"	-	M 27	M 27	-	1"	150 - 160	233045	K16422
	3	18.00 x 22.00	M 30	G ⅞"	-	M 30	M 30	-	1 1/8"	240 - 250	233046	K16423
	3	22.00 x 25.00	M 33	G 1"	-	M 33	M 33	-	1 1/4"	260 - 270	233047	K16424
	3	22.00 x 28.00	M 36	G 1 1/8"	-	M 36	M 36	-	1 3/8"	260 - 270	233048	K22438

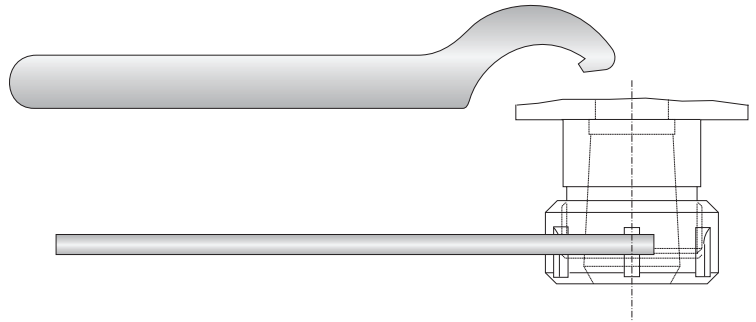


i = Imperial (in)  
m = Metric (mm)

## Service Keys for Collet Systems

### Service Keys for ISO 10897 (DIN 6388) Collet Chuck Systems

Service Key			
Nominal Size	Size	Type	Part No.
16	40 - 43	S	068179
25	58 - 62	S	068182
32	68 - 75	S	115867



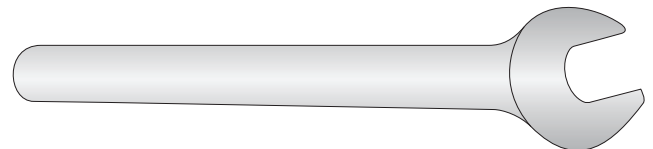
### Service Keys for ISO 15488 (DIN 6499) Collet Chuck Systems

Service Key				
Nominal Size	Size	Service Key	Type	Part No.
ER 08 Mini	9.0	-	X	415373
ER 11 Mini	12.0	-	X	415374
ER 16 Mini	17.5	-	X	415375
ER 16	-	25	P	215927
ER 25	42.0	-	T	215929
ER 32	50.0	-	T	215930
ER 40	63.0	-	T	215931

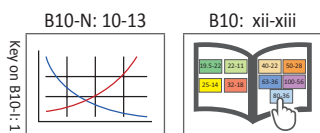
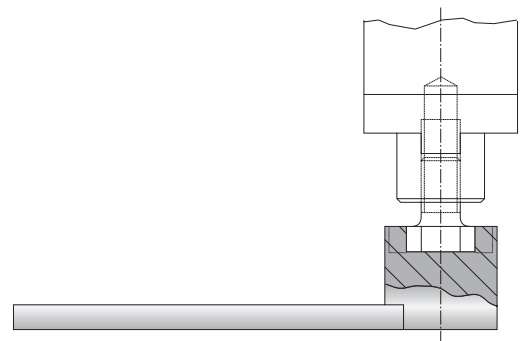


### Service Keys for Erickson Collet Chuck Systems

Service Key		
Service Key	Type	Part No.
13	P	315689
19	P	315691



Service Keys	
Service Key	Part No.
13	115785
16	115699
22	115660
27	115661
32	115662
40	115663
60	315637



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







SECTION

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# B10-J

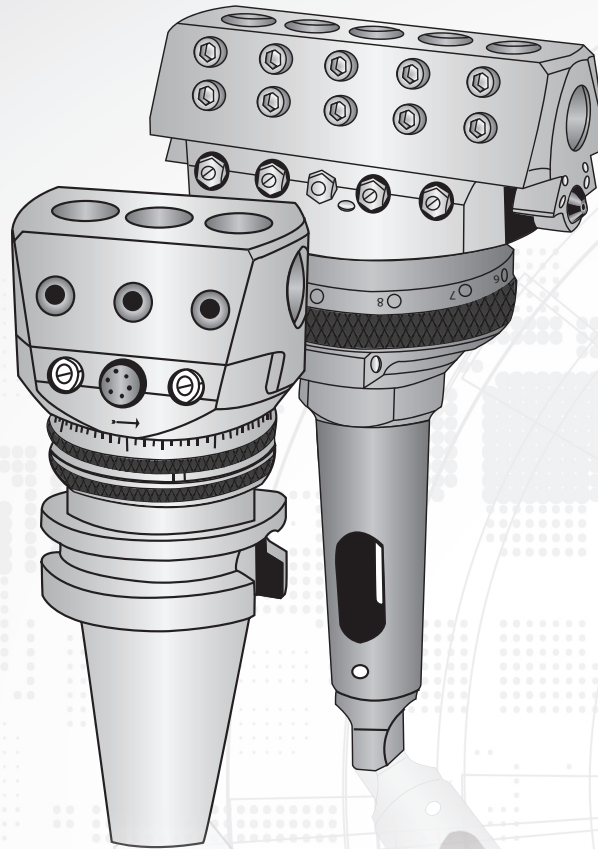
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UPA Versatile Boring Heads

# Wohlhaupter™ UPA Versatile Boring Heads

UPA 3 | UPA 4 | UPA 5s6

▶ Diameter Range: 0.000" - 24.409" (0.00mm - 620.00mm)



## Operation Facing and Boring

In 1936, the first model of the Wohlhaupter Universal Facing and Boring head was developed to launch the start of Wohlhaupter boring products. It became a staple to the boring industry.

Universal Facing and Boring heads are used on universal milling and boring machines, boring mills, and jig boring machines for machining stationary workpieces in individual and batch productions.

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



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

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

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

### **WARNING**

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

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

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

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

## Applicable Industries



Aerospace



Agriculture



Automotive



Firearms



General  
Machining



Oil & Gas



Renewable  
Energy

# Universal Versatile Boring Heads Table of Contents

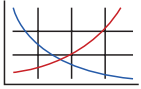
## Reference Icons

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



### Setup / Assembly Information

Detailed instructions and information regarding the corresponding part(s)



### Recommended Cutting Data

Speed and feed recommendations for optimum and safe drilling

## Introduction

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## UPA 3 Boring System

UPA 3 Boring Heads and Accessories . . . . . 4 - 5

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UPA 4 and 5-S 6 Shanks . . . . . 12

**Technical Data and Chip Production Values . . . . . 13**

**UPA Boring System Diagram . . . . . 14 - 15**

Series	Diameter Range	
	Imperial (inch)	Metric (mm)
UPA 3	0.000 - 10.230	0.00 - 260.00
UPA 4	0.000 - 15.740	0.00 - 400.00
UPA 5s6	0.000 - 24.404	0.00 - 620.00

# UPA Product Overview



## UPA Boring Head FACING AND BORING

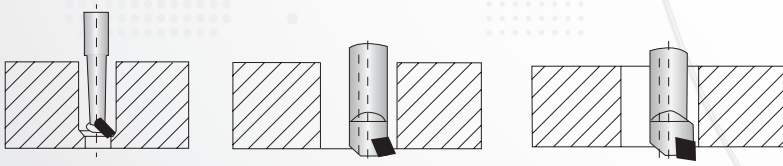
### Universal Facing and Boring Heads

The versatile Wohlhaupter UPA boring heads can be used for facing, boring, and taper turning. They can also be used for right or left-handed turning.

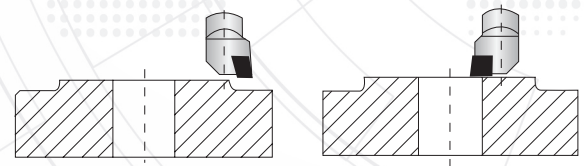
*Precise* and *versatile* boring heads.

- Diameter range: 0.000" - 24.409" (0.00mm - 620.00mm)
- Slide adjustment up to 4.410" (112.00mm)
- Can be used in a variety of operations

## UNIVERSAL FACING & BORING Applications



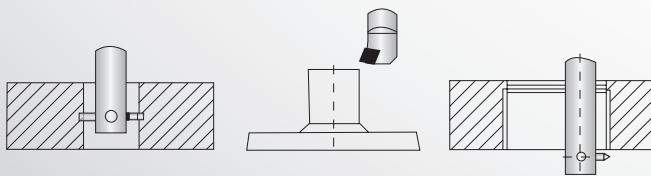
Boring with different tools



Facing

From inside outward

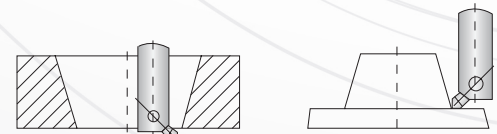
From outside inward



Recessing

Outside Turning

Thread Cutting

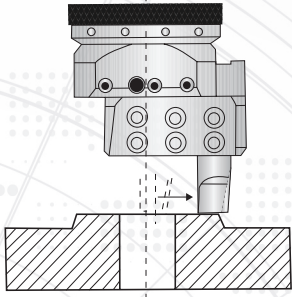


Taper Turning

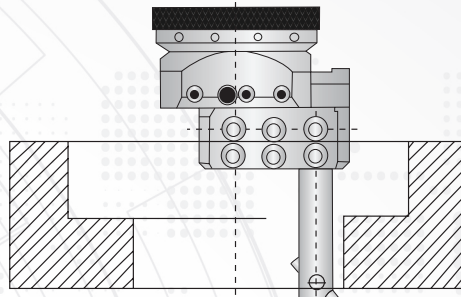


# UNIVERSAL

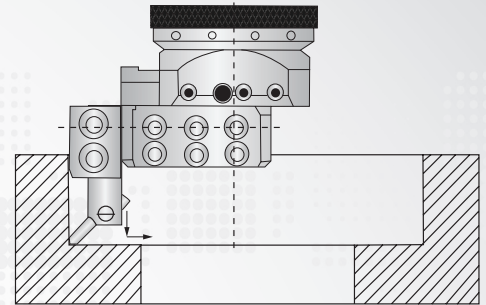
## FACING & BORING Application Examples



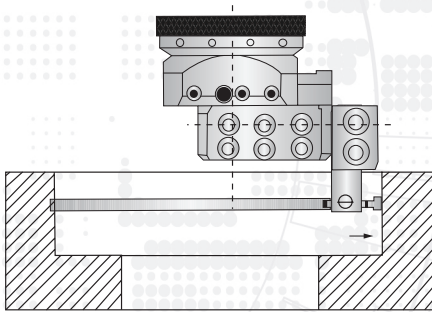
Facing with boring bar directly in slide



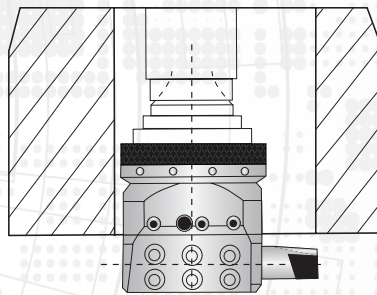
Boring with long boring bar



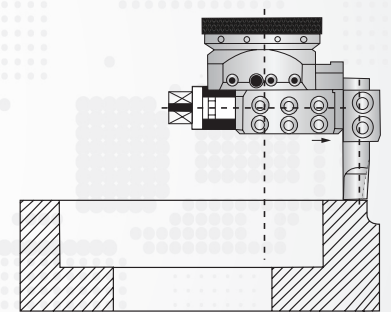
Boring and facing with short boring bar holder and a boring bar



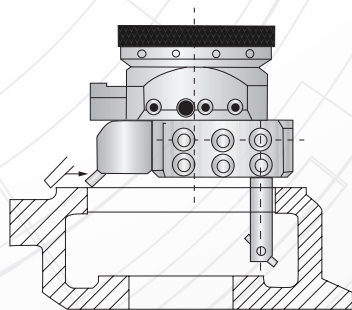
Recessing with short boring bar holder and a boring bar



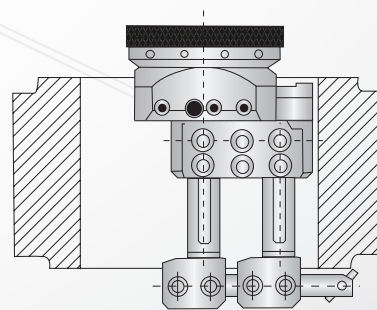
Deep hole boring with boring bar directly in slide



Large diameter facing with a long boring bar holder



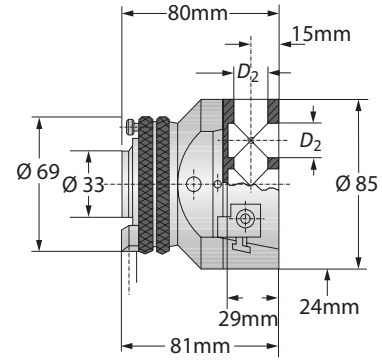
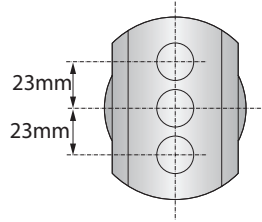
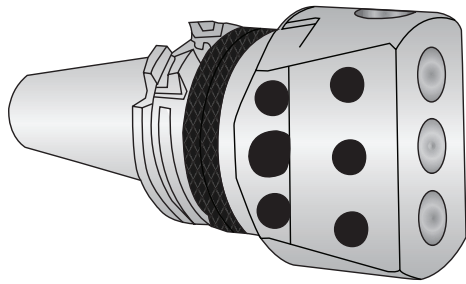
Facing in two areas with one boring bar and a boring bar holder



Facing the reverse side by using boring bar holders contained in attachment

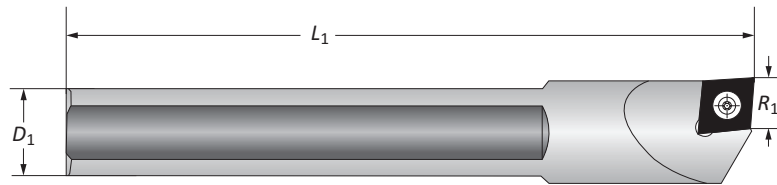
## UPA 3 Boring Heads and Accessories

Diameter Range: 0.000" - 10.230" (0.00mm - 260.00mm)



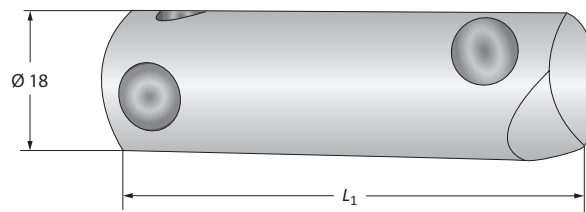
### UPA 3 Boring Heads

	Boring Head			Part No.
	Boring Range	D <sub>2</sub>	Weight	
<b>i</b>	0.000 - 10.230	0.750	4.629 (lbs)	<b>006020</b>
<b>m</b>	0.00 - 260.00	18.00	2.10 (kg)	<b>005020</b>



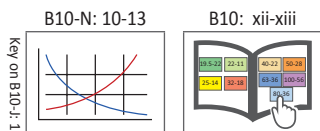
### UPA 3 Boring Bars

	Boring Bar				Cutting Direction	Insert Form	Part No.
	D <sub>1</sub>	L <sub>1</sub>	R <sub>1</sub>	Weight			
<b>i</b>	0.750	3.149	0.531	0.220 (lbs)	R	103	<b>0750BFBR</b>
	0.750	3.149	0.531	0.220 (lbs)	L	103	<b>0750BFBL</b>
<b>m</b>	18.00	80.00	13.50	0.10 (kg)	R	103	<b>081087</b>
	18.00	80.00	13.50	0.10 (kg)	L	103	<b>218088</b>



### UPA 3 Boring Bars

	Boring Bar		Designation	Part No.
	L <sub>1</sub>	Boring Depth		
<b>i</b>	2.362	1.181	B 306	<b>073003</b>
	3.543	2.362	B 309	<b>073004</b>
	4.724	3.543	B 312	<b>073005</b>
<b>m</b>	60.00	30.00	B 306	<b>073003</b>
	90.00	60.00	B 309	<b>073004</b>
	120.00	90.00	B 312	<b>073005</b>

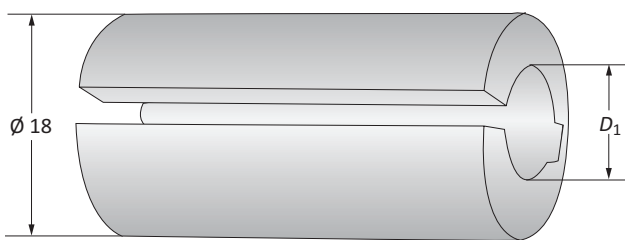


**i** = Imperial (in)  
**m** = Metric (mm)



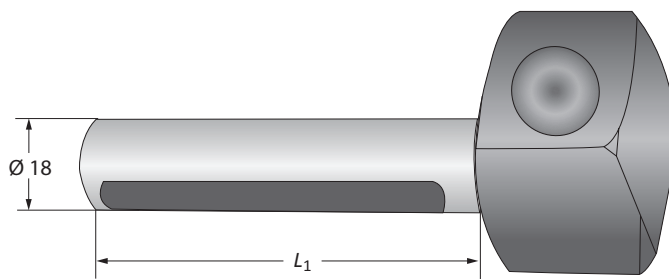
## UPA 3 Accessories

Reducing Sleeves | Boring Bar Holders



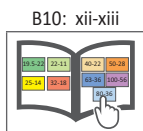
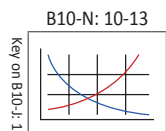
### UPA 3 Reducing Sleeves

Reducing Sleeve			
	$D_1$	Weight	Part No.
i	0.315	0.220 (lbs)	072104
	0.394	0.220 (lbs)	072105
	0.472	0.220 (lbs)	072106
	0.551	0.220 (lbs)	072107
m	8.00	0.10 (kg)	071103
	10.00	0.10 (kg)	071104
	12.00	0.10 (kg)	071105
	14.00	0.10 (kg)	071106



### UPA 3 Boring Bar Holders

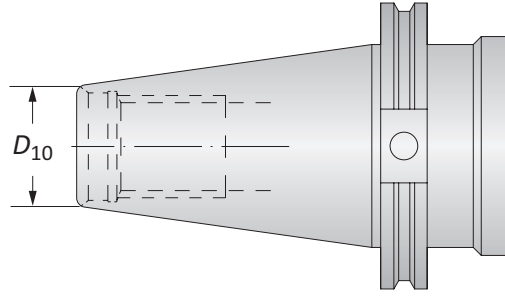
Boring Bar Holder				
	$L_1$	Working Diameter Range	Designation	Part No.
i	3.228	3.346 - 7.480	BH 308	075001
	4.724	6.299 - 10.236	BH 312	075002
m	82.00	85.00 - 190.00	BH 308	075001
	120.00	160.00 - 260.00	BH 312	075002



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

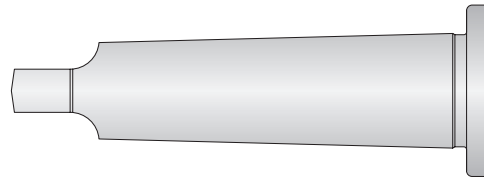
## UPA 3 Master Shanks

CAT 40/50 | Morse Taper 40/50



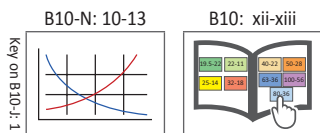
### CAT 40/50 Shanks

		Shank		
	Style	$D_{10}$	Weight	Part No.
i	CAT 40	5/8 - 11	2.336 (lbs)	130001T013939
	CAT 50	1 - 8	7.054 (lbs)	130001T011624
m	CAT 40	M16	1.06 (kg)	130001T013939
	CAT 50	M24	3.20 (kg)	130001T011624



### Morse Taper Shanks

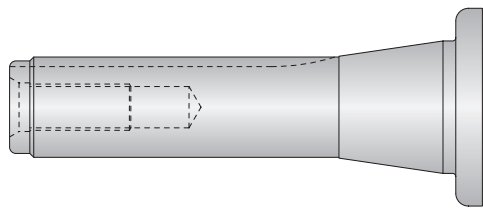
		Shank		
	Style	Weight	Part No.	
i	MT 3	0.661 (lbs)	130001T004509	
	MT 4	1.212 (lbs)	130001T003590	
	MT 5	2.976 (lbs)	130001T003920	
m	MT 3	0.30 (kg)	130001T004509	
	MT 4	0.55 (kg)	130001T003590	
	MT 5	1.35 (kg)	130001T003920	



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

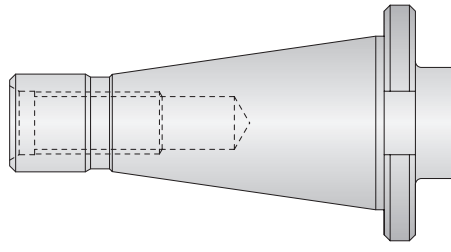
## UPA 3 Master Shanks

R-8 | NMTB 40/50



### R-8 Shanks

	Shank		
	Weight		Part No.
<b>i</b>	1.058 (lbs)		130001T007166
<b>m</b>	0.48 (kg)		130001T007166

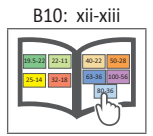
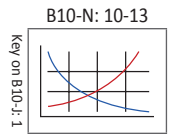


### NMTB 40/50 Shanks

	Shank		
	Style	Weight	Part No.
<b>i</b>	NMTB40	1.984 (lbs)	130001T004498
	NMTB50	5.798 (lbs)	130001T004480
<b>m</b>	NMTB40	0.90 (kg)	130001T004498
	NMTB50	2.63 (kg)	130001T004480

### Differential Screw

	Thread	Weight	Part No.
<b>i</b>	M16	0.066 (lbs)	KW9208
<b>m</b>	M16	0.03 (lbs)	KW9208

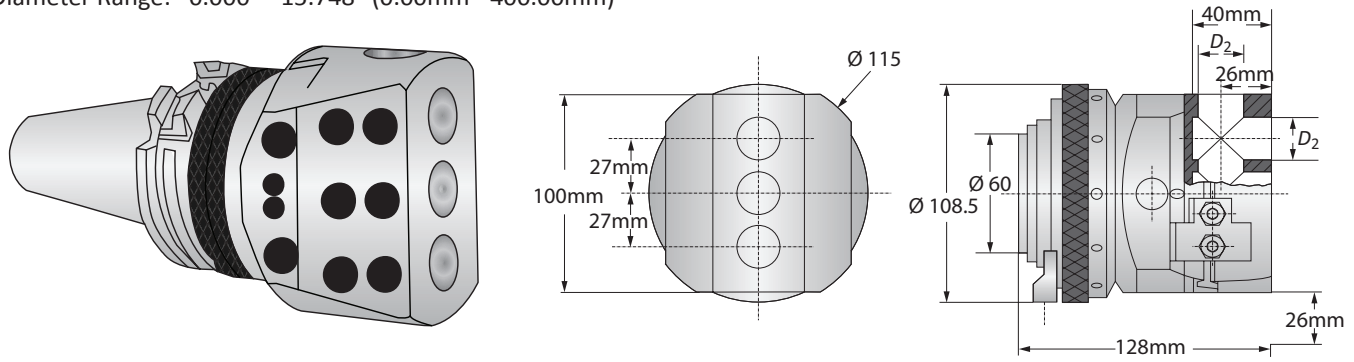


**i** = Imperial (in)  
**m** = Metric (mm)

A  
B  
C  
D  
E  
F  
G  
H  
I  
J  
K  
L  
M  
N  
INDEX

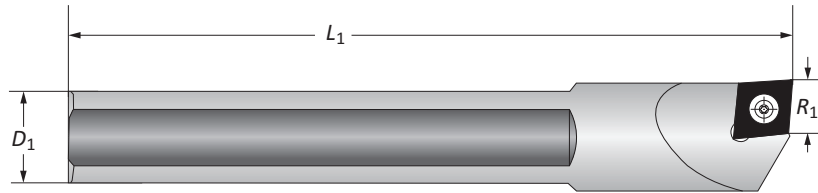
## UPA 4 Boring Heads and Accessories

Diameter Range: 0.000" - 15.748" (0.00mm - 400.00mm)



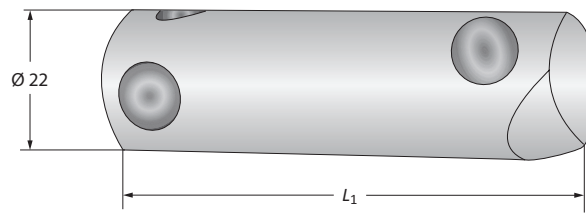
### UPA 4 Boring Heads

		Boring Head		
	Boring Range	$D_2$	Weight	Part No.
<b>i</b>	0.000 - 15.748	0.875	14.330 (lbs)	<b>008020</b>
<b>m</b>	0.00 - 400.00	22.00	6.50 (kg)	<b>007020</b>



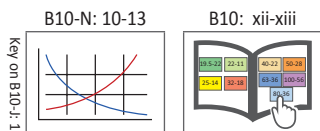
### UPA 4 Boring Bars

		Boring Bar					
	$D_1$	$L_1$	$R_1$	Weight	Cutting Direction	Insert Form	Part No.
<b>i</b>	0.875	3.937	0.531	0.220 (lbs)	R	103	<b>0875BFBR</b>
	0.875	3.937	0.531	0.220 (lbs)	L	103	<b>0875BFBL</b>
<b>m</b>	22.00	100.00	13.50	0.10 (kg)	R	103	<b>081092</b>
	22.00	100.00	13.50	0.10 (kg)	L	103	<b>218089</b>



### UPA 4 Boring Bars

		Boring Bar		
	$L_1$	Boring Depth	Designation	Part No.
<b>i</b>	3.346	1.771	B 408	<b>073006</b>
	4.921	3.346	B 412	<b>073007</b>
	6.496	4.921	B 416	<b>073008</b>
<b>m</b>	85.00	45.00	B 408	<b>073006</b>
	125.00	85.00	B 412	<b>073007</b>
	165.00	125.00	B 416	<b>073008</b>



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

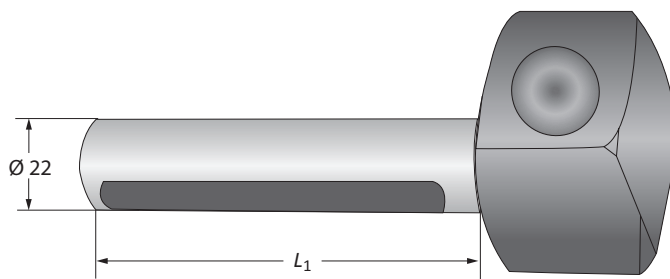
## UPA 4 Accessories

Reducing Sleeves | Boring Bar Holders



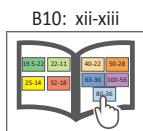
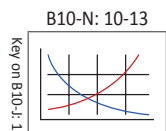
### UPA 4 Reducing Sleeves

Reducing Sleeve			
	$D_1$	Weight	Part No.
i	0.315	0.220 (lbs)	072107
	0.394	0.220 (lbs)	072108
	0.472	0.220 (lbs)	072109
	0.551	0.176 (lbs)	072110
	0.708	0.176 (lbs)	072111
m	8.00	0.10 (kg)	071107
	10.00	0.10 (kg)	071108
	12.00	0.10 (kg)	071109
	14.00	0.08 (kg)	071110
	18.00	0.08 (kg)	071111



### UPA 4 Boring Bar Holders

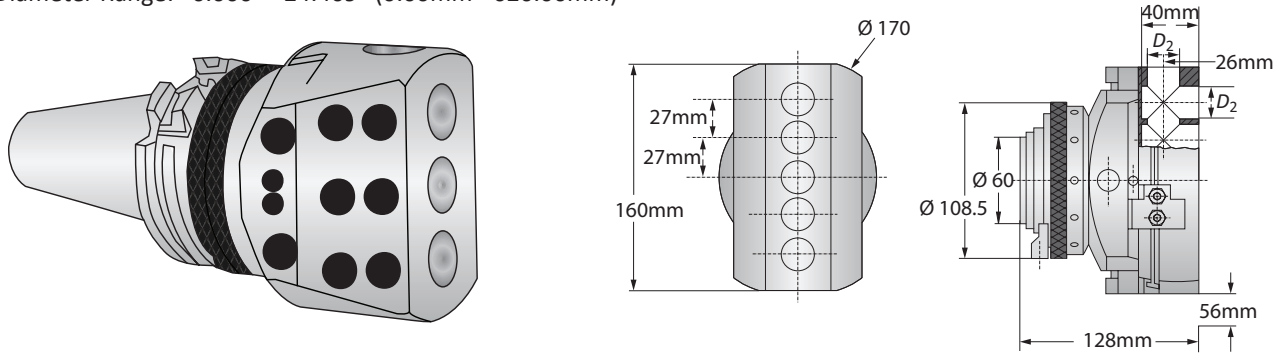
Boring Bar Holder				
	$L_1$	Working Diameter Range	Designation	Part No.
i	3.858	BH 410	4.527 - 9.448	075003
	7.086	BH 418	8.661 - 15.748	075004
m	98.00	BH 410	115.00 - 240.00	075003
	180.00	BH 418	220.00 - 400.00	075004



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

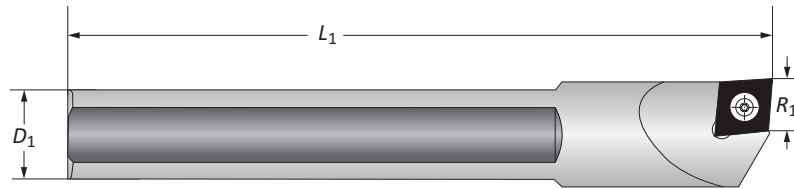
## UPA 5-S 6 Boring Heads and Accessories

