



# Wohlhaupter® MultiBore® System Tools CATALOGUE



Drilling



Boring



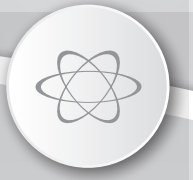
Reaming



Burnishing



Threading



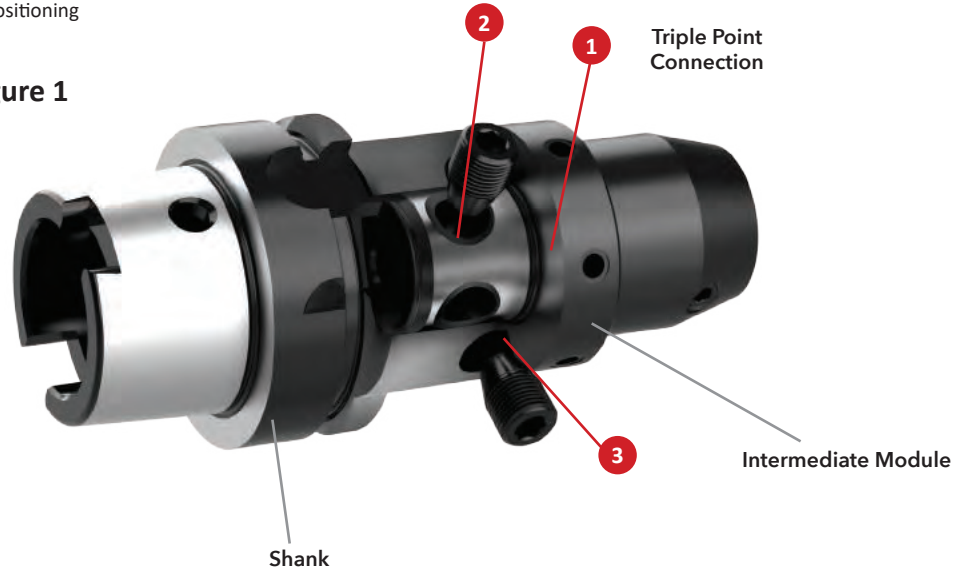
Specials

## The MVS Connection

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

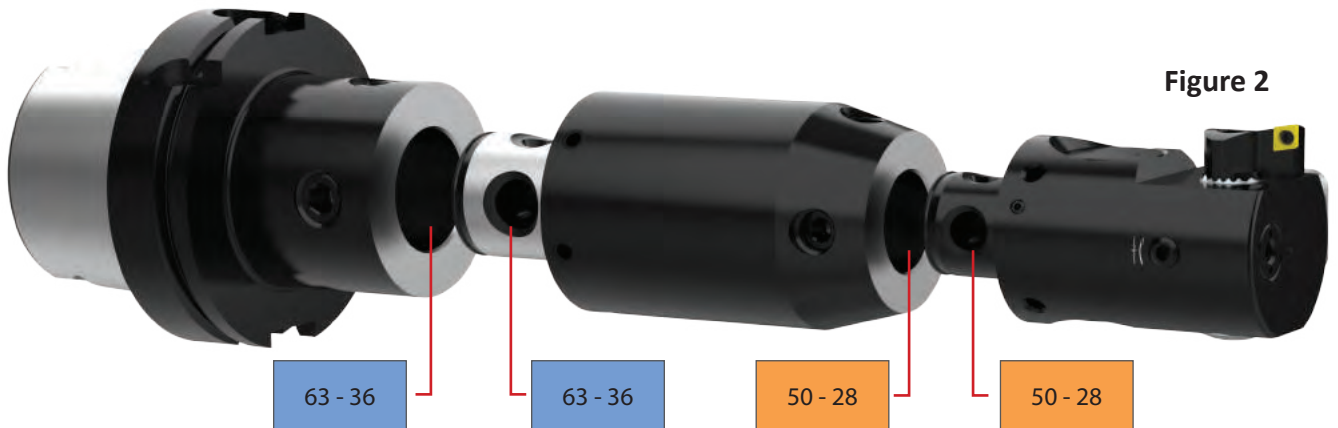
- Ensures high axial clamping forces on mating surfaces
- Provides maximum rigidity
- Threaded taper pins for precise cutter positioning

Figure 1



### MVS Connection Color Guide

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



## MVS Connection Example - Selecting the Correct Intermediate Module

### Example Machining Parameters

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

**1 Select your boring tool**

- Example: 464 Balanced Boring Head

**2 Select the tool that meets the required boring range**

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



**1** **3ETECH Digital Balanced 465 (464) Boring Head**

**2**

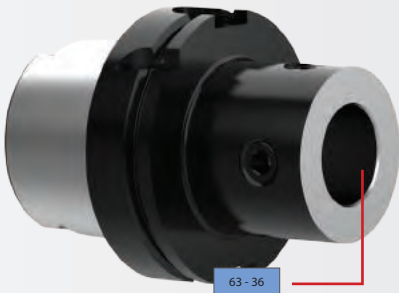
| D <sub>2</sub>   D <sub>1</sub> | A               | X <sub>1</sub> | Order | Boring Head |
|---------------------------------|-----------------|----------------|-------|-------------|
| 50 - 28                         | 65.00 - 83.00   | 75.00          | 3     | 464006      |
| 50 - 28                         | 65.00 - 83.00   | 75.00          | 3     | 464006      |
| 50 - 28                         | 65.00 - 83.00   | 75.00          | 3     | 464006      |
| 63 - 36                         | 82.00 - 103.00  | 90.00          | 3     | 464007      |
| 63 - 36                         | 82.00 - 103.00  | 90.00          | 3     | 464007      |
| 63 - 36                         | 82.00 - 103.00  | 90.00          | 3     | 464007      |
| 80 - 36                         | 100.00 - 130.00 | 90.00          | 3     | 464008      |
| 80 - 36                         | 100.00 - 130.00 | 90.00          | 3     | 464008      |
| 80 - 36                         | 100.00 - 130.00 | 90.00          | 3     | 464008      |
| 80 - 36                         | 125.00 - 167.50 | 90.00          | 3     | 464009      |
| 80 - 36                         | 125.00 - 167.50 | 90.00          | 3     | 464009      |

**3 Select the master shank that fits your spindle**

- Machine spindle: DIN 69893 HSK

**4 Choose the connection that fits your application**

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



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

**4**

| ØS  | ØD      | Order | Part No. |
|-----|---------|-------|----------|
| 63  | 80 - 36 | g)    | 246009   |
| 63  | ER 40   | g)    | 252090*  |
| 100 | 50 - 28 | g)    | 245014   |
| 100 | 50 - 28 | g)    | 246020   |
| 100 | 50 - 28 | g)    | 246021   |
| 100 | 63 - 36 | g)    | 245015   |
| 100 | 63 - 36 | g)    | 246019   |
| 100 | 63 - 36 | g)    | 246022   |
| 100 | 80 - 36 | g)    | 245016   |
| 100 | 80 - 36 | g)    | 246018   |
| 100 | 80 - 36 | g)    | 246023   |

**5 Select the correct intermediate module**

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

- Hole depth: 200.00mm (7.874")
- Boring tool 464006 length (X<sub>1</sub>): 75.00mm (2.953")
- Master shank 245015 length (L<sub>1</sub>): 51.00mm (2.008")
- Minimum required length of adapter: 74.00mm (2.913")
- Boring tool 464006 MVS connection: **50 - 28**
- Master shank 245015 MVS connection: **63 - 36**
- Adapter Part No.: **119025**



**5** **Reducers**

| ØS      | ØD      | Order | Part No. |
|---------|---------|-------|----------|
| 63 - 36 | 32 - 18 | g)    | 219081*  |
| 63 - 36 | 32 - 18 | g)    | 219088   |
| 63 - 36 | 32 - 18 | g)    | 219090   |
| 63 - 36 | 32 - 18 | g)    | 219021   |
| 63 - 36 | 32 - 18 | g)    | 219033*  |
| 63 - 36 | 40 - 22 | g)    | 219091   |
| 63 - 36 | 40 - 22 | g)    | 219092   |
| 63 - 36 | 40 - 22 | g)    | 119067   |
| 63 - 36 | 50 - 28 | g)    | 119064   |
| 63 - 36 | 50 - 28 | g)    | 119026** |
| 63 - 36 | 50 - 28 | g)    | 219095*  |
| 63 - 36 | 50 - 28 | g)    | 119098   |
| 63 - 36 | 50 - 28 | g)    | 219066   |



SECTION

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# B10-A

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Versatile Fine Boring

# Wohlhaupter® Versatile Fine Boring

VarioBore | 248 | PrimeBore | Digital 510 | DigiBore

► Diameter Range: 0.40 mm - 208.00 mm



## WOHLHAUPTER®

### Precision boring at its finest.

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

Your safety and the safety of others is very important. This catalogue 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 catalogue, 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 catalogue. 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

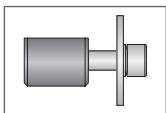


Renewable Energy



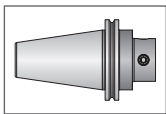
### Reference Icons

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



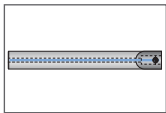
#### Clamping Elements

For use with insert holders and boring heads



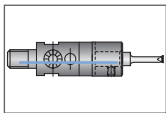
#### Shanks

A variety of shanks for different machines



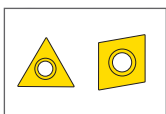
#### 248 Shanks

A variety of shanks for different machines



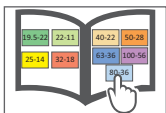
#### 248 Boring Head

248 boring head that connects into the adapter shanks



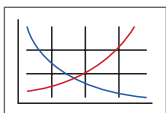
#### Inserts

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



#### MVS Connection Colour Guide

Detailed instructions and information regarding the MVS connection(s)



#### Recommended Cutting Data

Speed and feed recommendations for optimum and safe boring



#### Through Coolant Option

Indicates that the product is through coolant

| Series          | Diameter Range |
|-----------------|----------------|
|                 | Metric (mm)    |
| VarioBore 536   | 0.40 - 152.00  |
| 248 Boring Head | 3.00 - 30.20   |
| PrimeBore 450   | 3.00 - 208.00  |
| Digital 510     | 0.40 - 12.00   |
| DigiBore 501    | 3.00 - 208.00  |

## Versatile Fine Boring Contents

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# VarioBore Product Overview



## VarioBore with 3E<sup>TECH+</sup> VERSATILE FINE 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.

Experience *precision boring* for yourself.

- Diameter range: 0.40 mm - 152.00 mm
- Offers outside turning capabilities: 2.00 mm - 66.00 mm
- 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:** 3E<sup>TECH+</sup> adjustment accuracy of 0.001 mm on diameter

**NOTE:** Vernier adjustment accuracy of 0.002 mm on diameter

**IMPORTANT:** Max spindle speed refers to maximum possible speed for an individual boring head and is not a recommended parameter. Refer to page B10-M: 12 for recommended application-specific parameters. Factory technical assistance is available for your specific applications through our Application Engineering department.  
email: [engineering.eu@alliedmachine.com](mailto:engineering.eu@alliedmachine.com)





3E TECH+  
Universal Digital  
Module



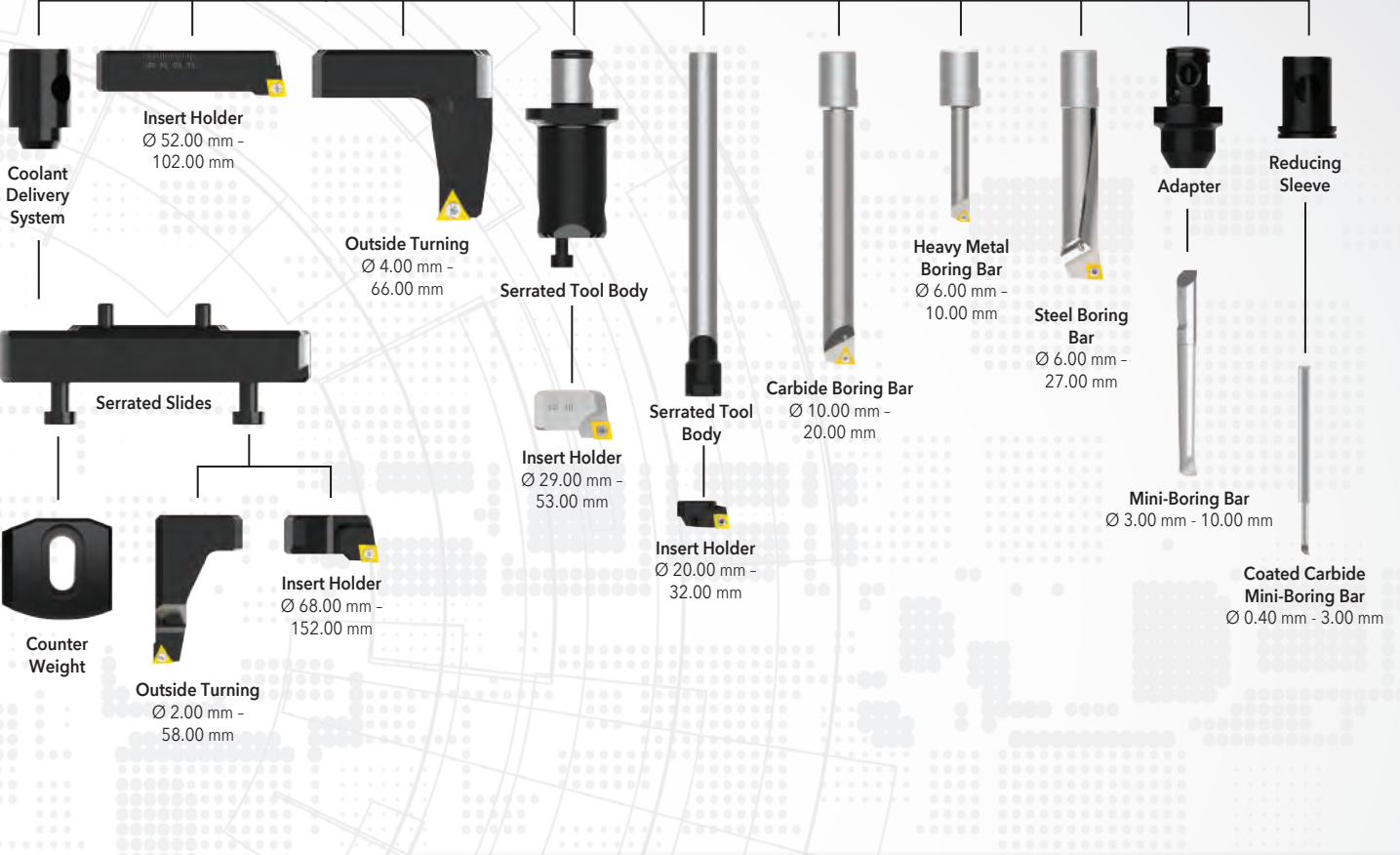
VarioBore Head

# VARIO BORE

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

NOTE: 3E TECH+ adjustment accuracy of 0.001 mm on diameter

NOTE: Vernier adjustment accuracy of 0.002 mm on diameter



## OPERATION **VERSATILITY**

from **0.40 mm** to **152.00 mm**  
*plus outside turning*



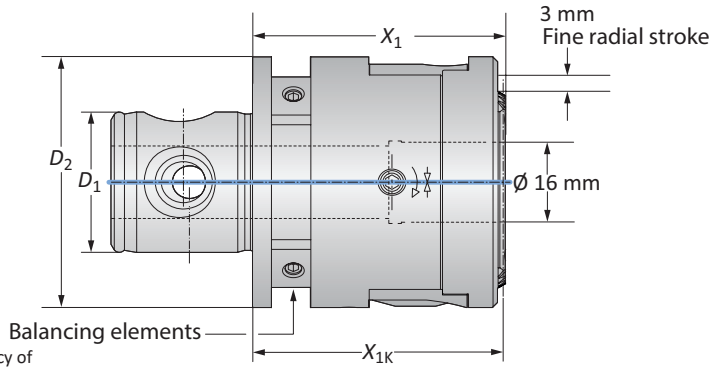
NOTE: 3E TECH+ adjustment accuracy of 0.001 mm on diameter

NOTE: Vernier adjustment accuracy of 0.002 mm on diameter



## Digital 3E<sup>TECH+</sup> Boring Head

Diameter Range: 0.40 mm - 152.00 mm



NOTE: Vernier adjustment accuracy of 0.002 mm on diameter

### VarioBore Digital 3E<sup>TECH+</sup> Boring Head

| MVS Connection | Boring Head   |       | Weight   | Part No.      |
|----------------|---------------|-------|----------|---------------|
| $D_2   D_1$    | Boring Range  | $X_1$ | $X_{1K}$ |               |
| <b>50 - 28</b> | 0.40 - 152.00 | 50.00 | 49.50    | <b>536002</b> |

NOTE: Balancing elements, 3E<sup>TECH+</sup> digital readout module, and charging unit must be ordered separately.

NOTE: VarioBore heads are compatible with Kaiser® connection

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

| Part No.      | Charging Unit* |
|---------------|----------------|
| <b>536015</b> | <b>536016</b>  |

NOTE: WEEE-Reg.-Nr. DE 15820388

\*Charging unit sold separately



NOTE: 3E<sup>TECH+</sup> adjustment accuracy of 0.001 mm on diameter

Key on B10-A:1

B10-M: 12-13

B10-F

B10: VI-VII

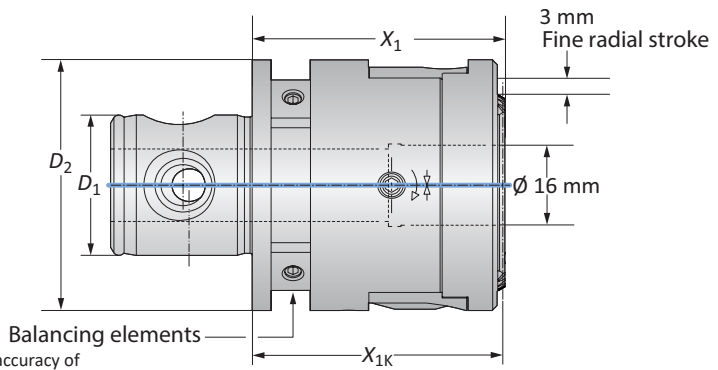
Ⓜ = Metric (mm)

**IMPORTANT:** Max spindle speed refers to maximum possible speed for an individual boring head and is not a recommended parameter. Refer to page B10-M: 12 for recommended application-specific parameters. Factory technical assistance is available for your specific applications through our Application Engineering department.  
 email: [engineering.eu@alliedmachine.com](mailto:engineering.eu@alliedmachine.com)




## Non-Digital Boring Head

Diameter Range: 0.40 mm - 152.00 mm



**NOTE:** Vernier adjustment accuracy of 0.002 mm on diameter

### VarioBore Non-Digital Boring Head

| MVS Connection  | Boring Head   |              |       |           | Weight | Part No. |
|---|---------------|--------------|-------|-----------|--------|----------|
|   | $D_2   D_1$   | Boring Range | $X_1$ | $X_{1K}$  |        |          |
|  50 - 28 | 0.40 - 152.00 | 50.00        | 49.50 | 0.70 (kg) | 536001 |          |

**NOTE:** Balancing elements must be ordered separately.

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

Key on B10-A-1

B10-M: 12-13

B10-F

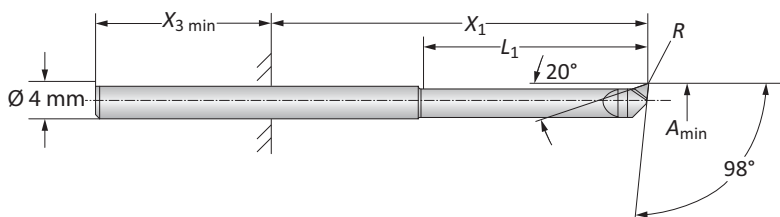
B10: VI-VII

 = Metric (mm)

**IMPORTANT:** Max spindle speed refers to maximum possible speed for an individual boring head and is not a recommended parameter. Refer to page B10-M: 12 for recommended application-specific parameters. Factory technical assistance is available for your specific applications through our Application Engineering department.  
 email: [engineering.eu@alliedmachine.com](mailto:engineering.eu@alliedmachine.com)

### Mini Boring Bars

WHC126 Coated Carbide | Diameter Range: 0.40 mm - 3.00 mm

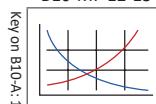


#### Mini Boring Bars

|   | Boring Range |               | Boring Bar*         |       |      | Part No.     |
|---|--------------|---------------|---------------------|-------|------|--------------|
|   | $A_{min}$    | $X_1$         | $X_{3 \text{ min}}$ | $L_1$ | $R$  |              |
| m | 0.40         | 3.00 - 17.00  | 25.00               | 2.00  | 0.03 | 081401WHC126 |
|   | 0.60         | 4.00 - 18.00  | 25.00               | 3.00  | 0.04 | 081402WHC126 |
|   | 0.80         | 5.00 - 19.00  | 25.00               | 4.00  | 0.04 | 081403WHC126 |
|   | 1.00         | 6.00 - 20.00  | 25.00               | 5.00  | 0.05 | 081404WHC126 |
|   | 1.50         | 8.50 - 22.50  | 25.00               | 7.50  | 0.05 | 081405WHC126 |
|   | 2.00         | 11.00 - 25.00 | 25.00               | 10.00 | 0.05 | 081406WHC126 |
|   | 2.50         | 13.50 - 27.50 | 25.00               | 12.50 | 0.05 | 081407WHC126 |
|   | 2.80         | 15.00 - 28.00 | 25.00               | 14.00 | 0.07 | 081408WHC126 |

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

B10-M: 12-13



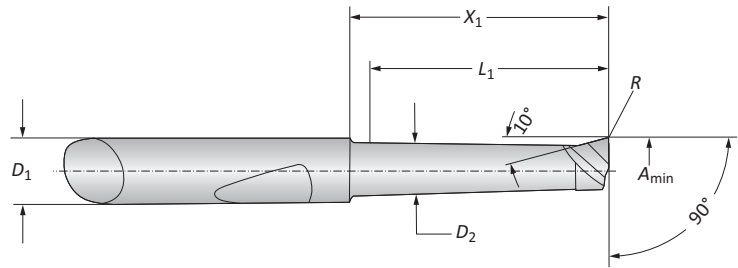
B10: VI-VII



m = Metric (mm)

## Mini Boring Bars

WHC05 | WHW04 | WBN150 | Diameter Range: 3.00 mm - 10.00 mm



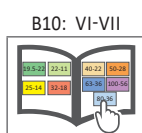
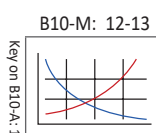
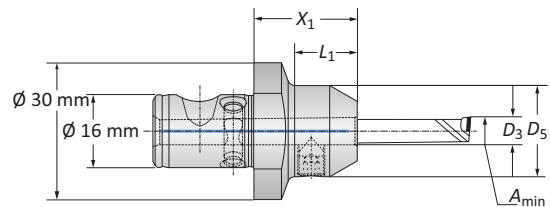
### Mini Boring Bars

| Boring Range | Boring Bar |       |       |       |       | Part No. |                |                  |              |
|--------------|------------|-------|-------|-------|-------|----------|----------------|------------------|--------------|
|              | $A_{min}$  | $D_1$ | $D_2$ | $X_1$ | $L_1$ | $R$      | Coated Carbide | Uncoated Carbide | CBN          |
| m            | 3.00       | 6.00  | 2.60  | 11.50 | 10.00 | 0.10     | 081306WHC05    | -                | 081322WBN150 |
|              | 3.00       | 6.00  | 2.60  | 16.50 | 15.00 | 0.10     | 081307WHC05    | 081307WHW04      | -            |
|              | 4.00       | 6.00  | 3.60  | 12.00 | 10.00 | 0.20     | 081308WHC05    | -                | 081317WBN150 |
|              | 4.00       | 6.00  | 3.60  | 17.00 | 15.00 | 0.20     | 081309WHC05    | -                | 081341WBN150 |
|              | 4.00       | 6.00  | 3.60  | 22.00 | 20.00 | 0.20     | 081310WHC05    | 081310WHW04      | -            |
|              | 5.00       | 6.00  | 4.60  | 12.00 | 10.00 | 0.20     | 081311WHC05    | -                | 081318WBN150 |
|              | 5.00       | 6.00  | 4.60  | 22.00 | 20.00 | 0.20     | 081312WHC05    | -                | 081319WBN150 |
|              | 5.00       | 6.00  | 4.60  | 32.00 | 30.00 | 0.20     | 081313WHC05    | 081313WHW04      | -            |
|              | 6.00       | 6.00  | 5.60  | 22.00 | 20.00 | 0.20     | 081314WHC05    | -                | 081320WBN150 |
|              | 6.00       | 6.00  | 5.60  | 32.00 | 30.00 | 0.20     | 081315WHC05    | -                | 081321WBN150 |
|              | 6.00       | 6.00  | 5.60  | 42.00 | 40.00 | 0.20     | 081316WHC05    | 081316WHW04      | -            |
|              | 8.00       | 8.00  | 7.60  | 25.00 | 23.00 | 0.20     | 081323WHC05    | -                | -            |
|              | 8.00       | 8.00  | 7.60  | 50.00 | 48.00 | 0.20     | 081324WHC05    | -                | -            |



### Adapters

| Boring Range | Adapter   |       |       |       | 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 |