Diameter Range: 0.000" - 24.409" (0.00mm - 620.00mm)



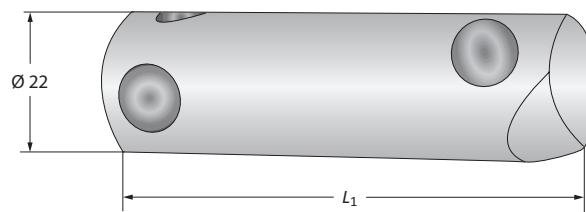
### UPA 5-S 6 Boring Heads

		Boring Head		
	Boring Range	D <sub>2</sub>	Weight	Part No.
i	0.000 - 24.409	0.875	17.416 (lbs)	014020
m	0.00 - 620.00	22.00	7.90 (kg)	013020



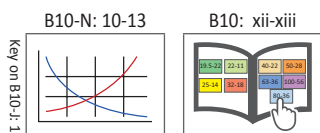
### UPA 5-S 6 Boring Bars

		Boring Bar					
	D <sub>1</sub>	L <sub>1</sub>	R <sub>1</sub>	Weight	Cutting Direction	Insert Form	Part No.
i	0.875	3.937	0.531	0.220 (lbs)	R	103	0875BFBR
	0.875	3.937	0.531	0.220 (lbs)	L	103	0875BFBL
m	22.00	100.00	13.50	0.10 (kg)	R	103	081092
	22.00	100.00	13.50	0.10 (kg)	L	103	218089



### UPA 5-S 6 Boring Bars

		Boring Bar			
	L <sub>1</sub>	Boring Depth	Designation	Part No.	
i	3.346	1.771	B 408	073006	
	4.921	3.346	B 412	073007	
	6.496	4.921	B 416	073008	
m	85.00	45.00	B 408	073006	
	125.00	85.00	B 412	073007	
	165.00	125.00	B 416	073008	

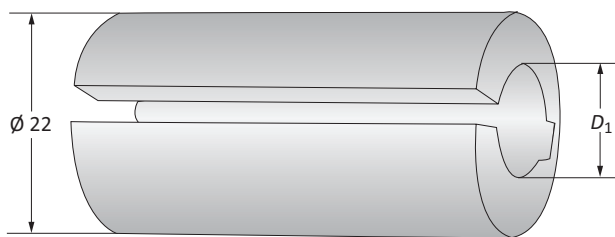


i = Imperial (in)  
m = Metric (mm)



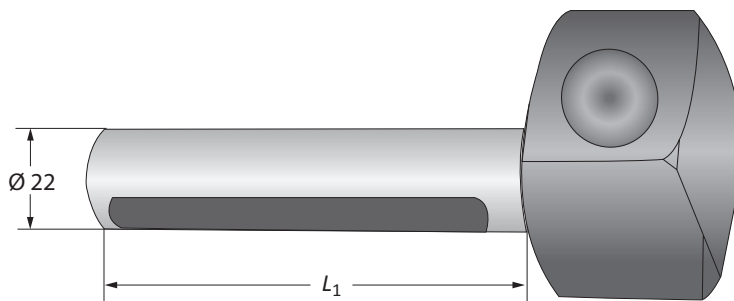
## UPA 5-S 6 Accessories

Reducing Sleeves | Boring Bar Holders



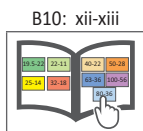
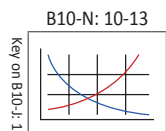
### UPA 5-S 6 Reducing Sleeves

Reducing Sleeve		Part No.	
$D_1$	Weight		
<b>i</b>	0.315	0.220 (lbs)	<b>072108</b>
	0.394	0.220 (lbs)	<b>072109</b>
	0.472	0.220 (lbs)	<b>072110</b>
	0.551	0.176 (lbs)	<b>072111</b>
	0.708	0.176 (lbs)	<b>072112</b>
<b>m</b>	8.00	0.10 (kg)	<b>071107</b>
	10.00	0.10 (kg)	<b>071108</b>
	12.00	0.10 (kg)	<b>071109</b>
	14.00	0.08 (kg)	<b>071110</b>
	18.00	0.08 (kg)	<b>071111</b>



### UPA 5-S 6 Boring Bar Holders

Boring Bar Holder		Part No.		
$L_1$	Working Diameter Range	Designation		
<b>i</b>	3.858	BH 410	4.527 - 9.448	<b>075003</b>
	7.086	BH 418	8.661 - 15.748	<b>075004</b>
<b>m</b>	98.00	BH 410	115.00 - 240.00	<b>075003</b>
	180.00	BH 418	220.00 - 400.00	<b>075004</b>



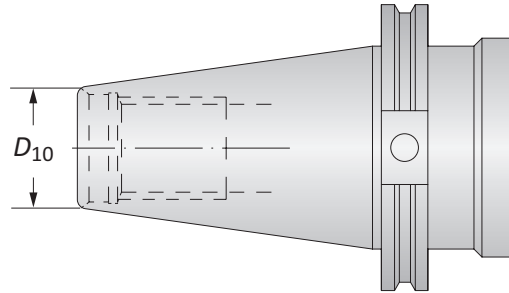
**i** = Imperial (in)  
**m** = Metric (mm)

## UPA 4 and 5-S 6 Master Shanks

CAT 40/50 | Morse Taper | NMTB 40/50

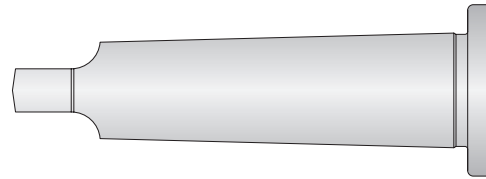
### CAT 40/50 Shanks

		Shank		
	Style	D <sub>10</sub>	Weight	Part No.
i	CAT 40	5/8 - 11	3.196 (lbs)	130005T013939
	CAT 50	1 - 8	7.054 (lbs)	130005T011624
m	CAT 40	M16	1.45 (kg)	130005T013939
	CAT 50	M24	3.20 (kg)	130005T011624



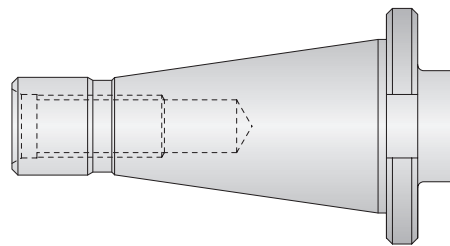
### Morse Taper Shanks

		Shank		
	Style		Weight	Part No.
i	MT 4		1.895 (lbs)	130005T003590
	MT 5		3.639 (lbs)	130005T003920
m	MT 4		0.86 (kg)	130005T003590
	MT 5		1.65 (kg)	130005T003920



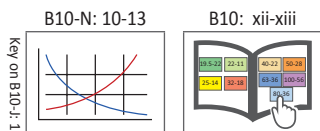
### NMTB 40/50 Shanks

		Shank		
	Style		Weight	Part No.
i	NMTB40		2.866 (lbs)	130005T004498
	NMTB50		6.393 (lbs)	130005T004480
m	NMTB40		1.30 (kg)	130005T004498
	NMTB50		2.90 (kg)	130005T004480



### Differential Screw

	Thread	Weight	Part No.
i	M20	0.154 (lbs)	KW9209
m	M20	0.07 (lbs)	KW9209

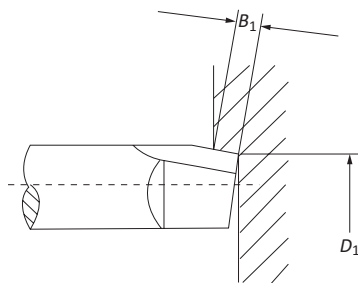


i = Imperial (in)  
m = Metric (mm)

## Technical Information | Chip Production Values

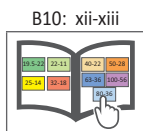
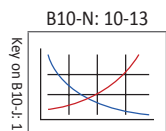
### Technical Data

Type	UPA 3	UPA 4	UPA 5-S 6
Working accuracy	±0.005	±0.005	±0.005
Diameter range	25.00	35.00	45.00
MT shank	3.00	4.00	5.00
ISO shank	30.00	40.00	40.00
Facing and boring range	0.00 - 260.00	0.00 - 400.00	0.00 - 620.00
Adjustment of slide (max)	48.00	52.00	112.00
Self activated feed of slide per revolution	0.05	0.02, 0.04, 0.06, 0.14, 0.16, 0.18	0.08, 0.10, 0.12, 0.20, 0.22, 0.24
<b>iii</b> Fine adjustment of 1 division	0.01	0.01	0.01
Fine adjustment of 1 revolution	1.00	0.40	0.40
Rapid return per revolution	1.00	-	-
Rapid return setting per revolution	-	6.00	6.00
Largest diameter of slide	85.00	115.00	170.00
Height of boring head without shank	75.00	128.00	128.00
Tool locations in slide	18.00	22.00	22.00
Max permissible revolutions	1000	600	600
End cut off accuracy	±0.05	±0.05	±0.05

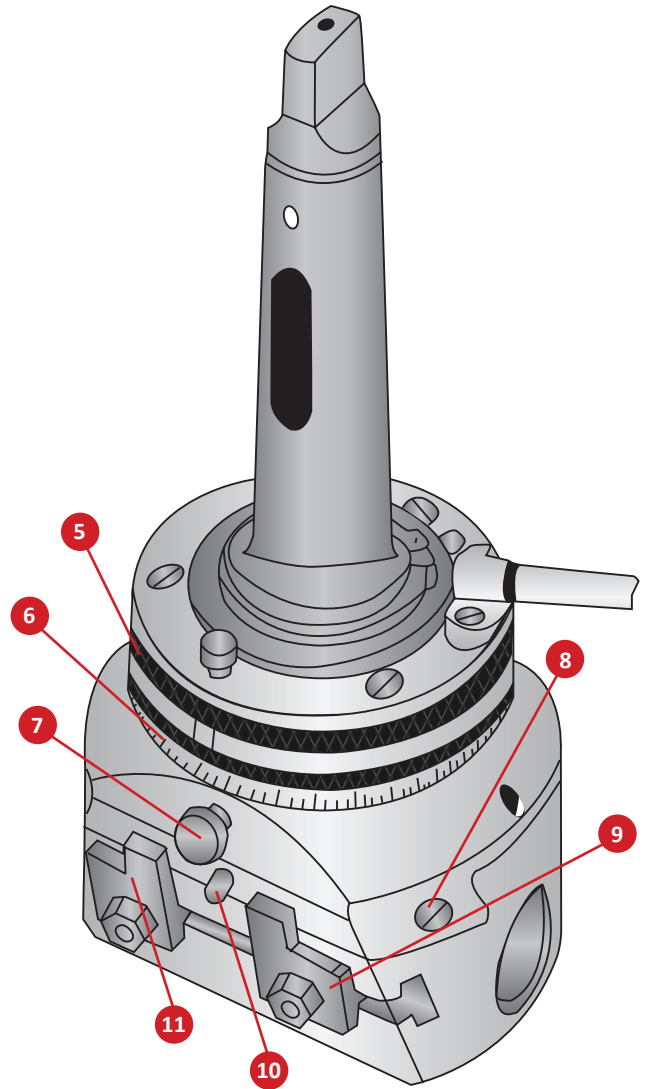
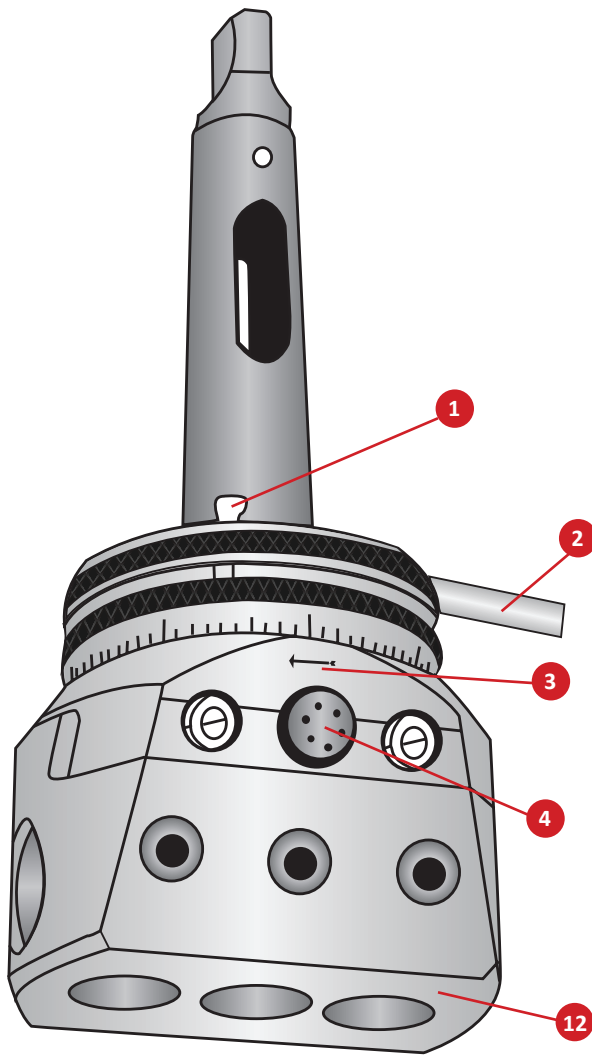


### Chip Production Values

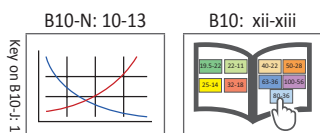
Chip Cutting Guide	Type	UPA 3	UPA 4	UPA 5-S 6
Max load	KW	2.50	7.00	9.50
With slide feed	mm/rev.	0.050	0.08, 0.12, 0.24	0.08, 0.12, 0.24
For smaller working $\varnothing$	$D_1$	60.00	150.00	200.00
<b>iii</b> Maximum width of chip	$B_1$	4.00	7.00, 6.00, 4.00	8.00, 7.00, 5.00
Maximum working $\varnothing$	$D_1$	260.00	400.00	500.00 / 620.00
Without reinforcement rings	$B_1$	2.00	2.20, 2.00, 1.50	2.50, 2.00, 1.50
With reinforcement rings	$B_1$	-	4.50, 4.00, 3.00	5.00, 4.00, 3.00



## UPA 3 Boring Head Diagram

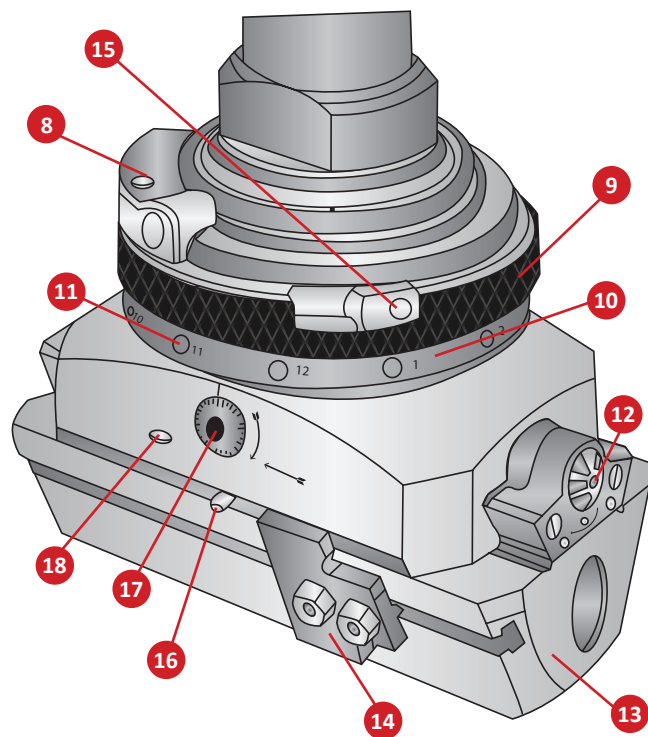
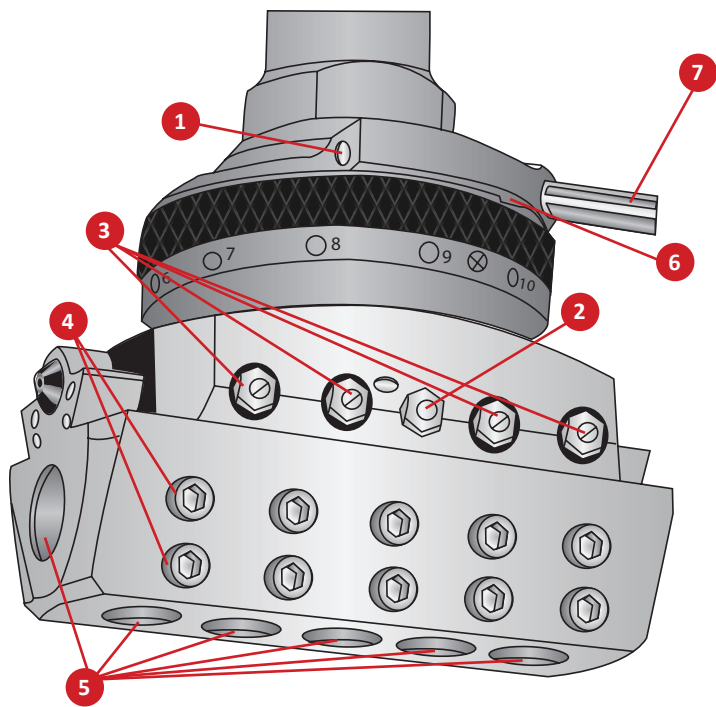


No.	Part	No.	Part
1	Button for return movement	7	Feed button
2	Stop rod	8	Regulating screw
3	Arrow	9	Stop
4	Locking screw	10	Fixed pin
5	Holding ring	11	Stop
6	Scale ring	12	Slide

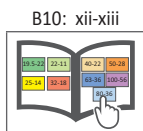
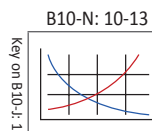


A  
B  
C  
D  
E  
F  
G  
H  
I  
J  
K  
L  
M  
N  
INDEX

## UPA 4 / 5-S 6 Boring Heads Diagram



No.	Part	No.	Part
1	Regulating screw	10	Scale ring
2	Locking screw	11	Feed buttons
3	Setting screws	12	Quick setting dial
4	Fastening screws	13	Slide with tool rotation bores
5	Tool post holes	14	Stop
6	Recess	15	Release ring
7	Stop rod	16	Fixed pin
8	Retaining ring	17	Fine setting dial
9	Feed ring	18	Retaining pin











SECTION

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# B10-K

---

Special Boring Solutions

# Wohlhaupter™ Special Boring Solutions



## Special Design Tooling

When it comes to special solutions for customers, Wohlhaupter has unique capabilities to effectively design and develop special boring tools. Our special boring tools are designed for specific machines, processes, and materials to help save you time and money.

If you have a particularly unique or difficult application, give our Application Engineering team a call.

phone: 330.343.4283 ext: 7611 | email: [appeng@alliedmachine.com](mailto:appeng@alliedmachine.com)

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



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

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.

## Applicable Industries



Aerospace



Agriculture



Automotive



Firearms



General  
Machining



Oil & Gas



Renewable  
Energy

# Wohlhaupter™ Special Boring Solutions Table of Contents

## Special Tooling Solutions

EK Goover and Lay Down Cartridge Tools . . . . .	2
Anti-Vibration and Wobble Bar Tools . . . . .	3
Large OD Turning Tools . . . . .	4
Padded Line Boring Tool . . . . .	5
DigiBore Special Boring Tools . . . . .	6
Combi-Line Special Boring Tool . . . . .	7

## Online Tools

ToolMD . . . . .	8
Boring Insert Selector . . . . .	9



GROOVING TOOLS

## EK GROOVER

- ▶ Create complex grooves faster and deeper than ever before
- ▶ Eliminate chatter in hard-to-reach internal forms
- ▶ The electronically-controlled insert release can be adapted to most machine tools
- ▶ Single or double grooving in one operation

ROUGH BORING TOOLS

## LAY DOWN CARTRIDGE

- ▶ Increase the precision of your roughing tool while protecting your investment
- ▶ If the tool is ever damaged, simply replace a cartridge and resume making chips





SPECIAL BORING TOOLS

## ANTI-VIBRATION

- ▶ Vibration dampening rings
- ▶ Used to reduce harmonic vibration in deeper boring applications



SPECIAL BORING TOOLS

## WOBBLE BAR

- ▶ Fine adjustment tool for reverse machining
- ▶ Combined with multi-diameter roughing cartridges



*SPECIAL BORING TOOLS*

## LARGE OD TURNING TOOLS

- ▶ Multi-step OD turning
- ▶ Drastically reduce cycle time
- ▶ Improve surface finish and feature concentricity

*SPECIAL BORING TOOLS*

## PADDED TOOLING

- ▶ Aids in stable part processing
- ▶ Expands length to diameter capabilities
- ▶ Improves surface finish
- ▶ Pads are replaceable to extend tool life



3E<sup>TECH</sup> BORING TOOL

## MULTI-STEP BORING TOOL

- ▶ Easy diameter adjustments with 3E<sup>TECH</sup>
- ▶ One digital readout module to use on all steps



3E<sup>TECH</sup> BORING TOOL

## LINE BORING TOOL

- ▶ One digital readout module used on all steps

## DigiBore Special Boring Tools



### FINISH BORING TOOLS

## DIGIBORE WITH 249(248)

- ▶ Standard DigiBore head, standard 249(248) head, and special slide for precise 2-step bore
- ▶ MVS connection

### FINISH BORING TOOLS

## DIGIBORE SPECIAL

- ▶ Standard DigiBore boring head with OD turn and OD chamfer insert holder
- ▶ MVS connection

## Combi-Line Special Boring Tool



*ROUGH, FINISH, and CHAMFER BORING TOOLS*

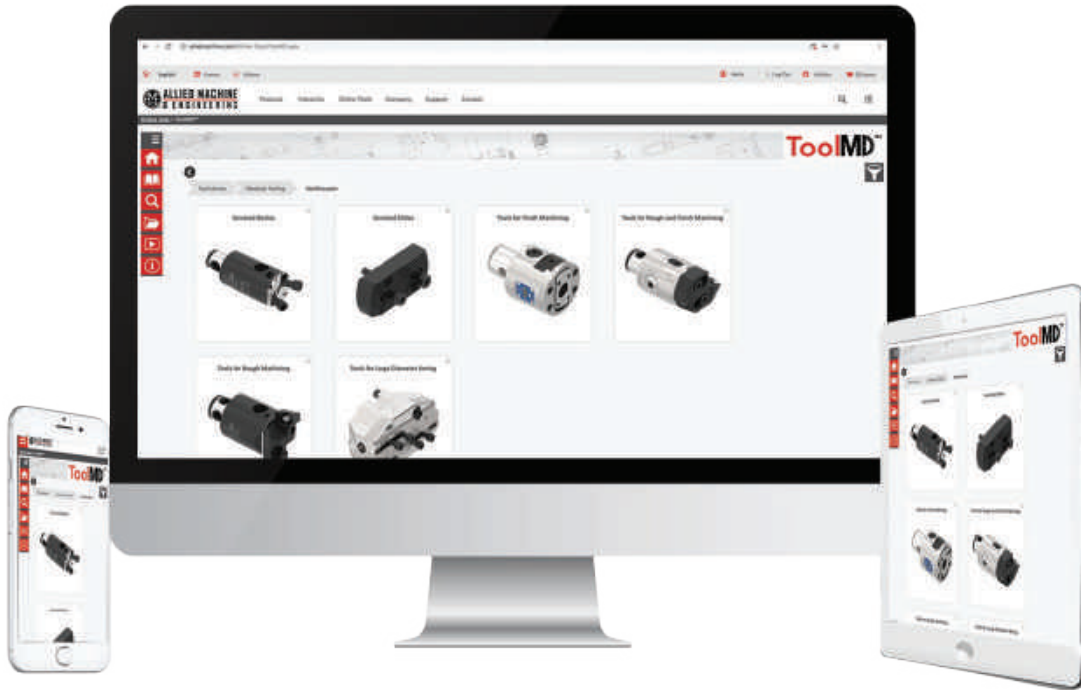
### **COMBI-LINE**

- ▶ Standard Combi-Line tooling with added chamfer insert holder
- ▶ MVS connection

ToolMD



www.toolmd.com

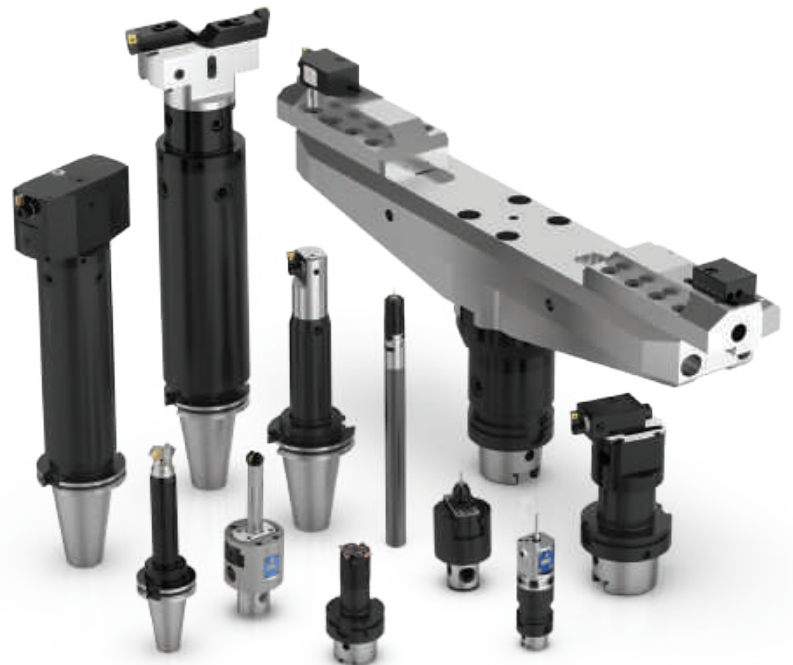


Design Your Own Solutions

ToolMD is a configurator for Wohlhaupter modular tooling systems that allows customers to virtually build their own solution. This online-based simulator puts the entire Wohlhaupter product line at your fingertips. It provides a digital bank of every individual part that Wohlhaupter manufactures in either inch or metric.

Once you select a component, you will be guided by a series of user-friendly prompts to select the next components until you have built your tooling system. Throughout the process, you can monitor the size of your custom tool and ensure what you're building matches your real-life specifications. Once a complete system is virtually assembled, the program will render the tool in either a 2D or 3D drawing to view on your device.

Designing your tools with ToolMD saves you time and allows you to instantly obtain the right tool for the job.



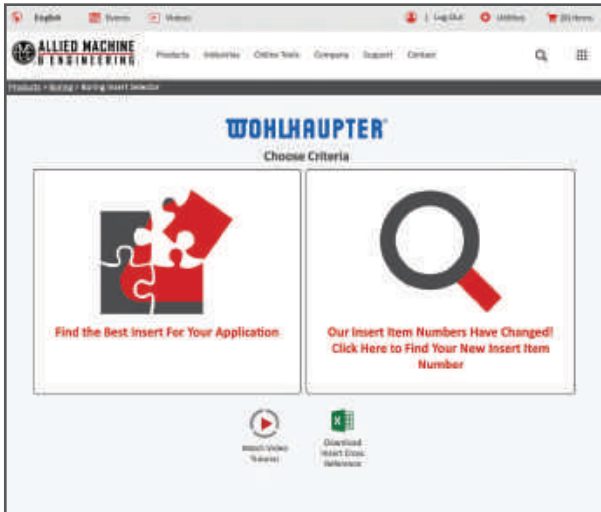
Design anytime from anywhere. Available online 24/7.

A B C D E F G H I J K L M N INDEX

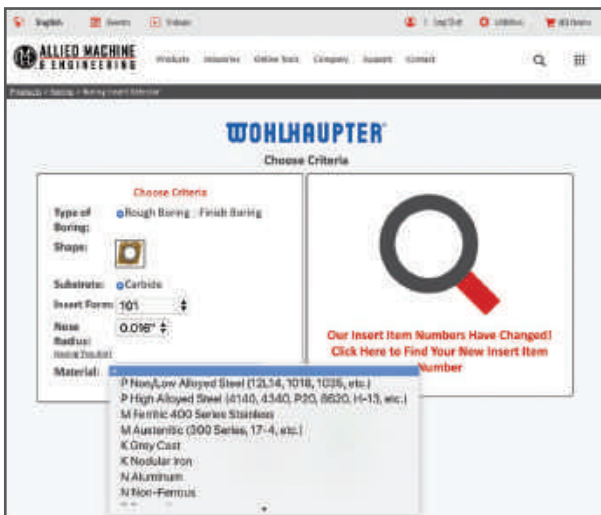


# WOHLHAUPTER® | Boring Insert Selector

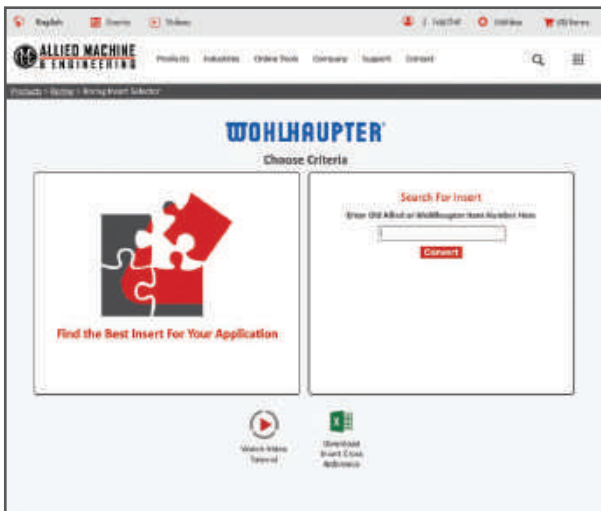
www.alliedmachine.com/bis



- Generate the correct boring insert for your application in just six easy steps



- Choose type, shape, substrate, insert form, nose radius, and workpiece material
- Order easily by adding the item to your cart



- Search for your new insert item number by entering your old item number



SECTION

---

# B10-L

---

Lay Down Cartridges

# Wohlhaupter™ Lay Down Cartridges

Holders for Pre-Machining | Holders for Compact Boring Bars | Short Clamp Holders | Fine Boring Holders



## Robust. Powerful. Versatile. Engineered Solutions.

From pre-machining holes with heavy stock removal to finish machining with tight tolerances and excellent surface finish, Wohlhaupter's extensive range of lay down cartridges can help you achieve specific boring solutions. Wohlhaupter's lay down cartridges bring innovative concepts designed to improve productivity, reduce scrap, and reduce the cost per part.