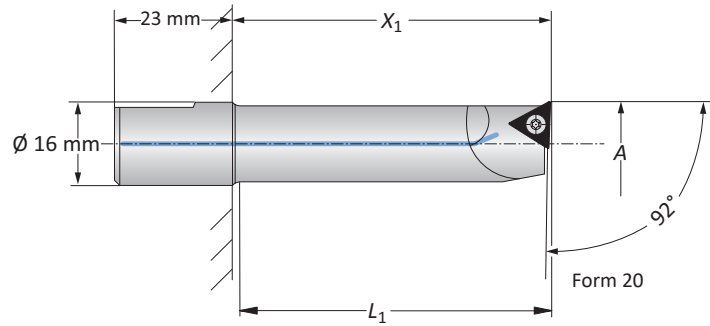
m = Metric (mm)

## Boring Bars

Steel | Diameter Range: 6.00 mm - 27.00 mm

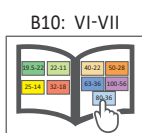
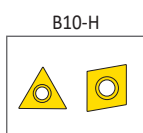
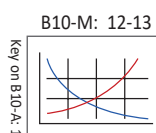


Form 101



| Boring Range    | Boring Bar |                | Weight | Insert Form | Part No. | Insert Form | Part No. |                |
|-----------------|------------|----------------|--------|-------------|----------|-------------|----------|----------------|
|                 | A          | X <sub>1</sub> |        |             |          |             |          | L <sub>1</sub> |
| 6.00 - 8.00     |            | 22.00          | 19.00  | 0.03 (kg)   | –        | –           | 211*     | 081053         |
| 8.00 - 10.00    |            | 30.00          | 27.00  | 0.04 (kg)   | –        | –           | 211*     | 218071         |
| 10.00 - 12.00   |            | 45.00          | 42.00  | 0.05 (kg)   | –        | –           | 20*      | 081044         |
| 10.00 - 12.00   |            | 25.00          | 22.00  | 0.04 (kg)   | 101      | 218047      | 20*      | 218058         |
| 10.00 - 12.00   |            | 35.00          | 32.00  | 0.05 (kg)   | 101      | 218048      | 20*      | 218059         |
| 12.00 - 14.00   |            | 30.00          | 27.00  | 0.05 (kg)   | 101      | 218012      | 20*      | 218014         |
| 12.00 - 14.00   |            | 45.00          | 42.00  | 0.06 (kg)   | 101      | 218049      | 20*      | 218060         |
| 14.00 - 16.00   |            | 35.00          | 32.00  | 0.06 (kg)   | 101      | 218050      | 20*      | 218061         |
| m 14.00 - 16.00 |            | 50.00          | 47.00  | 0.08 (kg)   | 101      | 218051      | 20*      | 218062         |
| 15.00 - 17.00   |            | 37.00          | 34.00  | 0.06 (kg)   | –        | –           | 20*      | 081048         |
| 15.00 - 17.00   |            | 60.00          | 57.00  | 0.08 (kg)   | 101      | 081041      | 20*      | 081045         |
| 16.00 - 20.00   |            | 40.00          | 37.00  | 0.08 (kg)   | 101      | 218052      | 20*      | 218063         |
| 16.00 - 20.00   |            | 60.00          | 57.00  | 0.09 (kg)   | 101      | 218053      | 20*      | 218064         |
| 20.00 - 25.00   |            | 37.00          | 34.00  | 0.07 (kg)   | –        | –           | 20*      | 081049         |
| 20.00 - 25.00   |            | 70.00          | 67.00  | 0.11 (kg)   | 101      | 081042      | 20*      | 081046         |
| 25.00 - 27.00   |            | 37.00          | 34.00  | 0.07 (kg)   | –        | –           | 20*      | 081050         |
| 25.00 - 27.00   |            | 70.00          | 67.00  | 0.11 (kg)   | 101      | 081043      | 20*      | 081047         |

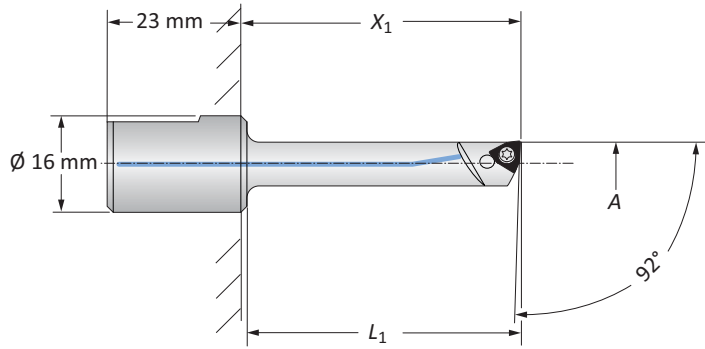
\*Not suitable for indexable inserts with a radius of 0.80 mm





## Boring Bars

Heavy Metal | Carbide Diameter Range: 6.00 mm - 20.00 mm



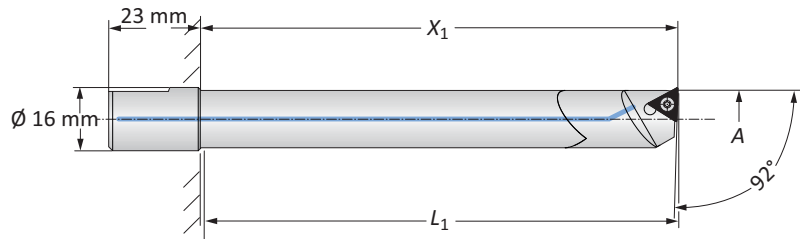
Heavy Metal Boring Bars | Diameter Range: 6.00 mm - 10.00 mm

| m | Boring Range |                | Boring Bar     |  | Weight    | Insert Form | Part No. |
|---|--------------|----------------|----------------|--|-----------|-------------|----------|
|   | A            | X <sub>1</sub> | L <sub>1</sub> |  |           |             |          |
|   | 6.00 - 8.00  | 32.00          | 29.00          |  | 0.08 (kg) | 211*        | 081055   |
|   | 8.00 - 10.00 | 45.00          | 42.00          |  | 0.09 (kg) | 211*        | 218072   |

\*Not suitable for indexable inserts with a radius of 0.80 mm



Form 101

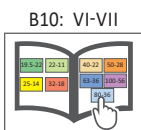
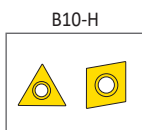
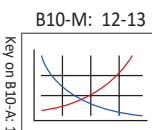


Form 20

Carbide Boring Bars | Diameter Range: 10.00 mm - 20.00 mm

| m | Boring Range  |                | Boring Bar     |  | Weight    | Insert Form | Part No. | Insert Form | Part No. |
|---|---------------|----------------|----------------|--|-----------|-------------|----------|-------------|----------|
|   | A             | X <sub>1</sub> | L <sub>1</sub> |  |           |             |          |             |          |
|   | 10.00 - 12.00 | 55.00          | 52.00          |  | 0.07 (kg) | 101         | 218042   | 20*         | 218037   |
|   | 10.00 - 12.00 | 75.00          | 72.00          |  | 0.09 (kg) | 101         | 218032   | 20*         | 218029   |
|   | 12.00 - 14.00 | 70.00          | 67.00          |  | 0.10 (kg) | 101         | 218043   | 20*         | 218038   |
|   | 12.00 - 14.00 | 90.00          | 87.00          |  | 0.15 (kg) | 101         | 218033   | 20*         | 218030   |
|   | 14.00 - 16.00 | 75.00          | 72.00          |  | 0.16 (kg) | 101         | 218044   | 20*         | 218039   |
|   | 14.00 - 16.00 | 100.00         | 97.00          |  | 0.20 (kg) | 101         | 218045   | 20*         | 218040   |
|   | 16.00 - 20.00 | 90.00          | 87.00          |  | 0.26 (kg) | 101         | 218046   | 20*         | 218041   |
|   | 16.00 - 20.00 | 120.00         | 117.00         |  | 0.33 (kg) | 101         | 218034   | 20*         | 218031   |

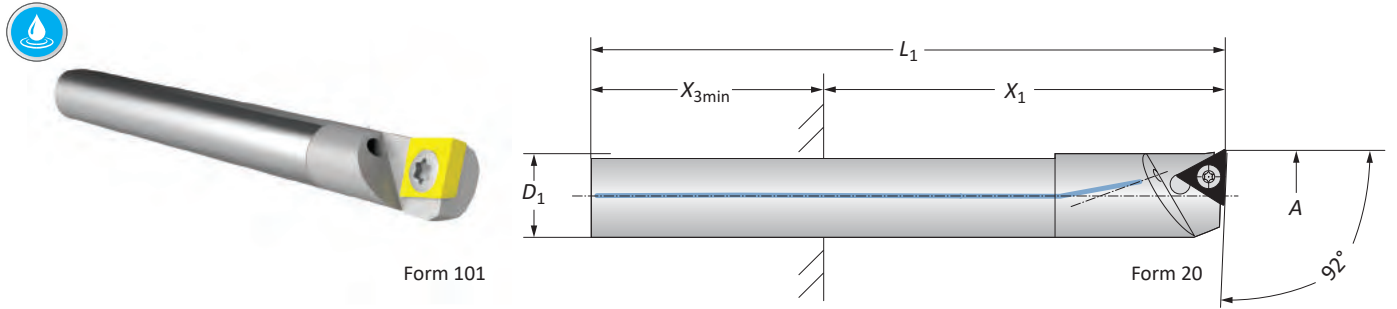
\*Not suitable for indexable inserts with a radius of 0.80 mm



m = Metric (mm)  
Inserts sold separately

## Boring Bars

Steel | Carbide | Diameter Range: 6.00 mm - 20.00 mm

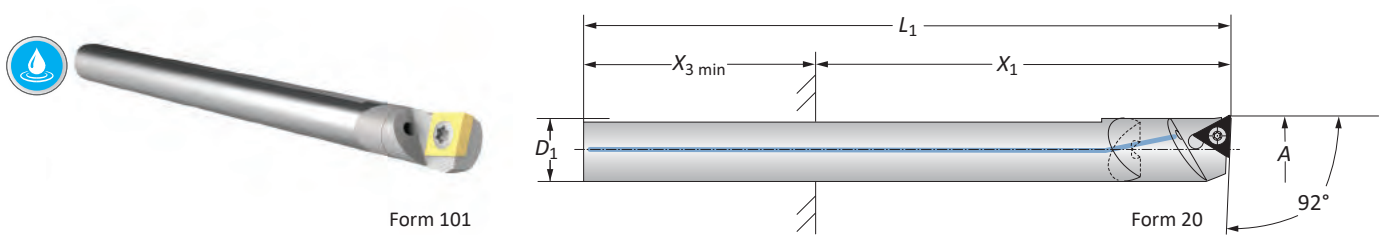


### Steel Boring Bars | Diameter Range: 6.00 mm - 20.00 mm

| Boring Range  | Boring Bar |                |                |                    |                | Weight | Part No.    |            |             |            |
|---------------|------------|----------------|----------------|--------------------|----------------|--------|-------------|------------|-------------|------------|
|               | A          | D <sub>1</sub> | X <sub>1</sub> | X <sub>3 min</sub> | L <sub>1</sub> |        | Insert Form | Boring Bar | Insert Form | Boring Bar |
| 6.00 - 8.00   | 5.00*      | 12.50 - 25.00  | 25.00          | 70.00              | 0.01 (kg)      | 211**  | 514032      | -          | -           |            |
| 8.00 - 10.00  | 7.00*      | 17.50 - 35.00  | 25.00          | 81.00              | 0.02 (kg)      | 211**  | 514033      | -          | -           |            |
| 10.00 - 12.00 | 8.00*      | 20.00 - 40.00  | 25.00          | 85.00              | 0.03 (kg)      | 101    | 514003      | 20**       | 514004      |            |
| 12.00 - 14.00 | 10.00*     | 25.00 - 50.00  | 25.00          | 100.00             | 0.05 (kg)      | 101    | 514005      | 20**       | 514006      |            |
| 14.00 - 16.00 | 12.00*     | 30.00 - 60.00  | 30.00          | 114.00             | 0.09 (kg)      | 101    | 514007      | 20**       | 514008      |            |
| 16.00 - 18.00 | 14.00*     | 56.00 - 70.00  | 30.00          | 121.00             | 0.13 (kg)      | 101    | 514009      | 20**       | 514010      |            |
| 18.00 - 20.00 | 14.00*     | 56.00 - 70.00  | 30.00          | 121.00             | 0.13 (kg)      | 101    | 514011      | 20**       | 514012      |            |

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

\*\*Not suitable for indexable inserts with a radius of 0.8 mm

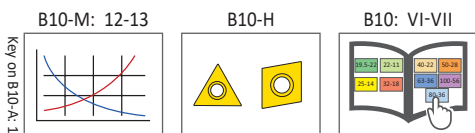


### Carbide Boring Bars | Diameter Range: 6.00 mm - 20.00 mm

| Boring Range  | Boring Bar |                 |                |                    |                | Weight | Part No.    |            |             |            |
|---------------|------------|-----------------|----------------|--------------------|----------------|--------|-------------|------------|-------------|------------|
|               | A          | D <sub>1</sub>  | X <sub>1</sub> | X <sub>3 min</sub> | L <sub>1</sub> |        | Insert Form | Boring Bar | Insert Form | Boring Bar |
| 6.00 - 8.00   | 5.00*      | 12.50 - 40.00   | 25.00          | 90.00              | 0.02 (kg)      | 211**  | 514034      | -          | -           |            |
| 8.00 - 10.00  | 7.00*      | 21.00 - 56.00   | 25.00          | 109.00             | 0.05 (kg)      | 211**  | 514035      | -          | -           |            |
| 10.00 - 12.00 | 8.00*      | 22.00 - 64.00   | 25.00          | 117.00             | 0.07 (kg)      | 101    | 514015      | 20**       | 514016      |            |
| 12.00 - 14.00 | 10.00*     | 51.00 - 80.00   | 25.00          | 140.00             | 0.13 (kg)      | 101    | 514017      | 20**       | 514018      |            |
| 14.00 - 16.00 | 12.00*     | 68.00 - 96.00   | 30.00          | 162.00             | 0.22 (kg)      | 101    | 514019      | 20**       | 514020      |            |
| 16.00 - 18.00 | 14.00*     | 77.00 - 112.00  | 30.00          | 142.00             | 0.26 (kg)      | 101    | 514021      | 20**       | 514022      |            |
| 16.00 - 18.00 | 14.00*     | 112.00 - 147.00 | 30.00          | 177.00             | 0.33 (kg)      | 101    | 514023      | 20**       | 514024      |            |
| 18.00 - 20.00 | 14.00*     | 77.00 - 112.00  | 30.00          | 142.00             | 0.26 (kg)      | 101    | 514025      | 20**       | 514026      |            |
| 18.00 - 20.00 | 14.00*     | 112.00 - 147.00 | 30.00          | 177.00             | 0.33 (kg)      | 101    | 514027      | 20**       | 514028      |            |

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

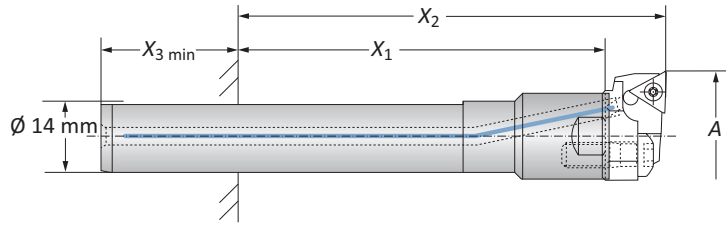
\*\*Not suitable for indexable inserts with a radius of 0.80 mm



m = Metric (mm)  
Inserts sold separately

## Serrated Tool Bodies | Insert Holders

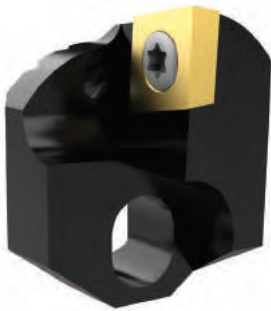
Diameter Range: 20.00 mm - 32.00 mm



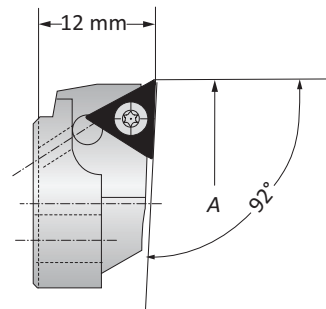
### Serrated Tool Bodies

| Substrate | Boring Range<br>A | Serrated Tool Body* |                 |                    | Weight    | Part No.      |
|-----------|-------------------|---------------------|-----------------|--------------------|-----------|---------------|
|           |                   | X <sub>1</sub>      | X <sub>2</sub>  | X <sub>3 min</sub> |           |               |
| Steel     | 20.00 - 32.00     | 37.00 - 72.00       | 49.00 - 84.00   | 30.00              | 0.13 (kg) | <b>514029</b> |
| Carbide   | 20.00 - 32.00     | 65.00 - 100.00      | 77.00 - 112.00  | 30.00              | 0.25 (kg) | <b>514030</b> |
| Carbide   | 20.00 - 32.00     | 100.00 - 135.00     | 112.00 - 147.00 | 30.00              | 0.33 (kg) | <b>514031</b> |

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



Form 101

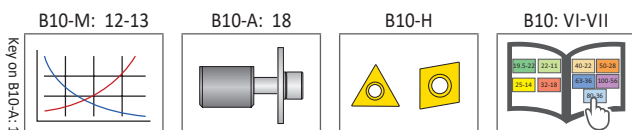


Form 20

### Insert Holders

| Boring Range<br>A | Weight    | Insert Form | Part No.      | Insert Form | Part No.      |
|-------------------|-----------|-------------|---------------|-------------|---------------|
|                   |           |             |               |             |               |
| 22.00 - 24.00     | 0.01 (kg) | 101         | <b>502053</b> | 20*         | <b>502047</b> |
| 24.00 - 26.00     | 0.01 (kg) | 101         | <b>502054</b> | 20*         | <b>502048</b> |
| 26.00 - 28.00     | 0.01 (kg) | 101         | <b>502055</b> | 20*         | <b>502049</b> |
| 28.00 - 30.00     | 0.01 (kg) | 101         | <b>502056</b> | 20*         | <b>502050</b> |
| 30.00 - 32.00     | 0.01 (kg) | 101         | <b>502057</b> | 20*         | <b>502051</b> |

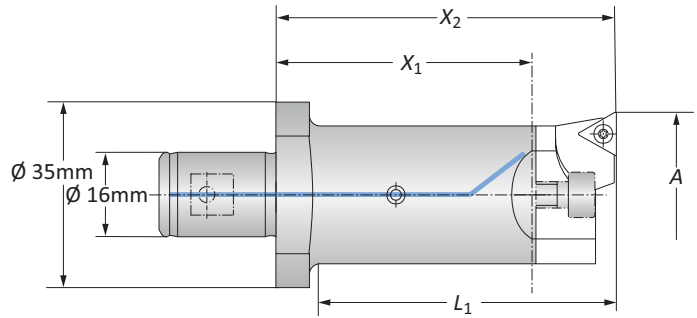
\*Not suitable for indexable inserts with a radius of 0.80 mm



**m** = Metric (mm)  
Inserts sold separately

## Serrated Tool Bodies | Insert Holders

Diameter Range: 29.00 mm - 53.00 mm

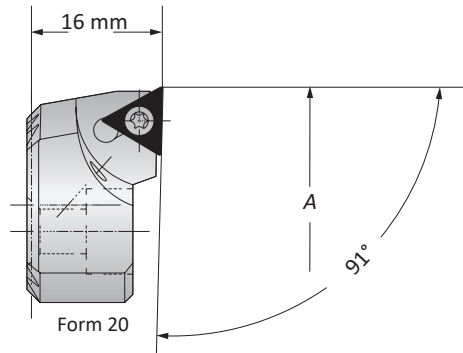


### Serrated Tool Bodies

|   | Boring Range  | Serrated Tool Body |                |                | Weight    | Part No. |
|---|---------------|--------------------|----------------|----------------|-----------|----------|
|   | A             | X <sub>1</sub>     | X <sub>2</sub> | L <sub>1</sub> |           |          |
| m | 29.00 - 53.00 | 48.00              | 64.00          | 56.00          | 0.20 (kg) | 236021   |
|   | 29.00 - 53.00 | 84.00              | 100.00         | 92.00          | 0.30 (kg) | 236031   |



Form 101

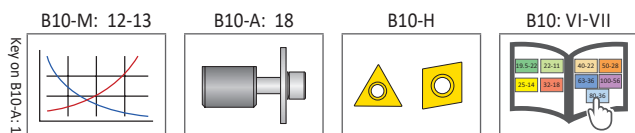


Form 20

### Insert Holders

|   | Boring Range  | Weight    | Insert Form | Part No. |
|---|---------------|-----------|-------------|----------|
|   | A             |           |             |          |
| m | 29.00 - 41.00 | 0.04 (kg) | 101         | 236023   |
|   | 29.00 - 41.00 | 0.04 (kg) | 20*         | 236022   |
|   | 40.00 - 53.00 | 0.06 (kg) | 101         | 236025   |
|   | 40.00 - 53.00 | 0.06 (kg) | 20*         | 236024   |

\*Not suitable for indexable inserts with a radius of 0.80 mm



B10-A: 12

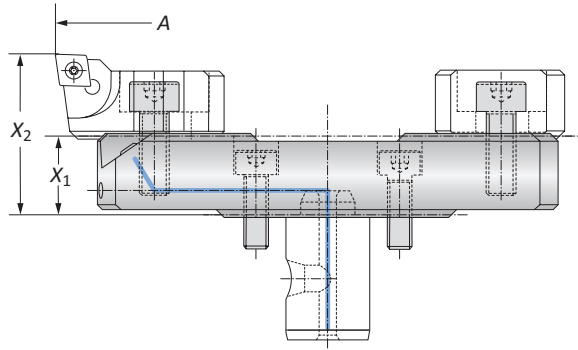
www.alliedmachine.com | +44 (0) 1384 400 900 | enquiries.eu@alliedmachine.com

m = Metric (mm)  
Inserts sold separately




## Alu-Line Serrated Slides | Insert Holders

Diameter Range: 68.00 mm - 152.00 mm



### Alu-Line Serrated Slides

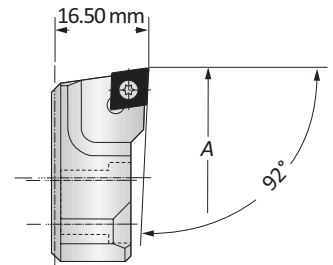
|   | Boring Range    |                | Serrated Slide |  | Weight    | Part No. |
|---|-----------------|----------------|----------------|--|-----------|----------|
|   | A               | X <sub>1</sub> | X <sub>2</sub> |  |           |          |
|  | 68.00 - 96.00   | 16.00          | 32.50          |  | 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. |
|---|----------------|-----------|--------|-------------|----------|
|   | A              |           |        |             |          |
|  | 68.00 - 152.00 | 0.05 (kg) | 101    | 502064      |          |
|   | 68.00 - 152.00 | 0.05 (kg) | 20     | 502069      |          |




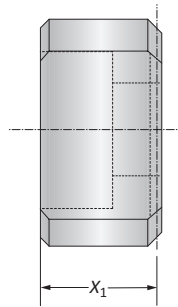
Form 20



Form 101

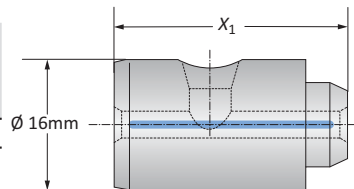
### Counterweight

|   | Counterweight  |           | Part No. |
|---|----------------|-----------|----------|
|   | X <sub>1</sub> | Weight    |          |
|  | 13.40          | 0.05 (kg) | 502165   |



### Alu-Line Coolant Delivery Section

|   | Coolant Delivery |           | Part No. |
|---|------------------|-----------|----------|
|   | X <sub>1</sub>   | Weight    |          |
|  | 25.50            | 0.01 (kg) | 450137   |




B10-M: 12-13  
Key on B10-A-1

B10-A: 18

B10-H

B10: VI-VII

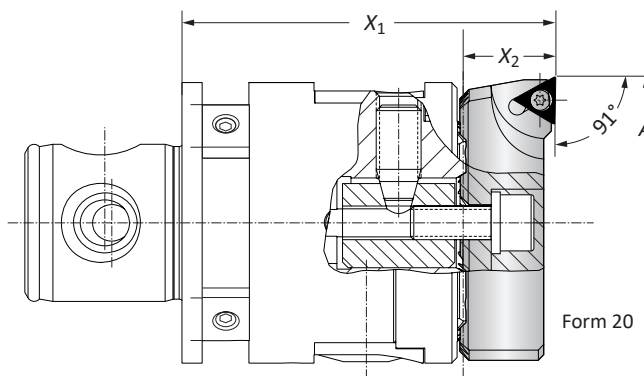
 = Metric (mm)  
Inserts sold separately

## Insert Holders for Boring Heads

Diameter Range: 52.00 mm - 102.00 mm



Form 101

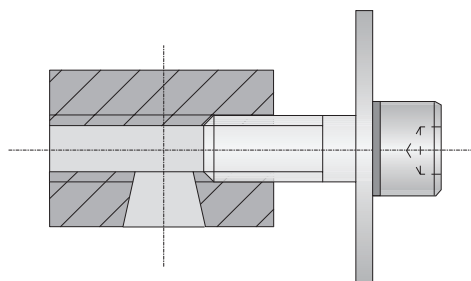


### Insert Holders for Boring Heads

|   | Boring Range   |  | Insert Holder  |                | Weight    | Insert Form | Part No.      |
|---|----------------|--|----------------|----------------|-----------|-------------|---------------|
|   | A              |  | X <sub>1</sub> | X <sub>2</sub> |           |             |               |
| Ⓜ | 52.00 - 77.00  |  | 66.00          | 16.50          | 0.06 (kg) | 101         | <b>236027</b> |
|   | 52.00 - 77.00  |  | 66.00          | 16.50          | 0.06 (kg) | 20          | <b>236026</b> |
|   | 76.00 - 102.00 |  | 66.00          | 16.50          | 0.10 (kg) | 101         | <b>236029</b> |
|   | 76.00 - 102.00 |  | 66.00          | 16.50          | 0.10 (kg) | 20          | <b>236028</b> |

### Clamping Piece for Insert Holder for Boring Heads

|   | Boring Range   | Service Key | Complete Part No. |
|---|----------------|-------------|-------------------|
| Ⓜ | 52.00 - 102.00 | s5          | <b>236020</b>     |

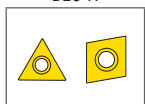
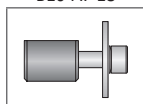
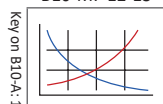


B10-M: 12-13

B10-A: 18

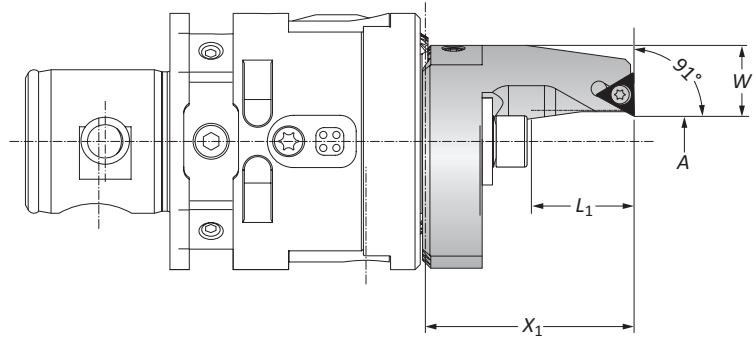
B10-H

B10: VI-VII



## Outside Turning Insert Holders for Boring Heads

Outside Turning | Diameter Range: 4.00 mm - 66.00 mm

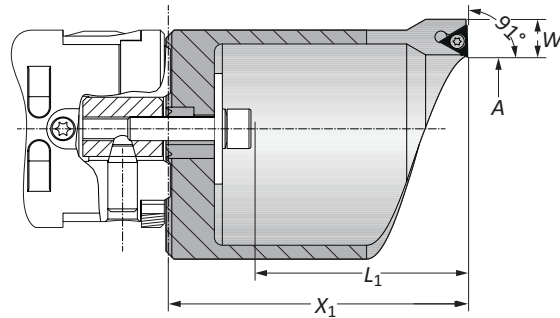


### Type A Insert Holders

|   | Boring Range  |                | Insert Holder  |       |      | Weight | Type | Insert Form | Part No. |
|---|---------------|----------------|----------------|-------|------|--------|------|-------------|----------|
|   | A             | X <sub>1</sub> | L <sub>1</sub> | W     |      |        |      |             |          |
| m | 4.00 - 17.50  | 40.50          | 20.00          | 16.60 | 0.10 | A      | 20*  | 236081      |          |
|   | 16.50 - 30.00 | 50.50          | 30.00          | 11.10 | 0.10 | A      | 20*  | 236082      |          |

**NOTE:** Clockwise and neutral execution

\*Not suitable for indexable inserts with a radius of 0.80 mm



### Type B Insert Holders

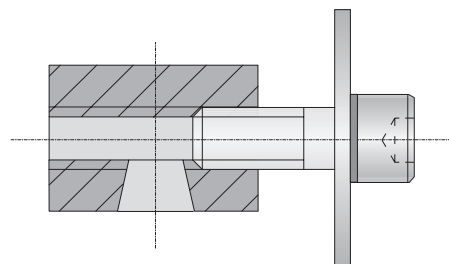
|   | Boring Range  |                | Insert Holder  |      |           | Weight | Type | Insert Form | Part No. |
|---|---------------|----------------|----------------|------|-----------|--------|------|-------------|----------|
|   | A             | X <sub>1</sub> | L <sub>1</sub> | W    |           |        |      |             |          |
| 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

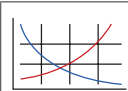
\*Not suitable for indexable inserts with a radius of 0.80 mm

### Clamping Pieces for Outside Turning Insert Holders

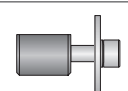
| Insert Holder Type | Boring Range  | Service Key | Complete Part No. |
|--------------------|---------------|-------------|-------------------|
| A                  | 4.00 - 30.00  | s5          | 236088            |
| B                  | 29.00 - 66.00 | s5          | 236089            |



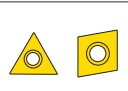
B10-M: 12-13



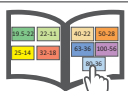
B10-A: 18



B10-H



B10: VI-VII

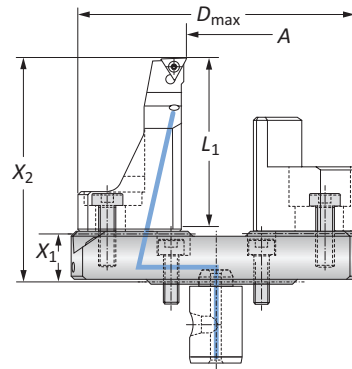


Key on B10-A-1

m = Metric (mm)  
Inserts sold separately

## Outside Turning Serrated Slides | Insert Holders

Diameter Range: 2.00 mm - 58.00 mm



### Serrated Slides

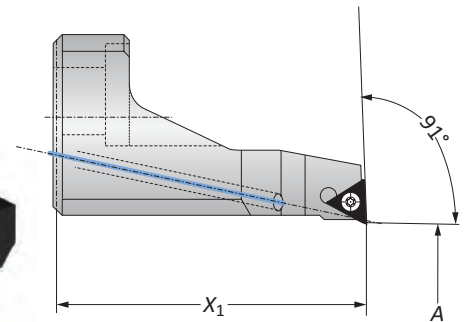
|   | Outside Turning Range | Serrated Slide |                |                | Weight    | Interfering Diameter | Part No. |
|---|-----------------------|----------------|----------------|----------------|-----------|----------------------|----------|
|   | A                     | X <sub>1</sub> | X <sub>2</sub> | L <sub>1</sub> |           | D <sub>max</sub>     |          |
| Ⓜ | 2.00 - 30.00          | 16.00          | 73.00          | 55.00          | 0.35 (kg) | 101.00               | 501064   |
|   | 30.00 - 58.00         | 16.00          | 73.00          | 55.00          | 0.44 (kg) | 129.00               | 501065   |



### Insert Holder

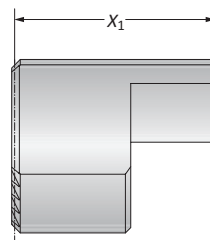
|   | Boring Range | Insert Holder  | Weight    | Insert Form | Part No. |
|---|--------------|----------------|-----------|-------------|----------|
|   | A            | X <sub>1</sub> |           |             |          |
| Ⓜ | 2.00 - 58.00 | 57.00          | 0.15 (kg) | 20*         | 502082   |

\*Clockwise and neutral execution



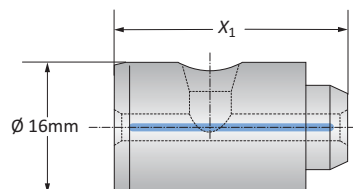
### Counterweight

|   | Counterweight  | Weight    | Part No. |
|---|----------------|-----------|----------|
|   | X <sub>1</sub> |           |          |
| Ⓜ | 37.75          | 0.16 (kg) | 502183   |



### Alu-Line Coolant Delivery Section

|   | Coolant Delivery Section | Weight    | Part No. |
|---|--------------------------|-----------|----------|
|   | X <sub>1</sub>           |           |          |
| Ⓜ | 25.50                    | 0.01 (kg) | 450137   |

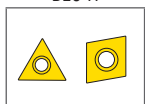
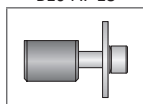
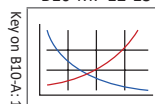


B10-M: 12-13

B10-A: 18

B10-H

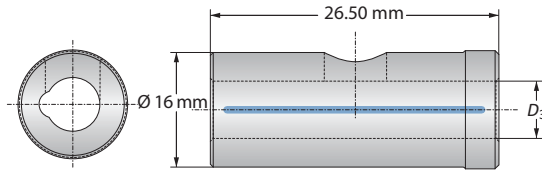
B10: VI-VII



Ⓜ = Metric (mm)  
Inserts sold separately

Accessories

Metric Reducing Sleeves



Reducing Sleeves

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

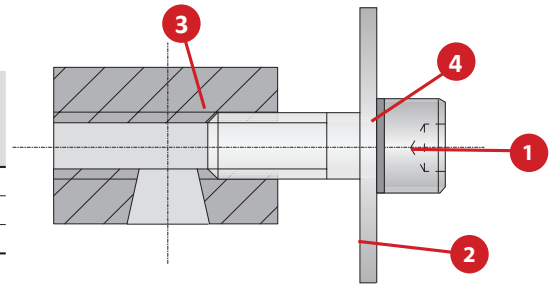
 = Metric (mm)

## Accessories

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

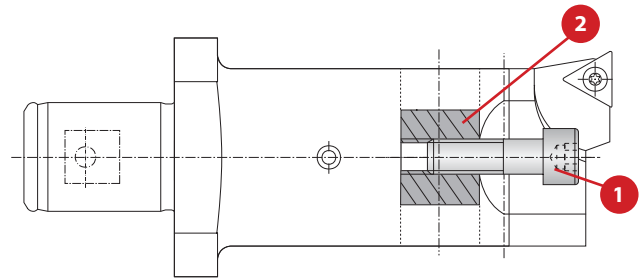
### Clamping Elements for Insert Holders

| Boring Range | 1<br>Cap Screw | Hex Size | 2<br>Washer | 3<br>Clamping Nut | 4<br>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            |



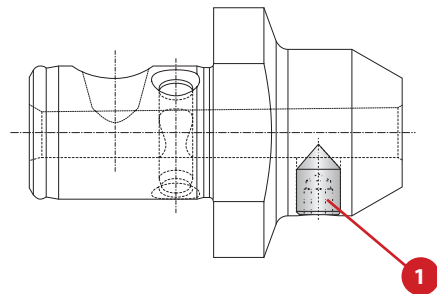
### Clamping Elements for Serrated Tool Body

| 1<br>Cap Screw | Hex Size | 2<br>Clamping Piece |
|----------------|----------|---------------------|
| 027154         | s4       | 145184              |



### Thread Pin

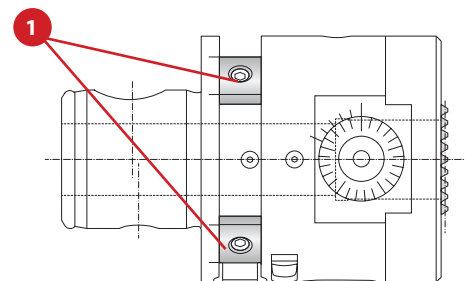
| Service Key | 1<br>Part No. |
|-------------|---------------|
| S3 / A      | 415244        |



### Balancing Element

| Nominal Size  | Key Size / Type | 1<br>Part No. |
|---------------|-----------------|---------------|
| M8 x 1.25 x 8 | s2 / A          | 536005        |

**NOTE:** Balancing elements sold separately



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

| 1<br>Charging Unit |
|--------------------|
| Part No.           |
| 536016             |

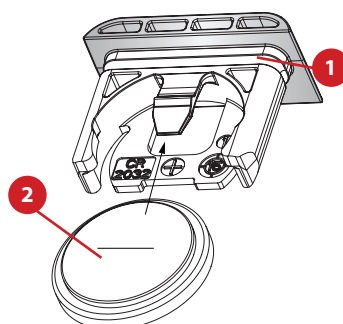
**NOTE:** Charging unit sold separately from 3E<sup>TECH+</sup>



**NOTE:** 3E<sup>TECH+</sup> adjustment accuracy of 0.001 mm on diameter

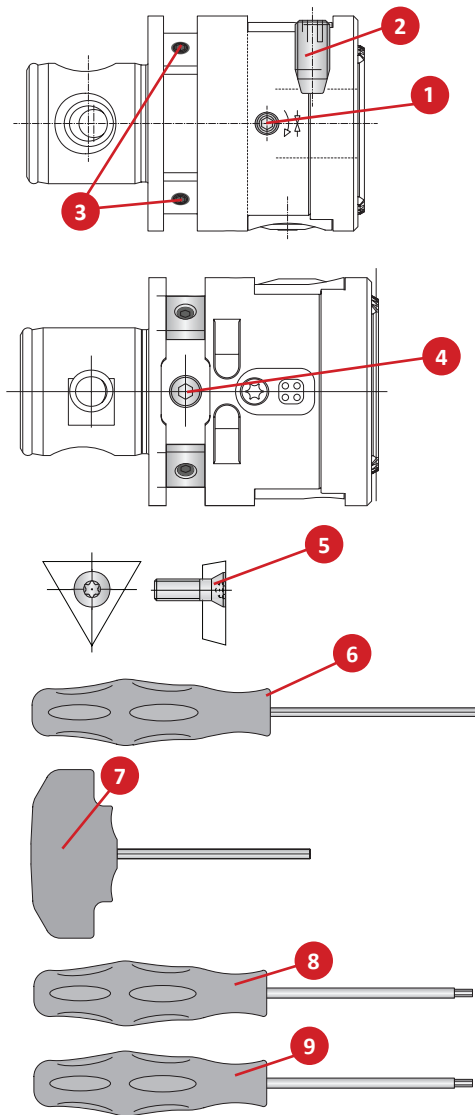
### 3E<sup>TECH</sup> Accessories

| 1<br>Sealing Ring | 2<br>Battery CR2032 |
|-------------------|---------------------|
| Part No.          | Part No.            |
| 215483            | 515491              |

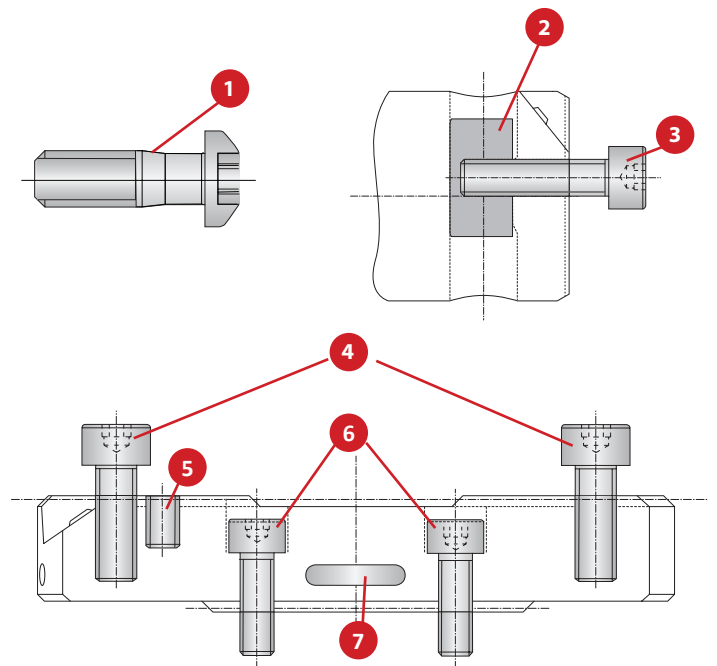


Accessories

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



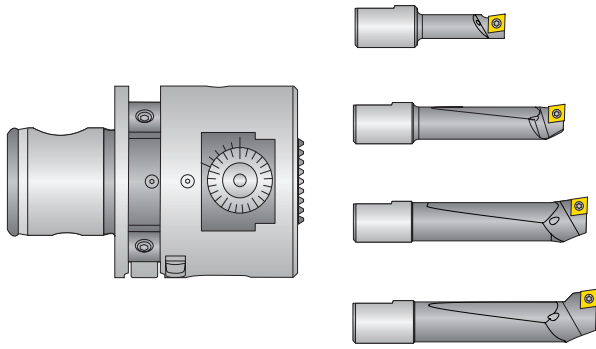
| No. | Part   | Size | Part No. |
|-----|--|------|----------|
| 1   | Screw for securing insert holder                   | T25  | 415112   |
| 2   | Clamping piece                                     | -    | 145184   |
| 3   | Cap screw for securing insert holders              | s4   | 027154   |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





## Kit Components

3E<sup>TECH+</sup> | Insert Form 101 | Diameter Range: 10.00 mm - 30.00 mm



Diameter Range: 10.00 mm - 30.00 mm

| Kit Components |             |                  |             |               |         |
|----------------|-------------|------------------|-------------|---------------|---------|
|                | Boring Head | Boring Bar Range | Boring Bars | Service Keys  | Kit No. |
| m              | 536002      | 10.00 - 15.00    | 218048      | 115575 (s2.5) | 103046  |
|                |             | 15.00 - 20.00    | 081041      | 215403 (s4)   |         |
|                |             | 20.00 - 25.00    | 081042      | 115590 (T8)   |         |
|                |             | 25.00 - 30.00    | 081043      |               |         |

NOTE: Balancing elements and inserts sold separately

NOTE: 3E<sup>TECH+</sup> digital readout module and charging station sold separately



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

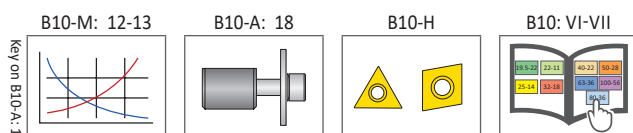
| Part No. | Charging Unit* |
|----------|----------------|
| 536015   | 536016         |

NOTE: WEEE-Reg.-Nr. DE 15820388

\*Charging unit sold separately



NOTE: 3E<sup>TECH+</sup> adjustment accuracy of 0.001 mm on diameter



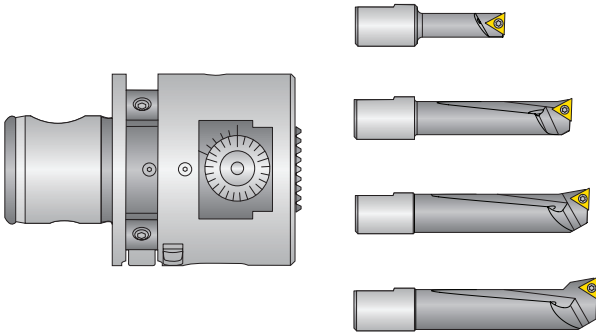
m = Metric (mm)

Inserts sold separately

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email: [engineering.eu@alliedmachine.com](mailto:engineering.eu@alliedmachine.com)

## Kit Components

3E<sup>TECH+</sup> | Insert Form 20 | Diameter Range: 10.00 mm - 30.00 mm



Diameter Range: 10.00 mm - 30.00 mm

| Kit Components |             |                  |             |               |         |
|----------------|-------------|------------------|-------------|---------------|---------|
|                | Boring Head | Boring Bar Range | Boring Bars | Service Keys  | Kit No. |
| m              | 536002      | 10.00 - 15.00    | 218059      | 115575 (s2.5) | 103045  |
|                |             | 15.00 - 20.00    | 081045      | 215403 (s4)   |         |
|                |             | 20.00 - 25.00    | 081046      | 115591 (T7)   |         |
|                |             | 25.00 - 30.00    | 081047      |               |         |

NOTE: Balancing elements and inserts sold separately

NOTE: 3E<sup>TECH+</sup> digital readout module and charging station sold separately



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

| Part No. | Charging Unit* |
|----------|----------------|
| 536015   | 536016         |

NOTE: WEEE-Reg.-Nr. DE 15820388

\*Charging unit sold separately



NOTE: 3E<sup>TECH+</sup> adjustment accuracy of 0.001 mm on diameter

Key on B10-A-1:

B10-M: 12-13

B10-A: 18

B10-H

B10: VI-VII

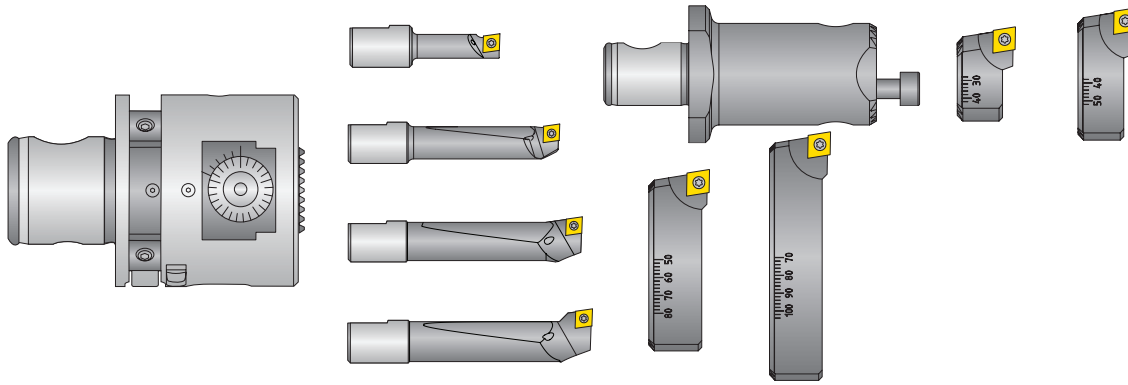
m = Metric (mm)

Inserts sold separately

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## Kit Components

3E<sup>TECH+</sup> | Insert Form 101 | Diameter Range: 10.00 mm - 102.00 mm



Diameter Range: 10.00 mm - 102.00 mm

| Kit Components |                  |          |                                     |                     |          |                                |          |                |               |         |  |
|----------------|------------------|----------|-------------------------------------|---------------------|----------|--------------------------------|----------|----------------|---------------|---------|--|
| Boring Head    | Boring Bars      |          | Serrated Tool Body & Insert Holders |                     |          | Insert Holders for Boring Head |          |                | Service Keys  | Kit No. |  |
|                | Boring Bar Range | Part No. | Serrated Tool Body                  | Insert Holder Range | Part No. | Insert Holder Range            | Part No. | Clamping Piece |               |         |  |
| m              | 10.00 - 15.00    | 218048   | 236021                              | 29.00 - 41.00       | 236023   | 52.00 - 77.00                  | 236027   | 236020         | 115575 (s2.5) | 103048  |  |
|                | 15.00 - 20.00    | 081041   |                                     | 40.00 - 53.00       | 236025   | 76.00 - 102.00                 | 236029   |                | 215403 (s4)   |         |  |
|                | 20.00 - 25.00    | 081042   |                                     |                     |          |                                |          |                | 215521 (s5)   |         |  |
|                | 25.00 - 30.00    | 081043   |                                     |                     |          |                                |          |                | 115590 (T8)   |         |  |

NOTE: Balancing elements and inserts sold separately  
 NOTE: 3E<sup>TECH+</sup> digital readout module and charging station sold separately



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

| Part No. | Charging Unit* |
|----------|----------------|
| 536015   | 536016         |

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



NOTE: 3E<sup>TECH+</sup> adjustment accuracy of 0.001 mm on diameter

Key on B10-A-1

B10-M: 12-13

B10-A: 18

B10-H

B10: VI-VII

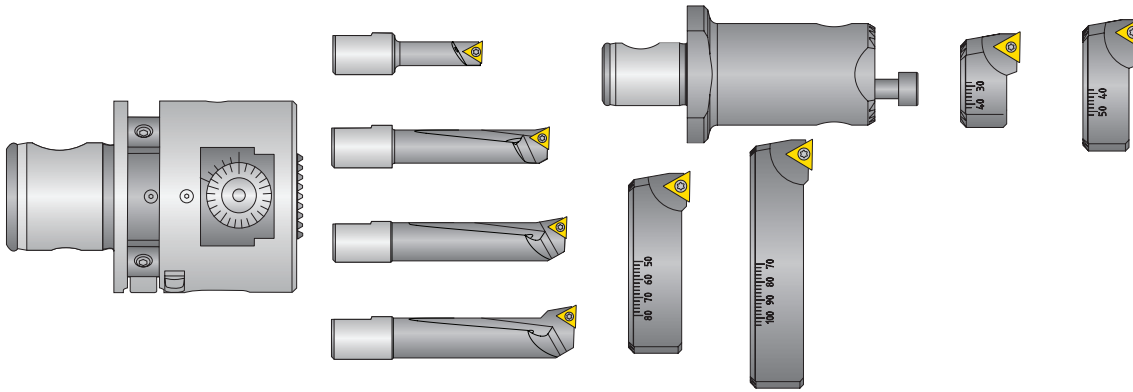
m = Metric (mm)

Inserts sold separately

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## Kit Components

3E<sup>TECH+</sup> | Insert Form 20 | Diameter Range: 10.00 mm - 102.00 mm



Diameter Range: 10.00 mm - 102.00 mm

| Kit Components |                  |          |                                     |                     |          |                                |             |                |               |         |
|----------------|------------------|----------|-------------------------------------|---------------------|----------|--------------------------------|-------------|----------------|---------------|---------|
| Boring Head    | Boring Bars      |          | Serrated Tool Body & Insert Holders |                     |          | Insert Holders for Boring Head |             |                | Service Keys  | Kit No. |
|                | Boring Bar Range | Part No. | Serrated Tool Body                  | Insert Holder Range | Part No. | Insert Holder Range            | Part No.    | Clamping Piece |               |         |
| m              | 10.00 - 15.00    | 218059   | 236021                              | 29.00 - 41.00       | 236026   | 52.00 - 77.00                  | 236022      | 236020         | 115575 (s2.5) | 103047  |
|                | 15.00 - 20.00    | 081045   |                                     | 40.00 - 53.00       | 236028   | 76.00 - 102.00                 | 236024      |                | 215403 (s4)   |         |
|                | 20.00 - 25.00    | 081046   |                                     |                     |          |                                | 215521 (s5) |                |               |         |
|                | 25.00 - 30.00    | 081047   |                                     |                     |          |                                | 115591 (T7) |                |               |         |