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



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

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

## Applicable Industries



Aerospace



Agriculture



Automotive



Firearms



General  
Machining



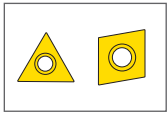
Oil & Gas



Renewable  
Energy

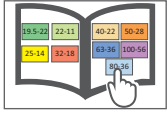
### Reference Icons

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



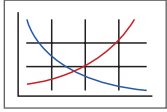
#### Inserts

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



#### MVS Connection Color Guide

Detailed instructions and information regarding the MVS connection(s)



#### Recommended Cutting Data

Speed and feed recommendations for optimum and safe boring

## Lay Down Cartridges Table of Contents

### Insert Holders

Pre-Machining Lay Down Cartridges . . . . .	2 - 5
Accessories . . . . .	6

Compact Lay Down Cartridges . . . . .	7 - 9
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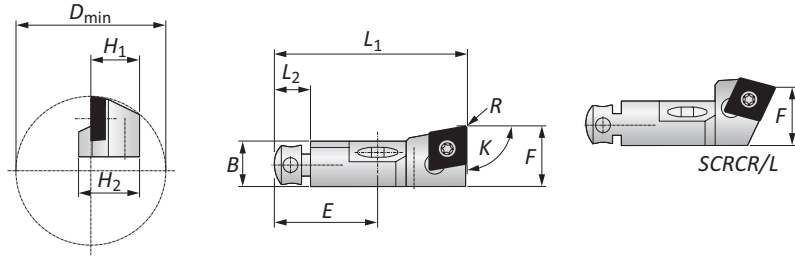
Lay Down Cartridges for Heavy Cutting . . . . .	11 - 13
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Accessories . . . . .	20

## Pre-Machining Lay Down Cartridges | Insert Forms 101, 103, 112, 113

Diameter Range:  $\geq 0.948''$  (25.00mm)

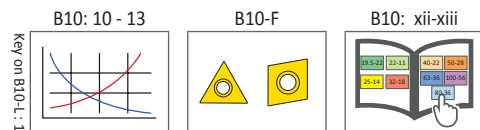


### Insert Form 101, 103 Insert Holders

Holder Type	K	ISO	D <sub>min</sub> Boring Range	Designation	Insert Holder								Insert Form	Part No.
					L <sub>1</sub>	L <sub>2</sub>	B	H <sub>1</sub>	H <sub>2</sub>	F	R	E		
	95°	CC..0602..	0.984	SCLCR08CA-06	1.259	0.236	0.295	0.314	0.433	0.393	0.015	0.669	101	343051
	95°	CC..0602..	0.984	SCLCL08CA-06	1.259	0.236	0.295	0.314	0.433	0.393	0.015	0.669	101	343052
	90°	CC..0602..	0.984	SCFCR08CA-06	1.259	0.236	0.295	0.314	0.433	0.393	0.015	0.669	101	343053
	90°	CC..0602..	0.984	SCFCL08CA-06	1.259	0.236	0.295	0.314	0.433	0.393	0.015	0.669	101	343054
	90°	CC..09T3..	1.574	SCFCR10CA-09	1.968	0.314	0.433	0.393	0.590	0.551	0.031	0.787	103	343055
	90°	CC..09T3..	1.574	SCFCL10CA-09	1.968	0.314	0.433	0.393	0.590	0.551	0.031	0.787	103	343056
	75°	CC..0602..	0.984	SCRCR08CA-06	1.259	0.236	0.295	0.314	0.433	0.393	0.015	0.669	101	343059
	75°	CC..0602..	0.984	SCRCL08CA-06	1.259	0.236	0.295	0.314	0.433	0.393	0.015	0.669	101	343060
	75°	CC..0602..	0.984	SCKCR08CA-06	1.259	0.236	0.295	0.314	0.433	0.393	0.015	0.669	101	343057
	75°	CC..0602..	0.984	SCKCL08CA-06	1.259	0.236	0.295	0.314	0.433	0.393	0.015	0.669	101	343058
	95°	CC..0602..	25.00	SCLCR08CA-06	32.00	6.00	7.50	8.00	11.00	10.00	0.40	17.00	101	343051
	95°	CC..0602..	25.00	SCLCL08CA-06	32.00	6.00	7.50	8.00	11.00	10.00	0.40	17.00	101	343052
	90°	CC..0602..	25.00	SCFCR08CA-06	32.00	6.00	7.50	8.00	11.00	10.00	0.40	17.00	101	343053
	90°	CC..0602..	25.00	SCFCL08CA-06	32.00	6.00	7.50	8.00	11.00	10.00	0.40	17.00	101	343054
	90°	CC..09T3..	40.00	SCFCR10CA-09	50.00	8.00	11.00	10.0	15.00	14.00	0.80	20.00	103	343055
	90°	CC..09T3..	40.00	SCFCL10CA-09	50.00	8.00	11.00	10.0	15.00	14.00	0.80	20.00	103	343056
	75°	CC..0602..	25.00	SCRCR08CA-06	32.00	6.00	7.50	8.00	11.00	10.00	0.40	17.00	101	343059
	75°	CC..0602..	25.00	SCRCL08CA-06	32.00	6.00	7.50	8.00	11.00	10.00	0.40	17.00	101	343060
	75°	CC..0602..	25.00	SCKCR08CA-06	32.00	6.00	7.50	8.00	11.00	10.00	0.40	17.00	101	343057
	75°	CC..0602..	25.00	SCKCL08CA-06	32.00	6.00	7.50	8.00	11.00	10.00	0.40	17.00	101	343058

### Insert Form 112, 113 Insert Holders

Holder Type	K	ISO	D <sub>min</sub> Boring Range	Designation	Insert Holder								Insert Form	Part No.
					L <sub>1</sub>	L <sub>2</sub>	B	H <sub>1</sub>	H <sub>2</sub>	F	R	E		
	75°	SC..09T3..	0.984	SSKCR08CA-06	1.968	0.314	0.433	0.393	0.590	0.551	0.031	0.787	112	343061
	75°	SC..09T3..	0.984	SSKCL08CA-06	1.968	0.314	0.433	0.393	0.590	0.551	0.031	0.787	112	343062
	75°	SC..1204..	1.968	SSKCR12CA-12	2.165	0.314	0.590	0.472	0.787	0.787	0.031	0.787	113	343063
	75°	SC..1204..	1.968	SSKCL12CA-12	2.165	0.314	0.590	0.472	0.787	0.787	0.031	0.787	113	343064
	75°	SC..09T3..	25.00	SSKCR08CA-06	50.00	8.00	11.00	10.00	15.00	14.00	0.80	20.00	112	343061
	75°	SC..09T3..	25.00	SSKCL08CA-06	50.00	8.00	11.00	10.00	15.00	14.00	0.80	20.00	112	343062
	75°	SC..1204..	50.00	SSKCR12CA-12	55.00	8.00	15.00	12.00	20.00	20.00	0.80	20.00	113	343063
	75°	SC..1204..	50.00	SSKCL12CA-12	55.00	8.00	15.00	12.00	20.00	20.00	0.80	20.00	113	343064



= Imperial (in)  
 = Metric (mm)

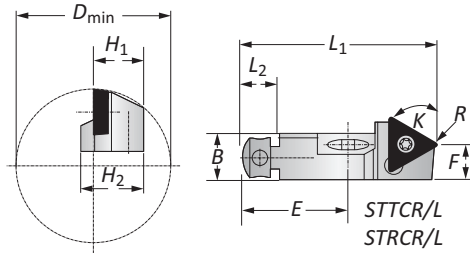
Inserts sold separately











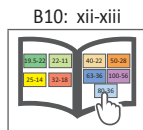
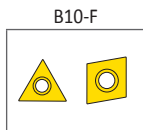
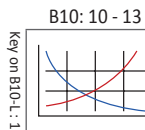




### Pre-Machining Lay Down Cartridges | Insert Forms 73, 160, 161, 163

Diameter Range: ≥0.614" (15.60mm)



Holder Type	K	ISO	D <sub>min</sub> Boring Range	Designation	Insert Holder								Insert Form	Part No.		
					L <sub>1</sub>	L <sub>2</sub>	B	H <sub>1</sub>	H <sub>2</sub>	F	R	E				
	95°	TC..06T1..	0.614	STLCR06CA-06X7	0.964	0.177	0.177	0.236	0.236	0.275	0.007	0.472	73	343043		
	95°	TC..06T1..	0.614	STCLR06CA-06X7	0.964	0.177	0.177	0.236	0.236	0.275	0.007	0.472	73	343044		
		93°	TC..0902..	0.984	STUCR08CA-09	1.259	0.236	0.295	0.314	0.433	0.393	0.015	0.669	160	343035	
		93°	TC..0902..	0.984	STUCLR08CA-09	1.259	0.236	0.295	0.314	0.433	0.393	0.015	0.669	160	343036	
		90°	TC..06T1..	0.614	STFCR06CA-06X7	0.964	0.177	0.177	0.236	0.236	0.275	0.007	0.472	73	343001	
		90°	TC..06T1..	0.614	STFCLR06CA-06X7	0.964	0.177	0.177	0.236	0.236	0.275	0.007	0.472	73	343002	
		90°	TC..06T1..	0.787	STFCR06CA-06	0.984	0.177	0.196	0.236	0.314	0.314	0.015	0.472	73	343003	
		90°	TC..06T1..	0.787	STFCLR06CA-06	0.984	0.177	0.196	0.236	0.314	0.314	0.015	0.472	73	343004	
			90°	TC..0902..	0.984	STFCR08CA-09	1.259	0.236	0.295	0.314	0.433	0.393	0.015	0.669	160	343005
			90°	TC..0902..	0.984	STFCLR08CA-09	1.259	0.236	0.295	0.314	0.433	0.393	0.015	0.669	160	343006
		90°	TC..1102..	1.574	STFCR10CA-11	1.968	0.314	0.433	0.393	0.590	0.551	0.015	0.787	161	343007	
		90°	TC..1102..	1.574	STFCLR10CA-11	1.968	0.314	0.433	0.393	0.590	0.551	0.015	0.787	161	343008	
		90°	TC..16T3..	1.968	STFCR12CA-16	2.165	0.314	0.590	0.472	0.787	0.787	0.031	0.787	163	343009	
		90°	TC..16T3..	1.968	STFCLR12CA-16	2.165	0.314	0.590	0.472	0.787	0.787	0.031	0.787	163	343010	
		90°	TC..16T3..	2.165	STFCR16CA-16	2.480	0.314	0.787	0.629	0.787	0.984	0.031	0.984	163	343011	
		90°	TC..16T3..	2.165	STFCLR16CA-16	2.480	0.314	0.787	0.629	0.787	0.984	0.031	0.984	163	343012	
		95°	TC..06T1..	15.60	STLCR06CA-06X7	24.50	4.50	4.50	6.00	6.00	7.00	0.20	12.00	73	343043	
		95°	TC..06T1..	15.60	STCLR06CA-06X7	24.50	4.50	4.50	6.00	6.00	7.00	0.20	12.00	73	343044	
		93°	TC..0902..	25.00	STUCR08CA-09	32.00	6.00	7.50	8.00	11.00	10.00	0.40	17.00	160	343035	
		93°	TC..0902..	25.00	STUCLR08CA-09	32.00	6.00	7.50	8.00	11.00	10.00	0.40	17.00	160	343036	
		90°	TC..06T1..	15.60	STFCR06CA-06X7	24.50	4.50	4.50	6.00	6.00	7.00	0.20	12.00	73	343001	
		90°	TC..06T1..	15.60	STFCLR06CA-06X7	24.50	4.50	4.50	6.00	6.00	7.00	0.20	12.00	73	343002	
		90°	TC..06T1..	20.00	STFCR06CA-06	25.00	4.50	5.00	6.00	8.00	8.00	0.40	12.00	73	343003	
		90°	TC..06T1..	20.00	STFCLR06CA-06	25.00	4.50	5.00	6.00	8.00	8.00	0.40	12.00	73	343004	
			90°	TC..0902..	25.00	STFCR08CA-09	32.00	6.00	7.50	8.00	11.00	10.00	0.40	17.00	160	343005
			90°	TC..0902..	25.00	STFCLR08CA-09	32.00	6.00	7.50	8.00	11.00	10.00	0.40	17.00	160	343006
		90°	TC..1102..	40.00	STFCR10CA-11	50.00	8.00	11.00	10.00	15.00	14.00	0.40	20.00	161	343007	
		90°	TC..1102..	40.00	STFCLR10CA-11	50.00	8.00	11.00	10.00	15.00	14.00	0.40	20.00	161	343008	
		90°	TC..16T3..	50.00	STFCR12CA-16	55.00	8.00	15.00	12.00	20.00	20.00	0.80	20.00	163	343009	
		90°	TC..16T3..	50.00	STFCLR12CA-16	55.00	8.00	15.00	12.00	20.00	20.00	0.80	20.00	163	343010	
		90°	TC..16T3..	55.00	STFCR16CA-16	63.00	8.00	20.00	16.00	20.00	25.00	0.80	25.00	163	343011	
		90°	TC..16T3..	55.00	STFCLR16CA-16	63.00	8.00	20.00	16.00	20.00	25.00	0.80	25.00	163	343012	

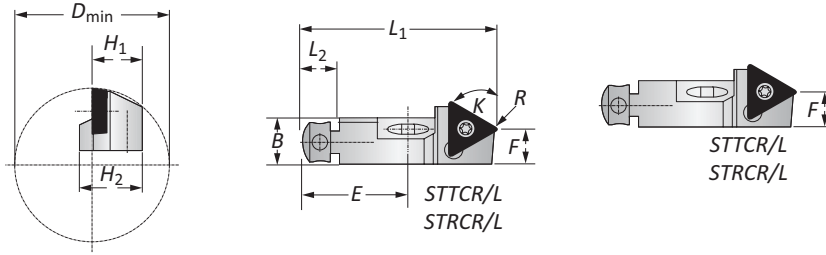


 = Imperial (in)  
 = Metric (mm)  
 Inserts sold separately

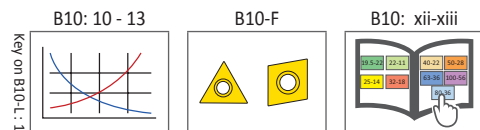
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## Pre-Machining Lay Down Cartridges | Insert Forms 73, 160, 159, 161, 163

Diameter Range:  $\geq 0.614$ " (15.60mm)



Holder Type	K	ISO	D <sub>min</sub> Boring Range	Designation	Insert Holder							Insert Form	Part No.	
					L <sub>1</sub>	L <sub>2</sub>	B	H <sub>1</sub>	H <sub>2</sub>	F	R			E
	75°	TC..06T1..	0.614	STKCR06CA-06X7	0.964	0.177	0.177	0.236	0.236	0.275	0.007	0.472	73	343037
	75°	TC..06T1..	0.614	STKCL06CA-06X7	0.964	0.177	0.177	0.236	0.236	0.275	0.007	0.472	73	343038
	75°	TC..06T1..	0.787	STKCR06CA-06	0.984	0.177	0.196	0.236	0.314	0.314	0.015	0.472	73	343039
	75°	TC..06T1..	0.787	STKCL06CA-06	0.984	0.177	0.196	0.236	0.314	0.314	0.015	0.472	73	343040
	75°	TC..0902..	0.984	STKCR08CA-09	1.259	0.236	0.295	0.314	0.433	0.393	0.015	0.669	160	343041
	75°	TC..0902..	0.984	STKCL08CA-09	1.259	0.236	0.295	0.314	0.433	0.393	0.015	0.669	160	343042
	75°	TC..0902..	0.984	STKCR08CA-09	1.259	0.236	0.295	0.314	0.433	0.307	0.015	0.669	160	343033
	75°	TC..0902..	0.984	STKCL08CA-09	1.259	0.236	0.295	0.314	0.433	0.307	0.015	0.669	160	343034
	60°	TC..06T1..	0.614	STTCR06CA-06X7	0.964	0.177	0.177	0.236	0.236	0.145	0.007	0.472	159	343013
	60°	TC..06T1..	0.614	STTCL06CA-06X7	0.964	0.177	0.177	0.236	0.236	0.145	0.007	0.472	159	343014
	60°	TC..06T1..	0.787	STTCR06CA-06	0.984	0.177	0.196	0.236	0.314	0.216	0.015	0.472	159	343015
	60°	TC..06T1..	0.787	STTCL06CA-06	0.984	0.177	0.196	0.236	0.314	0.216	0.015	0.472	159	343016
	60°	TC..0902..	0.984	STTCR08CA-09	1.259	0.236	0.295	0.314	0.433	0.236	0.015	0.669	160	343017
	60°	TC..0902..	0.984	STTCL08CA-09	1.259	0.236	0.295	0.314	0.433	0.236	0.015	0.669	160	343018
	60°	TC..1102..	1.575	STTCR10CA-11	1.968	0.314	0.433	0.393	0.590	0.354	0.015	0.787	161	343019
	60°	TC..1102..	1.575	STTCL10CA-11	1.968	0.314	0.433	0.393	0.590	0.354	0.015	0.787	161	343020
	60°	TC..16T3..	1.968	STTCR12CA-16	2.165	0.314	0.590	0.472	0.787	0.511	0.031	0.787	163	343021
	60°	TC..16T3..	1.968	STTCL12CA-16	2.165	0.314	0.590	0.472	0.787	0.511	0.031	0.787	163	343022
	75°	TC..06T1..	15.60	STKCR06CA-06X7	24.50	4.50	4.50	6.00	6.00	7.00	0.20	12.00	73	343037
	75°	TC..06T1..	15.60	STKCL06CA-06X7	24.50	4.50	4.50	6.00	6.00	7.00	0.20	12.00	73	343038
	75°	TC..06T1..	20.00	STKCR06CA-06	25.00	4.50	5.00	6.00	8.00	8.00	0.40	12.00	73	343039
	75°	TC..06T1..	20.00	STKCL06CA-06	25.00	4.50	5.00	6.00	8.00	8.00	0.40	12.00	73	343040
	75°	TC..0902..	25.00	STKCR08CA-09	32.00	6.00	7.50	8.00	11.00	10.00	0.40	17.00	160	343041
	75°	TC..0902..	25.00	STKCL08CA-09	32.00	6.00	7.50	8.00	11.00	10.00	0.40	17.00	160	343042
	75°	TC..0902..	25.00	STKCR08CA-09	32.00	6.00	7.50	8.00	11.00	7.80	0.40	17.00	160	343033
	75°	TC..0902..	25.00	STKCL08CA-09	32.00	6.00	7.50	8.00	11.00	7.80	0.40	17.00	160	343034
	60°	TC..06T1..	15.60	STTCR06CA-06X7	24.50	4.50	4.50	6.00	6.00	3.70	0.20	12.00	159	343013
	60°	TC..06T1..	15.60	STTCL06CA-06X7	24.50	4.50	4.50	6.00	6.00	3.70	0.20	12.00	159	343014
	60°	TC..06T1..	20.00	STTCR06CA-06	25.00	4.50	5.00	6.00	8.00	5.50	0.40	12.00	159	343015
	60°	TC..06T1..	20.00	STTCL06CA-06	25.00	4.50	5.00	6.00	8.00	5.50	0.40	12.00	159	343016
	60°	TC..0902..	25.00	STTCR08CA-09	32.00	6.00	7.50	8.00	11.00	6.00	0.40	17.00	160	343017
	60°	TC..0902..	25.00	STTCL08CA-09	32.00	6.00	7.50	8.00	11.00	6.00	0.40	17.00	160	343018
	60°	TC..1102..	40.00	STTCR10CA-11	50.00	8.00	11.00	10.00	15.00	9.00	0.40	20.00	161	343019
	60°	TC..1102..	40.00	STTCL10CA-11	50.00	8.00	11.00	10.00	15.00	9.00	0.40	20.00	161	343020
	60°	TC..16T3..	50.00	STTCR12CA-16	55.00	8.00	15.00	12.00	20.00	13.00	0.80	20.00	163	343021
	60°	TC..16T3..	50.00	STTCL12CA-16	55.00	8.00	15.00	12.00	20.00	13.00	0.80	20.00	163	343022

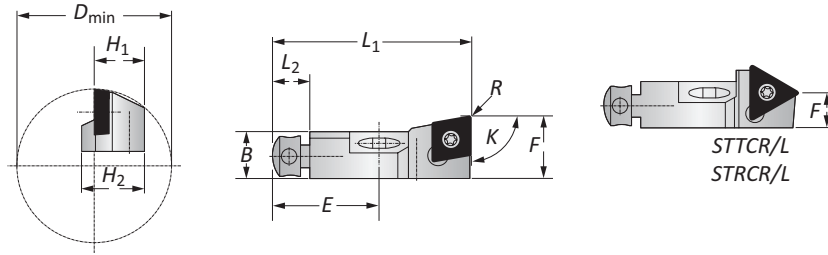








**i** = Imperial (in)  
**m** = Metric (mm)

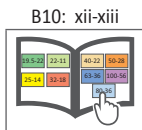
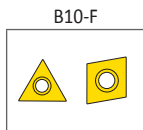
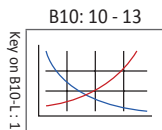
Inserts sold separately



### Pre-Machining Lay Down Cartridges | Insert Forms 73, 160, 159, 161, 163

Diameter Range:  $\geq 0.614$ " (15.60mm)



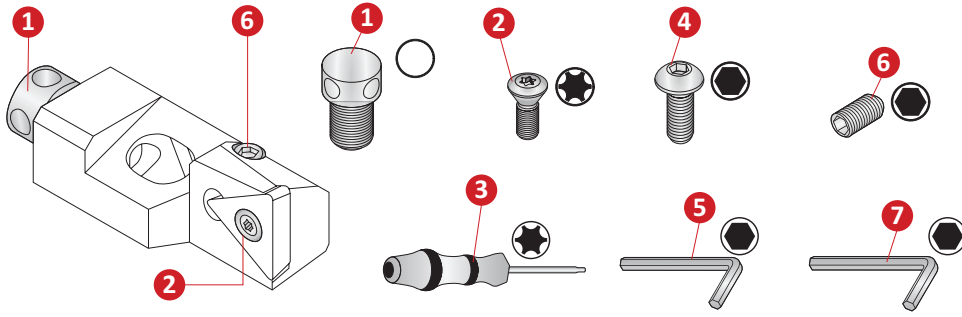
Holder Type	K	ISO	D <sub>min</sub> Boring Range	Designation	Insert Holder								Insert Form	Part No.
					L <sub>1</sub>	L <sub>2</sub>	B	H <sub>1</sub>	H <sub>2</sub>	F	R	E		
		60° TC..06T1..	0.614	STWCR06CA-06X7	0.826	0.177	0.177	0.236	0.236	0.275	0.007	0.472	73	343045
		60° TC..06T1..	0.614	STWCL06CA-06X7	0.826	0.177	0.177	0.236	0.236	0.275	0.007	0.472	73	343046
		60° TC..06T1..	0.787	STWCR06CA-06	0.826	0.177	0.196	0.236	0.314	0.314	0.015	0.472	73	343047
		60° TC..06T1..	0.787	STWCL06CA-06	0.826	0.177	0.196	0.236	0.314	0.314	0.015	0.472	73	343048
		60° TC..0902..	0.787	STWCR08CA-09	1.102	0.236	0.295	0.314	0.433	0.393	0.015	0.669	160	343049
		60° TC..0902..	0.787	STWCL08CA-09	1.102	0.236	0.295	0.314	0.433	0.393	0.015	0.669	160	343050
		45° TC..06T1..	0.614	STSCR06CA-06X7	0.964	0.177	0.177	0.236	0.236	0.275	0.007	0.472	73	343023
		45° TC..06T1..	0.614	STSCL06CA-06X7	0.964	0.177	0.177	0.236	0.236	0.275	0.007	0.472	73	343024
		45° TC..06T1..	0.787	STSCR06CA-06	0.826	0.177	0.196	0.236	0.314	0.314	0.015	0.472	73	343025
		45° TC..06T1..	0.787	STSCL06CA-06	0.826	0.177	0.196	0.236	0.314	0.314	0.015	0.472	73	343026
		45° TC..0902..	0.984	STSCR08CA-09	1.102	0.236	0.295	0.314	0.433	0.393	0.015	0.669	160	343027
		45° TC..0902..	0.984	STSCL08CA-09	1.102	0.236	0.295	0.314	0.433	0.393	0.015	0.669	160	343028
	45° TC..1102..	1.574	STSCR10CA-11	1.732	0.314	0.433	0.393	0.590	0.551	0.015	0.787	161	343029	
	45° TC..1102..	1.574	STSCL10CA-11	1.732	0.314	0.433	0.393	0.590	0.551	0.015	0.787	161	343030	
	45° TC..16T3..	1.968	STSCR12CA-16	1.850	0.314	0.590	0.472	0.787	0.787	0.031	0.984	163	343031	
	45° TC..16T3..	1.968	STSCL12CA-16	1.850	0.314	0.590	0.472	0.787	0.787	0.031	0.984	163	343032	
			60° TC..06T1..	15.60	STWCR06CA-06X7	21.00	4.50	4.50	6.00	6.00	7.00	0.20	12.00	73
60° TC..06T1..			15.60	STWCL06CA-06X7	21.00	4.50	4.50	6.00	6.00	7.00	0.20	12.00	73	343046
60° TC..06T1..			20.00	STWCR06CA-06	21.00	4.50	5.00	6.00	8.00	8.00	0.40	12.00	73	343047
60° TC..06T1..			20.00	STWCL06CA-06	21.00	4.50	5.00	6.00	8.00	8.00	0.40	12.00	73	343048
60° TC..0902..			20.00	STWCR08CA-09	28.00	6.00	7.50	8.00	11.00	10.00	0.40	17.00	160	343049
60° TC..0902..			20.00	STWCL08CA-09	28.00	6.00	7.50	8.00	11.00	10.00	0.40	17.00	160	343050
		45° TC..06T1..	15.60	STSCR06CA-06X7	24.50	4.50	4.50	6.00	6.00	7.00	0.20	12.00	73	343023
		45° TC..06T1..	15.60	STSCL06CA-06X7	24.50	4.50	4.50	6.00	6.00	7.00	0.20	12.00	73	343024
		45° TC..06T1..	20.00	STSCR06CA-06	21.00	4.50	5.00	6.00	8.00	8.00	0.40	12.00	73	343025
		45° TC..06T1..	20.00	STSCL06CA-06	21.00	4.50	5.00	6.00	8.00	8.00	0.40	12.00	73	343026
		45° TC..0902..	25.00	STSCR08CA-09	28.00	6.00	7.50	8.00	11.00	10.00	0.40	17.00	160	343027
		45° TC..0902..	25.00	STSCL08CA-09	28.00	6.00	7.50	8.00	11.00	10.00	0.40	17.00	160	343028
		45° TC..1102..	40.00	STSCR10CA-11	44.00	8.00	11.00	10.00	15.00	14.00	0.40	20.00	161	343029
		45° TC..1102..	40.00	STSCL10CA-11	44.00	8.00	11.00	10.00	15.00	14.00	0.40	20.00	161	343030
		45° TC..16T3..	50.00	STSCR12CA-16	47.00	8.00	15.00	12.00	20.00	20.00	0.80	25.00	163	343031
		45° TC..16T3..	50.00	STSCL12CA-16	47.00	8.00	15.00	12.00	20.00	20.00	0.80	25.00	163	343032



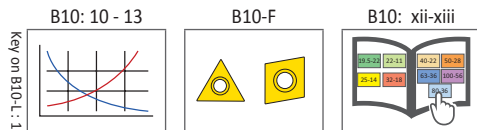
 = Imperial (in)  
 = Metric (mm)  
 Inserts sold separately

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## Accessories for Pre-Machining Lay Down Cartridges



Clamping Holder Part No.		1 Barrel Screw	2 Insert Screw	3 Torx Driver	4 Holder Fixing Screw	5 Hex Driver	6 Radial Set Screw	7 Hex Driver
343001	343002	413994	415970	115537	415108	027149	215346	027148
343003	343004	419994	415970	115537	215481	027149	215346	027148
343005	343006	419995	415971	115591	215343	031148	115455	027148
343007	343008	419996	415967	115591	215643	003195	115151	027149
343009	343010	419996	415972	115664	215431	003195	126157	031148
343011	343012	419996	415972	115664	215300	005195	415993	031148
343013	343014	419994	415970	115537	415108	027149	215346	027148
343015	343016	419994	415970	115537	215481	027149	215346	027148
343017	343018	419995	415971	115591	215343	031148	115455	027148
343019	343020	419996	415967	115591	215643	003195	115151	027149
343021	343022	419996	415972	115664	215431	003195	126157	031148
343023	343024	419994	415970	115537	415108	027149	215346	027148
343025	343026	419994	415970	115537	215481	027149	215346	027148
343027	343028	419995	415971	115591	215343	031148	115455	027148
343029	343030	419996	415967	115591	215643	003195	115151	027149
343031	343032	419996	415972	115664	215431	003195	126157	031148
343033	434034	419995	415971	115591	215343	031148	115455	027148
343035	343036	419995	415971	115591	215343	031148	115455	027148
343037	343038	419994	415970	115537	415108	027149	215346	027148
343039	343040	419994	415970	115537	215481	027149	215346	027148
343041	343042	419995	415971	115591	215343	031148	115455	027148
343043	343044	419994	415970	115537	415108	027149	215346	027148
343045	343046	419994	415970	115537	415108	027149	215346	027148
343047	343048	419994	415970	115537	215481	027149	215346	027148
343049	343050	415970	415971	415108	215343	031148	215346	027148
343051	343052	419995	415967	115591	215343	031148	115455	027148
343053	343054	419995	415967	115591	215343	031148	115455	027148
343055	343056	419996	415968	115664	215643	003195	115151	027149
343057	343058	419995	415967	115591	215343	031148	115455	027148
343059	343060	419995	415967	115591	215343	031148	115455	027148
343061	343062	419995	415967	115591	215343	031148	115455	027148
343063	343064	419996	415969	215150	215431	003195	126157	031148