NOTE: Balancing elements and inserts sold separately

NOTE: 3E<sup>TECH+</sup> digital readout module and charging station sold separately



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

| Part No. | Charging Unit* |
|----------|----------------|
| 536015   | 536016         |

NOTE: WEEE-Reg.-Nr. DE 15820388

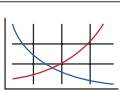
\*Charging unit sold separately



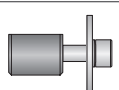
NOTE: 3E<sup>TECH+</sup> adjustment accuracy of 0.001 mm on diameter

Key on B10-A-1

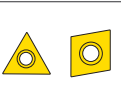
B10-M: 12-13



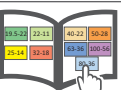
B10-A: 18



B10-H



B10: VI-VII



m = Metric (mm)

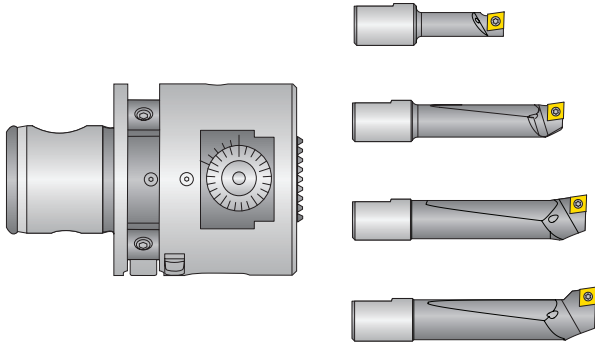
Inserts sold separately

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 email: [engineering.eu@alliedmachine.com](mailto:engineering.eu@alliedmachine.com)



## Kit Components

Non-Digital | Insert Form 101 | Diameter Range: 10.00 mm - 30.00 mm



Diameter Range: 10.00 mm - 30.00 mm

| Kit Components |             |                  |             |               |         |
|----------------|-------------|------------------|-------------|---------------|---------|
|                | Boring Head | Boring Bar Range | Boring Bars | Service Keys  | Kit No. |
| m              | 536001      | 10.00 - 15.00    | 218048      | 115575 (s2.5) | 103050  |
|                |             | 15.00 - 20.00    | 081041      | 215403 (s4)   |         |
|                |             | 20.00 - 25.00    | 081042      | 115590 (T8)   |         |
|                |             | 25.00 - 30.00    | 081043      |               |         |

NOTE: Balancing elements and inserts sold separately



Key on B10-A-1

B10-M: 12-13

B10-A: 18

B10-H

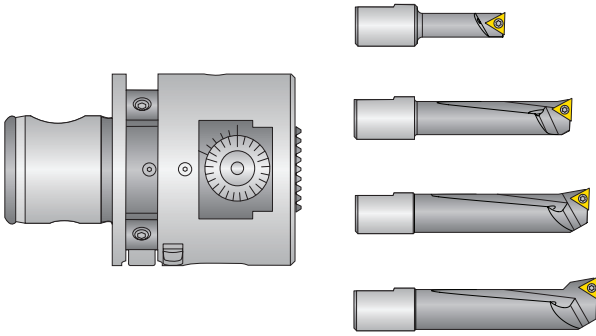
B10: VI-VII

m = Metric (mm)  
Inserts sold separately

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## Kit Components

Non-Digital | Insert Form 20 | Diameter Range: 10.00 mm - 30.00 mm



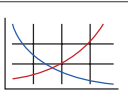
Diameter Range: 10.00 mm - 30.00 mm

| Kit Components |             |                  |             |               |         |
|----------------|-------------|------------------|-------------|---------------|---------|
|                | Boring Head | Boring Bar Range | Boring Bars | Service Keys  | Kit No. |
| m              | 536001      | 10.00 - 15.00    | 218059      | 115575 (s2.5) | 103049  |
|                |             | 15.00 - 20.00    | 081045      | 215403 (s4)   |         |
|                |             | 20.00 - 25.00    | 081046      | 115591 (T7)   |         |
|                |             | 25.00 - 30.00    | 081047      |               |         |

**NOTE:** Balancing elements and inserts sold separately

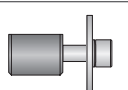


B10-M: 12-13

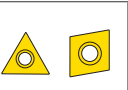


Key on B10-A: 1

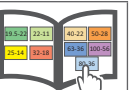
B10-A: 18



B10-H



B10: VI-VII

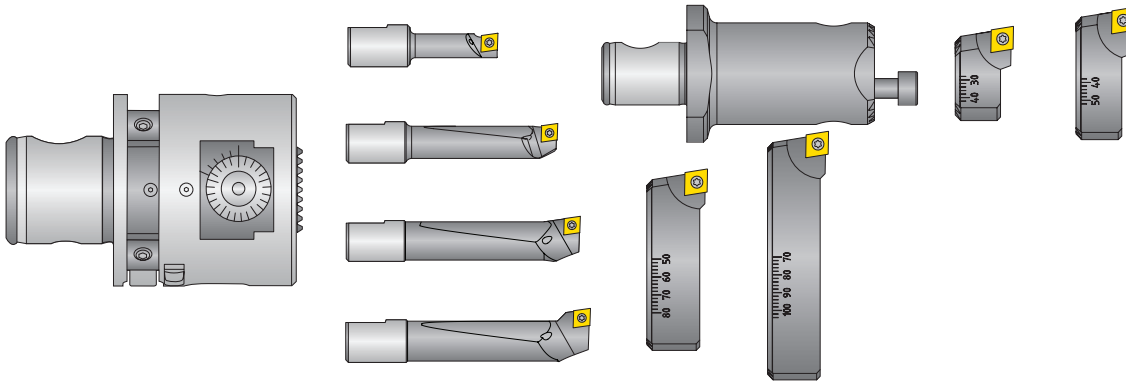


m = Metric (mm)  
Inserts sold separately

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## Kit Components

Non-Digital | Insert Form 101 | Diameter Range: 10.00 mm - 102.00 mm



Diameter Range: 10.00 mm - 102.00 mm

| Kit Components |                  |          |                                     |                     |          |                                |          |                |               |         |
|----------------|------------------|----------|-------------------------------------|---------------------|----------|--------------------------------|----------|----------------|---------------|---------|
| Boring Head    | Boring Bars      |          | Serrated Tool Body & Insert Holders |                     |          | Insert Holders for Boring Head |          |                | Service Keys  | Kit No. |
|                | Boring Bar Range | Part No. | Serrated Tool Body                  | Insert Holder Range | Part No. | Insert Holder Range            | Part No. | Clamping Piece |               |         |
| m              | 10.00 - 15.00    | 218048   | 236021                              | 29.00 - 41.00       | 236023   | 52.00 - 77.00                  | 236027   | 236020         | 115575 (s2.5) | 103052  |
|                | 15.00 - 20.00    | 081041   |                                     | 40.00 - 53.00       | 236025   | 76.00 - 102.00                 | 236029   |                | 215403 (s4)   |         |
|                | 20.00 - 25.00    | 081042   |                                     |                     |          |                                |          |                | 215521 (s5)   |         |
|                | 25.00 - 30.00    | 081043   |                                     |                     |          |                                |          |                | 115590 (T8)   |         |

NOTE: Balancing elements and inserts sold separately



Key on B10-A-1

B10-M: 12-13

B10-A: 18

B10-H

B10: VI-VII

m = Metric (mm)

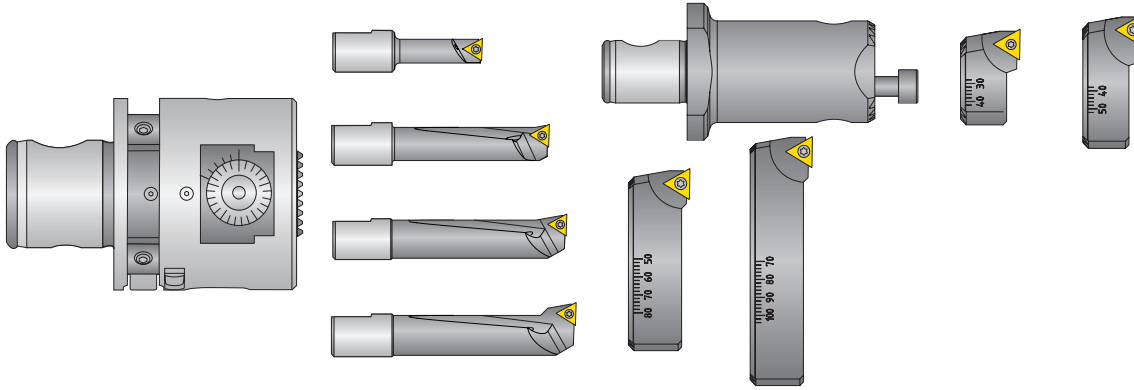
Inserts sold separately

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## Kit Components

Non-Digital | Insert Form 20 | Diameter Range: 10.00 mm - 102.00 mm



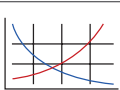
Diameter Range: 10.00 mm - 102.00 mm

| Kit Components |                  |          |                                     |                     |          |                                |          |                |                |         |        |
|----------------|------------------|----------|-------------------------------------|---------------------|----------|--------------------------------|----------|----------------|----------------|---------|--------|
| Boring Head    | Boring Bars      |          | Serrated Tool Body & Insert Holders |                     |          | Insert Holders for Boring Head |          |                | Service Keys   | Kit No. |        |
|                | Boring Bar Range | Part No. | Serrated Tool Body                  | Insert Holder Range | Part No. | Insert Holder Range            | Part No. | Clamping Piece |                |         |        |
| Ⓜ              | 10.00 - 15.00    | 218059   | 236021                              | 29.00 - 41.00       | 236022   | 52.00 - 77.00                  | 236026   | 236020         | 115575 (s2.5)  | 103051  |        |
|                | 15.00 - 20.00    | 081045   |                                     | 40.00 - 53.00       |          | 236024                         |          |                | 76.00 - 102.00 |         | 236028 |
|                | 20.00 - 25.00    | 081046   |                                     |                     |          |                                |          | 215521 (s5)    |                |         |        |
|                | 25.00 - 30.00    | 081047   |                                     |                     |          |                                |          | 115591 (T7)    |                |         |        |

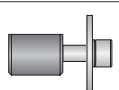
NOTE: Balancing elements and inserts sold separately



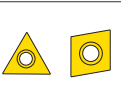
B10-M: 12-13



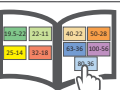
B10-A: 18



B10-H



B10: VI-VII



Ⓜ = Metric (mm)

Inserts sold separately

**IMPORTANT:** Max spindle speed refers to maximum possible speed for an individual boring head and is not a recommended parameter. Refer to page B10-M: 12 for recommended application-specific parameters. Factory technical assistance is available for your specific applications through our Application Engineering department.  
 email: [engineering.eu@alliedmachine.com](mailto:engineering.eu@alliedmachine.com)

# 248 Product Overview

## 248 VERSATILE FINE BORING

### Compact design. Precision boring.

The Wohlhaupter® 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: 3.00 mm - 30.20 mm
- Length adjustment up to 10xD
- Through coolant boring tool
- 0.01 mm 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-M: 12 for recommended application-specific parameters. Factory technical assistance is available for your specific applications through our Application Engineering department.  
*email: [engineering.eu@alliedmachine.com](mailto:engineering.eu@alliedmachine.com)*



248 Head



Insert Holder  
Ø 15.90 mm - 30.20 mm



Adapter



Adapter



Boring Bar  
Ø 3.70 mm - 16.00 mm



Mini Boring Bar  
Ø 3.00 mm - 6.00 mm

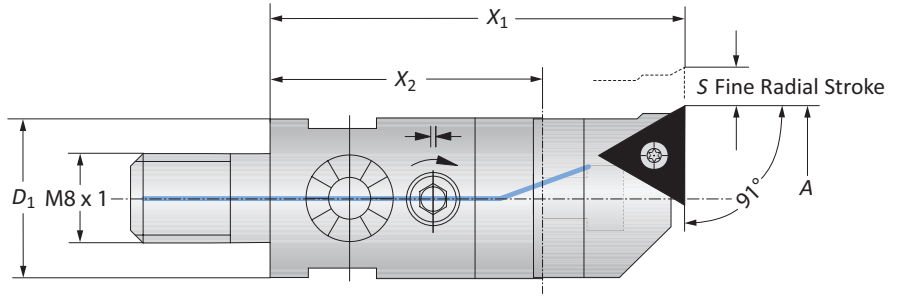
## OPERATION **VERSATILITY**

from **3.00 mm** to **30.20 mm**



## Boring Heads

Diameter Range: 15.90 mm - 30.20 mm



| Boring Connection | Boring Range<br>A | Boring Head    |                |                |      | Weight    | Insert Form | Part No.      |             |
|-------------------|-------------------|----------------|----------------|----------------|------|-----------|-------------|---------------|-------------|
|                   |                   | X <sub>1</sub> | X <sub>2</sub> | D <sub>1</sub> | S    |           |             | Insert Holder | Boring Head |
| M8 x 1            | 15.90 - 20.10     | 42.00          | 26.00          | 15.00          | 1.40 | 0.06 (kg) | 20*         | 248051        | 248001      |
| M8 x 1            | 15.90 - 20.10     | 42.00          | 26.00          | 15.00          | 1.40 | 0.06 (kg) | 101         | 248054        | 248001      |
| M8 x 1            | 19.90 - 24.80     | 46.00          | 30.00          | 18.00          | 1.80 | 0.09 (kg) | 20*         | 248052        | 248002      |
| M8 x 1            | 19.90 - 24.80     | 46.00          | 30.00          | 18.00          | 1.80 | 0.09 (kg) | 101         | 248055        | 248002      |
| M8 x 1            | 24.50 - 30.20     | 46.00          | 30.00          | 23.00          | 2.30 | 0.13 (kg) | 20*         | 248053        | 248003      |
| M8 x 1            | 24.50 - 30.20     | 46.00          | 30.00          | 23.00          | 2.30 | 0.13 (kg) | 101         | 248056        | 248003      |

\*Not suitable for indexable inserts with a radius of 0.80 mm

B10-M: 12-13

B10-A: 34

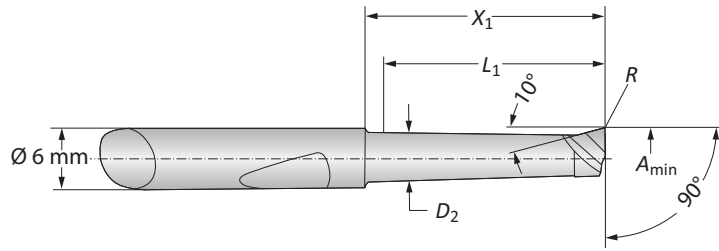
B10: VI-VII

Ⓜ = Metric (mm)

**IMPORTANT:** Max spindle speed refers to maximum possible speed for an individual boring head and is not a recommended parameter. Refer to page B10-M: 12 for recommended application-specific parameters. Factory technical assistance is available for your specific applications through our Application Engineering department.  
 email: [engineering.eu@alliedmachine.com](mailto:engineering.eu@alliedmachine.com)

### Mini Boring Bars

WHC05 | WHW04 | WBN150 | Diameter Range: 3.00 mm - 6.00 mm

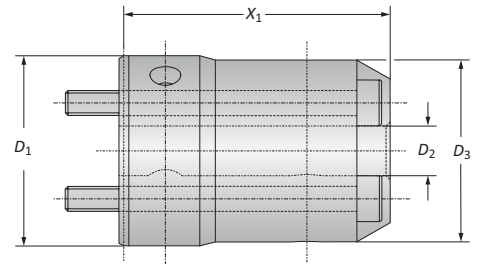


#### Mini Boring Bars

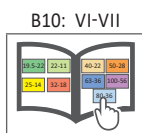
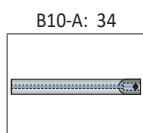
| Boring Range | Boring Bar |       |       |       |       | Part No.    |                |                  |
|--------------|------------|-------|-------|-------|-------|-------------|----------------|------------------|
|              | $A_{min}$  | $D_1$ | $D_2$ | $X_1$ | $L_1$ | $R$         | Coated Carbide | Uncoated Carbide |
| 3.00         | 6.00       | 2.60  | 11.50 | 10.00 | 0.10  | 081306WHC05 | -              | 081322WBN150     |
| 3.00         | 6.00       | 2.60  | 16.50 | 15.00 | 0.10  | 081307WHC05 | 081307WHW04    | -                |
| 4.00         | 6.00       | 3.60  | 12.00 | 10.00 | 0.20  | 081308WHC05 | -              | 081317WBN150     |
| 4.00         | 6.00       | 3.60  | 17.00 | 15.00 | 0.20  | 081309WHC05 | -              | 081341WBN150     |
| 4.00         | 6.00       | 3.60  | 22.00 | 20.00 | 0.20  | 081310WHC05 | 081310WHW04    | -                |
| 5.00         | 6.00       | 4.60  | 12.00 | 10.00 | 0.20  | 081311WHC05 | -              | 081318WBN150     |
| 5.00         | 6.00       | 4.60  | 22.00 | 20.00 | 0.20  | 081312WHC05 | -              | 081319WBN150     |
| 5.00         | 6.00       | 4.60  | 32.00 | 30.00 | 0.20  | 081313WHC05 | 081313WHW04    | -                |
| 6.00         | 6.00       | 5.60  | 22.00 | 20.00 | 0.20  | 081314WHC05 | -              | 081320WBN150     |
| 6.00         | 6.00       | 5.60  | 32.00 | 30.00 | 0.20  | 081315WHC05 | -              | 081321WBN150     |
| 6.00         | 6.00       | 5.60  | 42.00 | 40.00 | 0.20  | 081316WHC05 | 081316WHW04    | -                |

#### Adapter

| Boring Head | Adapter |       |       |  | Part No. |
|-------------|---------|-------|-------|--|----------|
| $X_1$       | $D_1$   | $D_2$ | $D_3$ |  |          |
| 32.00       | 23.00   | 6.00  | 22.00 |  | 248071   |



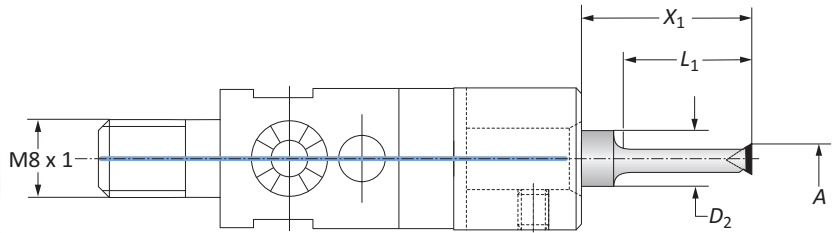
B10-M: 12-13  
Key on B10-A: 1



 = Metric (mm)

## Boring Bars

Diameter Range: 3.70 mm - 16.00 mm



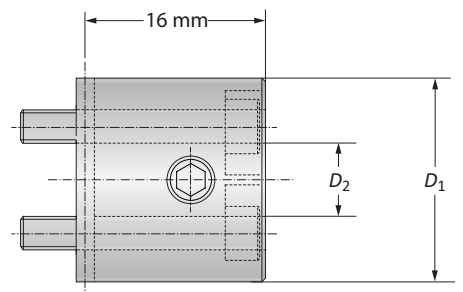
### Boring Bars

| Boring Range  | Boring Bar    |                |                |                | Insert Form | Part No. |
|---------------|---------------|----------------|----------------|----------------|-------------|----------|
|               | A             | D <sub>2</sub> | X <sub>1</sub> | L <sub>1</sub> |             |          |
| Ⓜ             | 3.70 - 5.00   | 8.00           | 20.80          | 18.00          | 325*        | 218074   |
|               | 4.90 - 6.00   | 8.00           | 26.00          | 23.00          | 47*         | 218075   |
|               | 5.90 - 8.00   | 8.00           | 27.00          | 25.00          | 211*        | 218076   |
|               | 7.90 - 10.00  | 8.00           | 30.50          | 30.00          | 211*        | 218077   |
|               | 9.90 - 12.00  | 8.00           | 35.00          | 35.00          | 20*         | 218079   |
|               | 9.90 - 12.00  | 8.00           | 35.00          | 35.00          | 101         | 218082   |
|               | 11.90 - 14.00 | 10.00          | 45.00          | 45.00          | 20*         | 218080   |
|               | 11.90 - 14.00 | 10.00          | 45.00          | 45.00          | 101         | 218083   |
| 13.90 - 16.00 | 10.00         | 50.00          | 50.00          | 20*            | 218081      |          |
| 13.90 - 16.00 | 10.00         | 50.00          | 50.00          | 101            | 218084      |          |

\*Not suitable for indexable inserts with a radius of 0.80 mm

### Adapters

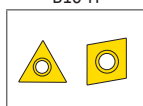
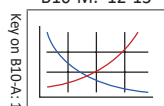
| Boring Head | Adapter        |                | Part No. |
|-------------|----------------|----------------|----------|
|             | D <sub>1</sub> | D <sub>2</sub> |          |
| 248002      | 18.00          | 8.00           | 248063   |
| 248003      | 23.00          | 8.00           | 248064   |
| 248003      | 23.00          | 10.00          | 248065   |



B10-M: 12-13

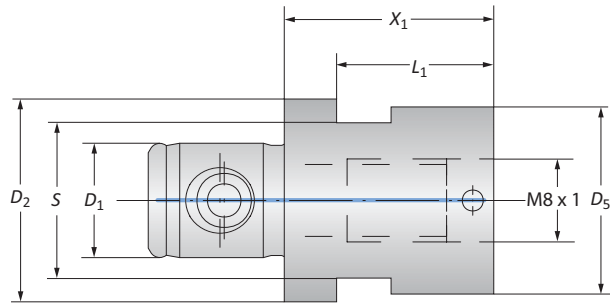
B10-H

B10: VI-VII




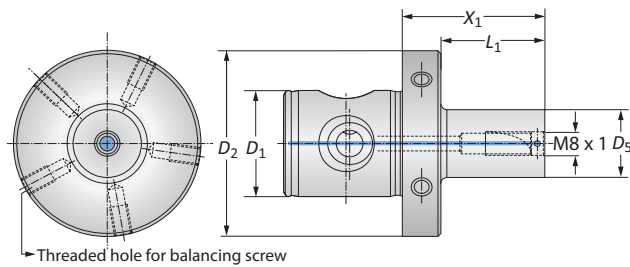


## Adapters




### Adapters

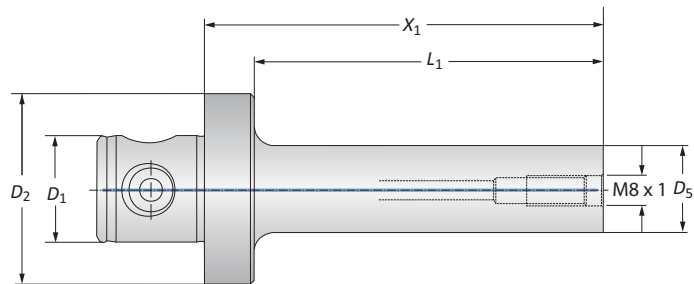
| MVS Connection  | Boring Connection | Adapter       |       |       |       | Weight    | Service Key | Part No. |
|---|-------------------|---------------|-------|-------|-------|-----------|-------------|----------|
|   |                   | $D_2$   $D_1$ | $X_1$ | $L_1$ | $S$   |           |             |          |
|  19.5 - 11 | M8 x 1            | 20.00         | 15.00 | 15/P  | 18.00 | 0.05 (kg) | 15 S / P    | 219168   |
| 23 - 11   | M8 x 1            | 20.00         | -     | 19/P  | 23.00 | 0.07 (kg) | 19 S / P    | 219169   |




### Balanced Adapters

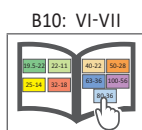
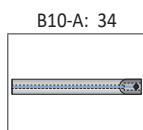
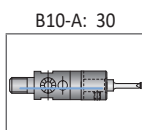
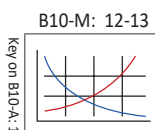
| MVS Connection  | Boring Connection | Adapter       |       |       | Weight    | Balancing Screw | Part No. |
|---|-------------------|---------------|-------|-------|-----------|-----------------|----------|
|   |                   | $D_2$   $D_1$ | $X_1$ | $L_1$ |           |                 |          |
|  50 - 28 | M8 x 1            | 32.00         | 19.00 | 15.00 | 0.35 (kg) | M6 x 1 x 10     | 219185   |
| 50 - 28   | M8 x 1            | 48.00         | 35.00 | 18.00 | 0.40 (kg) | M6 x 1 x 10     | 219176   |
| 50 - 28   | M8 x 1            | 48.00         | 35.00 | 23.00 | 0.45 (kg) | M6 x 1 x 10     | 219177   |

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



### Vibration Reducing Heavy Metal Adapters

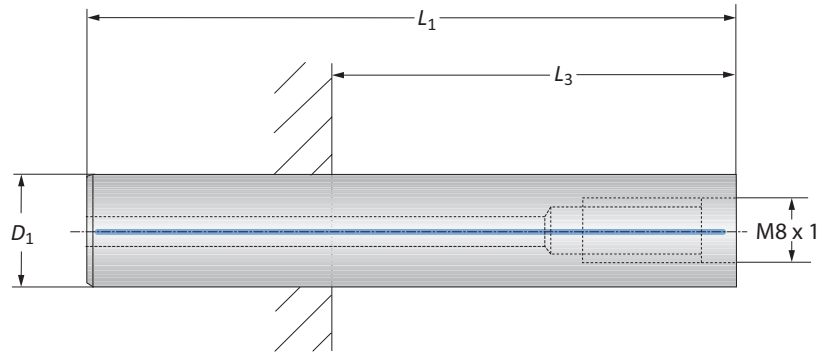
| MVS Connection  | Boring Connection | Adapter       |       |       | Weight    | Part No. |
|---|-------------------|---------------|-------|-------|-----------|----------|
|   |                   | $D_2$   $D_1$ | $X_1$ | $L_1$ |           |          |
|  50 - 28 | M8 x 1            | 68.00         | 55.00 | 15.00 | 0.80 (kg) | 248147   |
| 50 - 28   | M8 x 1            | 84.00         | 71.00 | 19.00 | 1.00 (kg) | 248148   |
| 50 - 28   | M8 x 1            | 104.00        | 91.00 | 23.00 | 1.30 (kg) | 248149   |



 = Metric (mm)

## Shanks

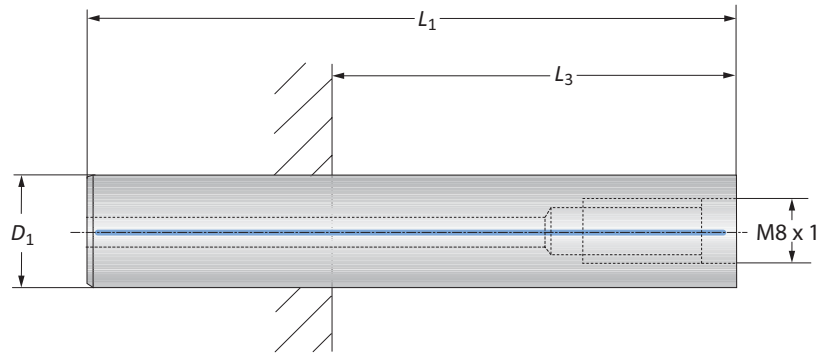
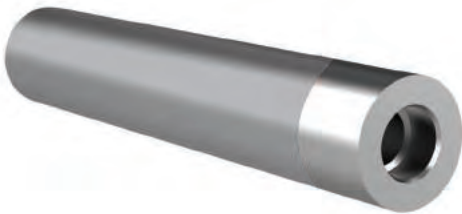
Steel | Carbide



### 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 |           |          |
| M8 x 1     | 15.00 | 85.00  | 37.00      | –          | –        | –         | 0.10 (kg) | 248136   |
| M8 x 1     | 18.00 | 100.00 | 52.00      | –          | 5.00     | 12.00     | 0.20 (kg) | 248137   |
| M8 x 1     | 23.00 | 117.00 | 69.00      | –          | 22.00    | 29.00     | 0.40 (kg) | 248138   |

\* $L_3$  dimensions apply to collet chucks



### Carbide Shanks

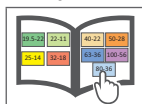
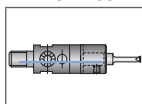
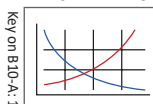
| Connection | Shank |        |            | $L_3$ min* |        |          |           | Weight    | Part No. |
|------------|-------|--------|------------|------------|--------|----------|-----------|-----------|----------|
|            | $D_1$ | $L_1$  | $L_3$ max* | SK 40      | SK 50  | HSK-A 63 | HSK-A 100 |           |          |
| M8 x 1     | 15.00 | 130.00 | 82.00      | 20.00      | 20.00  | 35.00    | 42.00     | 0.30 (kg) | 248142   |
| M8 x 1     | 18.00 | 155.00 | 107.00     | 39.00      | 21.00  | 60.00    | 67.00     | 0.60 (kg) | 248143   |
| M8 x 1     | 23.00 | 180.00 | 132.00     | 64.00      | 46.00  | 85.00    | 92.00     | 1.10 (kg) | 248144   |
| M8 x 1     | 23.00 | 242.00 | 194.00     | 126.00     | 108.00 | 147.00   | 154.00    | 1.40 (kg) | 248145   |

\* $L_3$  dimensions apply to collet chucks

B10-M: 12-13

B10-A: 30

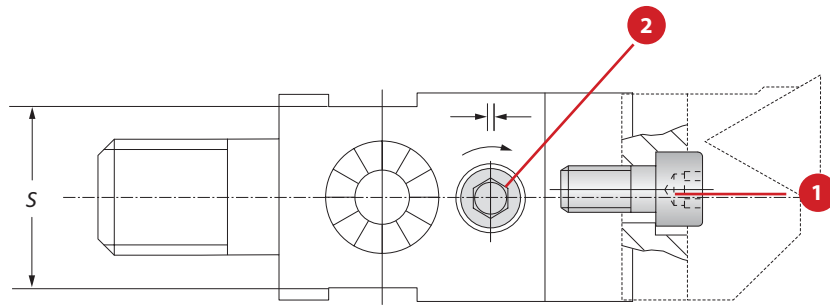
B10: vi-vii




m = Metric (mm)

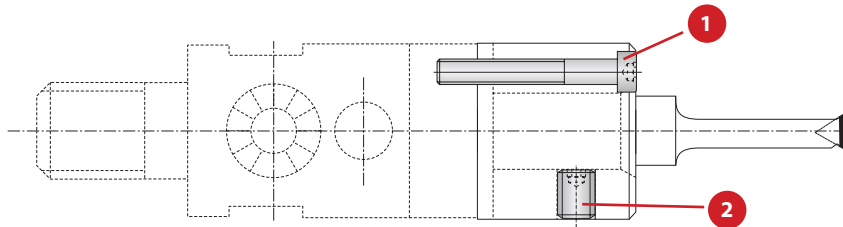
**Accessories**

Clamping Elements




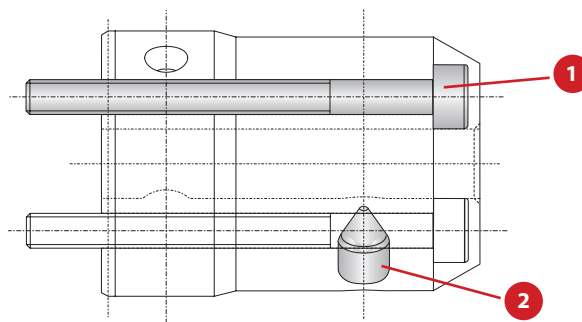
**Clamping Elements for Boring Heads**

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




**Clamping Elements for Adapters**

| Adapters   | 1 Cap Screw |             | 2 Set Screw |             |
|--|-------------|-------------|-------------|-------------|
|  | Part No.    | Service Key | Part No.    | Service Key |
|  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 for Adapter**

| Adapters   | 1 Cap Screw |             | 2 Set Screw |             |
|--|-------------|-------------|-------------|-------------|
|  | Part No.    | Service Key | Part No.    | Service Key |
|  248071 | 515166      | S 2.5 / A   | 415244      | S 3 / A     |

 = Metric (mm)

# PrimeBore Product Overview

## PrimeBore VERSATILE FINE BORING

### Advancing versatile technology.

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

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

- Diameter range: 3.00 mm - 208.00 mm
- Ease the stress of working on different day-to-day projects with boring kits
- 0.002 mm adjust on diameter
- Economical precision and versatility
- Max spindle speed: 12,000 RPM
- Through coolant



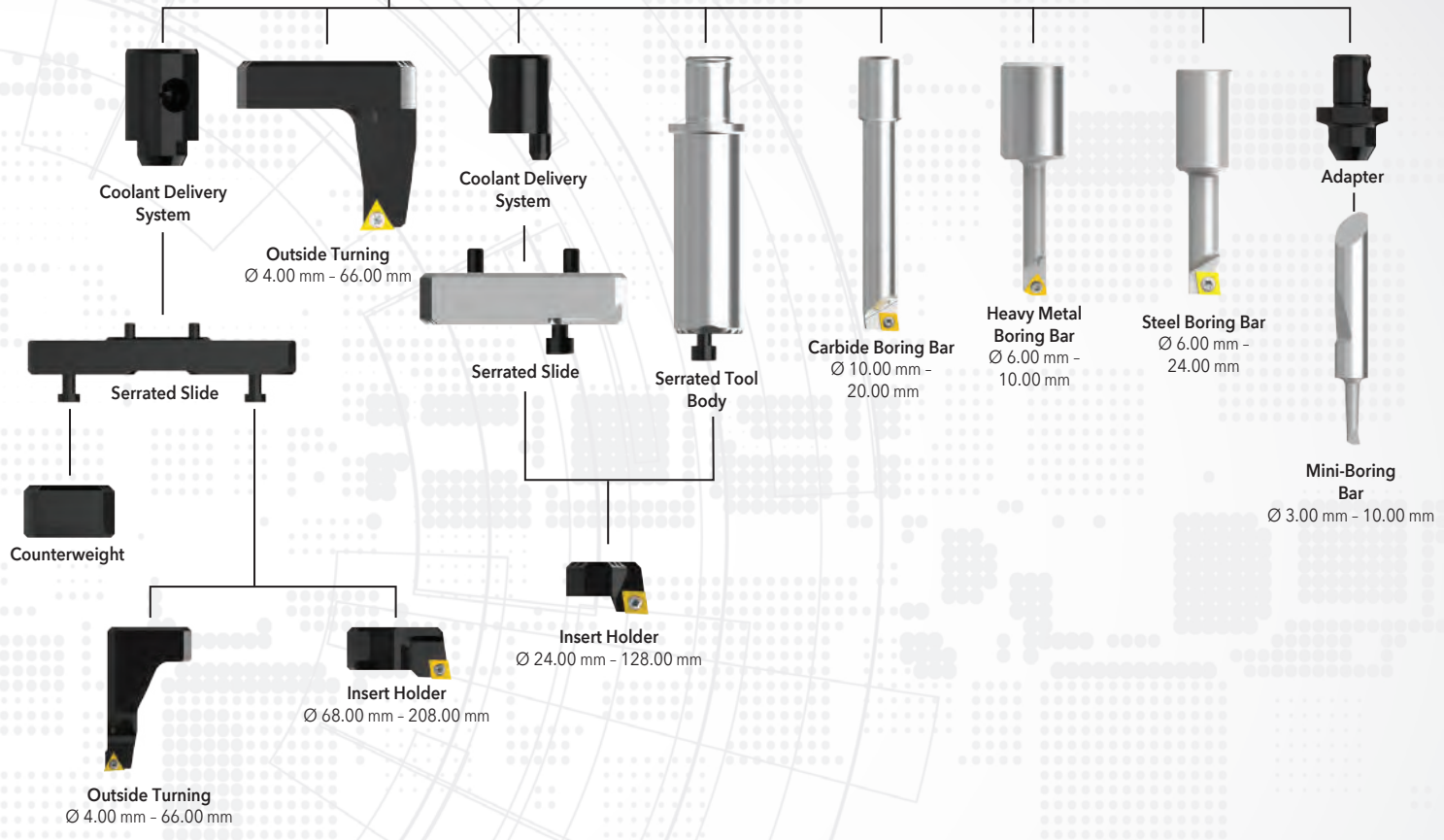
**IMPORTANT:** Max spindle speed refers to maximum possible speed for an individual boring head and is not a recommended parameter. Refer to page B10-M: 12 for recommended application-specific parameters. Factory technical assistance is available for your specific applications through our Application Engineering department.  
*email: [engineering.eu@alliedmachine.com](mailto:engineering.eu@alliedmachine.com)*



# PRIME BORE



PrimeBore Head



## OPERATION **VERSATILITY**

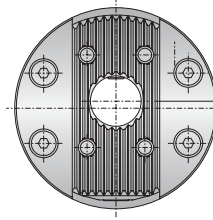
from **3.00 mm** to **208.00 mm**  
*plus outside turning*



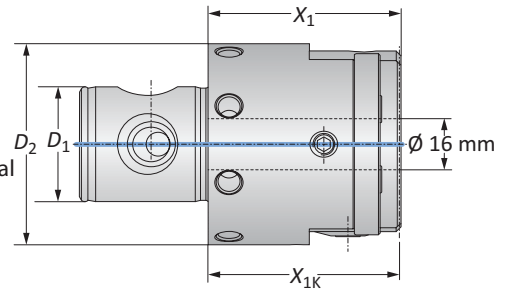


## Boring Heads

Diameter Range: 3.00 mm - 208.00 mm

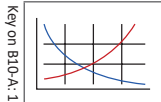


+4.5  
-0.1  
Fine Radial Stroke

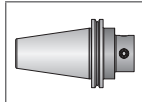


| MVS Connection   | Boring Head   |              | Weight | Part No.  |        |
|------------------|---------------|--------------|--------|-----------|--------|
|                  | $D_2$   $D_1$ | Boring Range |        |           | $X_1$  |
| <b>m</b> 63 - 36 | 3.00 - 208.00 | 60.00        | 59.50  | 1.30 (kg) | 450001 |

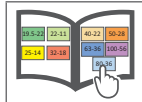
B10-M: 12-13



B10-F



B10: VI-VII



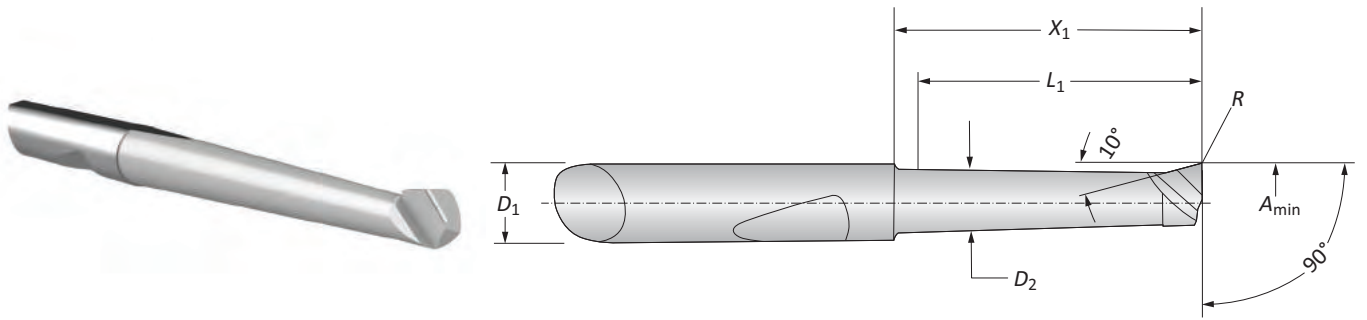
Key on B10-A:1

**m** = Metric (mm)

**IMPORTANT:** Max spindle speed refers to maximum possible speed for an individual boring head and is not a recommended parameter. Refer to page B10-M: 12 for recommended application-specific parameters. Factory technical assistance is available for your specific applications through our Application Engineering department.  
 email: [engineering.eu@alliedmachine.com](mailto:engineering.eu@alliedmachine.com)

### Mini Boring Bars

WHC05 | WHW04 | WBN150 | Diameter Range: 3.00 mm - 10.00 mm



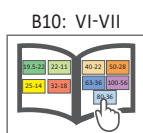
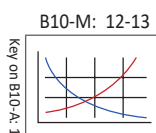
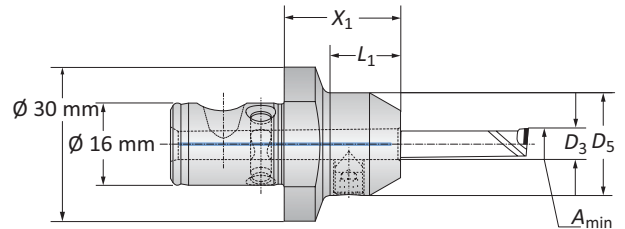
#### Mini Boring Bars

| Boring Range | Boring Bar |       |       |       |       | Part No. |                |                  |              |
|--------------|------------|-------|-------|-------|-------|----------|----------------|------------------|--------------|
|              | $A_{min}$  | $D_1$ | $D_2$ | $X_1$ | $L_1$ | $R$      | Coated Carbide | Uncoated Carbide | CBN          |
| m            | 3.00       | 6.00  | 2.60  | 11.50 | 10.00 | 0.10     | 081306WHC05    | -                | 081322WBN150 |
|              | 3.00       | 6.00  | 2.60  | 16.50 | 15.00 | 0.10     | 081307WHC05    | 081307WHW04      | -            |
|              | 4.00       | 6.00  | 3.60  | 12.00 | 10.00 | 0.20     | 081308WHC05    | -                | 081317WBN150 |
|              | 4.00       | 6.00  | 3.60  | 17.00 | 15.00 | 0.20     | 081309WHC05    | -                | 081341WBN150 |
|              | 4.00       | 6.00  | 3.60  | 22.00 | 20.00 | 0.20     | 081310WHC05    | 081310WHW04      | -            |
|              | 5.00       | 6.00  | 4.60  | 12.00 | 10.00 | 0.20     | 081311WHC05    | -                | 081318WBN150 |
|              | 5.00       | 6.00  | 4.60  | 22.00 | 20.00 | 0.20     | 081312WHC05    | -                | 081319WBN150 |
|              | 5.00       | 6.00  | 4.60  | 32.00 | 30.00 | 0.20     | 081313WHC05    | 081313WHW04      | -            |
|              | 6.00       | 6.00  | 5.60  | 22.00 | 20.00 | 0.20     | 081314WHC05    | -                | 081320WBN150 |
|              | 6.00       | 6.00  | 5.60  | 32.00 | 30.00 | 0.20     | 081315WHC05    | -                | 081321WBN150 |
|              | 6.00       | 6.00  | 5.60  | 42.00 | 40.00 | 0.20     | 081316WHC05    | 081316WHW04      | -            |
|              | 8.00       | 8.00  | 7.60  | 25.00 | 23.00 | 0.20     | 081323WHC05    | -                | -            |
|              | 8.00       | 8.00  | 7.60  | 50.00 | 48.00 | 0.20     | 081324WHC05    | -                | -            |



#### Adapters

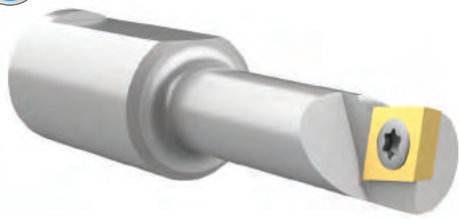
|   | Adapter |       |       |       | Part No. |
|---|---------|-------|-------|-------|----------|
|   | $D_3$   | $D_5$ | $X_1$ | $L_1$ |          |
| m | 6.00    | 20.00 | 22.50 | 14.00 | 319010   |
|   | 8.00    | 22.00 | 22.50 | 14.00 | 236071   |



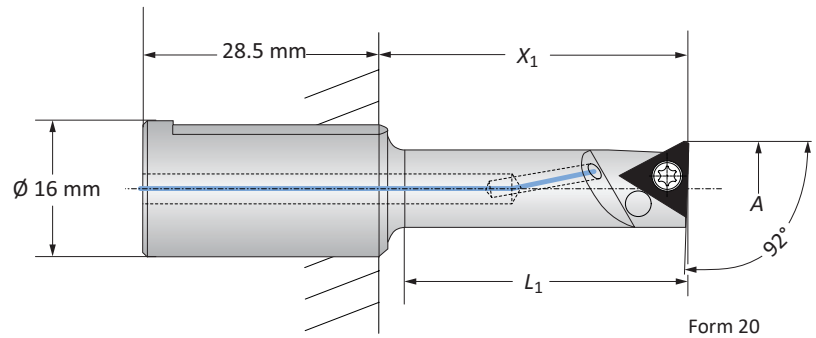
m = Metric (mm)

## Boring Bars

Steel | Heavy Metal



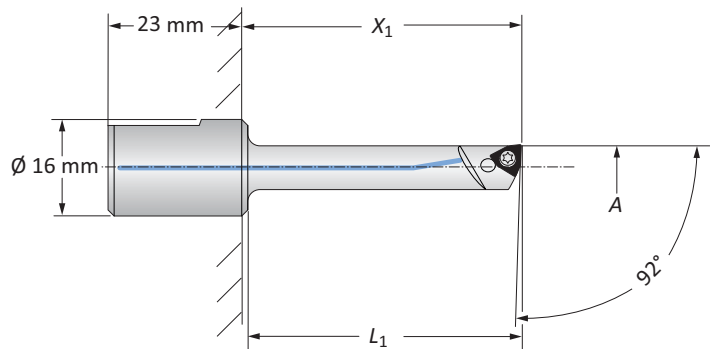
Form 101



### Steel Boring Bars | Diameter Range: 6.00 mm - 24.00 mm

|   | Boring Range  |                | Boring Bar     |  | Weight    | Insert Form | Part No. |
|---|---------------|----------------|----------------|--|-----------|-------------|----------|
|   | A             | X <sub>1</sub> | L <sub>1</sub> |  |           |             |          |
| 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 0.80 mm



### Heavy Metal Boring Bars | Diameter Range: 6.00 mm - 10.00 mm

|   | Boring Range |                | Boring Bar     |  | Weight    | Insert Form | Part No. |
|---|--------------|----------------|----------------|--|-----------|-------------|----------|
|   | A            | X <sub>1</sub> | L <sub>1</sub> |  |           |             |          |
| m | 6.00 - 8.00  | 32.00          | 29.00          |  | 0.08 (kg) | 211*        | 081055   |
|   | 8.00 - 10.00 | 45.00          | 42.00          |  | 0.09 (kg) | 211*        | 218072   |

\*Not suitable for indexable inserts with a radius of 0.80 mm

B10-M: 12-13      B10-H      B10: VI-VII

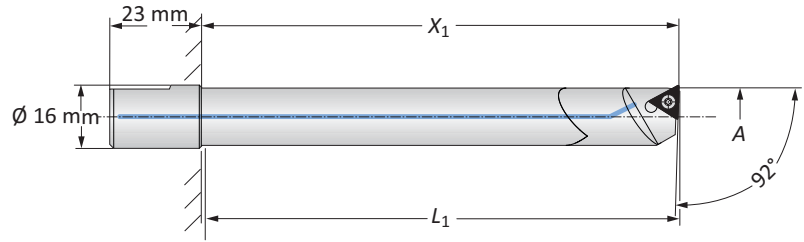
m = Metric (mm)  
Inserts sold separately

## Boring Bars

Carbide | Diameter Range: 10.00 mm - 20.00 mm



Form 101



Form 20

### Carbide Boring Bars

|          | Boring Range  |                | Boring Bar     |           | Weight | Insert Form   | Part No. | Insert Form   | Part No. |
|----------|---------------|----------------|----------------|-----------|--------|---------------|----------|---------------|----------|
|          | A             | X <sub>1</sub> | L <sub>1</sub> |           |        |               |          |               |          |
| <b>m</b> | 10.00 - 12.00 | 55.00          | 52.00          | 0.07 (kg) | 101    | <b>218042</b> | 20*      | <b>218037</b> |          |
|          | 10.00 - 12.00 | 75.00          | 72.00          | 0.09 (kg) | 101    | <b>218032</b> | 20*      | <b>218029</b> |          |
|          | 12.00 - 14.00 | 70.00          | 67.00          | 0.10 (kg) | 101    | <b>218043</b> | 20*      | <b>218038</b> |          |
|          | 12.00 - 14.00 | 90.00          | 87.00          | 0.15 (kg) | 101    | <b>218033</b> | 20*      | <b>218030</b> |          |
|          | 14.00 - 16.00 | 75.00          | 72.00          | 0.16 (kg) | 101    | <b>218044</b> | 20*      | <b>218039</b> |          |
|          | 14.00 - 16.00 | 100.00         | 97.00          | 0.20 (kg) | 101    | <b>218045</b> | 20*      | <b>218040</b> |          |
|          | 16.00 - 20.00 | 90.00          | 87.00          | 0.26 (kg) | 101    | <b>218046</b> | 20*      | <b>218041</b> |          |
|          | 16.00 - 20.00 | 120.00         | 117.00         | 0.33 (kg) | 101    | <b>218034</b> | 20*      | <b>218031</b> |          |

\*Not suitable for indexable inserts with a radius of 0.80 mm

B10-M: 12-13

Key on B10-A: 1

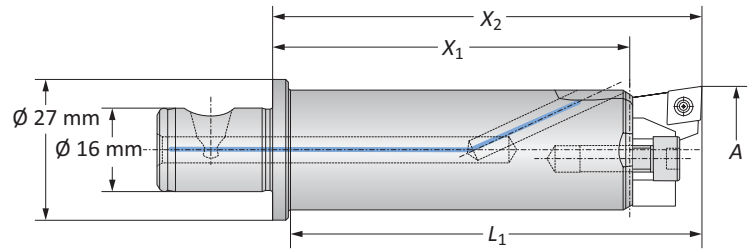
B10-H

B10: VI-VII

**m** = Metric (mm)  
Inserts sold separately

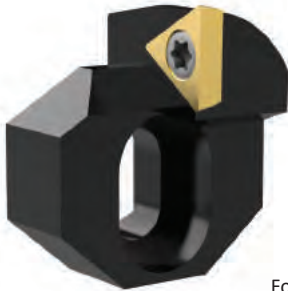
## Serrated Tool Bodies | Insert Holders

Diameter Range: 24.00 mm - 65.00 mm

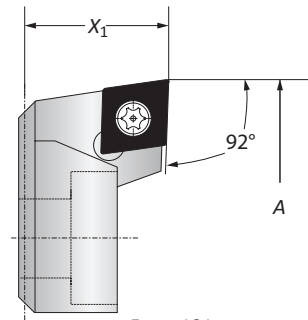


### Serrated Tool Body

| Boring Range  | Serrated Tool Body |                |                |                | Weight | Part No. |
|---------------|--------------------|----------------|----------------|----------------|--------|----------|
|               | A                  | X <sub>1</sub> | X <sub>2</sub> | L <sub>1</sub> |        |          |
| 24.00 - 65.00 | 68.00              | 82.00          | 79.00          | 0.20 (kg)      | 450021 |          |