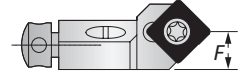
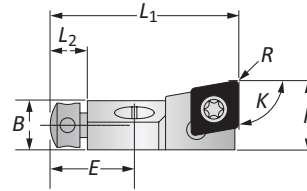
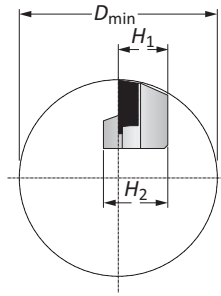
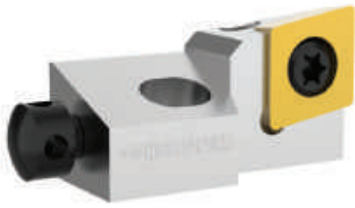
i = Imperial (in)  
m = Metric (mm)































Inserts sold separately

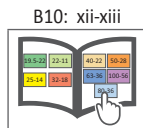
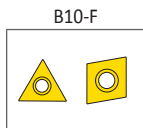
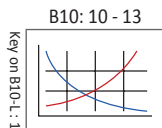
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### Compact Lay Down Cartridges | Insert Forms 101, 103, 104, 105



Diameter Range: ≥0.984" (25.00mm)



Holder Type	K	ISO	D <sub>min</sub> Boring Range	Designation	Insert Holder								Insert Form	Part No.		
					L <sub>1</sub>	L <sub>2</sub>	B	H <sub>1</sub>	H <sub>2</sub>	F	R Radius	E				
		90°	CC..0602..	0.984	SCFCR08CK-06	1.102	0.236	0.255	0.314	0.393	0.393	0.015	0.511	101	345001	
		90°	CC..09T3..	1.574	SCFCR10CK-09	1.496	0.295	0.393	0.393	0.511	0.551	0.031	0.669	103	345002	
		90°	CC..1204..	1.968	SCFCR12CK-12	1.771	0.314	0.551	0.472	0.629	0.787	0.031	0.787	104	345003	
		90°	CC..1605..	2.165	SCFCE14CK-16	2.125	0.314	0.629	0.551	0.708	0.905	0.031	0.925	105	345004	
		80°	CC..0602..	0.984	SCOCR08CK-06	1.102	0.236	0.255	0.314	0.393	0.354	0.015	0.511	101	345014	
		80°	CC..09T3..	1.574	SCOCR10CK-09	1.496	0.295	0.393	0.393	0.511	0.492	0.031	0.669	103	345009	
		75°	CC..0602..	0.984	SCRCR08CK-06	1.102	0.236	0.255	0.314	0.393	0.334	0.015	0.511	101	345013	
		75°	CC..09T3..	1.574	SCRCR10CK-09	1.496	0.295	0.393	0.393	0.511	0.460	0.031	0.669	103	345008	
		70°	CC..0602..	0.984	SCPCR08CK-06	1.102	0.236	0.255	0.314	0.393	0.314	0.015	0.511	101	345012	
		70°	CC..09T3..	1.574	SCPCR10CK-09	1.496	0.295	0.393	0.393	0.511	0.433	0.031	0.669	103	345007	
		60°	CC..0602..	0.984	SCTCR08CK-06	1.102	0.236	0.255	0.314	0.393	0.275	0.015	0.511	101	345011	
		60°	CC..09T3..	1.574	SCTCR10CK-09	1.496	0.295	0.393	0.393	0.511	0.381	0.031	0.669	103	345006	
		45°	CC..0602..	0.984	SCSCR08CK-06	0.944	0.236	0.255	0.314	0.393	0.393	0.015	0.511	101	345010	
		45°	CC..09T3..	1.574	SCSCR10CK-09	1.259	0.295	0.393	0.393	0.511	0.570	0.031	0.669	103	345005	
			90°	CC..0602..	25.00	SCFCR08CK-06	28.00	6.00	6.50	8.00	10.00	10.00	0.40	13.00	101	345001
			90°	CC..09T3..	40.00	SCFCR10CK-09	38.00	7.50	10.00	10.00	13.00	14.00	0.80	17.00	103	345002
		90°	CC..1204..	50.00	SCFCR12CK-12	45.00	8.00	14.00	12.00	16.00	20.00	0.80	20.00	104	345003	
		90°	CC..1605..	55.00	SCFCE14CK-16	54.00	8.00	16.00	14.00	18.00	23.00	0.80	23.50	105	345004	
		80°	CC..0602..	25.00	SCOCR08CK-06	28.00	6.00	6.50	8.00	10.00	9.00	0.40	13.00	101	345014	
		80°	CC..09T3..	40.00	SCOCR10CK-09	38.00	7.50	10.00	10.00	13.00	12.50	0.80	17.00	103	345008	
		75°	CC..0602..	25.00	SCRCR08CK-06	28.00	6.00	6.50	8.00	10.00	8.50	0.40	13.00	101	345013	
		75°	CC..09T3..	40.00	SCRCR10CK-09	38.00	7.50	10.00	10.00	13.00	11.70	0.80	17.00	103	345009	
		70°	CC..0602..	25.00	SCPCR08CK-06	28.00	6.00	6.50	8.00	10.00	8.00	0.40	13.00	101	345012	
		70°	CC..09T3..	40.00	SCPCR10CK-09	38.00	7.50	10.00	10.00	13.00	11.00	0.80	17.00	103	345007	
		60°	CC..0602..	25.00	SCTCR08CK-06	28.00	6.00	6.50	8.00	10.00	7.00	0.40	13.00	101	345011	
		60°	CC..09T3..	40.00	SCTCR10CK-09	38.00	7.50	10.00	10.00	13.00	9.70	0.80	17.00	103	345006	
		45°	CC..0602..	25.00	SCSCR08CK-06	24.00	6.00	6.50	8.00	10.00	10.00	0.40	13.00	101	345010	
		45°	CC..09T3..	40.00	SCSCR10CK-09	32.00	7.50	10.00	10.00	13.00	14.50	0.80	17.00	103	345005	



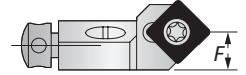
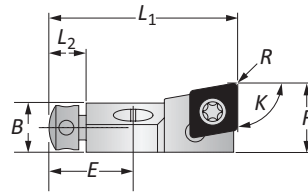
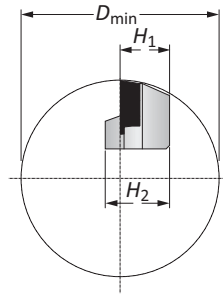
Key on B10-L-1

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

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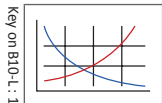
## Compact Lay Down Cartridges | Insert Form 112

Diameter Range:  $\geq 1.574$ " (40.00mm)

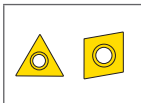


Holder Type	K	ISO	D <sub>min</sub> Boring Range	Designation	Insert Holder								Insert Form	Part No.
					L <sub>1</sub>	L <sub>2</sub>	B	H <sub>1</sub>	H <sub>2</sub>	F	R Radius	E		
	80°	SC..09T3..	1.574	SSOCR10CK-09	1.496	0.295	0.393	0.393	0.511	0.472	0.031	0.669	112	<b>345019</b>
	75°	SC..09T3..	1.574	SSRCR10CK-09	1.496	0.295	0.393	0.393	0.511	0.460	0.031	0.669	112	<b>345018</b>
	70°	SC..09T3..	1.574	SSPCR10CK-09	1.496	0.295	0.393	0.393	0.511	0.433	0.031	0.669	112	<b>345017</b>
	60°	SC..09T3..	1.574	SSTCR10CK-09	1.496	0.295	0.393	0.393	0.511	0.381	0.031	0.669	112	<b>345016</b>
	45°	SC..09T3..	1.574	SSSCR10CK-09	1.260	0.295	0.393	0.393	0.511	0.551	0.031	0.669	112	<b>345015</b>
	80°	SC..09T3..	40.00	SSOCR10CK-09	38.00	7.50	10.00	10.00	13.00	12.50	0.80	17.00	112	<b>345019</b>
	75°	SC..09T3..	40.00	SSRCR10CK-09	38.00	7.50	10.00	10.00	13.00	11.70	0.80	17.00	112	<b>345018</b>
	70°	SC..09T3..	40.00	SSPCR10CK-09	38.00	7.50	10.00	10.00	13.00	11.00	0.80	17.00	112	<b>345017</b>
	60°	SC..09T3..	40.00	SSTCR10CK-09	38.00	7.50	10.00	10.00	13.00	9.70	0.80	17.00	112	<b>345016</b>
	45°	SC..09T3..	40.00	SSSCR10CK-09	32.00	7.50	10.00	10.00	13.00	14.00	0.80	17.00	112	<b>345015</b>

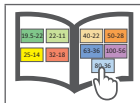
B10: 10 - 13



B10-F



B10: xii-xiii



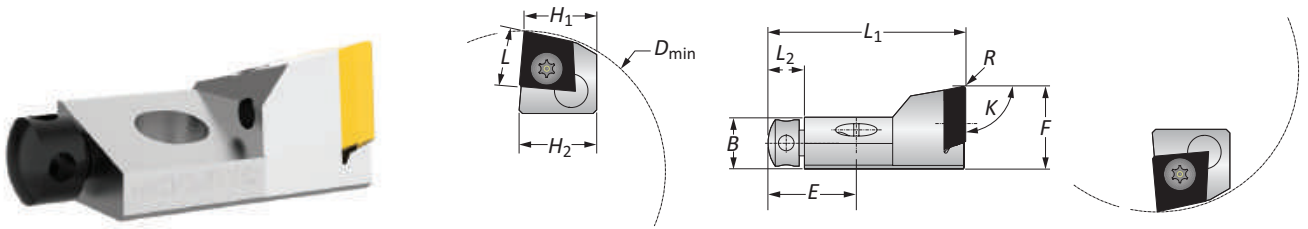
**i** = Imperial (in)  
**m** = Metric (mm)

Inserts sold separately


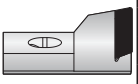

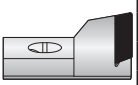


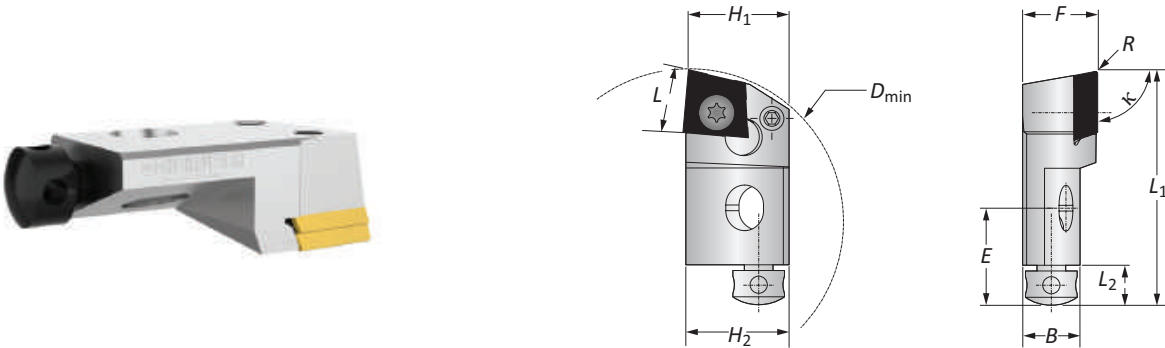
## Tangential Compact Lay Down Cartridges | Insert Forms 04, 05

Diameter Range:  $\geq 2.125$ " (54.00mm)




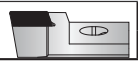


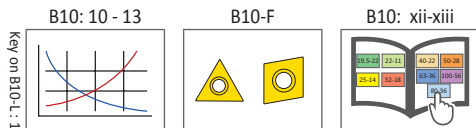
### Insert Form 04, 05 Insert Holders



Holder Type	K	D <sub>min</sub> Boring Range	Insert Holder								Holder Cutting Form	L	Insert Form	Part No.	
			L <sub>1</sub>	L <sub>2</sub>	B	H <sub>1</sub>	H <sub>2</sub>	F	R Radius	E					
		90°	2.125	1.496	0.295	0.393	0.551	0.590	0.629	0.019	0.669	Right	0.413	04	345023
		90°	2.125	1.496	0.295	0.393	0.551	0.590	0.629	0.019	0.669	Left	0.413	04	345025
		90°	2.755	2.755	0.314	0.551	0.748	0.787	0.866	0.019	0.787	Right	0.570	05	345020
		90°	2.755	2.755	0.314	0.551	0.748	0.787	0.866	0.019	0.787	Left	0.570	05	345022
		90°	54.00	38.00	7.50	10.00	14.00	15.00	16.00	0.50	17.00	Right	10.50	04	345023
		90°	54.00	38.00	7.50	10.00	14.00	15.00	16.00	0.50	17.00	Left	10.50	04	345025
		90°	70.00	45.00	8.00	14.00	19.00	20.00	22.00	0.50	20.00	Right	14.50	05	345020
		90°	70.00	45.00	8.00	14.00	19.00	20.00	22.00	0.50	20.00	Left	14.50	05	345022



### Insert Form 04, 05 Radial Cutting Insert Holders

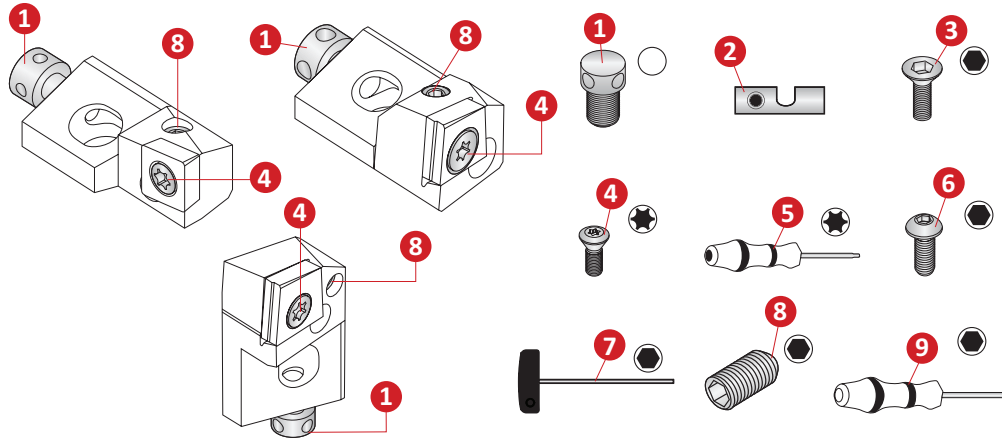
Holder Type	K	D <sub>min</sub> Boring Range	Insert Holder								Holder Cutting Form	L	Insert Form	Part No.	
			L <sub>1</sub>	L <sub>2</sub>	B	H <sub>1</sub>	H <sub>2</sub>	F	R Radius	E					
		90°	2.125	1.614	0.295	0.393	0.669	0.708	0.511	0.019	0.669	Right	0.413	04	345024
		90°	2.755	1.968	0.314	0.551	0.826	0.866	0.669	0.019	0.787	Right	0.570	05	345021
		90°	54.00	41.00	7.50	10.00	17.00	18.00	13.00	0.50	17.00	Right	10.50	04	345024
		90°	70.00	50.00	8.00	14.00	21.00	22.00	17.00	0.50	20.00	Right	14.50	05	345021



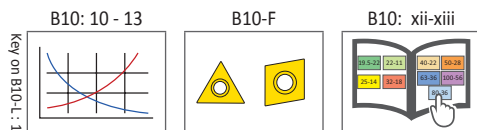
 = Imperial (in)  
 = Metric (mm)  
 Inserts sold separately

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## Compact Lay Down Cartridges Accessories



Insert Holder Part No.	1 Axial Barrel Screw	2 Shim	3 Insert Screw	4 Insert Screw	5 Torx Driver	6 Holder Fixing Screw	7 Hex Driver	8 Radial Set Screw	9 Hex Driver
345001	215742	345201	215461	115676	115590	215343	415577	114224	215472
345002	415299	345202	116433	115673-1	115664	215634	415164	070161	215473
345003	215250	345203	116433	415298	215150	215431	415164	215467	115575
345004	215265	345204	116433	215149	215150	315476	415165	215467	115575
345005	415299	345216	116433	115673-1	115664	215634	415164	070161	215473
345006	415299	345218	116433	115673-1	115664	215634	415164	070161	215473
345007	415299	345208	116433	115673	115664	215634	415164	070161	215473
345008	415299	345208	116433	115673-1	115664	215634	415164	070161	215473
345009	415299	345202	116433	115673-1	115664	215634	415164	070161	215473
345010	215742	345211	215461	115676	115590	215343	415577	114224	215472
345011	215742	345211	215461	115676	115590	215343	415577	114224	215472
345012	215742	345213	215461	115676	115590	215343	415577	114224	215472
345013	215742	345213	215461	115676	115590	215343	415577	114224	215472
345014	215742	345201	215461	115676	115590	215343	415577	114224	215472
345015	415299	345215	116433	115673-1	115664	215634	415164	070161	215473
345016	415299	345216	116433	115673-1	115664	215634	415164	070161	215473
345017	415299	345218	116433	115673-1	115664	215634	415164	070161	215473
345018	415299	345218	116433	115673-1	115664	215634	415164	070161	215473
345019	415299	345208	116433	115673-1	115664	215634	415164	070161	215473
345020	215250	345220	116433	415949	215150	315476	415165	215467	115575
345021	215250	345221	116433	415949	215150	315476	415165	215104	115575
345022	215250	345222	116433	415949	215150	315476	415165	215467	115575
345023	415299	345223	116433	415977	115664	215634	415164	415280	215473
345024	415299	345224	116433	415977	115664	215634	415164	070161	215473
345025	415299	345225	116433	415977	115664	215634	415164	415280	215473

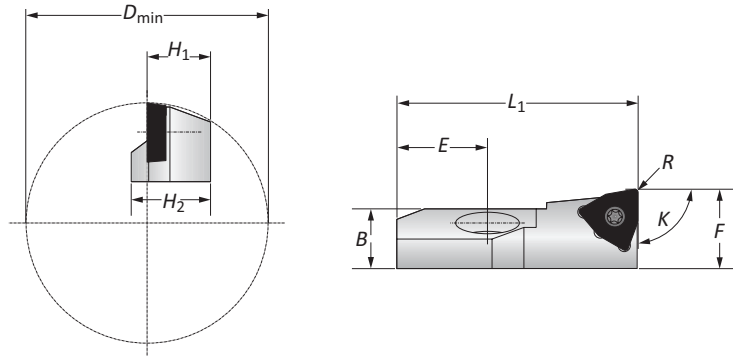


i = Imperial (in)  
m = Metric (mm)

Inserts sold separately

Lay Down Cartridges for Heavy Cutting | Insert Forms 112, 113, 453, 455, 456, 457, 458, 459, 460, 461

Diameter Range: ≥1.181" (30.00mm)



Holder Type	K	ISO	D <sub>min</sub> Boring Range	Designation	Insert Holder							Insert Form	Part No.	
					L <sub>1</sub>	B	H <sub>1</sub>	H <sub>2</sub>	F	R Radius	E			
i	85°	SC..09T3..	1.574	SSYCR10CX-09	1.574	0.393	0.393	0.590	0.511	0.015	0.590	112	344021	
	85°	SC..1204..	1.957	SSYCR12CX-12	1.732	0.511	0.472	0.787	0.708	0.031	0.551	113	344022	
	90°	WCGX0302..	1.181	SWFCR08CX-03	0.984	0.255	0.314	0.433	0.354	0.015	0.393	453	344001	
	90°	WCGX0302..	1.574	SWFCR10CX-05	1.574	0.393	0.393	0.590	0.511	0.015	0.590	453	344002	
	90°	WCGX05T3..	1.574	SWFCR10CX-05HD	1.574	0.393	0.393	0.590	0.511	0.015	0.590	455	344003	
	90°	WCGX0603..	1.968	SWFCR12CX-06	1.732	0.511	0.472	0.787	0.708	0.015	0.551	456	344004	
	90°	WCGX06T3..	1.968	SWFCR12CX-06HD	1.732	0.511	0.472	0.787	0.708	0.015	0.551	457	344005	
	90°	WCGX0703..	1.968	SWFCR12CX-07	1.732	0.511	0.472	0.787	0.708	0.015	0.551	458	344006	
	90°	WCGX0704..	1.968	SWFCR12CX-07HD	1.732	0.511	0.472	0.787	0.708	0.015	0.551	459	344007	
	90°	WCGX0904..	2.362	SWFCR16CX-09	1.732	0.708	0.629	0.826	0.905	0.015	0.669	460	344008	
	90°	WCGX0905..	2.362	SWFCR16CX-09HD	1.732	0.708	0.629	0.826	0.905	0.015	0.669	461	344009	
	ii	78°	WCGX0302..	1.181	SWXCR08CX-03	0.984	0.255	0.314	0.433	0.354	0.015	0.393	453	344010
		78°	WCGX0503..	1.574	SWXCR10CX-05	1.574	0.393	0.393	0.590	0.511	0.015	0.590	454	344011
		78°	WCGX05T3..	1.574	SWXCR10CX-05HD	1.574	0.393	0.393	0.590	0.511	0.015	0.590	455	344012
		78°	WCGX0603..	1.968	SWXCR12CX-06	1.732	0.511	0.472	0.787	0.708	0.015	0.551	456	344013
		78°	WCGX06T3..	1.968	SWXCR12CX-06HD	1.732	0.511	0.472	0.787	0.708	0.015	0.551	457	344014
		78°	WCGX0703..	1.968	SWXCR12CX-07	1.732	0.511	0.472	0.787	0.708	0.015	0.551	458	344015
		78°	WCGX0704..	1.968	SWXCR12CX-07HD	1.732	0.511	0.472	0.787	0.708	0.015	0.551	459	344016
78°		WCGX0904..	2.362	SWXCR16CX-09	1.968	0.708	0.629	0.826	0.905	0.015	0.669	460	344017	
78°		WCGX0905..	2.362	SWXCR16CX-09HD	1.968	0.708	0.629	0.826	0.905	0.015	0.669	461	344018	
iii		85°	SC..09T3..	40.00	SSYCR10CX-09	40.00	10.00	10.00	15.00	13.00	0.40	15.00	112	344021
	85°	SC..1204..	50.00	SSYCR12CX-12	44.00	13.00	12.00	20.00	18.00	0.80	14.00	113	344022	
	90°	WCGX0302..	30.00	SWFCR08CX-03	25.00	6.50	8.00	11.00	9.00	0.40	10.00	453	344001	
	90°	WCGX0302..	40.00	SWFCR10CX-05	40.00	10.00	10.00	15.00	13.00	0.40	15.00	453	344002	
	90°	WCGX05T3..	40.00	SWFCR10CX-05HD	40.00	10.00	10.00	15.00	13.00	0.40	15.00	455	344003	
	90°	WCGX0603..	50.00	SWFCR12CX-06	44.00	13.00	12.00	20.00	18.00	0.40	14.00	456	344004	
	90°	WCGX06T3..	50.00	SWFCR12CX-06HD	44.00	13.00	12.00	20.00	18.00	0.40	14.00	457	344005	
	90°	WCGX0703..	50.00	SWFCR12CX-07	44.00	13.00	12.00	20.00	18.00	0.40	14.00	458	344006	
	90°	WCGX0704..	50.00	SWFCR12CX-07HD	44.00	13.00	12.00	20.00	18.00	0.40	14.00	459	344007	
	90°	WCGX0904..	60.00	SWFCR16CX-09	44.00	18.00	16.00	21.00	23.00	0.40	17.00	460	344008	
	90°	WCGX0905..	60.00	SWFCR16CX-09HD	44.00	18.00	16.00	21.00	23.00	0.40	17.00	461	344009	
	iii	78°	WCGX0302..	30.00	SWXCR08CX-03	25.00	6.50	8.00	11.00	9.00	0.40	10.00	453	344010
		78°	WCGX0503..	40.00	SWXCR10CX-05	40.00	10.00	10.00	15.00	13.00	0.40	15.00	454	344011
		78°	WCGX05T3..	40.00	SWXCR10CX-05HD	40.00	10.00	10.00	15.00	13.00	0.40	15.00	455	344012
		78°	WCGX0603..	50.00	SWXCR12CX-06	44.00	13.00	12.00	20.00	18.00	0.40	14.00	456	344013
		78°	WCGX06T3..	50.00	SWXCR12CX-06HD	44.00	13.00	12.00	20.00	18.00	0.40	14.00	457	344014
		78°	WCGX0703..	50.00	SWXCR12CX-07	44.00	13.00	12.00	20.00	18.00	0.40	14.00	458	344015
		78°	WCGX0704..	50.00	SWXCR12CX-07HD	44.00	13.00	12.00	20.00	18.00	0.40	14.00	459	344016
78°		WCGX0904..	60.00	SWXCR16CX-09	50.00	18.00	16.00	21.00	23.00	0.40	17.00	460	344017	
78°		WCGX0905..	60.00	SWXCR16CX-09HD	50.00	18.00	16.00	21.00	23.00	0.40	17.00	461	344018	

B10: 10 - 13

B10-F

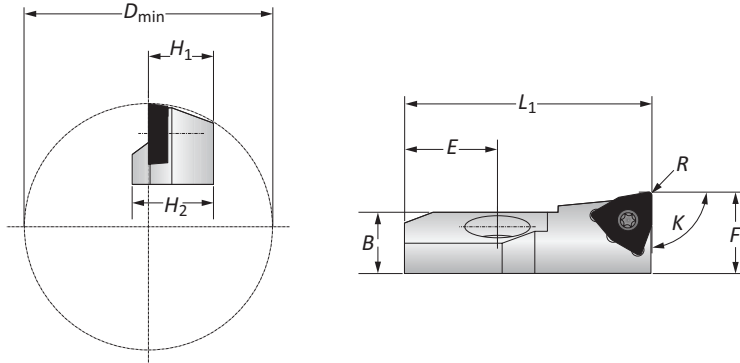
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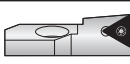
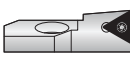
i = Imperial (in)  
 iii = Metric (mm)  
 Inserts sold separately

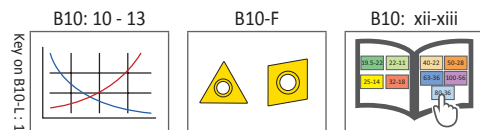
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## Lay Down Cartridges for Heavy Cutting | Insert Forms 161, 163

Diameter Range:  $\geq 1.574"$  (40.00mm)



Holder Type	K	ISO	D <sub>min</sub> Boring Range	Designation	Insert Holder							Insert Form	Part No.
					L <sub>1</sub>	B	H <sub>1</sub>	H <sub>2</sub>	F	R Radius	E		
<b>i</b> 	90°	TC..1102..	1.574	STFCR10CX-11	1.574	0.393	0.393	0.590	0.511	0.015	0.590	161	<b>344019</b>
	90°	TC..16T3..	1.968	STFCR12CX-16	1.732	0.511	0.472	0.787	0.708	0.031	0.551	163	<b>344020</b>
	90°	TC..16T3..	1.968	STGCR12CX-16	1.732	0.511	0.472	0.787	0.708	0.031	0.551	163	<b>344023</b>
<b>m</b> 	90°	TC..1102..	40.00	STFCR10CX-11	40.00	10.00	10.00	15.00	13.00	0.40	15.00	161	<b>344019</b>
	90°	TC..16T3..	50.00	STFCR12CX-16	44.00	13.00	12.00	20.00	18.00	0.80	14.00	163	<b>344020</b>
	90°	TC..16T3..	50.00	STGCR12CX-16	44.00	13.00	12.00	20.00	18.00	0.80	14.00	163	<b>344023</b>



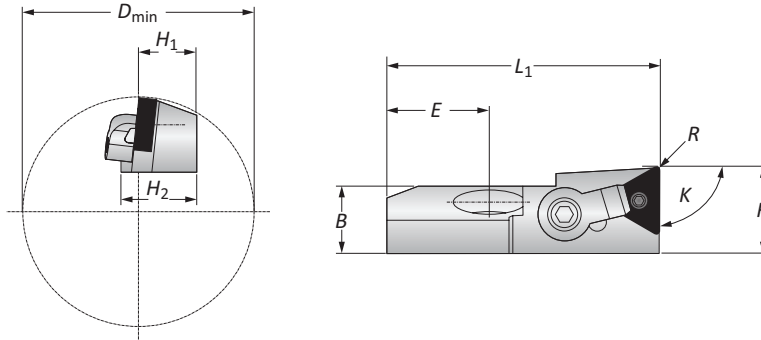
**i** = Imperial (in)  
**m** = Metric (mm)

Inserts sold separately

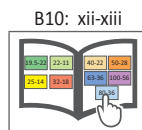
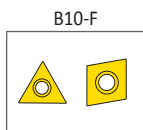
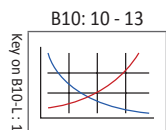