Form 20

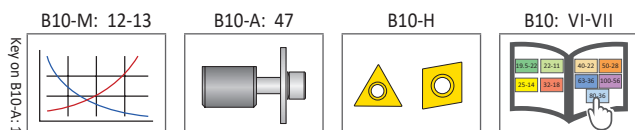


Form 101

### Insert Holders

| Boring Range  | Insert Holder | Weight    | Insert Form | Part No. |
|---------------|---------------|-----------|-------------|----------|
|               |               |           |             |          |
| 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 0.80 mm



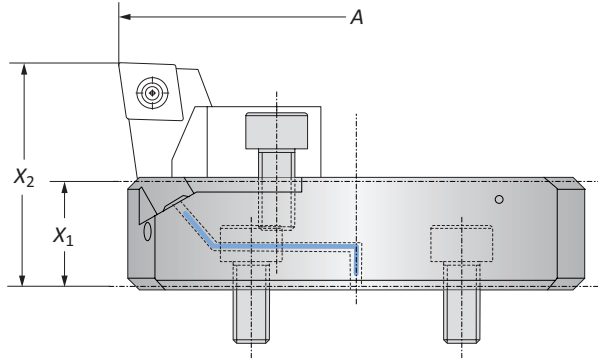
B10-A: 42

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m = Metric (mm)  
Inserts sold separately

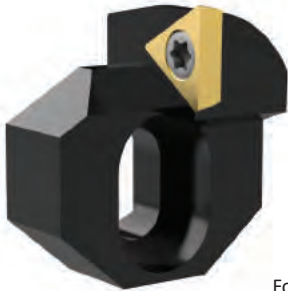
## Serrated Slides | Insert Holders

Diameter Range: 65.00 mm - 128.00 mm

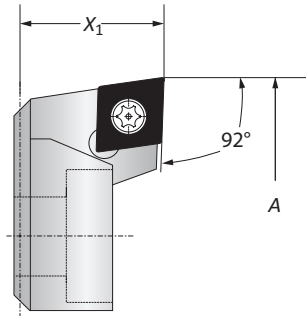


### Serrated Slides

| Boring Range   | Serrated Slide |                | Weight    | Part No. |
|----------------|----------------|----------------|-----------|----------|
|                | A              | X <sub>1</sub> |           |          |
| 65.00 - 128.00 | 14.50          | 29.50          | 0.08 (kg) | 450024   |



Form 20



Form 101

### Insert Holders

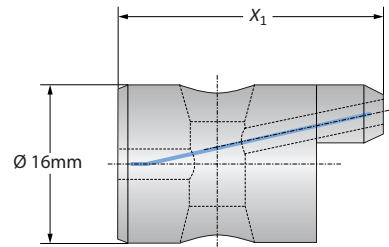
| Boring Range   | Insert Holder  | Weight    | Insert Form | Part No. |
|----------------|----------------|-----------|-------------|----------|
| A              | X <sub>1</sub> |           |             |          |
| 65.00 - 128.00 | 14.00          | 0.03 (kg) | 101         | 450023   |
| 65.00 - 128.00 | 14.00          | 0.03 (kg) | 20*         | 450041   |

\*Not suitable for indexable inserts with a radius of 0.80 mm



### Alu-Line Coolant Delivery Section

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



B10-M: 12-13  
Key on B10-A-1

B10-A: 47

B10-H

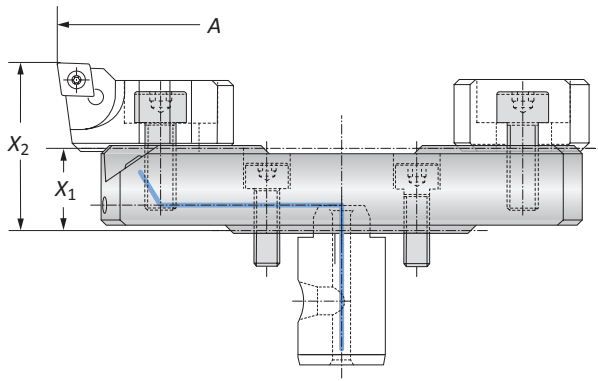
B10: VI-VII

= Metric (mm)  
Inserts sold separately



## Alu-Line Serrated Slides | Insert Holders

Diameter Range: 68.00 mm - 208.00 mm



### Alu-Line Serrated Slides

|   | Boring Range    |                | Serrated Slide |  | Weight    | Part No. |
|---|-----------------|----------------|----------------|--|-----------|----------|
|   | A               | X <sub>1</sub> | X <sub>2</sub> |  |           |          |
|   | 68.00 - 96.00   | 16.00          | 32.50          |  | 0.10 (kg) | 501054   |
|   | 96.00 - 124.00  | 16.00          | 32.50          |  | 0.10 (kg) | 501055   |
| m | 124.00 - 152.00 | 16.00          | 32.50          |  | 0.20 (kg) | 501056   |
|   | 152.00 - 180.00 | 22.00          | 38.50          |  | 0.25 (kg) | 501058   |
|   | 180.00 - 208.00 | 22.00          | 38.50          |  | 0.30 (kg) | 501059   |

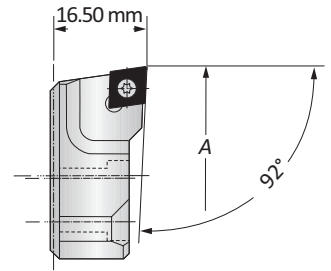
### Insert Holders

|   | Boring Range   |           | Insert Form | Part No. |
|---|----------------|-----------|-------------|----------|
|   | A              | Weight    |             |          |
| 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



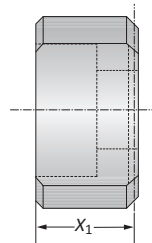
Form 20



Form 101

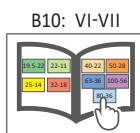
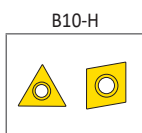
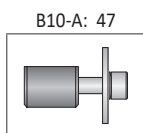
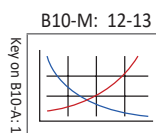
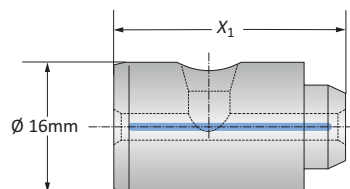
### Counterweight

| Counterweight  |       | Weight    | Part No. |
|----------------|-------|-----------|----------|
| X <sub>1</sub> |       |           |          |
| m              | 13.40 | 0.05 (kg) | 502165   |



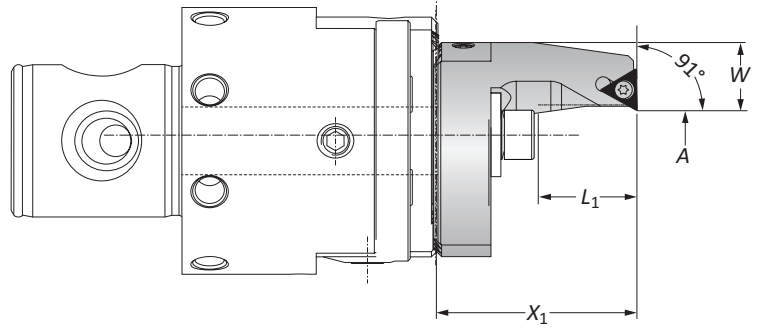
### Alu-Line Coolant Delivery Section

| Coolant Delivery Section |       | Weight    | Part No. |
|--------------------------|-------|-----------|----------|
| X <sub>1</sub>           |       |           |          |
| m                        | 25.50 | 0.01 (kg) | 450137   |



## Outside Turning Insert Holders for Boring Heads

Diameter Range: 4.00 mm - 66.00 mm

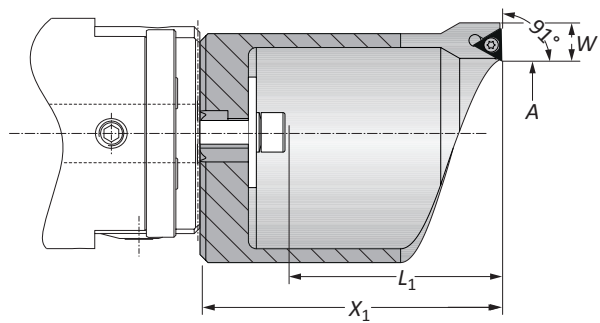
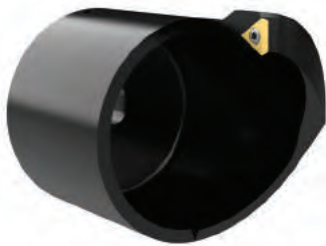


### Type A Insert Holders | Diameter Range: 4.00 mm - 30.00 mm

| Metric | Boring Range  |                | Insert Holder  |       |           | Weight | Type | Insert Form | Part No. |
|--------|---------------|----------------|----------------|-------|-----------|--------|------|-------------|----------|
|        | A             | X <sub>1</sub> | L <sub>1</sub> | W     |           |        |      |             |          |
| 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 0.80 mm



### Type B Insert Holders | Diameter Range: 29.00 mm - 66.00 mm

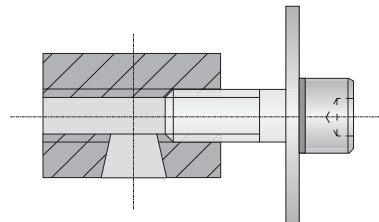
| Metric | Boring Range  |                | Insert Holder  |      |           | Weight | Type | Insert Form | Part No. |
|--------|---------------|----------------|----------------|------|-----------|--------|------|-------------|----------|
|        | A             | X <sub>1</sub> | L <sub>1</sub> | W    |           |        |      |             |          |
| 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 0.80 mm

### Clamping Pieces for Outside Turning Insert Holders

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



Key on B10-A-1

B10-M: 12-13

B10-A: 47

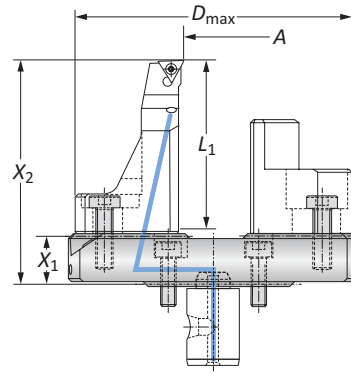
B10-H

B10: VI-VII

m = Metric (mm)  
Inserts sold separately

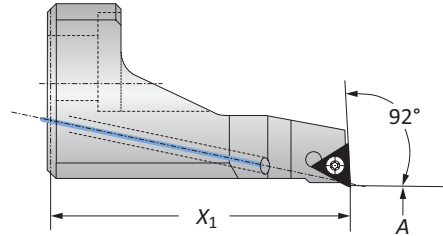
## Outside Turning Serrated Slides | Insert Holders

Diameter Range: 2.00 mm - 114.00 mm



### 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> |           |          |
| Ⓜ | 2.00 - 30.00   | 16.00          | 73.00          | 55.00          | 101.00           | 0.35 (kg) | 501064   |
|   | 30.00 - 58.00  | 16.00          | 73.00          | 55.00          | 129.00           | 0.44 (kg) | 501065   |
|   | 58.00 - 86.00  | 22.00          | 79.00          | 55.00          | 157.00           | 0.60 (kg) | 501066   |
|   | 86.00 - 114.00 | 22.00          | 79.00          | 55.00          | 185.00           | 0.73 (kg) | 501067   |



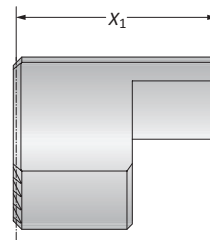
### Insert Holder

|   | Outside Turning Range | Insert Holder  | Weight    | Insert Form | Part No. |
|---|-----------------------|----------------|-----------|-------------|----------|
|   | A                     | X <sub>1</sub> |           |             |          |
| Ⓜ | 2.00 - 114.00         | 57.00          | 0.15 (kg) | 20          | 502082   |

NOTE: clockwise and neutral execution

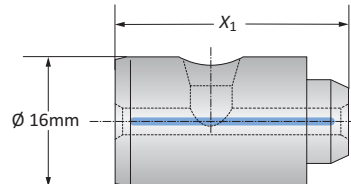
### Counterweight

|   | Counterweight  |           | Part No. |
|---|----------------|-----------|----------|
|   | X <sub>1</sub> | Weight    |          |
| Ⓜ | 37.75          | 0.16 (kg) | 502183   |



### Coolant Delivery Section

|   | Coolant Delivery Section |           | Part No. |
|---|--------------------------|-----------|----------|
|   | X <sub>1</sub>           | Weight    |          |
| Ⓜ | 25.50                    | 0.01 (kg) | 450137   |



B10-M: 12-13

Key on B10-A-1

B10-A: 47

B10-H

B10: VI-VII

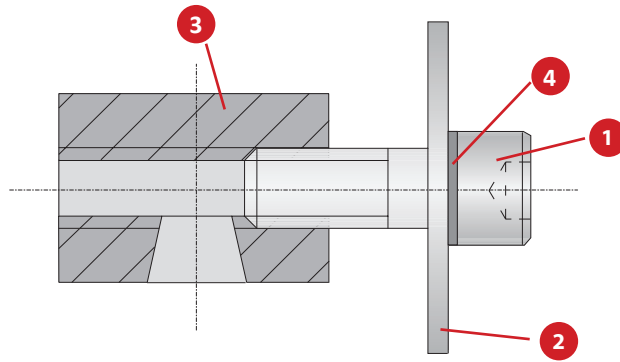
B10-A: 46

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Ⓜ = Metric (mm)  
Inserts sold separately

## Accessories

### Clamping Elements

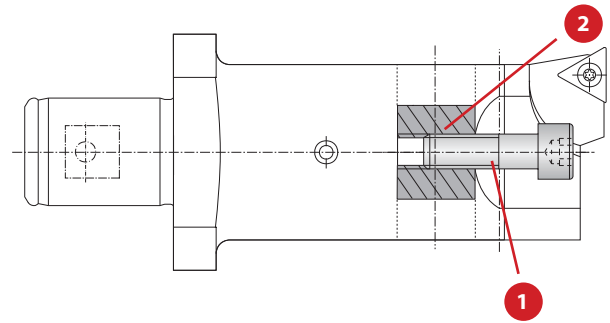


#### Clamping Elements for Insert Holders

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

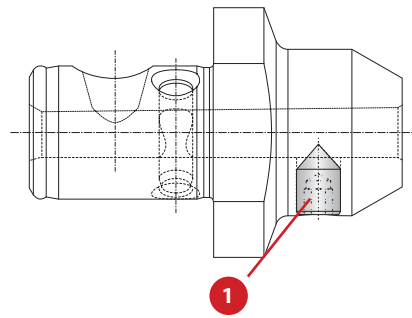
#### Clamping Elements for Serrated Tool Body

| 1         |          | 2              |
|-----------|----------|----------------|
| Cap Screw | Hex Size | Clamping Piece |
| 027154    | s4       | 145184         |



#### Thread Pin

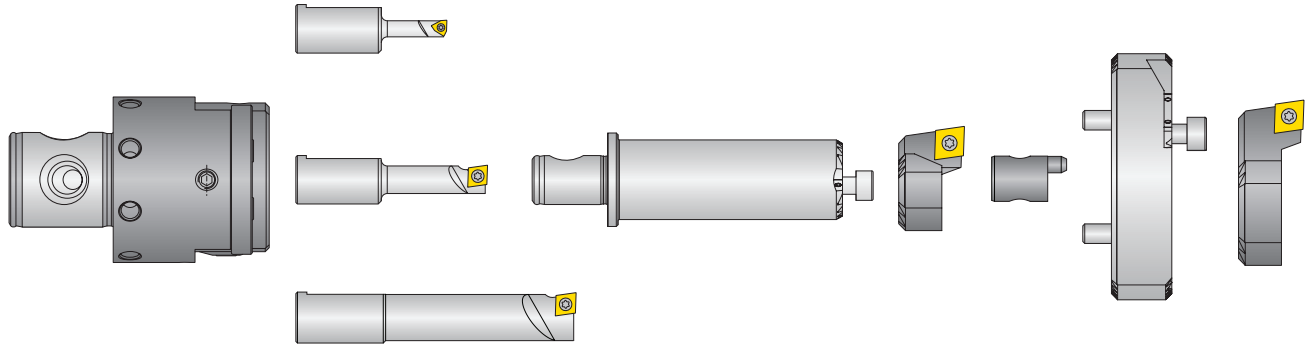
|             | 1        |
|-------------|----------|
| Service Key | Part No. |
| S3 / A      | 415244   |



 = Metric (mm)

## Kit Components

Form 101 | Diameter Range: 6.00 mm - 128.00 mm



Diameter Range: 6.00 mm - 128.00 mm

| Kit Components |               |                   |                |          |                    |                |                          |   |         |  |
|----------------|---------------|-------------------|----------------|----------|--------------------|----------------|--------------------------|---|---------|--|
| Boring Head    | Boring Bars   |                   | Insert Holders |          | Serrated Tool Body | Serrated Slide | Coolant Delivery Section | Service Keys                              | Kit No. |  |
|                | Boring Range  | Part No.          | Boring Range   | Part No. |                    |                |                          |   |         |  |
| m 450001       | 6.00 - 10.00  | 450026 (Form 211) | 24.00 - 40.00  | 450022   | 450021             | 450024         | 450125                   | 003195 (s4)<br>515451 (T6)<br>515452 (T8) | 103088  |  |
|                | 10.00 - 16.00 | 450027 (Form 101) | 40.00 - 65.00  | 450023   |                    |                |                          |   |         |  |
|                | 16.00 - 24.00 | 450028 (Form 101) |                |          |                    |                |                          |   |         |  |

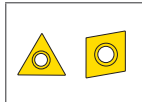
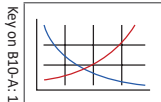
NOTE: Inserts sold separately



B10-M: 12-13

B10-H

B10: VI-VII



|       |       |       |        |
|-------|-------|-------|--------|
| 08-22 | 22-11 | 40-22 | 58-28  |
| 25-14 | 10-58 | 63-30 | 100-36 |

m = Metric (mm)

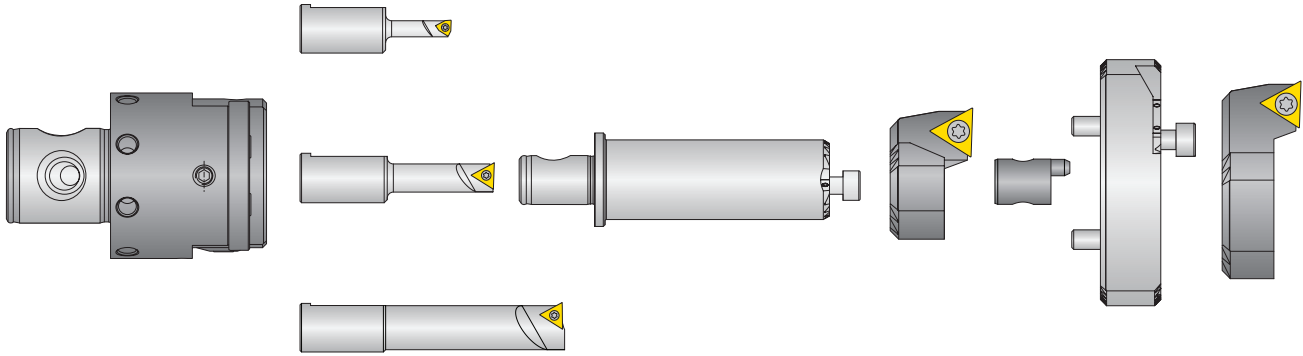
Inserts sold separately

**IMPORTANT:** Max spindle speed refers to maximum possible speed for an individual boring head and is not a recommended parameter. Refer to page B10-M: 12 for recommended application-specific parameters. Factory technical assistance is available for your specific applications through our Application Engineering department.  
email: [engineering.eu@alliedmachine.com](mailto:engineering.eu@alliedmachine.com)



## Kit Components

Form 20 | Diameter Range: 6.00 mm - 128.00 mm



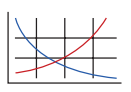
Diameter Range: 6.00 mm - 128.00 mm

| Kit Components |              |               |                   |               |                    |                |                          |              |   |        |
|----------------|--------------|---------------|-------------------|---------------|--------------------|----------------|--------------------------|--------------|---|--------|
| Boring Head    | Boring Bars  |               | Insert Holders    |               | Serrated Tool Body | Serrated Slide | Coolant Delivery Section | Service Keys | Kit No.                                   |        |
|                | Boring Range | Part No.      | Boring Range      | Part No.      |                    |                |                          |              |   |        |
| Ⓜ              | 450001       | 6.00 - 10.00  | 450026 (Form 211) | 24.00 - 40.00 | 450040             | 450021         | 450024                   | 450125       | 003195 (s4)<br>515451 (T6)<br>515453 (T7) | 103089 |
|                |              | 10.00 - 16.00 | 450038 (Form 20)  | 40.00 - 65.00 | 450041             |                |                          |              |   |        |
|                |              | 16.00 - 24.00 | 450039 (Form 20)  |               |                    |                |                          |              |   |        |

NOTE: Inserts sold separately

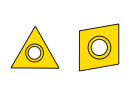


B10-M: 12-13




Key on B10-A: 1

B10-H



B10: VI-VII



Ⓜ = Metric (mm)  
Inserts sold separately

**IMPORTANT:** Max spindle speed refers to maximum possible speed for an individual boring head and is not a recommended parameter. Refer to page B10-M: 12 for recommended application-specific parameters. Factory technical assistance is available for your specific applications through our Application Engineering department.  
email: [engineering.eu@alliedmachine.com](mailto:engineering.eu@alliedmachine.com)

# Digital 510 Product Overview

## Digital 510 VERSATILE FINE BORING

Improve your boring job with the Digital 510 boring head.

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

Experience *precision boring* for yourself.

- Diameter range: 0.40 mm - 12.00 mm
- Easy-to-read digital display
- Through coolant
- External counterweight for balancing
- Protected against coolant and dust according to IP65
- Fine adjustments of 0.002 mm
- Ideal for CAT40, BT30, HSK40
- Max spindle speed: 35,000 RPM



**NOTE:** Adjustment accuracy of 0.002 mm on diameter

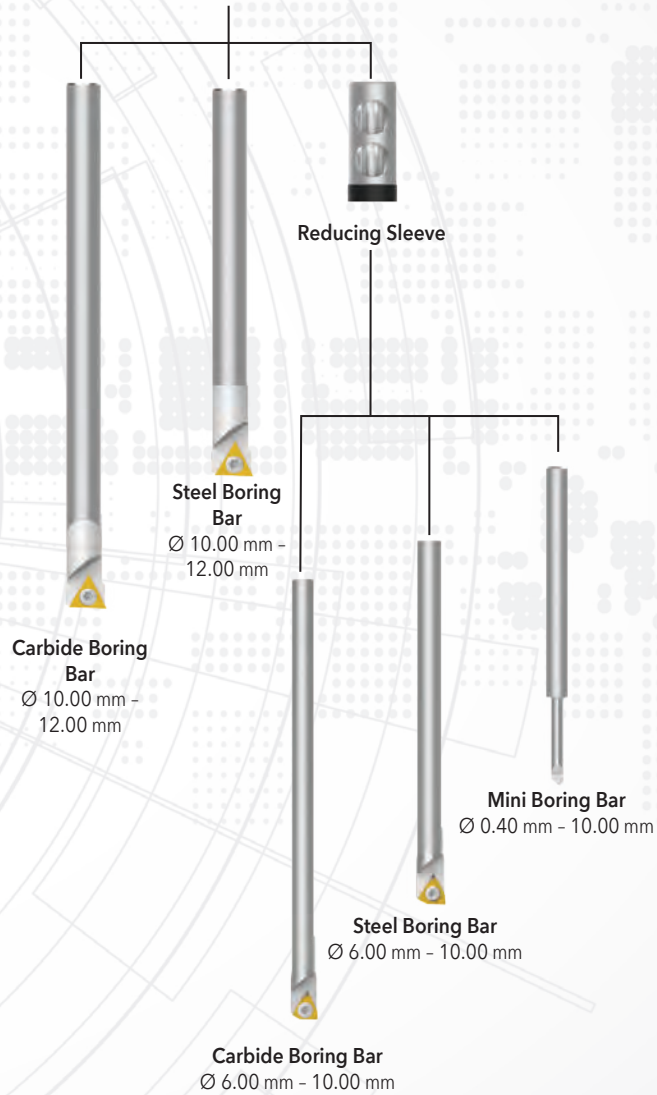
**IMPORTANT:** Max spindle speed refers to maximum possible speed for an individual boring head and is not a recommended parameter. Refer to page B10-M: 12 for recommended application-specific parameters. Factory technical assistance is available for your specific applications through our Application Engineering department.  
email: [engineering.eu@alliedmachine.com](mailto:engineering.eu@alliedmachine.com)

# DIGITAL



NOTE: Adjustment accuracy of 0.002 mm on diameter

Digital 510001 Boring Head  
0.40 mm - 12.00 mm

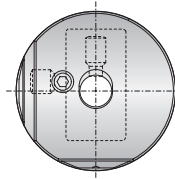


## OPERATION **VERSATILITY**

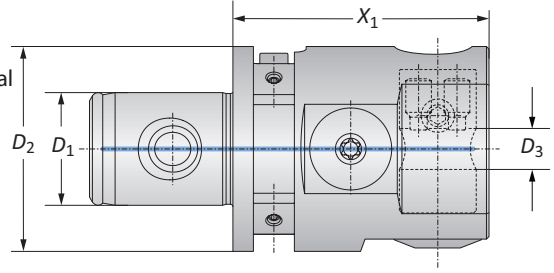
from **0.40 mm** to **12.00 mm**

## Boring Heads

Diameter Range: 0.40 mm - 12.00 mm



Fine Radial Stroke  
+1.1 mm  
-0.1 mm

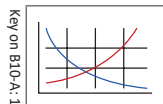


**NOTE:** Adjustment accuracy of 0.002 mm on diameter

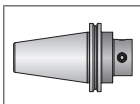
### Boring Heads

| MVS Connection | Boring Range | Boring Head   |       | Weight    | Part No. |
|----------------|--------------|---------------|-------|-----------|----------|
|                |              | $D_2$   $D_1$ | $D_3$ |           |          |
| 40 - 22        | 0.40 - 12.00 | 8.00          | 50.00 | 0.42 (kg) | 510001   |

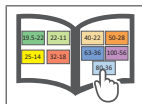
B10-M: 12-13



B10-F



B10: VI-VII



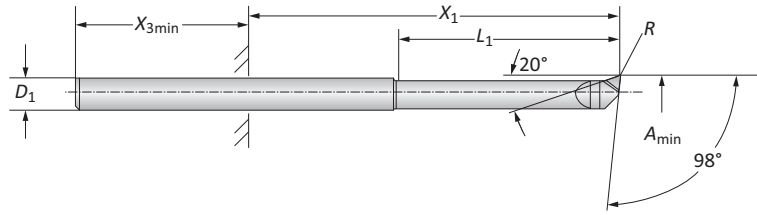
Key on B10-A:1

= Metric (mm)


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email: [engineering.eu@alliedmachine.com](mailto:engineering.eu@alliedmachine.com)

## Mini Boring Bars

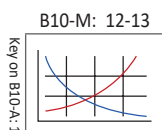
Diameter Range: 0.40 mm - 5.00 mm



### Mini Boring Bars

|   | Boring Range |       | Boring Bar    |              |       |      | Part No.            |
|---|--------------|-------|---------------|--------------|-------|------|---------------------|
|   | $A_{min}$    | $D_1$ | $X_1$         | $X_{3\ min}$ | $L_1$ | $R$  |                     |
|  | 0.40         | 4.00* | 3.00 - 26.00  | 16.00        | 2.00  | 0.03 | <b>081401WHC126</b> |
|   | 0.60         | 4.00* | 4.00 - 27.00  | 16.00        | 3.00  | 0.04 | <b>081402WHC126</b> |
|   | 0.80         | 4.00* | 5.00 - 28.00  | 16.00        | 4.00  | 0.04 | <b>081403WHC126</b> |
|   | 1.00         | 4.00* | 6.00 - 29.00  | 16.00        | 5.00  | 0.05 | <b>081404WHC126</b> |
|   | 1.50         | 4.00* | 8.50 - 31.50  | 16.00        | 7.50  | 0.05 | <b>081405WHC126</b> |
|   | 2.00         | 4.00* | 11.00 - 34.00 | 16.00        | 10.00 | 0.05 | <b>081406WHC126</b> |
|   | 2.50         | 4.00* | 13.50 - 36.50 | 16.00        | 12.50 | 0.05 | <b>081407WHC126</b> |
|   | 2.80         | 4.00* | 15.00 - 38.00 | 16.00        | 14.00 | 0.07 | <b>081408WHC126</b> |

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

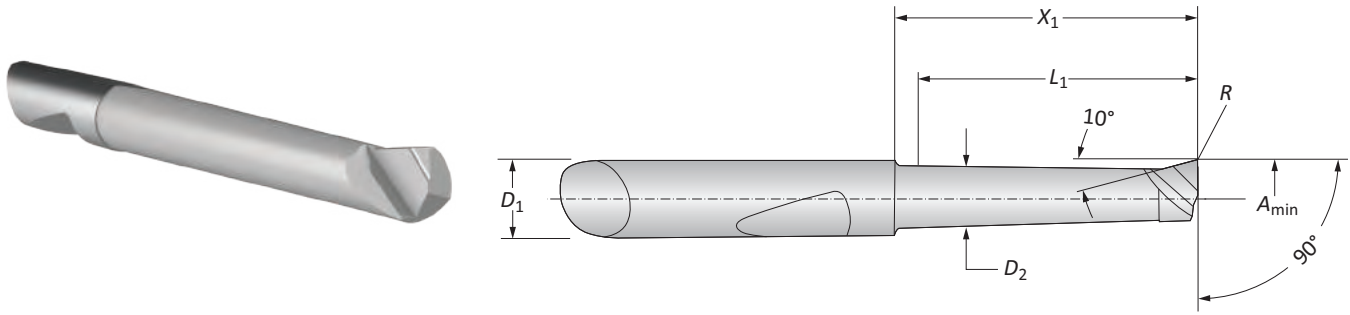


 = Metric (mm)



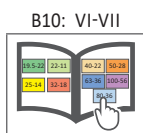
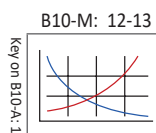
### Mini Boring Bars

WHC05 | WHW04 | WBN150 | Diameter Range: 3.00 mm - 10.00 mm



|   | Boring Range |       | Boring Bar |       |       |      | Part No.       |                  |              |
|---|--------------|-------|------------|-------|-------|------|----------------|------------------|--------------|
|   | $A_{min}$    | $D_1$ | $D_2$      | $X_1$ | $L_1$ | $R$  | Coated Carbide | Uncoated Carbide | CBN          |
| E | 3.00         | 6.00* | 2.60       | 11.50 | 10.00 | 0.10 | 081306WHC05    | -                | 081322WBN150 |
|   | 3.00         | 6.00* | 2.60       | 16.50 | 15.00 | 0.10 | 081307WHC05    | 081307WHW04      | -            |
| E | 4.00         | 6.00* | 3.60       | 12.00 | 10.00 | 0.20 | 081308WHC05    | -                | 081317WBN150 |
|   | 4.00         | 6.00* | 3.60       | 17.00 | 15.00 | 0.20 | 081309WHC05    | -                | 081341WBN150 |
| E | 4.00         | 6.00* | 3.60       | 22.00 | 20.00 | 0.20 | 081310WHC05    | 081310WHW04      | -            |
|   | 5.00         | 6.00* | 4.60       | 12.00 | 10.00 | 0.20 | 081311WHC05    | -                | 081318WBN150 |
| F | 5.00         | 6.00* | 4.60       | 22.00 | 20.00 | 0.20 | 081312WHC05    | -                | 081319WBN150 |
|   | 5.00         | 6.00* | 4.60       | 32.00 | 30.00 | 0.20 | 081313WHC05    | 081313WHW04      | -            |
| F | 6.00         | 6.00* | 5.60       | 22.00 | 20.00 | 0.20 | 081314WHC05    | -                | 081320WBN150 |
|   | 6.00         | 6.00* | 5.60       | 32.00 | 30.00 | 0.20 | 081315WHC05    | -                | 081321WBN150 |
| G | 6.00         | 6.00* | 5.60       | 42.00 | 40.00 | 0.20 | 081316WHC05    | 081316WHW04      | -            |
|   | 8.00         | 8.00* | 7.60       | 25.00 | 23.00 | 0.20 | 081323WHC05    | -                | -            |
| G | 8.00         | 8.00* | 7.60       | 50.00 | 48.00 | 0.20 | 081324WHC05    | -                | -            |

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



Ⓜ = Metric (mm)

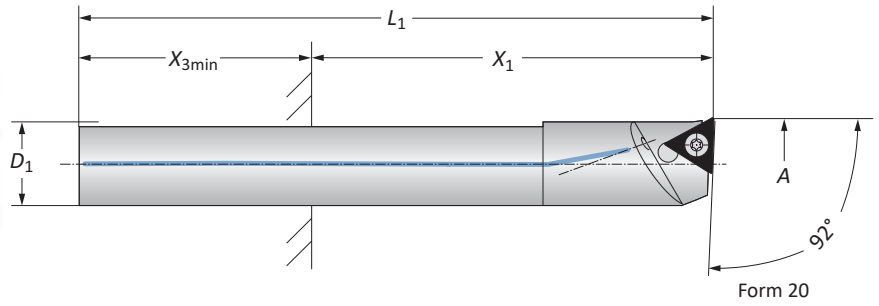



## Boring Bars

Steel | Diameter Range: 6.00 mm - 12.00 mm



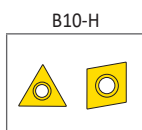
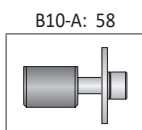
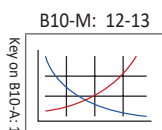
Form 101




|   | Boring Range  |                | Boring Bar     |                    |                |           | Part No.    |               |             |               |
|---|---------------|----------------|----------------|--------------------|----------------|-----------|-------------|---------------|-------------|---------------|
|   | A             | D <sub>1</sub> | X <sub>1</sub> | X <sub>3 min</sub> | L <sub>1</sub> | Weight    | Insert Form | Boring Bar    | Insert Form | Boring Bar    |
|  | 6.00 - 8.00   | 5.00*          | 12.50 - 25.00  | 16.00              | 70.00          | 0.01 (kg) | 211**       | <b>514032</b> | -           | -             |
|   | 8.00 - 10.00  | 7.00*          | 17.50 - 35.00  | 16.00              | 81.00          | 0.02 (kg) | 211**       | <b>514033</b> | -           | -             |
|   | 10.00 - 12.00 | 8.00           | 20.00 - 40.00  | 19.00              | 85.00          | 0.03 (kg) | 101         | <b>514003</b> | 20**        | <b>514004</b> |

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

\*\*Not suitable for indexable inserts with a radius of 0.8 mm



Key on B10-A: 1

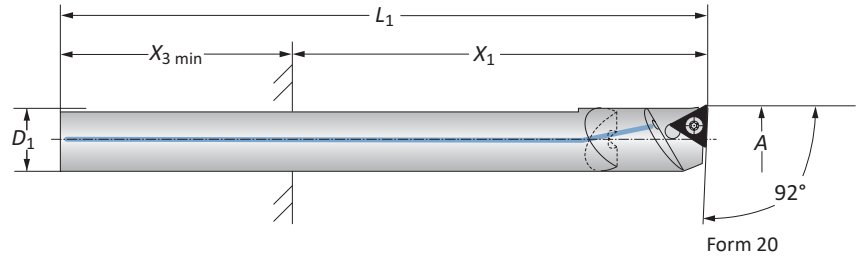
 = Metric (mm)  
Inserts sold separately

## Boring Bars

Carbide | Diameter Range: 6.00 mm - 12.00 mm



Form 101

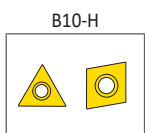
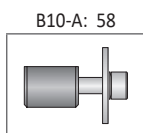
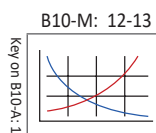


Form 20

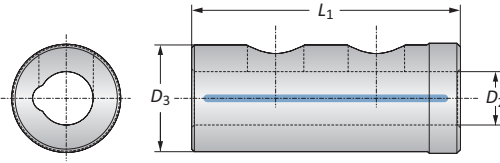
| Boring Range  | Boring Bar |                |                |                    | Weight    | Part No.       |               |            |               |
|---------------|------------|----------------|----------------|--------------------|-----------|----------------|---------------|------------|---------------|
|               | A          | D <sub>1</sub> | X <sub>1</sub> | X <sub>3 min</sub> |           | L <sub>1</sub> | Insert Form   | Boring Bar | Insert Form   |
| 6.00 - 8.00   | 5.00*      | 12.50 - 40.00  | 16.00          | 90.00              | 0.02 (kg) | 211**          | <b>514034</b> | -          | -             |
| 8.00 - 10.00  | 7.00*      | 21.00 - 56.00  | 16.00          | 109.00             | 0.05 (kg) | 211**          | <b>514035</b> | -          | -             |
| 10.00 - 12.00 | 8.00       | 22.00 - 64.00  | 19.00          | 117.00             | 0.07 (kg) | 101            | <b>514015</b> | 20**       | <b>514016</b> |

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

\*\*Not suitable for indexable inserts with a radius of 0.80 mm

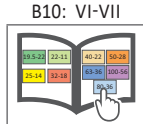
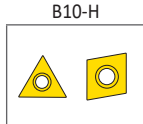
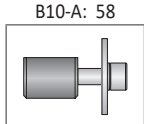
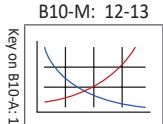


## Reducing Sleeves



| Reducing Sleeve |       |       |  | Part No. |
|-----------------|-------|-------|--|----------|
| $D_3$           | $D_2$ | $L_1$ |  |          |
| 8.00            | 4.00  | 20.00 |  | 514201   |
| 8.00            | 5.00  | 20.00 |  | 514202   |
| 8.00            | 6.00  | 20.00 |  | 514210   |
| 8.00            | 7.00  | 20.00 |  | 514203   |

Ⓜ

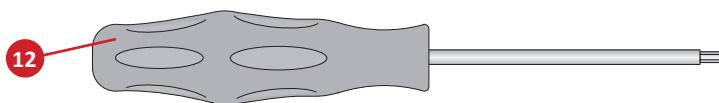
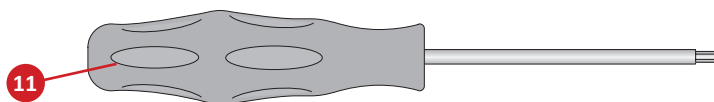
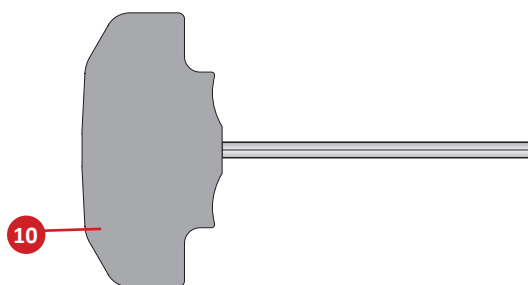
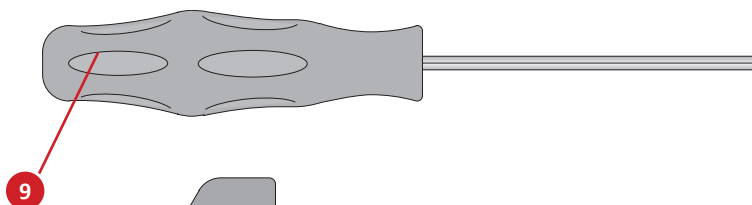
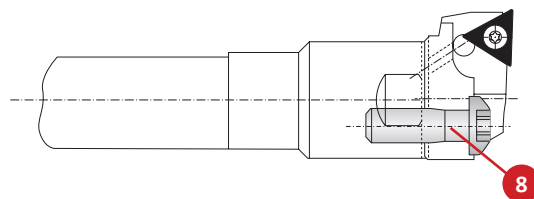
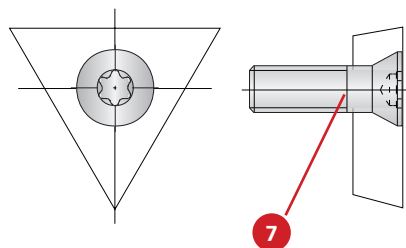
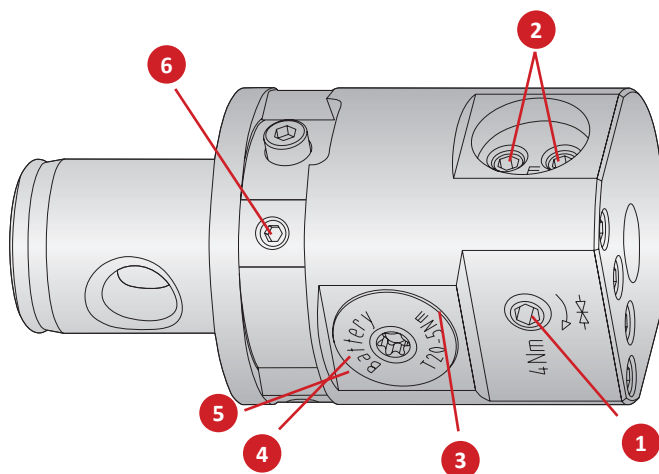


Ⓜ = Metric (mm)  
Inserts sold separately

## Boring Head Accessories

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

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







# DigiBore Product Overview



## DigiBore VERSATILE FINE BORING

### Advanced versatile technology.

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

Engineered with the *future in mind*.

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



**NOTE:** Adjustment accuracy of 0.002 mm on diameter

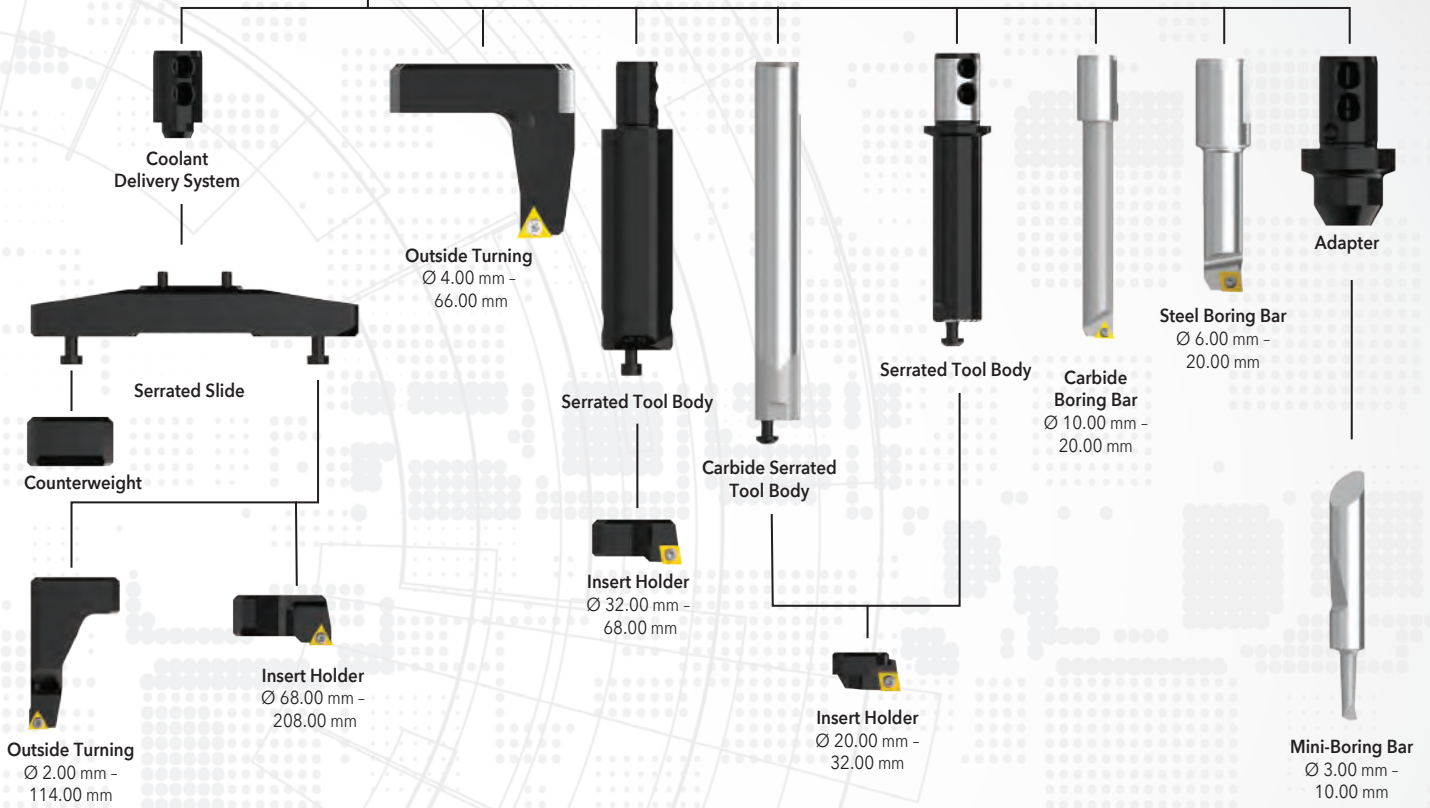
**IMPORTANT:** Max spindle speed refers to maximum possible speed for an individual boring head and is not a recommended parameter. Refer to page B10-M: 12 for recommended application-specific parameters. Factory technical assistance is available for your specific applications through our Application Engineering department.  
[email: engineering.eu@alliedmachine.com](mailto:engineering.eu@alliedmachine.com)

# DIGI BORE



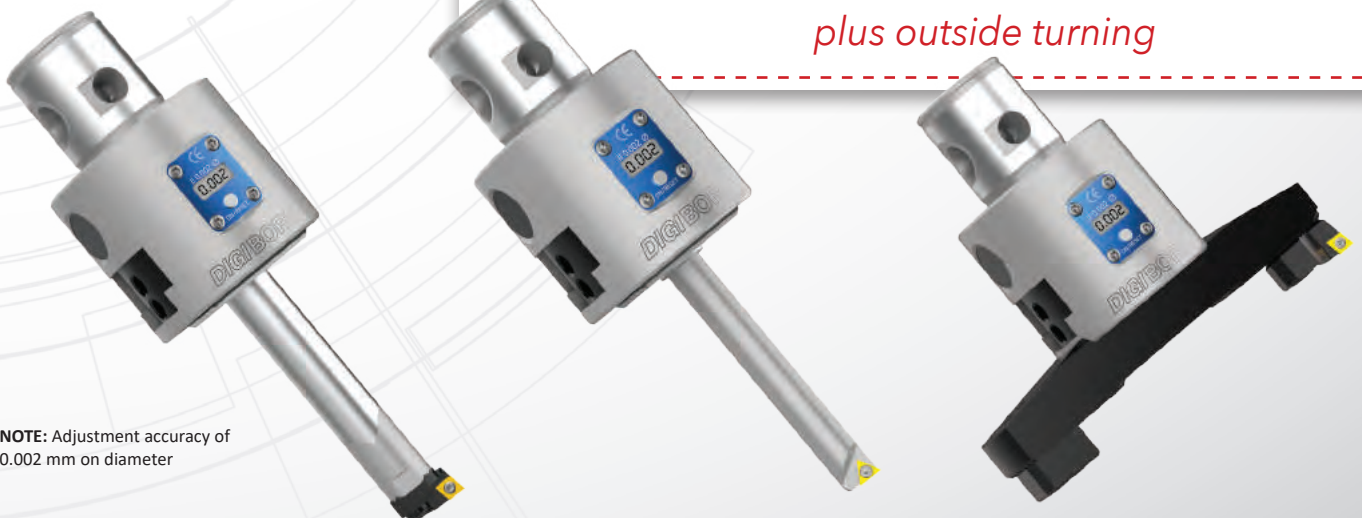
DigiBore Head

NOTE: Adjustment accuracy of 0.002 mm on diameter



## OPERATION **VERSATILITY**

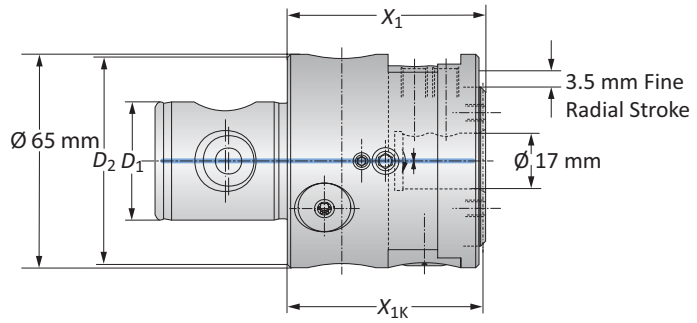
from **3.00 mm** to **208.00 mm**  
plus outside turning



NOTE: Adjustment accuracy of 0.002 mm on diameter

## Boring Heads

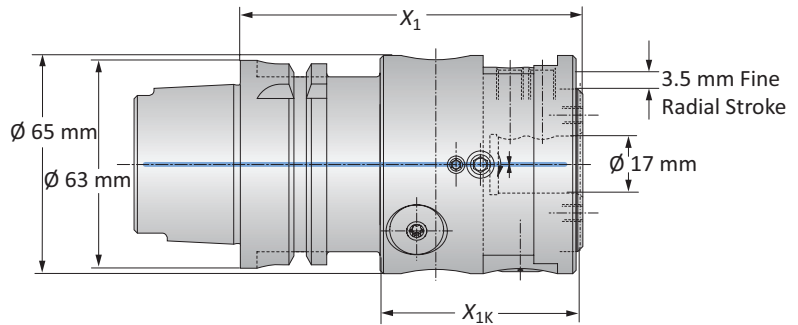
Diameter Range: 3.00 mm - 208.00 mm



NOTE: Adjustment accuracy of 0.002 mm on diameter

### DigiBore Boring Heads

| MVS Connection | Boring Range  | Boring Head |          | Weight    | Part No. |
|----------------|---------------|-------------|----------|-----------|----------|
|                |               | $X_1$       | $X_{1K}$ |           |          |
| $D_2   D_1$    |               |             |          |           |          |
| 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: Adjustment accuracy of 0.002 mm on diameter

### DigiBore Boring Heads

| Connection             | Boring Range  | Boring Head |          | Weight    | Part No. |
|------------------------|---------------|-------------|----------|-----------|----------|
|                        |               | $X_1$       | $X_{1K}$ |           |          |
| HSK-A 63               | 3.00 - 208.00 | 102.00      | 59.50    | 2.10 (kg) | 501004   |
| PSC 63 (Polygon Shank) | 3.00 - 208.00 | 102.00      | 59.50    | 2.10 (kg) | 501019   |