## Lay Down Cartridges for Heavy Cutting | Insert Forms 437, 123, 170, 171, 131, 132

Diameter Range:  $\geq 1.574''$  (40.00mm)

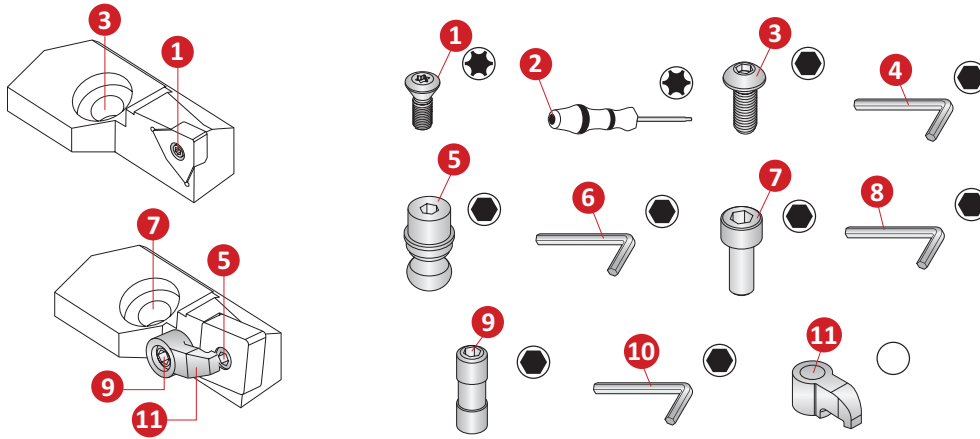


Holder Type	K	ISO	D <sub>min</sub> Boring Range	Designation	Insert Holder							Insert Form	Part No.
					L <sub>1</sub>	B	H <sub>1</sub>	H <sub>2</sub>	F	R Radius	E		
<b>i</b>	90°	CN..09T3..	1.574	MCFNR10CX-09	1.574	0.393	0.393	0.744	0.511	0.031	0.590	437	<b>344028</b>
	90°	CN..1204..	1.968	MCFNR12CX-12	1.732	0.511	0.472	0.929	0.708	0.031	0.551	123	<b>344029</b>
	90°	TN..1103..	1.574	MTFNR10CX-11	1.574	0.393	0.393	0.740	0.511	0.015	0.590	170	<b>344024</b>
	90°	TN..1604..	1.968	MTFNR12CX-16	1.732	0.511	0.472	0.925	0.708	0.031	0.551	171	<b>344025</b>
	85°	SN..0903..	1.574	MSYNR10CX-09	1.574	0.393	0.393	0.803	0.511	0.031	0.590	131	<b>344026</b>
	85°	SN..1204..	1.968	MSYNR12CX-12	1.732	0.511	0.472	0.929	0.708	0.031	0.551	132	<b>344027</b>
<b>m</b>	90°	CN..09T3..	40.00	MCFNR10CX-09	40.00	10.00	10.00	18.90	13.00	0.80	15.00	437	<b>344028</b>
	90°	CN..1204..	50.00	MCFNR12CX-12	44.00	13.00	12.00	23.60	18.00	0.80	14.00	123	<b>344029</b>
	90°	TN..1103..	40.00	MTFNR10CX-11	40.00	10.00	10.00	18.80	13.00	0.40	15.00	170	<b>344024</b>
	90°	TN..1604..	50.00	MTFNR12CX-16	44.00	13.00	12.00	23.50	18.00	0.80	14.00	171	<b>344025</b>
	85°	SN..0903..	40.00	MSYNR10CX-09	40.00	10.00	10.00	20.40	13.00	0.80	15.00	131	<b>344026</b>
	85°	SN..1204..	50.00	MSYNR12CX-12	44.00	13.00	12.00	23.60	18.00	0.80	14.00	132	<b>344027</b>



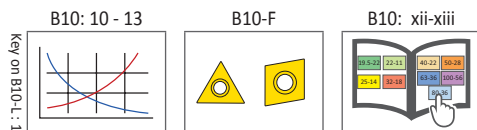
**i** = Imperial (in)  
**m** = Metric (mm)  
 Inserts sold separately

## Lay Down Cartridge for Heavy Cutting Accessories



Insert Holder Part No.	1 Insert Screw	2 Torx Driver	3 Fixing Holder Screw	4 Hex Wrench
344001	415966	115537	415997	051110
344002	415967	115591	415998	005195
344003	415967	115591	415998	005195
344004	415974	115664	415999	005195
344005	415974	115664	415999	005195
344006	415975	115664	415999	005195
344007	415975	115664	415999	005195
344008	415975	115664	515100	100102
344009	415975	115664	515100	100102
344010	415966	115537	415997	051110
344011	415967	115591	415998	005195
344012	415967	115591	415998	005195
344013	415974	115664	415999	005195
344014	415974	115664	415999	005195
344015	415975	115664	415999	005195
344016	415975	115664	415999	005195
344017	415975	115664	515100	100102
344018	415975	115664	515100	100102
344019	415967	115591	415998	005195
344020	415973	115664	415999	005195
344021	415973	115664	415998	005195
344022	415969	215150	415999	005195
344023	415973	115664	415999	005195

Insert Holder Part No.	5 Insert Lock	6 Hex Wrench	7 Fixing Holder Set Screw	8 Hex Wrench	9 Top Clamp Lock	10 Hex Wrench	11 Top Clamp
344024	515100	027148	415998	005195	515104	031148	415976
344025	515101	027149	415999	005195	515104	031148	515105
344026	515101	027149	415999	005195	515104	031148	515105
344027	515103	027149	415999	005195	515104	031148	515105
344028	515101	027149	415999	005195	515104	031148	415976
344029	515103	027149	415999	005195	515104	031148	515105



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

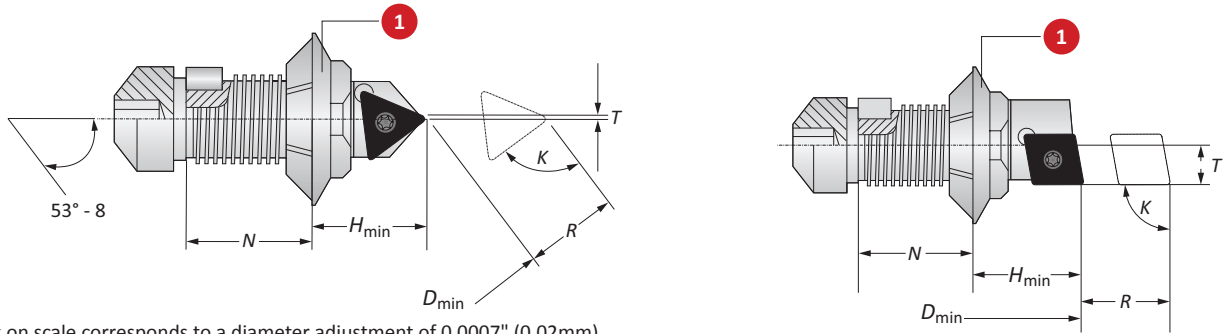
Inserts sold separately





## Fine Boring Cartridges for Pre-Processing | Insert Forms 101, 159, 160, 161, 163

Diameter Range:  $\geq 0.625''$  (15.87mm)



1 Mark on scale corresponds to a diameter adjustment of 0.0007" (0.02mm)

### Insert Form 101 Insert Holders

Holder Type	K	ISO	D <sub>min</sub> Boring Range	Designation	Insert Holder				Insert Form	Part No.	
					R Insert Radius	N	H <sub>min</sub>	T*			
i		90°	CC.0602..	0.933	R3B2C	0.157	0.468	0.437	0.007	101	340011
m		90°	CC.0602..	23.70	R3B2C	4.00	11.90	11.10	0.20	101	340011

\*Maximum radial adjustment

### Insert Form 101 Insert Holders

Holder Type	K	ISO	D <sub>min</sub> Boring Range	Designation	Insert Holder				Insert Form	Part No.	
					R Insert Radius	N	H <sub>min</sub>	T*			
i		90°	CC.0602..	1.236	R3A5C	0.015	0.625	0.437	-0.015	101	340024
m		90°	CC.0602..	31.40	R3A5C	0.40	15.90	11.10	-0.40	101	340024

\*Maximum radial adjustment

### Insert Form 159, 160, 161, 163 Insert Holders

Holder Type	K	ISO	D <sub>min</sub> Boring Range	Designation	Insert Holder				Insert Form	Part No.	
					R Insert Radius	N	H <sub>min</sub>	T*			
i		90°	TC..06T1..	0.625	R2B2S	0.029	0.250	0.370	0.053	159	340004
		90°	TC..06T1..	0.716	R2B2	0.078	0.374	0.370	0.053	159	340002
		90°	TC..06T1..	0.822	R2A2	0.177	0.500	0.370	0.053	159	340001
		90°	TC..06T1..	0.905	R3B1	0.157	0.468	0.444	0.051	159	340010
		90°	TC..0902..	0.984	R3B2	0.157	0.468	0.531	0.031	160	340008
		90°	TC..0902..	1.102	R3A2	0.287	0.625	0.531	0.031	160	340006
		90°	TC..1102..	1.417	R5B2	0.220	0.748	0.669	0.090	161	340014
		90°	TC..1102..	1.614	R5A2	0.421	1.000	0.669	0.090	161	340012
m		90°	TC..16T3..	2.283	R7A2	0.503	1.251	1.007	-0.015	163	340017
		90°	TC..06T1..	15.87	R2B2S	0.75	6.35	9.40	1.35	159	340004
		90°	TC..06T1..	18.20	R2B2	2.00	9.50	9.40	1.35	159	340002
		90°	TC..06T1..	20.90	R2A2	4.50	12.70	9.40	1.35	159	340001
		90°	TC..06T1..	23.00	R3B1	4.00	11.90	11.30	1.32	159	340010
		90°	TC..0902..	25.00	R3B2	4.00	11.90	13.50	0.80	160	340008
		90°	TC..0902..	28.00	R3A2	7.30	15.90	13.50	0.80	160	340006
		90°	TC..1102..	36.00	R5B2	5.60	19.00	17.00	2.30	161	340014
		90°	TC..1102..	41.00	R5A2	10.70	25.40	17.00	2.30	161	340012
		90°	TC..16T3..	58.00	R7A2	12.80	31.80	25.60	-0.40	163	340017

\*Maximum radial adjustment

B10: 10 - 13

B10-F

B10: xii-xiii

Key on B10-1

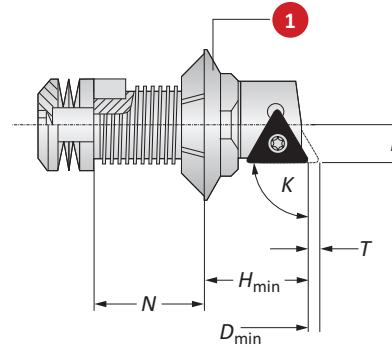
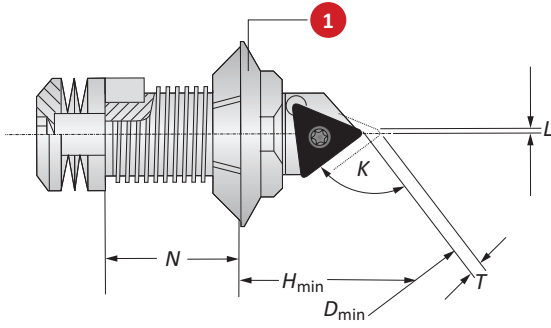
i = Imperial (in)  
m = Metric (mm)

Inserts sold separately

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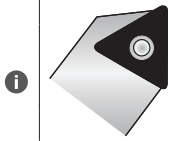
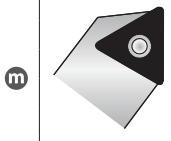
## Fine Boring Cartridges for Pre-Processing | Insert Forms 159, 73, 161, 163, 160

Diameter Range:  $\geq 0.731"$  (18.57mm)





1 Mark on scale corresponds to a diameter adjustment of 0.0007" (0.02mm)

### Insert Form 159, 161, 163 Insert Holders

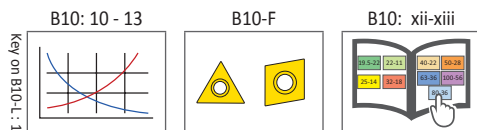
Holder Type	K	ISO	D <sub>min</sub> Boring Range	Designation	Insert Holder					Insert Form	Part No.
					T	R	N	H <sub>min</sub>	L*		
	90°	TC..06T1..	0.731	TR2B2S	0.007	0.029	0.250	0.370	0.053	159	340005
	90°	TC..06T1..	0.822	TR2B2	0.007	0.078	0.374	0.370	0.053	159	340003
	90°	TC..0902..	1.086	TR3B2	0.011	0.157	0.468	0.531	0.031	73	340009
	90°	TC..0902..	1.212	TR3A2	0.011	0.287	0.625	0.531	0.031	73	340007
	90°	TC..1102..	1.437	TR5B2	0.015	0.220	0.748	0.669	0.090	161	340015
	90°	TC..1102..	1.102	TR5B2-LH	0.015	0.220	0.748	0.669	0.090	161	340016
	90°	TC..1102..	1.102	TR5A2	0.015	0.421	1.000	0.669	0.090	161	340013
	90°	TC..16T3..	2.244	TR7B2	0.023	0.314	1.000	1.007	-0.015	163	340019
	90°	TC..16T3..	2.421	TR7A2	0.023	0.503	1.251	1.007	-0.015	163	340018
90°	TC..16T3..	3.208	TR10A2	0.027	0.905	1.874	1.248	-0.015	163	340020	
	90°	TC..06T1..	18.57	TR2B2S	0.20	0.75	6.35	9.40	1.35	159	340005
	90°	TC..06T1..	20.90	TR2B2	0.20	2.00	9.50	9.40	1.35	159	340003
	90°	TC..0902..	27.60	TR3B2	0.28	4.00	11.90	13.50	0.80	73	340009
	90°	TC..0902..	30.80	TR3A2	0.28	7.30	15.90	13.50	0.80	73	340007
	90°	TC..1102..	36.50	TR5B2	0.40	5.60	19.00	17.00	2.30	161	340015
	90°	TC..1102..	28.00	TR5B2-LH	0.40	5.60	19.00	17.00	2.30	161	340016
	90°	TC..1102..	28.00	TR5A2	0.40	10.70	25.40	17.00	2.30	161	340013
	90°	TC..16T3..	57.00	TR7B2	0.60	8.00	25.40	25.60	-0.40	163	340019
	90°	TC..16T3..	61.50	TR7A2	0.60	12.80	31.80	25.60	-0.40	163	340018
90°	TC..16T3..	81.50	TR10A2	0.70	23.00	47.60	31.70	-0.40	163	340020	

\*Maximum radial adjustment

### Insert Form 160 Insert Holders

Holder Type	K	ISO	D <sub>min</sub> Boring Range	Designation	Insert Holder					Insert Form	Part No.
					T	R	N	H <sub>min</sub>	L*		
	90°	TC..0909..	1.224	TR3B5L	0.015	0.196	0.468	0.484	0.078	160	340025
	90°	TC..0909..	1.381	TR3A5	0.015	0.358	0.625	0.484	0.118	160	340022
	90°	TC..0909..	31.10	TR3B5L	0.40	5.00	11.90	12.30	2.00	160	340025
	90°	TC..0909..	35.10	TR3A5	0.40	9.10	15.90	12.30	3.00	160	340022

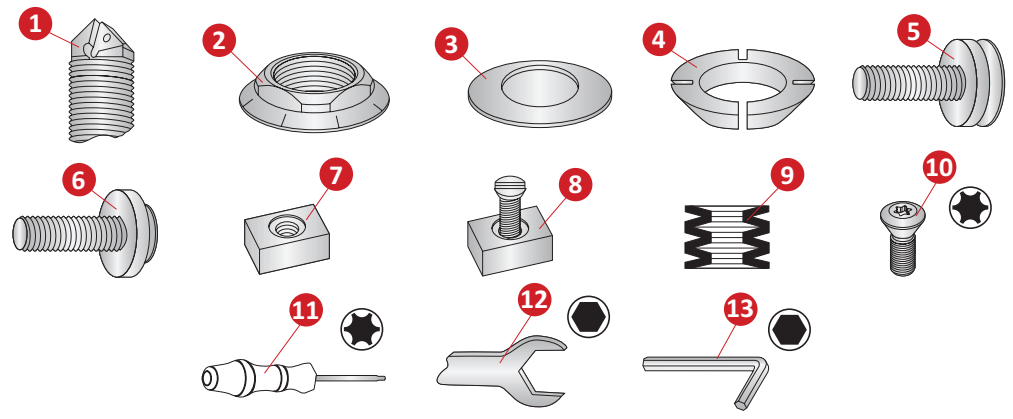
\*Maximum radial adjustment



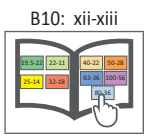
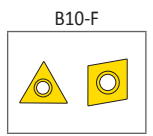
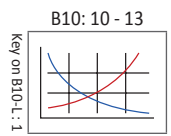
i = Imperial (in)  
m = Metric (mm)



Inserts sold separately

Fine Boring Cartridge Accessories



Insert Holder Part No.	1	2	3	4	5	6	7	8	9	10	11	12	13
	Insert Holder	Adjust Dial	Disk Spring	Collet	Screw + Washer	Tightening Bolt	Adjusting Spring	Adjusting Spring + Screw	Spring Package	Insert Screw	Torx Driver	Adjust Wrench	Hex Wrench
340001	340101	-	-	-	340155	-	-	-	-	415970	115537	515271	027149
340002	340102	-	-	-	340155	-	-	-	-	415970	115537	515271	027149
340003	340148	-	-	-	340118	-	-	-	340132	415970	115537	515271	027149
340004	340103	-	-	-	340150	-	-	-	-	415970	115537	515271	027149
340006	340105	340107	340126	340110	-	340138	340143	-	-	415971	115591	515272	031148
340007	340105	340107	340126	340110	340119	-	340143	-	340133	419971	115591	515272	031148
340008	340106	340107	340126	340110	-	340139	340143	-	-	415971	115591	515272	031148
340009	340106	340107	340126	340110	340120	-	340143	-	340133	415971	115591	515272	031148
340010	340104	340107	340126	340110	-	340137	340143	-	-	415971	115591	515272	031148
340012	340115	340109	340127	340111	-	340140	-	340144	-	415967	115591	515272	003195
340013	340115	340109	340129	340111	340121	-	-	340144	340134	415967	115591	515272	003195
340014	340108	340109	340127	340111	-	340141	-	340144	-	415967	115591	515272	003195
340015	340108	340109	340129	340111	340122	-	-	340144	340134	415967	115591	515272	003195
340017	340147	340150	340128	340153	-	340142	-	340145	-	415968	115664	515273	100102
340018	340147	340150	340130	340153	340123	-	-	340145	340135	415968	115664	515273	100102
340019	340149	340150	340130	340153	340124	-	-	340145	340135	415968	115664	515273	100102
340020	340116	340152	340131	340154	340125	-	-	340146	340136	515276	115664	515273	019195
340022	340113	340151	340126	340110	340119	-	340143	-	340133	415971	115591	515272	031148
340025	340114	340151	340126	340110	340120	-	340143	-	340133	415971	115591	515272	031148

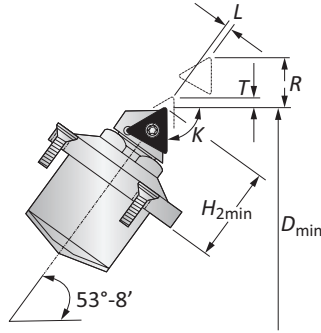


 = Imperial (in)  
 = Metric (mm)  
 Inserts sold separately

A  
B  
C  
D  
E  
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## Fine Boring Lay Down Cartridges | Insert Forms 101, 103, 73, 160, 161, 163

Diameter Range:  $\geq 0.945''$  (24.00mm)



### Insert Form 101, 103 Insert Holders

Holder Type	K	ISO	D <sub>min</sub> Boring Range	Designation	Insert Holder				Insert Form	Part No.
					T	R*	H <sub>2min</sub>	L**		
	90°	CC..0602..	1.181	MBTR/SAB2-3B2C	0.011	0.157	0.644	0.007	101	339015
	90°	CC..0602..	1.181	MBTR/SAB2-3B2CLH	0.011	0.157	0.644	0.007	101	339016
	90°	CC..0602..	1.574	MBTR/SAB3-5B2CM	0.015	0.220	0.856	0.047	101	339019
	90°	CC..0602..	1.574	MBTR/SAB3-7B2CLHM	0.015	0.220	0.856	0.047	101	339020
	90°	CC..09T3..	2.283	MBTR/SAB4-7B2C	0.023	0.314	1.282	0.062	103	339023
	90°	CC..09T3..	2.283	MBTR/SAB4-7B2CLH	0.023	0.314	1.282	0.062	103	339024
	90°	CC..0602..	30.00	MBTR/SAB2-3B2C	0.28	4.00	16.35	0.20	101	339015
	90°	CC..0602..	30.00	MBTR/SAB2-3B2CLH	0.28	4.00	16.35	0.20	101	339016
	90°	CC..0602..	40.00	MBTR/SAB3-5B2CM	0.40	5.60	21.75	1.20	101	339019
	90°	CC..0602..	40.00	MBTR/SAB3-7B2CLHM	0.40	5.60	21.75	1.20	101	339020
	90°	CC..09T3..	58.00	MBTR/SAB4-7B2C	0.60	8.00	32.75	1.60	103	339023
	90°	CC..09T3..	58.00	MBTR/SAB4-7B2CLH	0.60	8.00	32.75	1.60	103	339024

\*Maximum radial adjustment

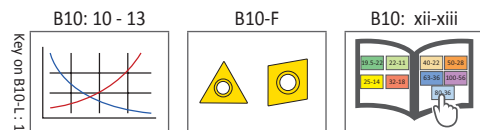
\*\*Measuring point to the tip of the insert

### Insert Form 73, 160, 161, 163 Insert Holders

Holder Type	K	ISO	D <sub>min</sub> Boring Range	Designation	Insert Holder				Insert Form	Part No.
					T	R*	H <sub>2min</sub>	L**		
	75°	TC..06T1..	0.945	MBTR/SAB-2B2L	0.007	0.078	0.539	-0.059	73	339014
	75°	TC..06T1..	0.945	MBTR/SAB1-2B2LLH	0.007	0.078	0.539	-0.059	73	339027
	75°	TC..0902..	1.181	MBTR/SAB2-3B2C	0.011	0.157	0.740	0.043	160	339017
	75°	TC..0902..	1.181	MBTR/SAB2-3B2LLH	0.011	0.157	0.740	0.043	160	339018
	75°	TC..1102..	1.575	MBTR/SAB3-5B2LM	0.015	0.220	0.881	0.051	161	339021
	75°	TC..1102..	1.575	MBTR/SAB3-5B2LLHM	0.015	0.220	0.881	0.051	161	339022
	75°	TC..16T3..	2.283	MBTR/SAB4-7B2L	0.023	0.314	1.157	-0.125	163	339025
	75°	TC..16T3..	2.283	MBTR/SAB4-7B2LLH	0.023	0.314	1.157	-0.125	163	339026
	75°	TC..06T1..	24.00	MBTR/SAB-2B2L	0.20	2.00	13.70	-1.50	73	339014
	75°	TC..06T1..	24.00	MBTR/SAB1-2B2LLH	0.20	2.00	13.70	-1.50	73	339027
	75°	TC..0902..	30.00	MBTR/SAB2-3B2C	0.28	4.00	18.80	1.10	160	339017
	75°	TC..0902..	30.00	MBTR/SAB2-3B2LLH	0.28	4.00	18.80	1.10	160	339018
	75°	TC..1102..	40.00	MBTR/SAB3-5B2LM	0.40	5.60	22.40	1.30	161	339021
	75°	TC..1102..	40.00	MBTR/SAB3-5B2LLHM	0.40	5.60	22.40	1.30	161	339022
	75°	TC..16T3..	58.00	MBTR/SAB4-7B2L	0.60	8.00	29.40	-3.20	163	339025
	75°	TC..16T3..	58.00	MBTR/SAB4-7B2LLH	0.60	8.00	29.40	-3.20	163	339026

\*Maximum radial adjustment

\*\*Measuring point to the tip of the insert

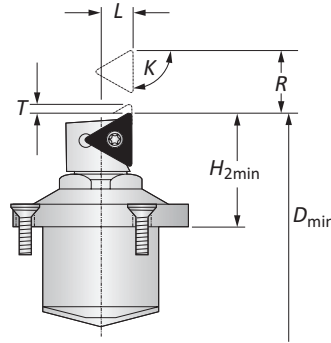


= Imperial (in)  
 = Metric (mm)



Inserts sold separately

## Fine Boring Lay Down Cartridges | Insert Forms 101, 103, 73, 160, 161, 163

Diameter Range: ≥0.984" (25.00mm)





### Insert Form 101, 103 Insert Holders

Holder Type	K	ISO	D <sub>min</sub> Boring Range	Designation	Insert Holder				Insert Form	Part No.
					T	R*	H <sub>2min</sub>	L**		
	90°	CC..0602..	1.299	MBTR/SAB2-3B5C	0.013	0.196	0.644	0.157	101	339003
	90°	CC..0602..	1.299	MBTR/SAB2-3B5CLH	0.013	0.196	0.644	0.157	101	339004
	90°	CC..0602..	1.771	MBTR/SAB3-5B5CM	0.019	0.275	0.856	0.212	101	339007
	90°	CC..0602..	1.771	MBTR/SAB3-5B5CLHM	0.019	0.275	0.856	0.212	101	339008
	90°	CC..09T3..	2.480	MBTR/SAB4-7B5C	0.029	0.393	1.236	0.250	103	339011
	90°	CC..0602..	33.00	MBTR/SAB2-3B5C	0.35	5.00	16.35	4.00	101	339003
	90°	CC..0602..	33.00	MBTR/SAB2-3B5CLH	0.35	5.00	16.35	4.00	101	339004
	90°	CC..0602..	45.00	MBTR/SAB3-5B5CM	0.50	7.00	21.75	5.40	101	339007
	90°	CC..0602..	45.00	MBTR/SAB3-5B5CLHM	0.50	7.00	21.75	5.40	101	339008
	90°	CC..09T3..	63.00	MBTR/SAB4-7B5C	0.75	10.00	31.40	6.35	103	339011

\*Maximum radial adjustment

\*\*Measuring point to the tip of the insert

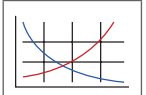
### Insert Form 73, 160, 161, 163 Insert Holders

Holder Type	K	ISO	D <sub>min</sub> Boring Range	Designation	Insert Holder				Insert Form	Part No.
					T	R*	H <sub>2min</sub>	L**		
	75°	TC..06T1..	0.984	MBTR/SAB-2B5L	0.009	0.098	0.515	0.078	73	339001
	75°	TC..06T1..	0.984	MBTR/SAB1-2B5LLH	0.009	0.098	0.515	0.078	73	339002
	75°	TC..0902..	1.299	MBTR/SAB2-3B5L	0.013	0.196	0.691	0.078	160	339005
	75°	TC..0902..	1.299	MBTR/SAB2-3B5LLH	0.013	0.196	0.691	0.078	160	339006
	75°	TC..1102..	1.771	MBTR/SAB3-5B5LM	0.019	0.275	0.864	0.125	161	339009
	75°	TC..1102..	1.771	MBTR/SAB3-5B5LLHM	0.019	0.275	0.864	0.125	161	339010
	75°	TC..16T3..	2.480	MBTR/SAB4-7B5L	0.029	0.393	1.240	0.244	163	339012
	75°	TC..16T3..	2.480	MBTR/SAB4-7B5LLH	0.029	0.393	1.240	0.244	163	339013
	75°	TC..06T1..	25.00	MBTR/SAB-2B5L	0.25	2.50	13.10	2.00	73	339001
	75°	TC..06T1..	25.00	MBTR/SAB1-2B5LLH	0.25	2.50	13.10	2.00	73	339002
	75°	TC..0902..	33.00	MBTR/SAB2-3B5L	0.35	5.00	17.55	2.00	160	339005
	75°	TC..0902..	33.00	MBTR/SAB2-3B5LLH	0.35	5.00	17.55	2.00	160	339006
	75°	TC..1102..	45.00	MBTR/SAB3-5B5LM	0.50	7.00	21.95	3.20	161	339009
	75°	TC..1102..	45.00	MBTR/SAB3-5B5LLHM	0.50	7.00	21.95	3.20	161	339010
	75°	TC..16T3..	63.00	MBTR/SAB4-7B5L	0.75	10.00	31.50	6.20	163	339012
	75°	TC..16T3..	63.00	MBTR/SAB4-7B5LLH	0.75	10.00	31.50	6.20	163	339013

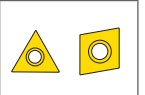
\*Maximum radial adjustment

\*\*Measuring point to the tip of the insert


B10: 10 - 13



B10-F



B10: xii-xiii

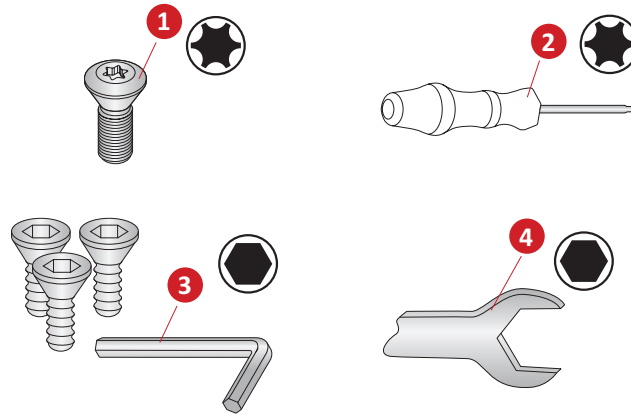


 = Imperial (in)  
 = Metric (mm)

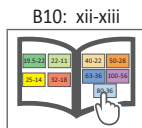
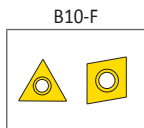
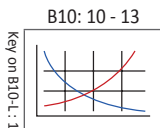
Inserts sold separately

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## Fine Boring Lay Down Cartridge Accessories



Insert Holder Part No.	1 Insert Screw	2 Torx Driver	3 Hex Wrench	4 Wrench
339001	415970	115537	339101	515271
339002	415970	115537	339101	515271
339003	415967	115591	339101	515272
339004	415967	115591	339101	515272
339005	415971	115591	339101	515272
339006	415971	115591	339101	515272
339007	415967	115591	339102	515272
339008	415967	115591	339102	515272
339009	415967	115591	339102	515272
339010	415967	115591	339102	515272
339011	415968	115664	339103	515273
339012	415968	115664	339103	515273
339013	415968	115664	339103	515273
339014	415970	115537	339101	515271
339015	415967	115591	339101	515272
339016	415967	115591	339101	515272
339017	415971	115591	339101	515272
339018	415971	115591	339102	515272
339019	415967	115591	339102	515272
339020	415967	115591	339102	515272
339021	415967	115591	339102	515272
339022	415967	115591	339102	515272
339023	415968	115664	339103	515273
339024	415968	115664	339103	515273
339025	415968	115664	339103	515273
339026	415968	115664	339103	515273
339027	415970	115537	339101	515271



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

Inserts sold separately







SECTION

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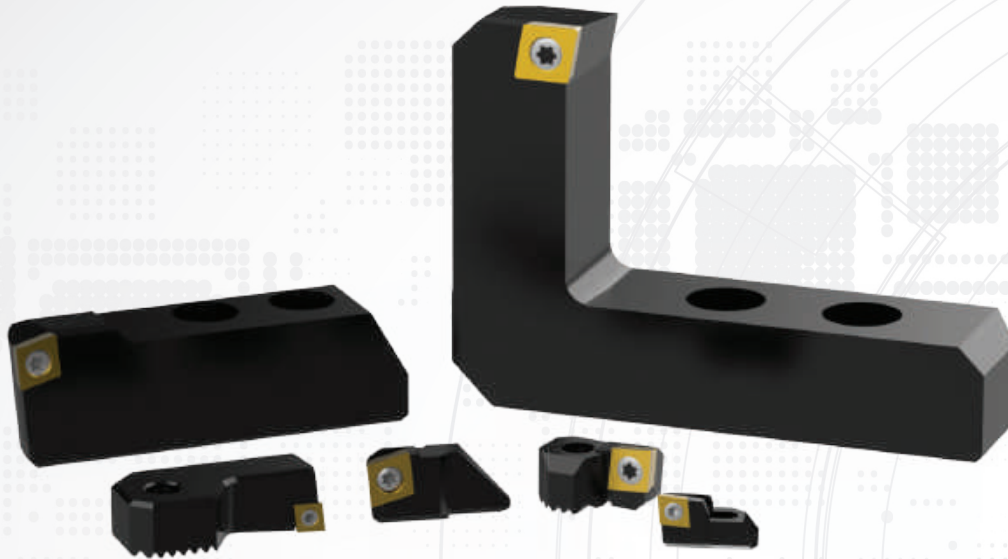
# B10-M

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Semi-Standard Insert Holders

# Wohlhaupter™ Semi-Standard Insert Holders

Insert Holders for Serrated Tool Bodies | Insert Holders for Outside Turning | Approach Angled Insert Holders



## Insert Holders for Every Boring Application

Wohlhaupter offers a complete range of semi-standard insert holders in various sized ISO insert geometries. These holders are designed in many forms to meet specific approach angles that may be required for your applications. Please consult your Allied tooling specialist in determining what is required for your application. All designs are pre-engineered and are generally available with lead times shorter than three weeks.

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.

## Applicable Industries



Aerospace



Agriculture



Automotive



Firearms



General  
Machining



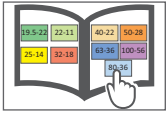
Oil & Gas



Renewable  
Energy

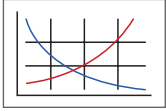
### Reference Icons

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



#### MVS Connection Color Guide

Detailed instructions and information regarding the MVS connection(s)



#### Recommended Cutting Data

Speed and feed recommendations for optimum and safe boring

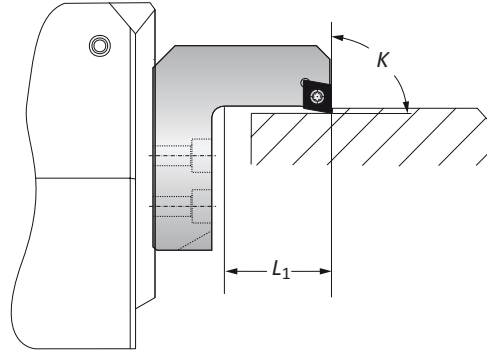
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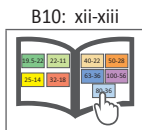
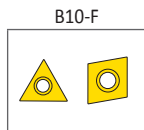
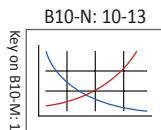
## Insert Holders for Serrated Tool Bodies - Form 103, 104

Diameter Range: 1.259" - 5.708" (32.00mm - 145.00mm)



	Serrated Tool Body	Boring Range	Insert Holders		Insert Form	Part No.
			$L_1$	$K$		
i	148006	1.259 - 2.165	0.905	90°	103	K24750
	148007	2.559 - 3.740	2.086	90°	104	K28701
	148009	3.543 - 5.708	2.086	90°	104	K28701
m	148006	32.00 - 55.00	23.00	90°	103	K24750
	148007	65.00 - 95.00	53.00	90°	104	K28701
	148009	90.00 - 145.00	53.00	90°	104	K28701

**NOTE:** Pricing and delivery available on request.

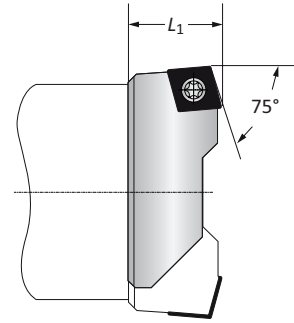


i = Imperial (in)  
m = Metric (mm)  
Inserts sold separately



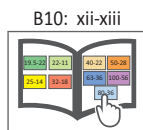
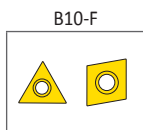
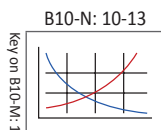
### Insert Holders for Serrated Tool Bodies - Form 103

Diameter Range: 1.147" - 8.070" (36.00mm - 205.00mm)



Serrated Tool Body		Boring Range	Insert Holders $L_1$	Insert Form	Part No.
i	148001	1.141 - 1.456	0.629	103	268011
	148002	1.147 - 1.732	0.629	103	268012
	148003	1.692 - 2.125	0.787	103	268013
	148004	1.692 - 2.125	0.787	103	268014
	148005	2.559 - 3.267	0.787	103	268015
	148007	3.937 - 5.118	1.181	103	268017
	148007	4.921 - 6.102	1.181	103	268018
	148009	5.905 - 8.070	1.181	103	268018
	m	148001	29.00 - 37.00	16.00	103
148002		36.00 - 44.00	16.00	103	268012
148003		43.00 - 54.00	20.00	103	268013
148004		53.00 - 66.00	20.00	103	268014
148005		65.00 - 83.00	20.00	103	268015
148007		100.00 - 130.00	30.00	103	268017
148007		125.00 - 155.00	30.00	103	268018
148009		150.00 - 205.00	30.00	103	268018

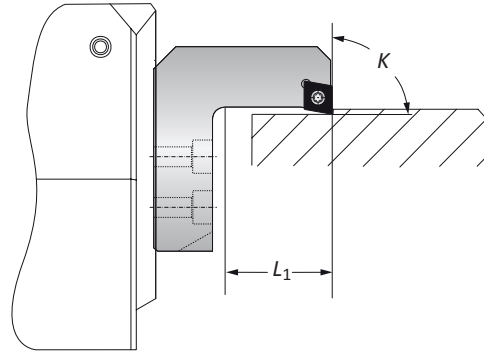
**NOTE:** Pricing and delivery available on request.



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

## Insert Holders for 350 (349) Serrated Tool Bodies - Form 104

Diameter Range: 5.905" - 38.180" (150.00mm - 970.00mm)



Serrated Tool Body	Boring Range	Insert Holders		Insert Form	Part No.
		L <sub>1</sub>	K		
350001	5.905 - 9.055	2.086	90°	104	K28703
350002	8.858 - 12.000	2.086	90°	104	K28703
350003	11.810 - 14.960	2.086	90°	104	K28703
350004	14.760 - 17.910	2.086	90°	104	K28703
350005	16.330 - 27.360	2.086	90°	104	K28703
350014*	16.330 - 27.360	2.086	90°	104	K28703
350006	27.160 - 38.180	2.086	90°	104	K28703
350014*	27.160 - 38.180	2.086	90°	104	K28703
350001	5.905 - 9.055	2.480	90°	104	K31892
350002	8.858 - 12.000	2.480	90°	104	K31892
350003	11.810 - 14.960	2.480	90°	104	K31892
350004	14.760 - 17.910	2.480	90°	104	K31892
350005	16.330 - 27.360	2.480	90°	104	K31892
350014*	16.330 - 27.360	2.480	90°	104	K31892
350006	27.160 - 38.180	2.480	90°	104	K31892
350014*	27.160 - 38.180	2.480	90°	104	K31892
349001	150.00 - 230.00	53.00	90°	104	K28703
349002	225.00 - 305.00	53.00	90°	104	K28703
349003	300.00 - 380.00	53.00	90°	104	K28703
349004	375.00 - 455.00	53.00	90°	104	K28703
349005	415.00 - 695.00	53.00	90°	104	K28703
349014*	415.00 - 695.00	53.00	90°	104	K28703
349006	690.00 - 970.00	53.00	90°	104	K28703
349014*	690.00 - 970.00	53.00	90°	104	K28703
349001	150.00 - 230.00	63.00	90°	104	K31892
349002	225.00 - 305.00	63.00	90°	104	K31892
349003	300.00 - 380.00	63.00	90°	104	K31892
349004	375.00 - 455.00	63.00	90°	104	K31892
349005	415.00 - 695.00	63.00	90°	104	K31892
349014*	415.00 - 695.00	63.00	90°	104	K31892
349006	690.00 - 970.00	63.00	90°	104	K31892
349014*	690.00 - 970.00	63.00	90°	104	K31892

\*Insert holder should only be used with the large diameter Alu-Line systems  
**NOTE:** Pricing and delivery available on request.

Key on B10-M: 1

B10-N: 10-13

B10-F

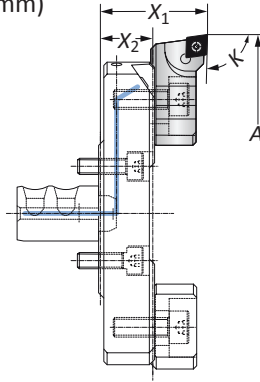
B10: xii-xiii

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



### Insert Holders for DigiBore - Form 101, 103

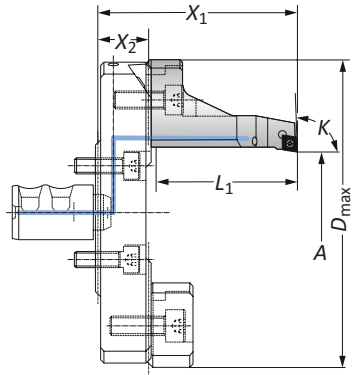
Diameter Range: 0.078" - 4.488" (2.00mm - 114.00mm)



#### 92° Angle Approach DigiBore Insert Holders - Form 103

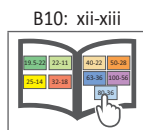
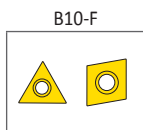
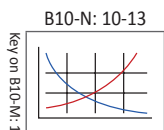
	Serrated Slide	Boring Range A	Insert Holders			Insert Form	Part No.
			X <sub>1</sub>	X <sub>2</sub>	K		
i	501054	2.677 - 3.779	1.279	0.629	92°	103	502063
	501055	3.779 - 4.881	1.279	0.629	92°	103	502063
	501056	4.921 - 5.984	1.279	0.629	92°	103	502063
	501058	5.984 - 7.086	1.515	0.866	92°	103	502063
	501059	7.086 - 8.188	1.515	0.866	92°	103	502063
m	501054	68.00 - 96.00	32.50	16.00	92°	103	502063
	501055	96.00 - 124.00	32.50	16.00	92°	103	502063
	501056	125.00 - 152.00	32.50	16.00	92°	103	502063
	501058	152.00 - 180.00	38.50	22.00	92°	103	502063
	501059	180.00 - 208.00	38.50	22.00	92°	103	502063

NOTE: Pricing and delivery available on request.



#### DigiBore Outside Turning Insert Holders - Form 101

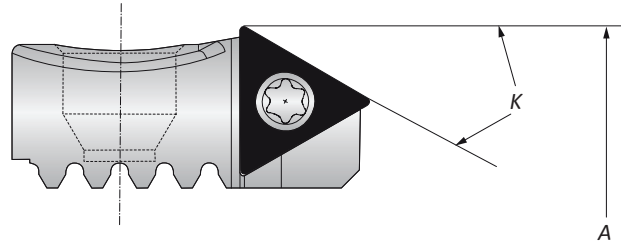
	Serrated Slide	Boring Range A	Insert Holders				K	Insert Form	Part No.
			X <sub>1</sub>	X <sub>2</sub>	L <sub>1</sub>	D <sub>max</sub>			
i	501055	0.078 - 1.181	2.874	0.629	2.165	3.976	92°	101	K31523
	501056	1.181 - 2.283	2.874	0.629	2.165	5.078	92°	101	K31523
	501058	2.283 - 3.385	3.110	0.866	2.165	6.181	92°	101	K31523
	501059	3.385 - 4.488	3.110	0.866	2.165	7.283	92°	101	K31523
m	501055	2.00 - 30.00	73.00	16.00	55.00	101.00	92°	101	K31523
	501056	30.00 - 58.00	73.00	16.00	55.00	129.00	92°	101	K31523
	501058	58.00 - 86.00	79.00	22.00	55.00	157.00	92°	101	K31523
	501059	86.00 - 114.00	79.00	22.00	55.00	185.00	92°	101	K31523



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

### 30° Angle Approach Insert Holders - Form 20

Diameter Range: 1.338" - 40.070" (34.00mm - 1018.00mm)



Boring Tool	Boring Range	Insert Holders	Insert Form	Part No.	
	A	K			
i	320001	1.338 - 1.653	30°	20	K26950
	365033	1.535 - 2.011	30°	20	K26950
	320003	1.614 - 2.047	30°	20	K26950
	365034	1.889 - 2.500	30°	20	K26950
	320004	2.007 - 2.519	30°	20	K25275
	365045	2.480 - 3.188	30°	20	K25275
	365046	3.149 - 3.976	30°	20	K25275
	365047	3.858 - 5.039	30°	20	K25275
	365048	4.842 - 6.515	30°	20	K25275
	365049	6.318 - 7.992	30°	20	K25275
338017	3.858 - 40.070	30°	20	K25275	
m	310001	34.00 - 42.00	30°	20	K26950
	364033	39.00 - 51.50	30°	20	K26950
	310003	41.00 - 52.00	30°	20	K26950
	364034	48.00 - 63.50	30°	20	K26950
	310004	51.00 - 64.00	30°	20	K25275
	364045	63.00 - 81.00	30°	20	K25275
	364046	80.00 - 101.00	30°	20	K25275
	364047	98.00 - 128.00	30°	20	K25275
	364048	123.00 - 165.50	30°	20	K25275
	364049	160.50 - 203.00	30°	20	K25275
337017	98.00 - 1018.00	30°	20	K25275	

NOTE: Pricing and delivery available on request.

Key on B10-M: 1

B10-N: 10-13

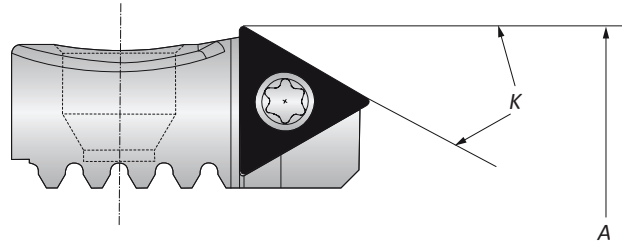
B10-F

B10: xii-xiii

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

## 45° Angle Approach Insert Holders - Form 20

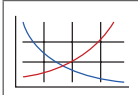
Diameter Range: 1.388" - 40.080" (34.70mm - 1018.20mm)



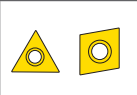
	Boring Range		Insert Holders		Part No.
	Boring Tool	A	K	Insert Form	
i	320001	1.388 - 1.708	45°	20	K19504
	365003	1.588 - 2.088	45°	20	K19504
	320003	1.668 - 2.088	45°	20	K19504
	365034	1.976 - 2.596	45°	20	K19504
	320004	2.015 - 2.527	45°	20	K19506
	365045	2.488 - 3.196	45°	20	K19506
	365046	3.157 - 3.984	45°	20	K19506
	365047	3.866 - 5.047	45°	20	K19506
	365048	4.850 - 6.523	45°	20	K19506
	365049	6.326 - 8.000	45°	20	K19506
338017	3.866 - 40.080	45°	20	K19506	
m	310001	34.70 - 42.70	45°	20	K19504
	364003	39.70 - 52.20	45°	20	K19504
	310003	41.70 - 52.20	45°	20	K19504
	364034	49.40 - 64.90	45°	20	K19504
	310004	51.20 - 64.20	45°	20	K19506
	364045	63.20 - 81.20	45°	20	K19506
	364046	80.20 - 101.20	45°	20	K19506
	364047	98.20 - 128.20	45°	20	K19506
	364048	123.20 - 165.70	45°	20	K19506
	364049	160.70 - 203.20	45°	20	K19506
337017	98.20 - 1018.20	45°	20	K19506	

**NOTE:** Pricing and delivery available on request.

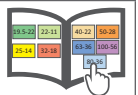
B10-N: 10-13



B10-F



B10: xii-xiii

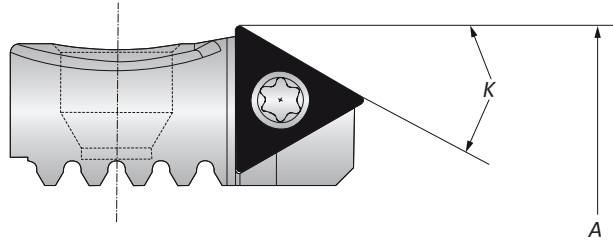


Key on B10-M: 1

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

## 60° Angle Approach Insert Holders - Form 20

Diameter Range: 1.377" - 40.110" (35.00mm - 1019.00mm)



	Boring Range		Insert Holders		Part No.
	Boring Tool	A	K	Insert Form	
i	320001	1.377 - 1.692	60°	20	K19505
	365003	1.574 - 2.066	60°	20	K19505
	320003	1.653 - 2.086	60°	20	K19505
	365034	1.929 - 2.539	60°	20	K19505
	320004	2.047 - 2.539	60°	20	K19507
	365045	2.519 - 3.228	60°	20	K19507
	365046	3.188 - 4.015	60°	20	K19507
	365047	3.897 - 5.078	60°	20	K19507
	365048	4.881 - 6.555	60°	20	K19507
	365049	6.358 - 8.031	60°	20	K19507
	338017	3.897 - 40.110	60°	20	K19507
m	310001	35.00 - 43.00	60°	20	K19505
	364003	40.00 - 52.50	60°	20	K19505
	310003	42.00 - 53.00	60°	20	K19505
	364034	49.00 - 64.50	60°	20	K19505
	310004	52.00 - 65.00	60°	20	K19507
	364045	64.00 - 82.00	60°	20	K19507
	364046	81.00 - 102.00	60°	20	K19507
	364047	99.00 - 129.00	60°	20	K19507
	364048	124.00 - 166.50	60°	20	K19507
	364049	161.50 - 204.00	60°	20	K19507
	337017	99.00 - 1019.00	60°	20	K19507

NOTE: Pricing and delivery available on request.

B10-N: 10-13 B10-F B10: xii-xiii

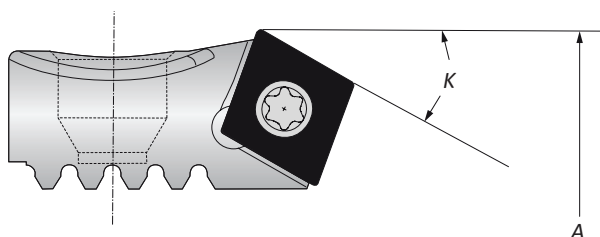
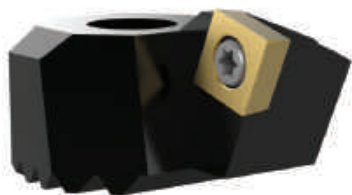
Key on B10-M: 1

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



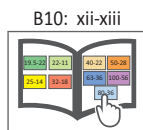
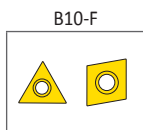
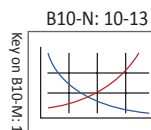
### 15° Angle Approach Insert Holders - Form 101

Diameter Range: 1.338" - 40.090" (34.00mm - 1018.40mm)



	Boring Range		Insert Holders		Part No.
	Boring Tool	A	K	Insert Form	
i	320001	1.338 - 1.653	15°	101	K26067
	365033	1.535 - 2.027	15°	101	K26067
	320003	1.614 - 2.047	15°	101	K26067
	365034	1.889 - 2.500	15°	101	K26067
	320004	2.023 - 2.535	15°	101	K21098
	365045	2.496 - 3.204	15°	101	K21098
	365046	3.165 - 3.992	15°	101	K21098
	365047	3.874 - 5.055	15°	101	K21098
	365048	4.858 - 6.531	15°	101	K21098
	365049	6.334 - 8.007	15°	101	K21098
338017	3.874 - 40.090	15°	101	K21098	
m	310001	34.00 - 42.00	15°	101	K26067
	364033	39.00 - 51.50	15°	101	K26067
	310003	41.00 - 52.00	15°	101	K26067
	364034	48.00 - 63.50	15°	101	K26067
	310004	51.40 - 64.40	15°	101	K21098
	364045	63.40 - 81.40	15°	101	K21098
	364046	80.40 - 101.40	15°	101	K21098
	364047	98.40 - 128.40	15°	101	K21098
	364048	123.40 - 165.90	15°	101	K21098
	364049	160.90 - 203.40	15°	101	K21098
337017	738.40 - 1018.40	15°	101	K21098	

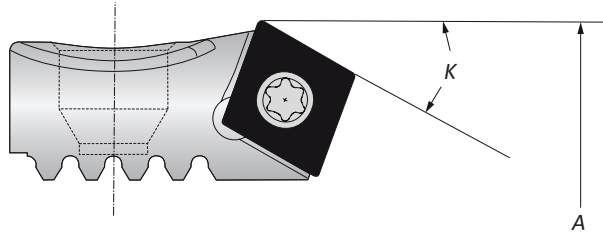
**NOTE:** Pricing and delivery available on request.



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

### 30° Angle Approach Insert Holders - Form 101

Diameter Range: 1.358" - 40.090" (34.50mm - 1018.50mm)



	Boring Range		Insert Holders		Part No.
	Boring Tool	A	K	Insert Form	
i	320001	1.358 - 1.673	30°	101	K26800
	365033	1.555 - 2.047	30°	101	K26800
	320003	1.633 - 2.066	30°	101	K26800
	365034	1.909 - 2.519	30°	101	K26800
	320004	2.027 - 2.539	30°	101	K28540
	365045	2.500 - 3.208	30°	101	K28540
	365046	3.169 - 3.996	30°	101	K28540
	365047	3.877 - 5.059	30°	101	K28540
	365048	4.862 - 6.535	30°	101	K28540
	365049	6.338 - 8.011	30°	101	K28540
	338017	3.877 - 40.090	30°	101	K28540
m	310001	34.50 - 42.50	30°	101	K26800
	364033	39.50 - 52.00	30°	101	K26800
	310003	41.50 - 52.50	30°	101	K26800
	364034	48.50 - 64.00	30°	101	K26800
	310004	51.50 - 64.50	30°	101	K28540
	364045	63.50 - 81.50	30°	101	K28540
	364046	80.50 - 101.50	30°	101	K28540
	364047	98.50 - 128.50	30°	101	K28540
	364048	123.50 - 166.00	30°	101	K28540
	364049	161.00 - 203.50	30°	101	K28540
	337017	98.50 - 1018.50	30°	101	K28540

NOTE: Pricing and delivery available on request.

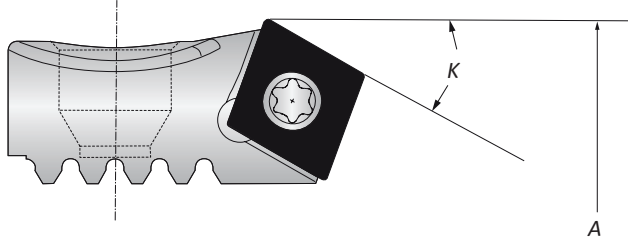
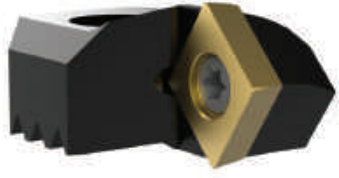
B10-N: 10-13 B10-F B10: xii-xiii

Key on B10-M: 1

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

### 45° Angle Approach Insert Holders - Form 101

Diameter Range: 1.358" - 40.090" (34.50mm - 1018.50mm)



	Boring Range	Insert Holders	Insert Form	Part No.
	A	K		
<b>i</b>	320001	1.358 - 1.673	45°	K26065
	365033	1.555 - 2.047	45°	K26065
	320003	1.633 - 2.066	45°	K26065
	365034	1.909 - 2.519	45°	K26065
	320004	2.027 - 2.539	45°	K25888
	365045	2.500 - 3.208	45°	K25888
	365046	3.169 - 3.996	45°	K25888
	365047	3.877 - 5.059	45°	K25888
	365048	4.862 - 6.535	45°	K25888
	365049	6.338 - 8.011	45°	K25888
338017	3.877 - 40.090	45°	101	K25888
<b>m</b>	310001	34.50 - 42.50	45°	K26065
	364033	39.50 - 52.00	45°	K26065
	310003	41.50 - 52.50	45°	K26065
	364034	48.50 - 64.00	45°	K26065
	310004	51.50 - 64.50	45°	K25888
	364045	63.50 - 81.50	45°	K25888
	364046	80.50 - 101.50	45°	K25888
	364047	98.50 - 128.50	45°	K25888
	364048	123.50 - 166.00	45°	K25888
	364049	161.00 - 203.50	45°	K25888
337017	98.50 - 1018.50	45°	101	K25888

**NOTE:** Pricing and delivery available on request.

B10-N: 10-13

B10-F

B10: xii-xiii

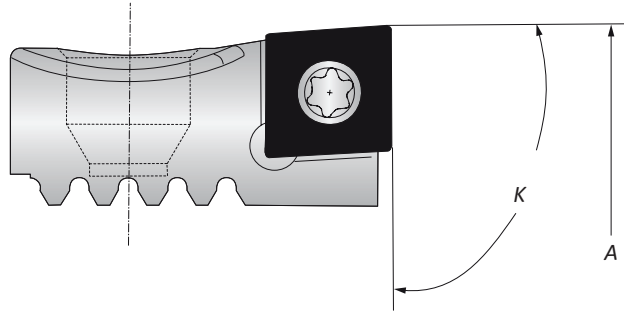
Key on B10-M: 1

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

A  
B  
C  
D  
E  
F  
G  
H  
I  
J  
K  
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INDEX

## 90° Angle Approach Insert Holders - Form 101

Diameter Range: 0.964" - 40.150" (24.50mm - 1020.00mm)



Boring Tool	Boring Range	Insert Holders	Insert Form	Part No.
	A	K		
365031	0.964 - 1.161	90°	101	K32944
320001	1.141 - 1.456	90°	101	K32944
365032	1.141 - 1.988	90°	101	K32944
365033	1.496 - 1.988	90°	101	K32822
320002	1.417 - 1.732	90°	101	K25618
320003	1.692 - 2.125	90°	101	K25618
365034	1.968 - 2.578	90°	101	K25618
320004	2.086 - 2.598	90°	101	K30260
365045	2.559 - 3.267	90°	101	K30260
365046	3.228 - 4.055	90°	101	K30260
365047	3.937 - 5.118	90°	101	K30260
365048	4.921 - 6.594	90°	101	K30260
365049	6.397 - 8.070	90°	101	K30260
338017	3.937 - 40.150	90°	101	K30260
<hr/>				
364031	24.50 - 29.50	90°	101	K32944
310001	29.00 - 37.00	90°	101	K32944
364032	29.00 - 38.50	90°	101	K32944
364033	38.00 - 50.50	90°	101	K32822
310002	36.00 - 44.00	90°	101	K25618
310003	43.00 - 54.00	90°	101	K25618
364034	50.00 - 65.50	90°	101	K25618
310004	53.00 - 66.00	90°	101	K30260
364045	65.00 - 83.00	90°	101	K30260
364046	82.00 - 103.00	90°	101	K30260
364047	100.00 - 130.00	90°	101	K30260
364048	125.00 - 167.50	90°	101	K30260
364049	162.50 - 205.00	90°	101	K30260
337017	100.00 - 1020.00	90°	101	K30260

NOTE: Pricing and delivery available on request.

Key on B10-M: 1

B10-N: 10-13

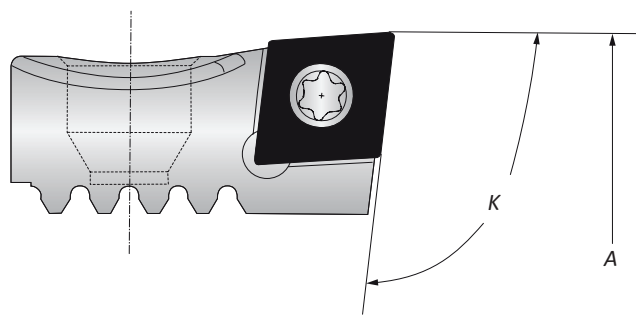
B10-F

B10: xii-xiii

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

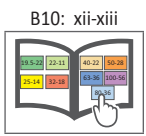
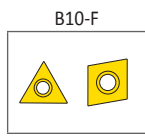
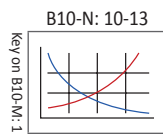
### 95° Angle Approach Insert Holders - Form 101

Diameter Range: 1.377" - 29.330" (35.00mm - 1020.00mm)



	Boring Range		Insert Holders		Part No.
	Boring Tool	A	K	Insert Form	
i	320001	1.377 - 1.692	95°	101	K22718
	365033	1.574 - 2.066	95°	101	K22718
	320003	1.653 - 2.086	95°	101	K22718
	365034	1.929 - 2.539	95°	101	K22718
	320004	2.086 - 2.598	95°	101	K26600
	365045	2.559 - 3.267	95°	101	K26600
	365046	3.228 - 4.055	95°	101	K26600
	365047	3.937 - 5.118	95°	101	K26600
	365048	4.921 - 6.594	95°	101	K26600
	365049	6.397 - 8.070	95°	101	K26600
	338017	3.937 - 29.330	95°	101	K26600
m	310001	35.00 - 43.00	95°	101	K22718
	364033	40.00 - 52.50	95°	101	K22718
	310003	42.00 - 53.00	95°	101	K22718
	364034	49.00 - 64.50	95°	101	K22718
	310004	53.00 - 66.00	95°	101	K26600
	364045	65.00 - 83.00	95°	101	K26600
	364046	82.00 - 103.00	95°	101	K26600
	364047	100.00 - 130.00	95°	101	K26600
	364048	125.00 - 167.50	95°	101	K26600
	364049	162.50 - 205.00	95°	101	K26600
	337017	100.00 - 1020.00	95°	101	K26600

NOTE: Pricing and delivery available on request.

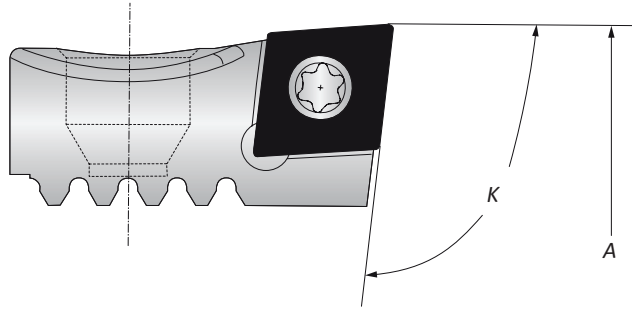


i = Imperial (in)  
m = Metric (mm)  
Inserts sold separately

A  
B  
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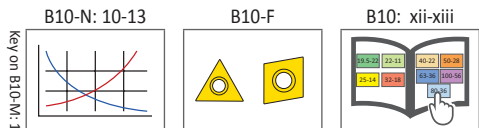
## 95° Angle Approach Insert Holders - Form 101

Diameter Range: 2.023" - 40.090" (51.40mm - 1018.40mm)



	Boring Range		Insert Holders		Part No.
	Boring Tool	A	K	Insert Form	
i	320004	2.023 - 2.535	95°	101	K28029
	365045	2.496 - 3.204	95°	101	K28029
	365046	3.165 - 3.992	95°	101	K28029
	365047	3.874 - 5.055	95°	101	K28029
	365048	4.858 - 6.531	95°	101	K28029
	365049	6.334 - 8.007	95°	101	K28029
	338017	3.874 - 40.090	95°	101	K28029
m	310004	51.40 - 64.40	95°	101	K28029
	364045	63.40 - 81.40	95°	101	K28029
	364046	80.40 - 101.40	95°	101	K28029
	364047	98.40 - 128.40	95°	101	K28029
	364048	123.40 - 165.90	95°	101	K28029
	364049	160.90 - 203.40	95°	101	K28029
	337017	98.40 - 1018.40	95°	101	K28029

NOTE: Pricing and delivery available on request.

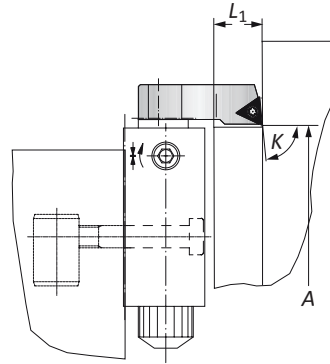


i = Imperial (in)  
m = Metric (mm)  
Inserts sold separately



### 85° Angle Approach Insert Holders - Form 20

Diameter Range: 0.705" - 38.770" (18.00mm - 985.00mm)



	Boring Tool	Boring Range		Insert Holders		Insert Form	Part No.
		A	K	L <sub>1</sub>			
<b>i</b>	320004	0.705 - 1.220	85°	0.708		20	K19346
	365045	1.176 - 1.889	85°	0.708		20	K19346
	365046	1.843 - 2.667	85°	0.708		20	K19346
	365047	2.549 - 3.740	85°	0.708		20	K19346
	365048	3.529 - 5.216	85°	0.708		20	K19346
	365049	5.000 - 6.692	85°	0.708		20	K19346
	338017	2.549 - 38.770	85°	0.708		20	K19346
<b>m</b>	310004	18.00 - 31.00	85°	18.00		20	K19346
	364045	30.00 - 48.00	85°	18.00		20	K19346
	364046	47.00 - 68.00	85°	18.00		20	K19346
	364047	65.00 - 95.00	85°	18.00		20	K19346
	364048	90.00 - 132.50	85°	18.00		20	K19346
	364049	127.50 - 170.00	85°	18.00		20	K19346
	337017	65.00 - 985.00	85°	18.00		20	K19346

NOTE: Pricing and delivery available on request.

B10-N: 10-13

B10-F

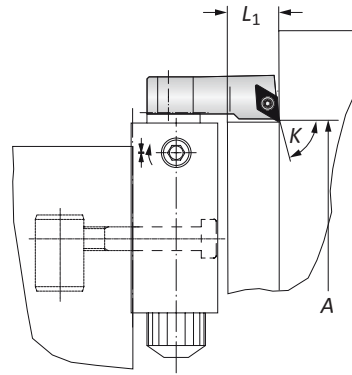
B10: xii-xiii

Key on B10-M: 1

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

## 60° Angle Approach Insert Holders - Form 37

Diameter Range: 0.708" - 38.770" (18.00mm - 985.00mm)



Boring Tool	Boring Range	Insert Holders		Insert Form	Part No.	
	A	K	L <sub>1</sub>			
i	320004	0.708 - 1.220	60°	0.944	37	K25066
	365045	1.181 - 1.889	60°	0.944	37	K25066
	365046	1.850 - 2.677	60°	0.944	37	K25066
	365047	2.559 - 3.740	60°	0.944	37	K25066
	365048	3.543 - 5.216	60°	0.944	37	K25066
	365049	5.019 - 6.692	60°	0.944	37	K25066
	338017	2.559 - 38.770	60°	0.944	37	K25066
m	310004	18.00 - 31.00	60°	24.00	37	K25066
	364045	30.00 - 48.00	60°	24.00	37	K25066
	364046	47.00 - 68.00	60°	24.00	37	K25066
	364047	65.00 - 95.00	60°	24.00	37	K25066
	364048	90.00 - 132.50	60°	24.00	37	K25066
	364049	127.50 - 170.00	60°	24.00	37	K25066
	337017	65.00 - 985.00	60°	24.00	37	K25066

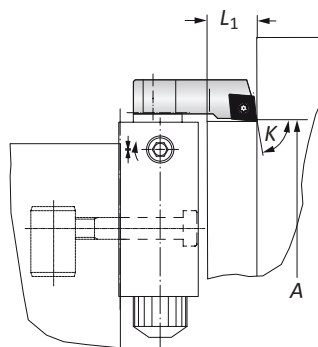
NOTE: Pricing and delivery available on request.

B10-N: 10-13 B10-F B10: xii-xiii

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

### 85° Angle Approach Insert Holders - Form 101

Diameter Range: 0.708" - 38.770" (18.00mm - 985.00mm)



	Boring Tool	Boring Range		Insert Holders		Insert Form	Part No.
		A	K	L <sub>1</sub>			
i	320004	0.708 - 1.220	85°	0.708		101	K19344
	365045	1.181 - 1.889	85°	0.708		101	K19344
	365046	1.850 - 2.677	85°	0.708		101	K19344
	365047	2.559 - 3.740	85°	0.708		101	K19344
	365048	3.543 - 5.216	85°	0.708		101	K19344
	365049	5.019 - 6.692	85°	0.708		101	K19344
	338017	2.559 - 38.770	85°	0.708		101	K19344
m	310004	18.00 - 31.00	85°	18.00		101	K19344
	364045	30.00 - 48.00	85°	18.00		101	K19344
	364046	47.00 - 68.00	85°	18.00		101	K19344
	364047	65.00 - 95.00	85°	18.00		101	K19344
	364048	90.00 - 132.50	85°	18.00		101	K19344
	364049	127.50 - 170.00	85°	18.00		101	K19344
	337017	65.00 - 985.00	85°	18.00		101	K19344

NOTE: Pricing and delivery available on request.

B10-N: 10-13

B10-F

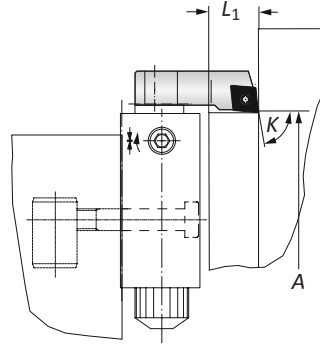
B10: xii-xiii

Key on B10-M: 1

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

## 85° Angle Approach Insert Holders - Form 101

Diameter Range: 0.787" - 38.770" (18.00mm - 985.00mm)



	Boring Tool	Boring Range	Insert Holders		Insert Form	Part No.
		A	K	L <sub>1</sub>		
i	320004	0.708 - 1.220	85°	0.866	101	K31045
	365045	1.181 - 1.889	85°	0.866	101	K31045
	365046	1.850 - 2.677	85°	0.866	101	K31045
	365047	2.559 - 3.740	85°	0.866	101	K31045
	365048	3.543 - 5.216	85°	0.866	101	K31045
	365049	5.019 - 6.692	85°	0.866	101	K31045
	338017	2.559 - 38.770	85°	0.866	101	K31045
m	310004	18.00 - 31.00	85°	22.00	101	K31045
	364045	30.00 - 48.00	85°	22.00	101	K31045
	364046	47.00 - 68.00	85°	22.00	101	K31045
	364047	65.00 - 95.00	85°	22.00	101	K31045
	364048	90.00 - 132.50	85°	22.00	101	K31045
	364049	127.50 - 170.00	85°	22.00	101	K31045
	337017	65.00 - 985.00	85°	22.00	101	K31045

NOTE: Pricing and delivery available on request.

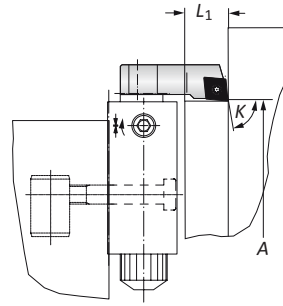
B10-N: 10-13 B10-F B10: xii-xiii

Key on B10-M: 1

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

### 85° Angle Approach Insert Holders - Form 103, 104

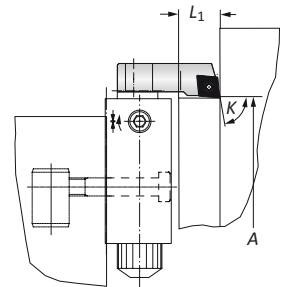
Diameter Range: 0.708" - 38.770" (18.00mm - 985.00mm)



#### 85° Angle Approach Insert Holders - Form 103

	Boring Tool	Boring Range		Insert Holders		Insert Form	Part No.
		A	K	L <sub>1</sub>			
i	320004	0.708 - 1.220	85°	0.708		103	K19125
	365045	1.181 - 1.889	85°	0.708		103	K19125
	365046	1.850 - 2.677	85°	0.708		103	K19125
	365047	2.559 - 3.740	85°	0.708		103	K19125
	365048	3.543 - 5.216	85°	0.708		103	K19125
	365049	5.019 - 6.692	85°	0.708		103	K19125
	338017	2.559 - 38.770	85°	0.708		103	K19125
m	310004	18.00 - 31.00	85°	18.00		103	K19125
	364045	30.00 - 48.00	85°	18.00		103	K19125
	364046	47.00 - 68.00	85°	18.00		103	K19125
	364047	65.00 - 95.00	85°	18.00		103	K19125
	364048	90.00 - 132.50	85°	18.00		103	K19125
	364049	127.50 - 170.00	85°	18.00		103	K19125
	337017	65.00 - 985.00	85°	18.00		103	K19125

NOTE: Pricing and delivery available on request.

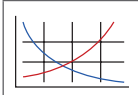


#### 85° Angle Approach Insert Holders - Form 104

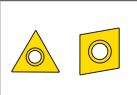
	Boring Tool	Boring Range		Insert Holders		Insert Form	Part No.
		A	K	L <sub>1</sub>			
i	320004	0.708 - 1.220	85°	1.062		104	K31574
	365045	1.181 - 1.889	85°	1.062		104	K31574
	365046	1.850 - 2.677	85°	1.062		104	K31574
	365047	2.559 - 3.740	85°	1.062		104	K31574
	364048	3.543 - 5.216	85°	1.062		104	K31574
	364049	5.019 - 6.692	85°	1.062		104	K31574
	338017	2.559 - 38.770	85°	1.062		104	K31574
m	310004	18.00 - 31.00	85°	27.00		104	K31574
	364045	30.00 - 48.00	85°	27.00		104	K31574
	364046	47.00 - 68.00	85°	27.00		104	K31574
	364047	65.00 - 95.00	85°	27.00		104	K31574
	364048	90.00 - 132.50	85°	27.00		104	K31574
	364049	127.50 - 170.00	85°	27.00		104	K31574
	337017	65.00 - 985.00	85°	27.00		104	K31574

NOTE: Pricing and delivery available on request.

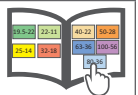
B10-N: 10-13



B10-F



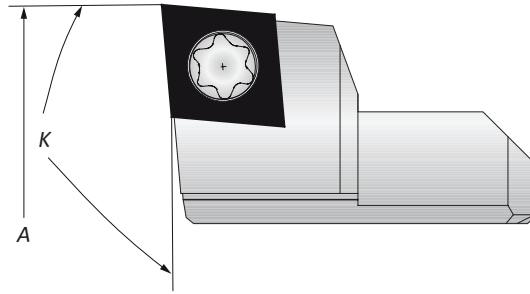
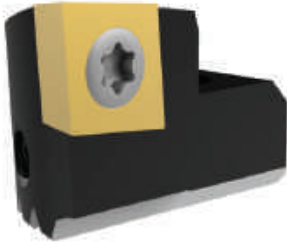
B10: xii-xiii



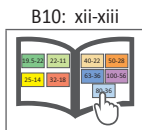
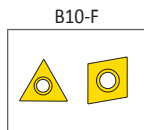
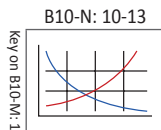
i = Imperial (in)  
 m = Metric (mm)  
 Inserts sold separately

## 95° Angle Approach Combi-Line Insert Holders - Form 101, 103

Diameter Range: 0.965" - 7.913" (24.51 - 200.90mm)



Boring Tool	Boring Range	Insert Holders	Insert Form	Part No.
	A	K		
404003	0.965 - 1.161	95°	101	K32618
404004	1.142 - 1.457	95°	103	K31403
404005	1.417 - 1.732	95°	103	K31404
404006	1.693 - 2.126	95°	103	K31405
404007	2.087 - 2.598	95°	103	K31406
<b>i</b> 404008	2.559 - 3.268	95°	103	K31407
404009	3.228 - 4.055	95°	103	K31408
404010	4.016 - 5.000	95°	103	K31632
404010	5.000 - 5.984	95°	103	K31634
404011	5.945 - 7.913	95°	103	K31632
404011	6.929 - 7.913	95°	103	K31634
401003	24.51 - 29.48	95°	101	K32618
401004	29.00 - 37.00	95°	103	K31403
401005	35.99 - 43.99	95°	103	K31404
401006	43.00 - 54.00	95°	103	K31405
401007	53.00 - 65.98	95°	103	K31406
<b>m</b> 401008	64.99 - 83.00	95°	103	K31407
401009	81.99 - 102.90	95°	103	K31408
401010	102.00 - 127.00	95°	103	K31632
401010	127.00 - 151.90	95°	103	K31634
401011	151.00 - 200.90	95°	103	K31632
401011	175.90 - 200.90	95°	103	K31634

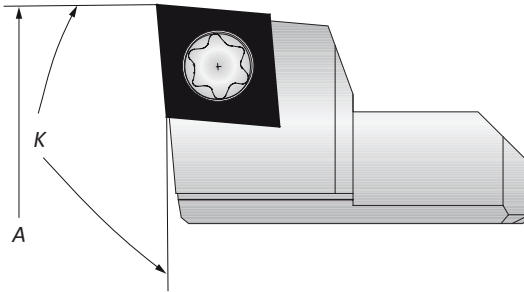
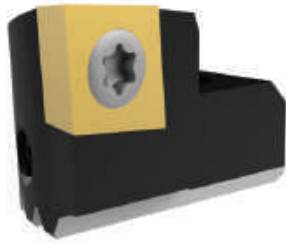


Key on B10-M: 1

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

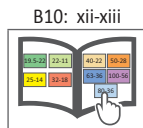
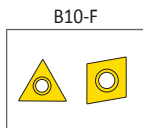
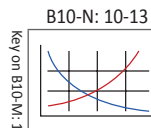
## 90° Angle Approach Combi-Line Same Level Insert Holders - Form 101, 103

Diameter Range: 0.965" - 7.913" (24.51mm - 200.90mm)



	Boring Tool	Boring Range	Insert Holders	Insert Form	Part No.
		A	K		
i	404003	0.965 - 1.161	90°	101	K32616
	404004	1.142 - 1.457	90°	103	K31372
	404005	1.417 - 1.732	90°	103	K31373
	404006	1.693 - 2.126	90°	103	K31374
	404007	2.087 - 2.598	90°	103	K31375
	404008	2.559 - 3.268	90°	103	K31376
	404009	3.228 - 4.055	90°	103	K31377
	404010	4.016 - 5.000	90°	103	K31628
	404010	5.000 - 5.984	90°	103	K31630
	404011	5.945 - 7.913	90°	103	K31628
	404011	6.929 - 7.913	90°	103	K31630
m	401003	24.51 - 29.48	90°	101	K32616
	401004	29.00 - 37.00	90°	103	K31372
	401005	35.99 - 43.99	90°	103	K31373
	401006	43.00 - 54.00	90°	103	K31374
	401007	53.00 - 65.98	90°	103	K31375
	401008	64.99 - 83.00	90°	103	K31376
	401009	81.99 - 102.90	90°	103	K31377
	401010	102.00 - 127.00	90°	103	K31628
	401010	127.00 - 151.90	90°	103	K31630
	401011	151.00 - 200.90	90°	103	K31628
	401011	175.90 - 200.90	90°	103	K31630

**NOTE:** Same level insert holders will still produce a 0.003" (0.0001mm) step



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





SECTION

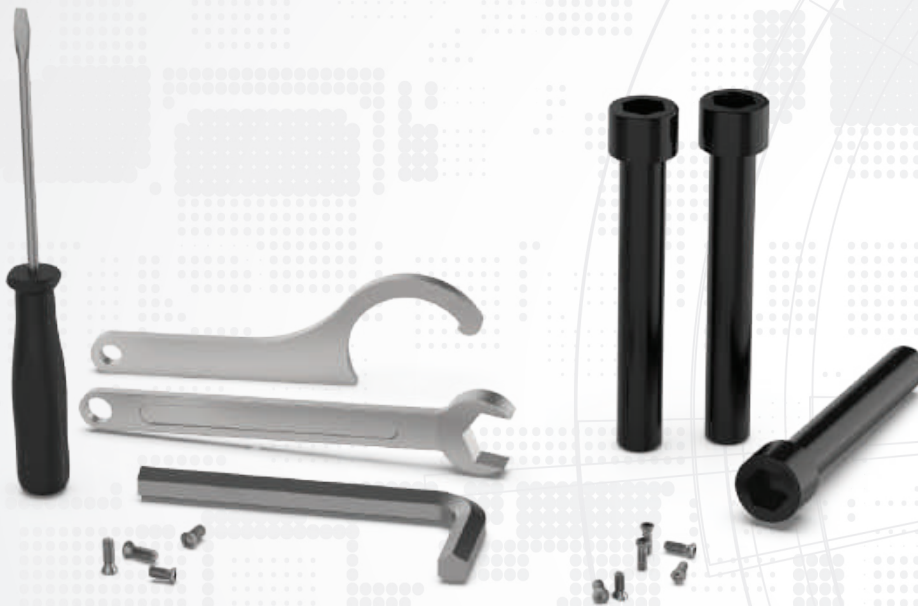
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# B10-N

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Accessories / Technical Information

# Wohlhaupter™ Accessories / Technical Information



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



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

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

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



**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.

## Applicable Industries



Aerospace



Agriculture



Automotive



Firearms



General  
Machining



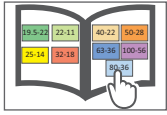
Oil & Gas



Renewable  
Energy

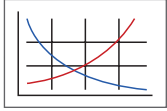
### Reference Icons

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



#### MVS Connection Color Guide

Detailed instructions and information regarding the MVS connection(s)



#### Recommended Cutting Data

Speed and feed recommendations for optimum and safe boring

## Accessories and Technical Information Table of Contents

Threaded Taper Pins . . . . . 2 - 3

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Heavy Metal Balancing Screws . . . . . 5

Torque Drivers and Wrenches . . . . . 6

Torque Driver and Wrench Sets . . . . . 7

### Technical Information

Guidelines for not Exceeding Recommended Length to Diameter Ratio . . . . . 8

Calculating Tool Assembly Weight . . . . . 9

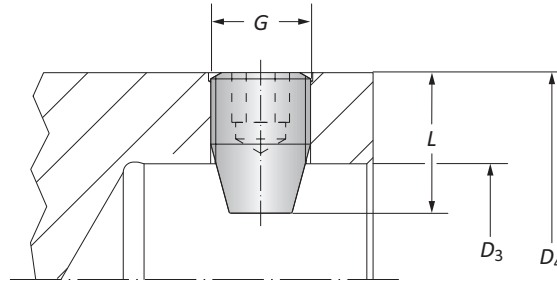
### Recommended Cutting Data

Imperial . . . . . 10 - 11

Metric . . . . . 12 - 13

Accessories

Threaded Taper Pins for MVS Connections

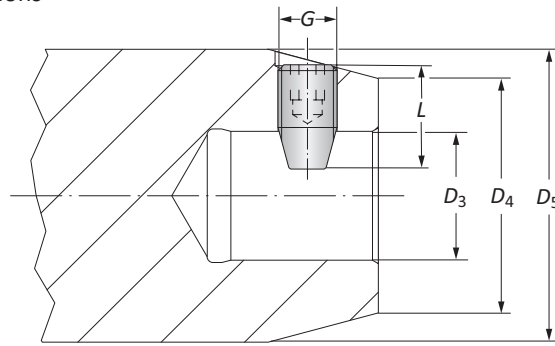


Connection	Taper Pin		Service Key	Steel	Titanium	
	$D_4   D_3$	G		L	Part No.	Part No.
i	19.5 - 11	M 5 x 0.5	0.256	s2.5 / A	115949	-
	22 - 11	M 5 x 0.5	0.327	s2.5 / A	215375	-
	25 - 14	M 8 x 1.0	0.327	s4 / B	132174	-
	32 - 18	M 8 x 1.0	0.409	s4 / B	132142	-
	40 - 22	M 10 x 1.0	0.571	s5 / B	133113	-
	50 - 28	M 12 x 1.0	0.657	s6 / B	132145	415334
	63 - 36	M 16 x 1.5	0.780	s8 / B	132146	415336
	100 - 56	M 24 x 2.0	1.339	s12 / B	215470	415337
m	19.5 - 11	M 5 x 0.5	6.50	s2.5 / A	115949	-
	22 - 11	M 5 x 0.5	8.30	s2.5 / A	215375	-
	25 - 14	M 8 x 1.0	8.30	s4 / B	132174	-
	32 - 18	M 8 x 1.0	10.40	s4 / B	132142	-
	40 - 22	M 10 x 1.0	14.50	s5 / B	133113	-
	50 - 28	M 12 x 1.0	16.70	s6 / B	132145	415334
	63 - 36	M 16 x 1.5	19.80	s8 / B	132146	415336
	100 - 56	M 24 x 2.0	34.00	s12 / B	215470	415337

NOTE: Steel or titanium taper pins are used in balancing the Alu-Line tooling.

## Accessories

### Threaded Taper Pins for MVS Connections

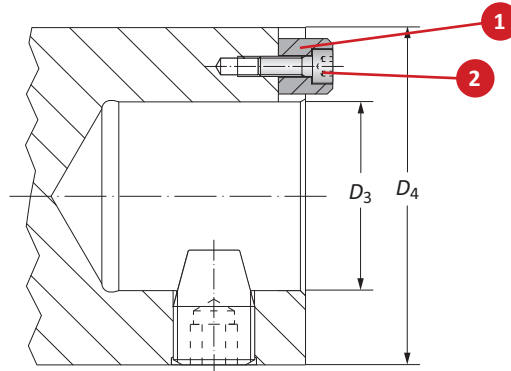


Connection	Taper Pin			Service Key	Steel	Titanium	
	$D_4   D_3$	$G$	$L$		$D_5$	Part No.	Part No.
i	22 - 11	M 5 x 0.5	0.327	1.260	s2.5 / A	215375	-
	22 - 11	M 5 x 0.5	0.630	1.575	s2.5 / A	215376	-
	22 - 11	M 5 x 0.5	0.630	1.969	s2.5 / A	215376	-
	22 - 11	M 5 x 0.5	0.630	2.480	s2.5 / A	215376	-
	25 - 14	M 8 x 1.0	0.409	1.260	s4 / B	132142	-
	25 - 14	M 8 x 1.0	0.409	1.417	s4 / B	132142	-
	32 - 18	M 8 x 1.0	0.409	1.378	s4 / B	132142	-
	32 - 18	M 8 x 1.0	0.571	1.457	s4 / B	132143	-
	32 - 18	M 8 x 1.0	0.571	1.575	s4 / B	132143	-
	32 - 18	M 8 x 1.0	0.571	1.811	s4 / B	132143	-
	40 - 22	M 10 x 1.0	0.571	1.575	s5 / B	133113	-
	40 - 22	M 10 x 1.0	0.701	1.850	s5 / B	132144	-
	40 - 22	M 10 x 1.0	0.701	1.969	s5 / B	132144	-
	50 - 28	M 12 x 1.0	0.657	2.480	s6 / B	132145	415334
	63 - 36	M 16 x 1.5	0.780	3.150	s8 / B	132146	415336
	80 - 36	M 16 x 1.5	1.134	3.150	s8 / B	132191	415335
m	22 - 11	M 5 x 0.5	8.30	32.00	s2.5 / A	215375	-
	22 - 11	M 5 x 0.5	16.00	40.00	s2.5 / A	215376	-
	22 - 11	M 5 x 0.5	16.00	50.00	s2.5 / A	215376	-
	22 - 11	M 5 x 0.5	16.00	63.00	s2.5 / A	215376	-
	25 - 14	M 8 x 1.0	10.40	32.00	s4 / B	132142	-
	25 - 14	M 8 x 1.0	10.40	36.00	s4 / B	132142	-
	32 - 18	M 8 x 1.0	10.40	35.00	s4 / B	132142	-
	32 - 18	M 8 x 1.0	14.50	37.00	s4 / B	132143	-
	32 - 18	M 8 x 1.0	14.50	40.00	s4 / B	132143	-
	32 - 18	M 8 x 1.0	14.50	46.00	s4 / B	132143	-
	40 - 22	M 10 x 1.0	14.50	40.00	s5 / B	133113	-
	40 - 22	M 10 x 1.0	17.80	47.00	s5 / B	132144	-
	40 - 22	M 10 x 1.0	17.80	50.00	s5 / B	132144	-
	50 - 28	M 12 x 1.0	16.70	63.00	s6 / B	132145	415334
	63 - 36	M 16 x 1.5	19.80	80.00	s8 / B	132146	415336
	80 - 36	M 16 x 1.5	28.80	80.00	s8 / B	132191	415335

NOTE: Steel or titanium taper pins are used in balancing the Alu-Line tooling.

## Accessories

### Clamping Pieces for MVS Connection 100 - 56 | D 60 / D 40 Connections



#### Clamping Pieces for MVS 100 - 56

Connection	Service Key	1 Torque		Service Key	2 Cap Screw	
		D x L	Part No.		D x L	Part No.
100 - 56	-	-	115641	S5 / B	M 6 x 16	115147

#### Clamping Pieces for D 60 / D 40

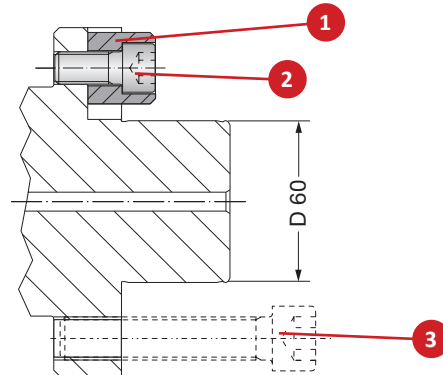
Connection	1 Torque	
	Part No.	
D 60	115643 (125mm)	
D 60	KW31562 (110mm)	
D 40	117143	

#### Clamping Pieces for D 60 / D 40

Connection	Service Key	2 Cap Screw	
		D x L	Part No.
D 60	s10 / B	M 12 x 25	115237
D 40	s5 / B	M 6 x 16	115147

#### Clamping Pieces for D 60 / D 40

Connection	Service Key	3 Cap Screw	
		D x L	Part No.
D 60	s14 / C	M 16 x 80	115170 <sup>(1)</sup>
D 60	s14 / C	M 16 x 55	215189 <sup>(2)</sup>
D 40	s10 / B	M 12 x 75	315186 <sup>(3)</sup>
D 40	s10 / B	M 12 x 50	077104 <sup>(2)</sup>



<sup>(1)</sup> To mount boring tools above  $\varnothing 7.874''$  (200.00mm) see section B10-F

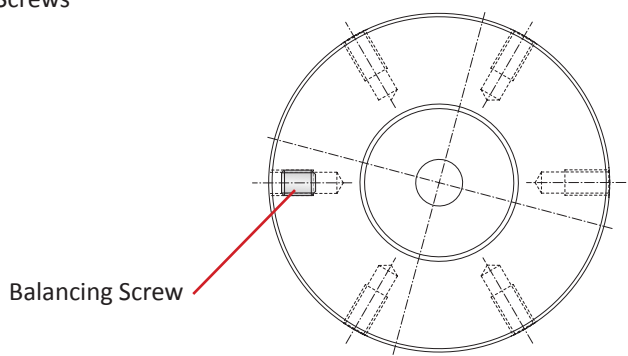
<sup>(2)</sup> Cap screws used for mounting cutter heads to DIN 1830

<sup>(3)</sup>  $\varnothing 7.874''$  - 26.771'' (200.00mm - 680.00mm)



**Accessories**

Heavy Metal Balancing Screws



Balancing Screw		
Nominal Size	Service Key	Part No.
M 5 x 6	0.8 x 4 / K	415573
M 6 x 6	0.8 x 4 / K	415284
M 6 x 8	0.8 x 4 / K	415341
M 6 x 10	0.8 x 4 / K	415283
M 8 x 8	1.2 x 6.5 / K	415285
M 8 x 10	1.2 x 6.5 / K	415286
M 8 x 12	1.2 x 6.5 / K	415287

A  
B  
C  
D  
E  
F  
G  
H  
I  
J  
K  
L  
M  
N

## Accessories

Torque Drivers | Wrenches

### Service Keys for Insert Holders and Fixing Screws (Type A, B, C, F)

Service Key	Part No.
S1.5 / A	215472
s2 / A	215473
s2 / B	415761
s2.5 / A	115575
s2.5 / B	415577
s3 / A	115630
s3 / B	415578
s4 / B	115576
s4 / F	315265
s4 / B	415164
s5 / B	115577
s5 / B	415165
s6 / B	115578
s8 / B	115579
s8 / C	415611
s10 / B	115580
s12 / B	215638
s14 / C	215639

### Fixed Torque Driver (Type H)

Service Key	Part No.
T6 / H	115537
T7 / H	115591
T8 / H	115590
T15 / H	115664
T20 / H	215150
T25 / H	415121

### Torque Driver (Type H)

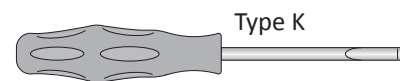
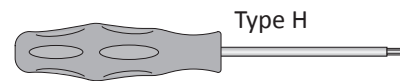
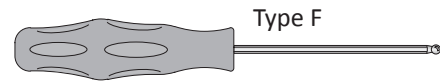
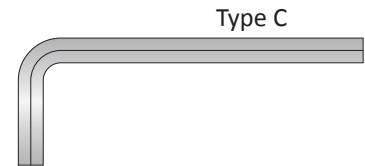
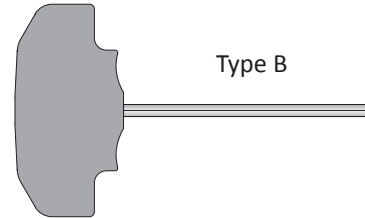
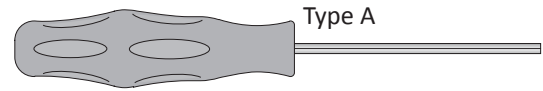
Service Key	Part No.
T6 / H	415507
T7 / H	415508
T8 / H	415514
T15 / H	415510
T20 / H	415543

### Torque Driver (Type K)

Service Key	Part No.
0.5 x 3 / K	315322
0.8 x 4 / K	415579
1.2 x 6.5 / K	415580

### Wrench (Type P)

Service Key	Part No.
13 / P	315689
15 / P	315690
19 / P	315691



## Accessories

Torque Driver Set | 25 Piece Wrench Set



**NOTE:** Torque driver set pictured

Torque Driver Set: Torx Bits, Hexagon Bits, Flat Blade Bits

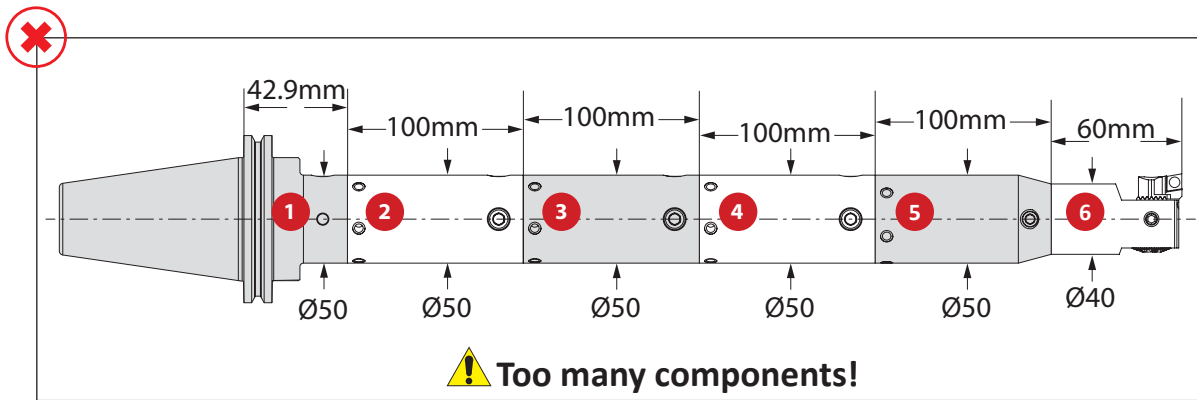
Type	Pieces	Size	Set Part No.
Flat Blade Bit	1	0.3 - 1.2 (Nm)	103086
Flat Blade Bit	1	1.2 - 3.0 (Nm)	
Flat Blade Bit	1	4.0 - 8.0 (Nm)	
Torque Driver	3	T6	
Torque Driver	3	T7	
Torque Driver	3	T8	
Torque Driver	1	T16	
Torque Driver	1	T20	
Torque Driver	1	T25	
Hexagon Bit	3	s2	
Hexagon Bit	3	s2.5	
Hexagon Bit	2	s3	
Hexagon Bit	2	s4	
Hexagon Bit	1	s5	
Hexagon Bit	1	0.5 x 3.0	

25 Piece Wrench Set

Type	Size	Set Part No.
A	s1.5 / s2 / s2.5 / s3 / s4	103025
B	s4 / s5 / s6 / s8 / s10 / s12 / s14	
C	s7	
F	s4	
H	T6 / T7 / T8 / T15 / T20 / T25	
K	0.5 x 3	
P	s13 / s15 / s19	

## Guidelines for not Exceeding Recommended Length to Diameter Ratio

To calculate, see graphics below:



**NOTE:** Length to diameter ratio is calculated using body diameters, not cutting diameter.  
**NOTE:** Do not exceed recommended 10xD length to diameter ratio or exceed 4 total components (including shank)

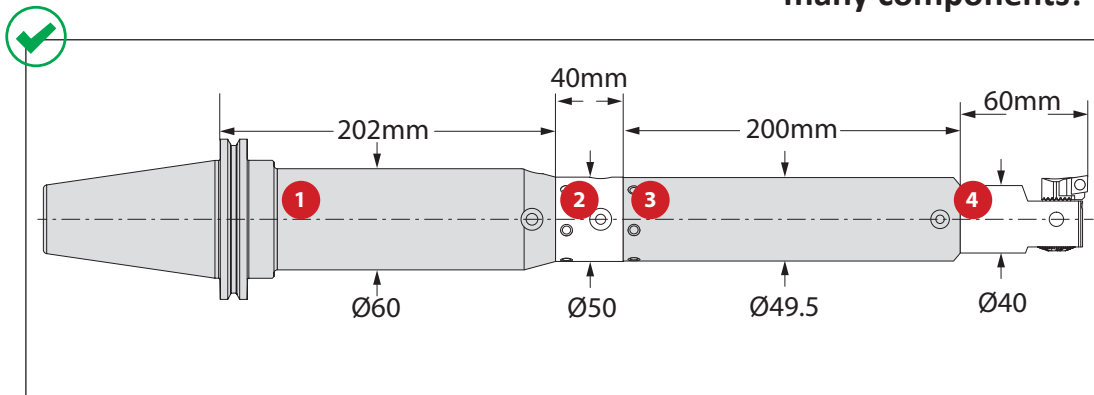
### Step 1: Find L : D by component

- 1 0.9 = 42.9/50
- 2 2.0 = 100/50
- 3 2.0 = 100/50
- 4 2.0 = 100/50
- 5 2.0 = 100/50
- 6 1.5 = 60/40

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

- 0.9
- 2.0
- 2.0
- 2.0
- 2.0
- 2.0
- + 1.5
- ⊗** 10.4 = L : D ratio

**⚠ Too long with too many components!**



**NOTE:** Length to diameter ratio is calculated using body diameters, not cutting diameter.  
**NOTE:** Do not exceed recommended 10xD length to diameter ratio or exceed 4 total components (including shank)

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

- 1 3.2 = 202/60
- 2 0.8 = 40/50
- 3 4.0 = 200/49.5
- 4 1.5 = 60/40

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

- 3.2
- 0.8
- 4.0
- + 1.5
- ✓** 9.5 = L : D ratio

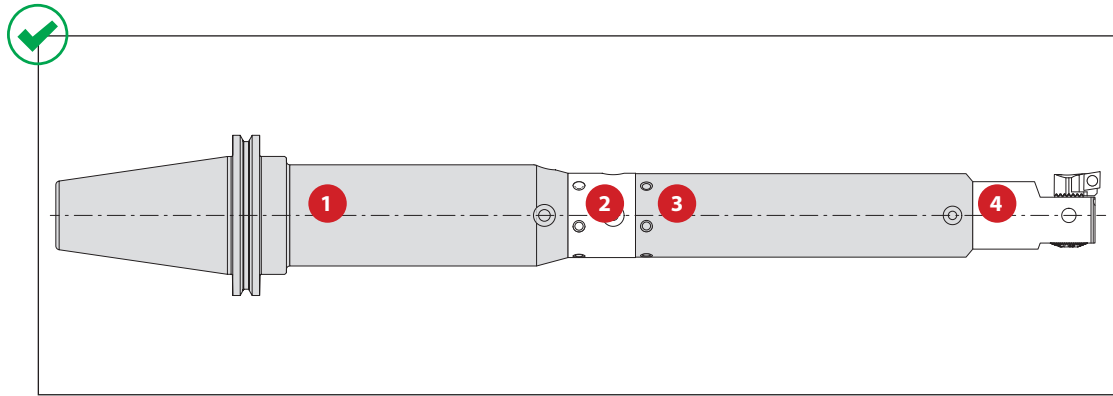
**⚠ WARNING** Tool failure can cause serious injury. To prevent:

-Do not exceed recommended 10xD length to diameter ratio or exceed 4 total components (including shank)

Factory technical assistance is available for your specific applications through our Application Engineering department. ext: 7611 | email: [appeng@alliedmachine.com](mailto:appeng@alliedmachine.com)

## Calculating Tool Assembly Weight

To calculate, see graphics below:



**Step 1:** Find weight for each component circled in the example table below

**Example:**

	MVS Connection	Boring Range	4 Boring Head				Weight	Part No.
	$D_1$ & $D_2$	A	$X_1$	$X_2$	$L_2$	$D_5$		
i	40 - 22	2.087 - 2.598	2.953	1.535	2.854	-	1.543 (lbs)	320004
m	40 - 22	53.01 - 65.98	75.00	39.00	72.50	-	0.70 (kg)	320004

**Step 2:** Calculate total assembly weight

$$\begin{array}{r}
 1 \ 6.6 \text{ kg} \\
 2 \ 0.6 \text{ kg} \\
 3 \ 3.5 \text{ kg} \\
 + 4 \ 0.7 \text{ kg} \\
 \hline
 11.4 \text{ kg}
 \end{array}$$

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

**⚠ WARNING** Exceeding weight capacity for machine tool spindle and tool changer can cause machine damage, and/or serious injury. To prevent:  
 -Consult machine tool builder for machine's weight limitations.  
 Factory technical assistance is also available for specific applications through our Application Engineering department. ext: 7611 | email: [appeng@alliedmachine.com](mailto:appeng@alliedmachine.com)

## Recommended Cutting Data | Imperial (inch)

ISO	Material	(BHN) Hardness	Grade	*Speed SFM	Recommended Feed (inch / tooth) Nose Radi			
					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

\*Not to exceed max recommended RPM for boring head found in corresponding Wohlhaupter Operation Manual

### Deep Hole Boring Speed Adjustment

#### ⚠ For Dynamic Boring Tool Length

Boring Type	7xD	8xD	9xD	10xD
Roughing	❖	❖	❖	❖
Finishing	0.70	0.50	0.30	❖

❖ Contact our Application Engineering department for assistance when boring these depths without NOVI<sup>TECH</sup>.

### Deep Hole Boring Speed Adjustment

#### ⚠ For Dynamic Boring Tool NOVI<sup>TECH</sup> Length

Boring Type	8xD	9xD	10xD
Roughing	0.80	0.60	0.40
Finishing	0.90	0.70	0.50

\*Not to exceed recommended RPM printed on NOVI<sup>TECH</sup> module

### Recommended Speed Example

If the recommended speed for a finish boring assembly under 5xD is 400 SFM, then the speed for a 10xD finish boring assembly in the same application would be 200 SFM. (400 SFM x 0.50 = 200 SFM)

5xD = 400 SFM

10xD = 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. ext: 7611 | email: [appeng@alliedmachine.com](mailto:appeng@alliedmachine.com)

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

- Do not exceed recommended 10xD length to diameter ratio or exceed 4 total components (including shank)
- Refer to example on page B10-N: 8 for calculating length to diameter ratio

Factory technical assistance is available for your specific applications through our Application Engineering department. ext: 7611 | email: [appeng@alliedmachine.com](mailto:appeng@alliedmachine.com)

## Recommended Cutting Data | Imperial (inch)

ISO	Material	(BHN) Hardness	Grade	*Speed SFM	Recommended Feed (inch / tooth) Nose Radi			
					0.004"	0.008"	0.016"	0.031"
H	Wear Plate Hardox, AR400, T-1, etc.	400 - 600	Carbide	100 - 200	0.001 - 0.002	0.002 - 0.003	0.003 - 0.004	0.004 - 0.006
			CBN	225 - 600	0.001 - 0.002	0.002 - 0.003	0.003 - 0.004	0.004 - 0.006
	Hardened Steel	300 - 500	Carbide	125 - 275	0.001 - 0.002	0.002 - 0.003	0.003 - 0.004	0.004 - 0.006
			CBN	225 - 600	0.001 - 0.002	0.002 - 0.003	0.003 - 0.004	0.004 - 0.006
K	SG / Nodular Cast Iron	120 - 320	Carbide	475 - 850	0.001 - 0.002	0.002 - 0.004	0.003 - 0.005	0.005 - 0.008
	Grey / White Iron	180 - 320	Carbide	600 - 1050	0.001 - 0.002	0.002 - 0.004	0.003 - 0.005	0.005 - 0.008
			CBN	1325 - 3275	0.001 - 0.002	0.002 - 0.004	0.003 - 0.005	0.005 - 0.008
N	Cast Aluminum	30 - 180	Carbide	850 - 2800	0.001 - 0.002	0.002 - 0.004	0.003 - 0.005	0.005 - 0.008
			PCD	1625 - 6550	0.001 - 0.002	0.002 - 0.004	0.003 - 0.005	0.005 - 0.008
	Wrought Aluminum	30 - 180	Carbide	675 - 1975	0.001 - 0.003	0.002 - 0.005	0.004 - 0.006	0.006 - 0.009
	Aluminum Bronze	100 - 250	Carbide	475 - 925	0.001 - 0.002	0.002 - 0.004	0.004 - 0.005	0.005 - 0.008
	Brass	100	Carbide	675 - 1975	0.001 - 0.002	0.002 - 0.004	0.003 - 0.005	0.005 - 0.008
Copper	60	Carbide	325 - 600	0.001 - 0.002	0.002 - 0.003	0.003 - 0.004	0.004 - 0.005	

\*Not to exceed max recommended RPM for boring head found in corresponding Wohlhaupter operation manual

### Deep Hole Boring Speed Adjustment

⚠ For Dynamic Boring Tool Length				
Boring Type	7xD	8xD	9xD	10xD
Roughing	❖	❖	❖	❖
Finishing	0.70	0.50	0.30	❖

❖ Contact our Application Engineering department for assistance when boring these depths without NOVI<sup>TECH</sup>.

### Deep Hole Boring Speed Adjustment

⚠ For Dynamic Boring Tool NOVI <sup>TECH</sup> Length			
Boring Type	8xD	9xD	10xD
Roughing	0.80	0.60	0.40
Finishing	0.90	0.70	0.50

\*Not to exceed recommended RPM printed on NOVI<sup>TECH</sup> module

### Recommended Speed Example

If the recommended speed for a finish boring assembly under 5xD is 400 SFM, then the speed for a 10xD finish boring assembly in the same application would be 200 SFM. (400 SFM x 0.50 = 200 SFM)

5xD = 400 SFM

10xD = 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. ext: 7611 | email: [appeng@alliedmachine.com](mailto:appeng@alliedmachine.com)

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

- Do not exceed recommended 10xD length to diameter ratio or exceed 4 total components (including shank)
- Refer to example on page B10-N: 8 for calculating length to diameter ratio

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## Recommended Cutting Data | Metric (mm)

ISO	Material	(BHN) Hardness	Grade	*Speed M / Min	Recommended Feed (mm / tooth) Nose Radi			
					0.1mm	0.2mm	0.4mm	0.8mm
P	Free Machining Steel 1118, 1215, 12L14, etc.	100 - 250	Carbide	150 - 300	0.02 - 0.08	0.05 - 0.13	0.10 - 0.15	0.15 - 0.23
	Low Carbon Steel 1010, 1020, 1025, 1522, 1144, etc.	85 - 275	Carbide	145 - 280	0.02 - 0.05	0.05 - 0.10	0.08 - 0.13	0.13 - 0.20
	Medium Carbon Steel 1030, 1040, 1050, 1527, 1140, 1151, etc.	125 - 325	Carbide	145 - 280	0.02 - 0.05	0.05 - 0.10	0.08 - 0.13	0.13 - 0.20
	Alloy Steel 4140, 5140, 8640, etc.	125 - 375	Carbide	120 - 215	0.02 - 0.05	0.05 - 0.10	0.08 - 0.13	0.13 - 0.20
	High Strength Alloy 4340, 4330V, 300M, etc.	225 - 400	Carbide	100 - 180	0.02 - 0.05	0.05 - 0.10	0.08 - 0.13	0.13 - 0.20
	Structural Steel A36, A285, A516, etc.	100 - 350	Carbide	145 - 280	0.02 - 0.05	0.05 - 0.10	0.08 - 0.13	0.13 - 0.20
	Tool Steel H-13, H-21, A-4, O-2, S-3, etc.	150 - 250	Carbide	100 - 180	0.02 - 0.05	0.05 - 0.08	0.08 - 0.10	0.10 - 0.15
S	High Temp Alloy Hastelloy B, Inconel 600, etc.	140 - 310	Carbide	30 - 70	0.02 - 0.05	0.05 - 0.08	0.08 - 0.13	0.10 - 0.15
	Titanium Alloy	140 - 310	Carbide	40 - 90	0.02 - 0.05	0.05 - 0.08	0.08 - 0.13	0.10 - 0.15
	Aerospace Alloy S82	185 - 350	Carbide	40 - 90	0.02 - 0.05	0.05 - 0.08	0.08 - 0.13	0.10 - 0.15
M	Stainless Steel 400 Series 416, 420, etc.	185 - 350	Carbide	90 - 160	0.02 - 0.05	0.05 - 0.10	0.08 - 0.10	0.10 - 0.15
	Stainless Steel 300 Series 304, 316, 17-4PH, etc.	135 - 275	Carbide	90 - 160	0.02 - 0.05	0.05 - 0.10	0.08 - 0.10	0.10 - 0.15
	Super Duplex Stainless Steel	135 - 275	Carbide	90 - 160	0.02 - 0.05	0.05 - 0.10	0.08 - 0.10	0.10 - 0.15

\*Not to exceed max recommended RPM for boring head found in corresponding Wohlhaupter Operation Manual

### Deep Hole Boring Speed Adjustment

#### ⚠ For Dynamic Boring Tool Length

Boring Type	7xD	8xD	9xD	10xD
Roughing	❖	❖	❖	❖
Finishing	0.70	0.50	0.30	❖

❖ Contact our Application Engineering department for assistance when boring these depths without NOVI<sup>TECH</sup>.

### Deep Hole Boring Speed Adjustment

#### ⚠ For Dynamic Boring Tool NOVI<sup>TECH</sup> Length

Boring Type	8xD	9xD	10xD
Roughing	0.80	0.60	0.40
Finishing	0.90	0.70	0.50

\*Not to exceed recommended RPM printed on NOVI<sup>TECH</sup> module

### Recommended Speed Example

If the recommended speed for a finish boring assembly under 5xD is 120 M/Min, then the speed for a 10xD finish boring assembly in the same application would be 60 M/Min (120 M/Min x 0.50 = 60 M/Min)

5xD = 120 M/Min

10xD = 60 M/Min

**IMPORTANT:** Max spindle speed refers to maximum possible speed for individual boring head and is not a recommended parameter. Factory technical assistance is available for your specific applications through our Application Engineering department. ext: 7611 | email: [appeng@alliedmachine.com](mailto:appeng@alliedmachine.com)

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

- Do not exceed recommended 10xD length to diameter ratio or exceed 4 total components (including shank)
- Refer to example on page B10-N: 8 for calculating length to diameter ratio

Factory technical assistance is available for your specific applications through our Application Engineering department. ext: 7611 | email: [appeng@alliedmachine.com](mailto:appeng@alliedmachine.com)

## Recommended Cutting Data | Metric (mm)

ISO	Material	(BHN) Hardness	Grade	*Speed M / Min	Recommended Feed (mm / tooth) Nose Radi			
					0.1mm	0.2mm	0.4mm	0.8mm
H	Wear Plate Hardox, AR400, T-1, etc.	400 - 600	Carbide	30 - 60	0.02 - 0.05	0.05 - 0.08	0.08 - 0.10	0.10 - 0.15
			CBN	70 - 180	0.02 - 0.05	0.05 - 0.08	0.08 - 0.10	0.10 - 0.15
	Hardened Steel	300 - 500	Carbide	40 - 80	0.02 - 0.05	0.05 - 0.08	0.08 - 0.10	0.10 - 0.15
			CBN	70 - 180	0.02 - 0.05	0.05 - 0.08	0.08 - 0.10	0.10 - 0.15
K	SG / Nodular Cast Iron	120 - 320	Carbide	145 - 260	0.02 - 0.05	0.05 - 0.10	0.08 - 0.13	0.13 - 0.20
	Grey / White Iron	180 - 320	Carbide	180 - 320	0.02 - 0.05	0.05 - 0.10	0.08 - 0.13	0.13 - 0.20
			CBN	400 - 1000	0.02 - 0.05	0.05 - 0.10	0.08 - 0.13	0.13 - 0.20
N	Cast Aluminum	30 - 180	Carbide	260 - 850	0.02 - 0.05	0.05 - 0.10	0.08 - 0.13	0.13 - 0.20
			PCD	495 - 1995	0.02 - 0.05	0.05 - 0.10	0.08 - 0.13	0.13 - 0.20
	Wrought Aluminum	30 - 180	Carbide	205 - 600	0.02 - 0.05	0.05 - 0.13	0.10 - 0.15	0.15 - 0.23
	Aluminum Bronze	100 - 250	Carbide	145 - 280	0.02 - 0.05	0.05 - 0.10	0.10 - 0.13	0.13 - 0.20
	Brass	100	Carbide	205 - 600	0.02 - 0.05	0.05 - 0.10	0.08 - 0.13	0.13 - 0.20
Copper	60	Carbide	100 - 180	0.02 - 0.05	0.05 - 0.08	0.08 - 0.10	0.10 - 0.13	

\*Not to exceed max recommended RPM for boring head found in corresponding Wohlhaupter operation manual

### Deep Hole Boring Speed Adjustment

#### ⚠ For Dynamic Boring Tool Length

Boring Type	7xD	8xD	9xD	10xD
Roughing	❖	❖	❖	❖
Finishing	0.70	0.50	0.30	❖

❖ Contact our Application Engineering department for assistance when boring the depths without NOVI<sup>TECH</sup>.

### Deep Hole Boring Speed Adjustment

#### ⚠ For Dynamic Boring Tool NOVI<sup>TECH</sup> Length

Boring Type	8xD	9xD	10xD
Roughing	0.80	0.60	0.40
Finishing	0.90	0.70	0.50

\*Not to exceed recommended RPM printed on NOVI<sup>TECH</sup> module

### Recommended Speed Example

If the recommended speed for a finish boring assembly under 5xD is 120 M/Min, then the speed for a 10xD finish boring assembly in the same application would be 60 M/Min (120 M/Min x 0.50 = 60 M/Min)

5xD = 120 M/Min

10xD = 60 M/Min

**IMPORTANT:** Max spindle speed refers to maximum possible speed for individual boring head and is not a recommended parameter. Factory technical assistance is available for your specific applications through our Application Engineering department. ext: 7611 | email: [appeng@alliedmachine.com](mailto:appeng@alliedmachine.com)

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

- Do not exceed recommended 10xD length to diameter ratio or exceed 4 total components (including shank)
- Refer to example on page B10-N: 8 for calculating length to diameter ratio

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# Guaranteed Test / Demo Application Form

Distributor PO # \_\_\_\_\_

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

**IMPORTANT:** For processing, send Purchase Order to your Allied Field Sales Engineer (FSE). Please clearly mark the paperwork as "Test Order."

## Distributor Information

Company Name: \_\_\_\_\_  
 Contact: \_\_\_\_\_  
 Account Number: \_\_\_\_\_  
 Phone: \_\_\_\_\_  
 Email: \_\_\_\_\_

## End User Information

Company Name: \_\_\_\_\_  
 Contact: \_\_\_\_\_  
 Industry: \_\_\_\_\_  
 Phone: \_\_\_\_\_  
 Email: \_\_\_\_\_

**Current Process** List all tooling, coatings, substrates, speeds and feeds, tool life, and any problems you are experiencing

\_\_\_\_\_

\_\_\_\_\_

**Test Objective** List what would make this a successful test (i.e. penetration rate, finish, tool life, hole size, etc.)

\_\_\_\_\_

\_\_\_\_\_

## Application Information

Hole Diameter: _____ in/mm	Tolerance: _____	Material: _____ (4150 / A36 / Cast Iron / etc.)
Pre-existing Diameter: _____ in/mm	Depth of Cut: _____ in/mm	Hardness: _____ (BHN / Rc)
Required Finish: _____ RMS	State: _____	(Casting / Hot rolled / Forging)

## Machine Information

Machine Type: _____ (Lathe / Screw machine / Machine center / etc.)	Builder: _____ (Haas, Mori Seiki, etc.)	Model #: _____
Shank Required: _____ (CAT50 / Morse taper, etc.)		Power: _____ HP/KW
Rigidity: _____	Orientation: _____	Tool Rotating: _____
<input type="checkbox"/> Excellent	<input type="checkbox"/> Vertical	<input type="checkbox"/> Yes
<input type="checkbox"/> Good	<input type="checkbox"/> Horizontal	<input type="checkbox"/> No
<input type="checkbox"/> Poor		Thrust: _____ lbs/N

## Coolant Information

Coolant Delivery: _____ (Through tool / Flood)	Coolant Pressure: _____ PSI / bar
Coolant Type: _____ (Air mist, oil, synthetic, water soluble, etc.)	Coolant Volume: _____ GPM / LPM

## Requested Tooling

QTY	Item Number

QTY	Item Number



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Allied Machine & Engineering ("Allied Machine") warrants to original equipment manufacturers, distributors, industrial and commercial users of its products for one year from the original date of sale that each new product manufactured or supplied by Allied Machine shall be free from defects in material and workmanship.

Allied Machine's sole and exclusive obligation under this warranty is limited to, at its option, without additional charge, replacing or repairing this product or issuing a credit. For this warranty to be applied, the product must be returned freight prepaid to the plant designated by an Allied Machine representative and which, upon inspection, is determined by Allied Machine to be defective in material and workmanship.

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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