B10-M: 12-13      B10-F      B10: VI-VII

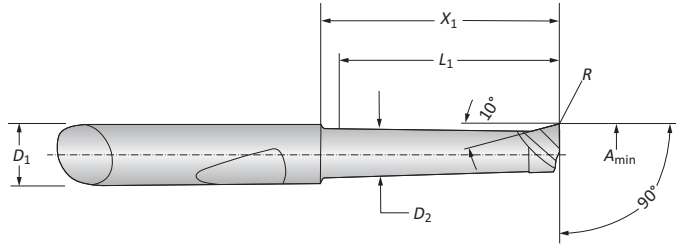
Ⓜ = Metric (mm)

**IMPORTANT:** Max spindle speed refers to maximum possible speed for an individual boring head and is not a recommended parameter. Refer to page B10-M: 12 for recommended application-specific parameters. Factory technical assistance is available for your specific applications through our Application Engineering department.  
 email: [engineering.eu@alliedmachine.com](mailto:engineering.eu@alliedmachine.com)

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INDEX

### Mini Boring Bars

WHC05 | WHW04 | WBN150 | Diameter Range: 3.00 mm - 10.00 mm



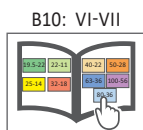
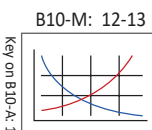
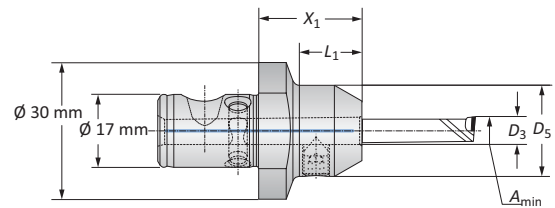
#### Mini Boring Bars

| Boring Range | Boring Bar |       |       |       |       |      | Part No.       |                  |              |
|--------------|------------|-------|-------|-------|-------|------|----------------|------------------|--------------|
|              | $A_{min}$  | $D_1$ | $D_2$ | $X_1$ | $L_1$ | $R$  | Coated Carbide | Uncoated Carbide | CBN          |
| m            | 3.00       | 6.00  | 2.60  | 11.50 | 10.00 | 0.10 | 081306WHC05    | -                | 081322WBN150 |
|              | 3.00       | 6.00  | 2.60  | 16.50 | 15.00 | 0.10 | 081307WHC05    | 081307WHW04      | -            |
|              | 4.00       | 6.00  | 3.60  | 12.00 | 10.00 | 0.20 | 081308WHC05    | -                | 081317WBN150 |
|              | 4.00       | 6.00  | 3.60  | 17.00 | 15.00 | 0.20 | 081309WHC05    | -                | 081341WBN150 |
|              | 4.00       | 6.00  | 3.60  | 22.00 | 20.00 | 0.20 | 081310WHC05    | 081310WHW04      | -            |
|              | 5.00       | 6.00  | 4.60  | 12.00 | 10.00 | 0.20 | 081311WHC05    | -                | 081318WBN150 |
|              | 5.00       | 6.00  | 4.60  | 22.00 | 20.00 | 0.20 | 081312WHC05    | -                | 081319WBN150 |
|              | 5.00       | 6.00  | 4.60  | 32.00 | 30.00 | 0.20 | 081313WHC05    | 081313WHW04      | -            |
|              | 6.00       | 6.00  | 5.60  | 22.00 | 20.00 | 0.20 | 081314WHC05    | -                | 081320WBN150 |
|              | 6.00       | 6.00  | 5.60  | 32.00 | 30.00 | 0.20 | 081315WHC05    | -                | 081321WBN150 |
|              | 6.00       | 6.00  | 5.60  | 42.00 | 40.00 | 0.20 | 081316WHC05    | 081316WHW04      | -            |
|              | 8.00       | 8.00  | 7.60  | 25.00 | 23.00 | 0.20 | 081323WHC05    | -                | -            |
|              | 8.00       | 8.00  | 7.60  | 50.00 | 48.00 | 0.20 | 081324WHC05    | -                | -            |



#### Adapters

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



m = Metric (mm)

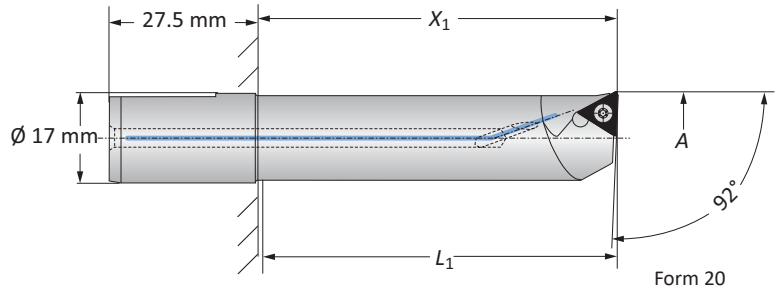


Boring Bars

Steel | Diameter Range: 6.00 mm - 20.00 mm



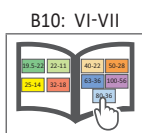
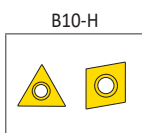
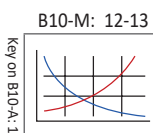
Form 101



Form 20

| Boring Range  | Boring Bar |                | Weight    | Insert Form | Part No. | Insert Form | Part No. |
|---------------|------------|----------------|-----------|-------------|----------|-------------|----------|
|               | A          | X <sub>1</sub> |           |             |          |             |          |
| 6.00 - 8.00   | 22.00      | 19.00          | 0.05 (kg) | 211*        | 502068   | -           | -        |
| 8.00 - 10.00  | 30.00      | 27.00          | 0.05 (kg) | 211*        | 502066   | -           | -        |
| 10.00 - 11.00 | 30.00      | 27.00          | 0.06 (kg) | 101         | 502012   | 20*         | 502001   |
| 11.00 - 12.00 | 30.00      | 27.00          | 0.06 (kg) | 101         | 502075   | 20*         | 502070   |
| 12.00 - 13.00 | 45.00      | 42.00          | 0.07 (kg) | 101         | 502013   | 20*         | 502002   |
| 13.00 - 14.00 | 45.00      | 42.00          | 0.08 (kg) | 101         | 502076   | 20*         | 502071   |
| 14.00 - 15.00 | 50.00      | 47.00          | 0.08 (kg) | 101         | 502014   | 20*         | 502003   |
| 15.00 - 16.00 | 50.00      | 47.00          | 0.09 (kg) | 101         | 502077   | 20*         | 502072   |
| 16.00 - 17.00 | 60.00      | 57.00          | 0.10 (kg) | 101         | 502015   | 20*         | 502004   |
| 17.00 - 18.00 | 60.00      | 57.00          | 0.12 (kg) | 101         | 502078   | 20*         | 502073   |
| 18.00 - 19.00 | 68.00      | 65.00          | 0.13 (kg) | 101         | 502016   | 20*         | 502005   |
| 19.00 - 20.00 | 68.00      | 65.00          | 0.14 (kg) | 101         | 502079   | 20*         | 502074   |

\*Not suitable for indexable inserts with a radius of 0.80 mm



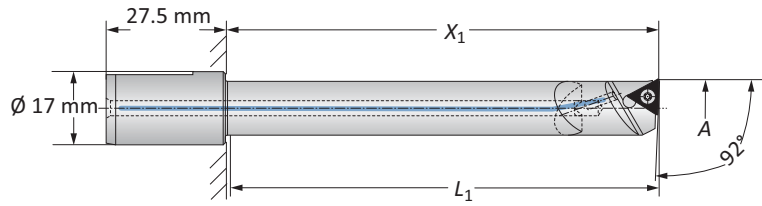


## Boring Bars

Carbide | Diameter Range: 10.00 mm - 20.00 mm



Form 101



Form 20

| Boring Range | Boring Bar    |                | Weight | Insert Form | Part No. | Insert Form | Part No. |                |
|--------------|---------------|----------------|--------|-------------|----------|-------------|----------|----------------|
|              | A             | X <sub>1</sub> |        |             |          |             |          | L <sub>1</sub> |
| m            | 10.00 - 12.00 | 55.00          | 52.00  | 0.12 (kg)   | 101      | 502093      | 20*      | 502088         |
|              | 10.00 - 12.00 | 70.00          | 67.00  | 0.14 (kg)   | 101      | 502034      | 20*      | 502023         |
|              | 12.00 - 14.00 | 65.00          | 62.00  | 0.13 (kg)   | 101      | 502094      | 20*      | 502089         |
|              | 12.00 - 14.00 | 85.00          | 82.00  | 0.18 (kg)   | 101      | 502035      | 20*      | 502024         |
|              | 14.00 - 16.00 | 75.00          | 72.00  | 0.17 (kg)   | 101      | 502095      | 20*      | 502090         |
|              | 14.00 - 16.00 | 90.00          | 87.00  | 0.22 (kg)   | 101      | 502036      | 20*      | 502025         |
|              | 16.00 - 18.00 | 85.00          | 82.00  | 0.26 (kg)   | 101      | 502096      | 20*      | 502091         |
|              | 16.00 - 18.00 | 110.00         | 107.00 | 0.32 (kg)   | 101      | 502037      | 20*      | 502026         |
|              | 18.00 - 20.00 | 95.00          | 92.00  | 0.28 (kg)   | 101      | 502097      | 20*      | 502092         |
|              | 18.00 - 20.00 | 120.00         | 117.00 | 0.40 (kg)   | 101      | 502038      | 20*      | 502027         |

\*Not suitable for indexable inserts with a radius of 0.80 mm

Key on B10-A: 1

B10-M: 12-13

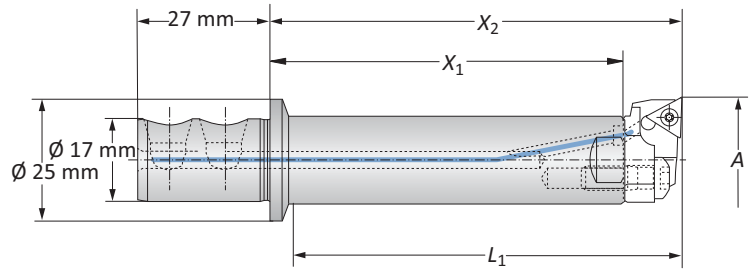
B10-H

B10: VI-VII

m = Metric (mm)  
Inserts sold separately

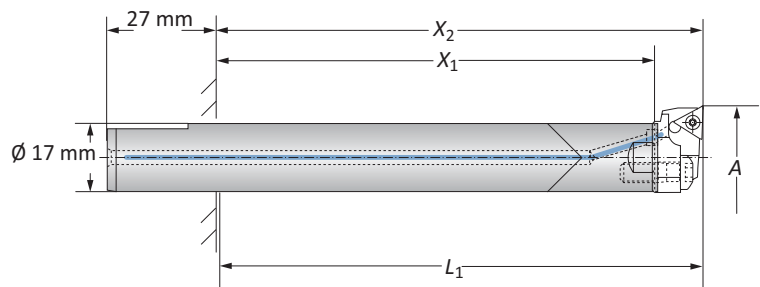
## Serrated Tool Bodies | Insert Holders

Steel | Carbide | Diameter Range: 20.00 mm - 32.00 mm



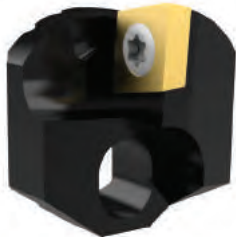
### Steel Serrated Tool Body

| Boring Range  | Serrated Tool Body |                |                | Weight    | Part No. |
|---------------|--------------------|----------------|----------------|-----------|----------|
| A             | X <sub>1</sub>     | X <sub>2</sub> | L <sub>1</sub> |           |          |
| 20.00 - 32.00 | 72.00              | 84.00          | 77.00          | 0.20 (kg) | 502045   |

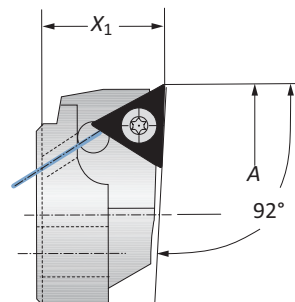


### Carbide Serrated Tool Body

| Boring Range  | Serrated Tool Body |                |                | Weight    | Part No. |
|---------------|--------------------|----------------|----------------|-----------|----------|
| A             | X <sub>1</sub>     | X <sub>2</sub> | L <sub>1</sub> |           |          |
| 20.00 - 32.00 | 108.00             | 120.00         | 117.00         | 0.40 (kg) | 502062   |



Form 101

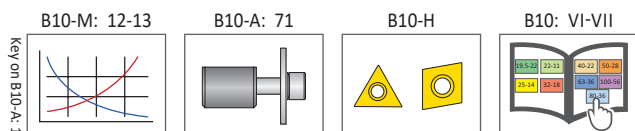


Form 20

### Insert Holders

| Boring Range  | Insert Holder  | Weight    | Insert Form | Part No. | Insert Form | Part No. |
|---------------|----------------|-----------|-------------|----------|-------------|----------|
| A             | X <sub>1</sub> |           |             |          |             |          |
| 20.00 - 22.00 | 12.00          | 0.01 (kg) | 101         | 502052   | 20*         | 502046   |
| 22.00 - 24.00 | 12.00          | 0.01 (kg) | 101         | 502053   | 20*         | 502047   |
| 24.00 - 26.00 | 12.00          | 0.01 (kg) | 101         | 502054   | 20*         | 502048   |
| 26.00 - 28.00 | 12.00          | 0.01 (kg) | 101         | 502055   | 20*         | 502049   |
| 28.00 - 30.00 | 12.00          | 0.01 (kg) | 101         | 502056   | 20*         | 502050   |
| 30.00 - 32.00 | 12.00          | 0.01 (kg) | 101         | 502057   | 20*         | 502051   |

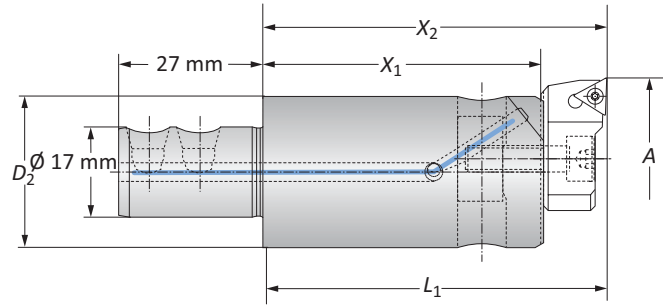
\*Not suitable for indexable inserts with a radius of 0.80 mm



Ⓜ = Metric (mm)  
Inserts sold separately

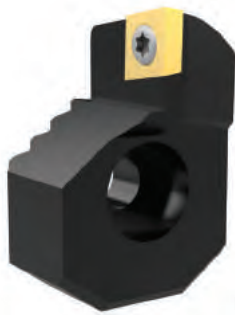
## Alu-Line Serrated Tool Bodies | Insert Holders

Diameter Range: 32.00 mm - 68.00 mm

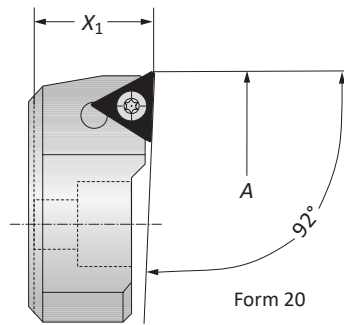


### Alu-Line Serrated Tool Bodies

| 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> |           |          |
| m            | 32.00 - 50.00      | 28.50          | 52.00          | 66.00          | 63.00          | 0.10 (kg) | 501052   |
|              | 32.00 - 50.00      | 28.50          | 88.00          | 102.00         | 99.00          | 0.20 (kg) | 501060   |
|              | 50.00 - 68.00      | 46.00          | 61.00          | 75.00          | 72.00          | 0.20 (kg) | 501053   |
|              | 50.00 - 68.00      | 46.00          | 106.00         | 120.00         | 117.00         | 0.30 (kg) | 501061   |



Form 101

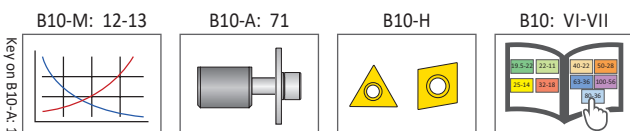


Form 20

### Insert Holders

| Serrated Tool Body | Boring Range    | Insert Holder  | Weight        | Insert Form | Part No.  |        |
|--------------------|-----------------|----------------|---------------|-------------|-----------|--------|
|                    | A               | X <sub>1</sub> |               |             |           |        |
| m                  | 501052 / 501060 | 32.00 - 41.00  | 14.00         | 0.03 (kg)   | 20*       | 502060 |
|                    |                 | 41.00 - 50.00  | 14.00         | 0.04 (kg)   | 20*       | 502061 |
|                    | 501053 / 501061 | 32.00 - 41.00  | 14.00         | 0.03 (kg)   | 101       | 502058 |
|                    |                 |                | 41.00 - 50.00 | 14.00       | 0.04 (kg) | 101    |
| 50.00 - 59.00      |                 | 14.00          | 0.03 (kg)     | 20*         | 502060    |        |
|                    |                 | 59.00 - 68.00  | 14.00         | 0.04 (kg)   | 20*       | 502061 |
| 50.00 - 59.00      | 14.00           | 0.03 (kg)      | 101           | 502058      |           |        |
|                    | 59.00 - 68.00   | 14.00          | 0.04 (kg)     | 101         | 502059    |        |

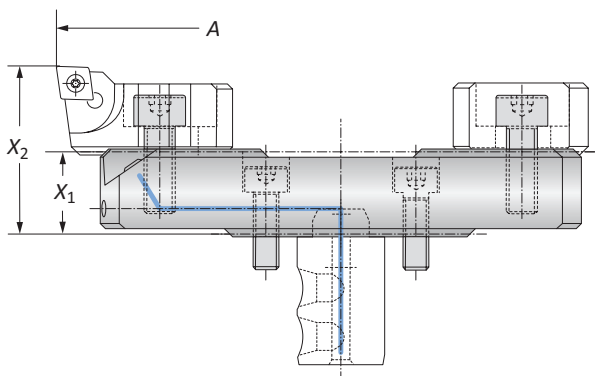
\*Not suitable for indexable inserts with a radius of 0.80 mm



m = Metric (mm)  
Inserts sold separately

## Alu-Line Serrated Slides | Insert Holders

Diameter Range: 68.00 mm - 208.00 mm



### Alu-Line Serrated Slides

| Boring Range    | Serrated Slide |                | Weight    | Part No. |
|-----------------|----------------|----------------|-----------|----------|
|                 | A              | X <sub>1</sub> |           |          |
| 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   |

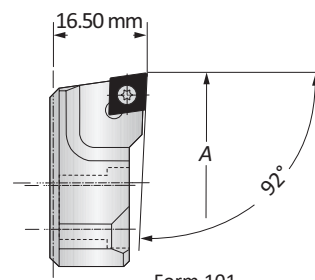
### Insert Holders

| Boring Range   | Weight    | Insert Form | Part No. |
|----------------|-----------|-------------|----------|
|                |           |             |          |
| 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



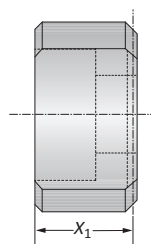
Form 20



Form 101

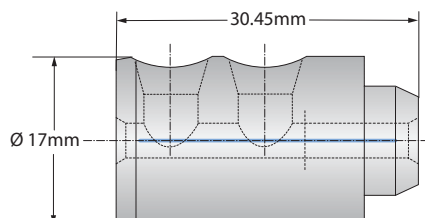
### Counterweight

| Counterweight  | Weight    | Part No. |
|----------------|-----------|----------|
| X <sub>1</sub> |           |          |
| 13.40          | 0.05 (kg) | 502165   |



### Coolant Delivery System

| Coolant Delivery System | Part No. |
|-------------------------|----------|
| Weight                  |          |
| 0.02 (kg)               | 501157   |

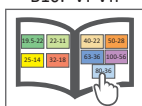
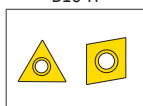
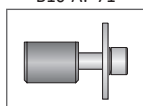
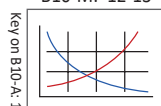


B10-M: 12-13

B10-A: 71

B10-H

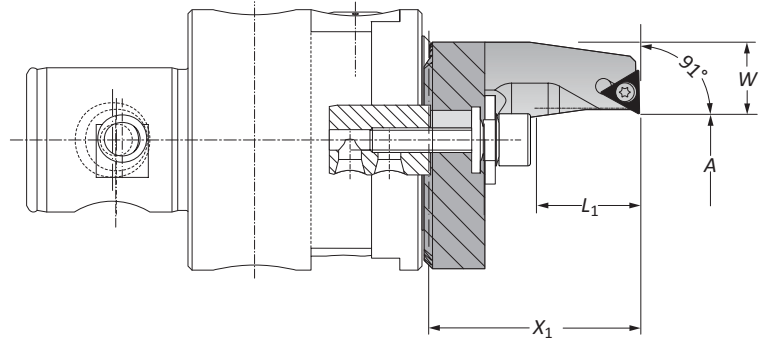
B10: VI-VII




Ⓜ = Metric (mm)  
Inserts sold separately

## Outside Turning Insert Holders for Boring Heads

Diameter Range: 4.00 mm - 66.00 mm

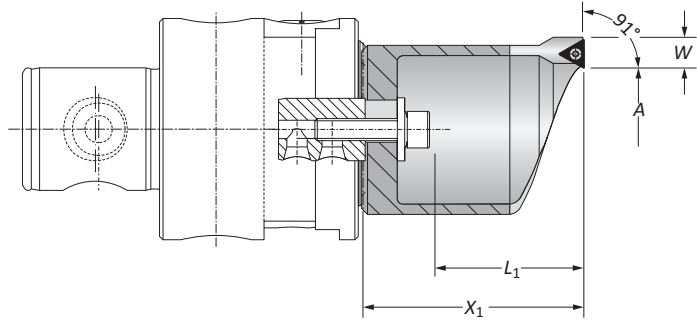


### Type A Insert Holders | Diameter Range: 4.00 mm - 30.00 mm


|   | Boring Range  |                | Insert Holder  |       |           | Weight | Insert Form   | Part No. |
|---|---------------|----------------|----------------|-------|-----------|--------|---------------|----------|
|   | A             | X <sub>1</sub> | L <sub>1</sub> | W     |           |        |               |          |
|  | 4.00 - 17.50  | 40.50          | 20.00          | 16.60 | 0.10 (kg) | 20*    | <b>236081</b> |          |
|   | 16.50 - 30.00 | 50.50          | 30.00          | 11.10 | 0.10 (kg) | 20*    | <b>236082</b> |          |

**NOTE:** Clockwise and neutral execution

\*Not suitable for indexable inserts with a radius of 0.80 mm




### Type B Insert Holders | Diameter Range: 29.00 mm - 66.00 mm

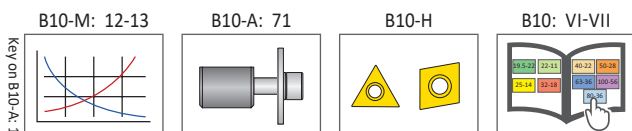
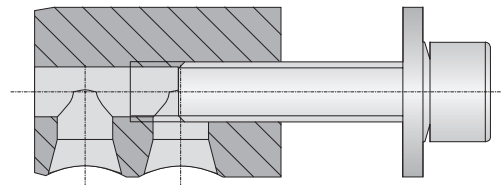
|   | Boring Range  |                | Insert Holder  |      |           | Weight | Insert Form   | Part No. |
|---|---------------|----------------|----------------|------|-----------|--------|---------------|----------|
|   | A             | X <sub>1</sub> | L <sub>1</sub> | W    |           |        |               |          |
|  | 29.00 - 44.00 | 75.50          | 54.00          | 9.60 | 0.30 (kg) | 20*    | <b>236083</b> |          |
|   | 43.00 - 66.00 | 100.50         | 79.00          | 9.60 | 0.40 (kg) | 20*    | <b>236084</b> |          |


**NOTE:** Clockwise and neutral execution

\*Not suitable for indexable inserts with a radius of 0.80 mm

### Clamping Pieces for Outside Turning Insert Holders

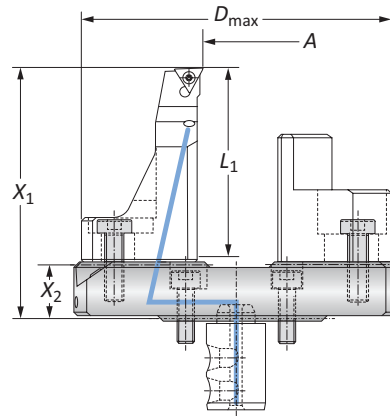
| Insert Holder Type  | Boring Range | Service Key | Complete Part No. |
|---|--------------|-------------|-------------------|
|  | A            | s5          | <b>502080</b>     |
|   | B            | s5          | <b>502081</b>     |



 = Metric (mm)  
Inserts sold separately

## Outside Turning Serrated Slides | Insert Holders

Diameter Range: 2.00 mm - 114.00 mm



### Outside Turning Serrated Slides

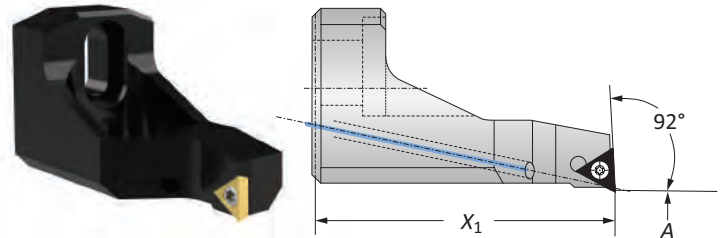
|   | Boring Range   |                | Serrated Slide |                |                  | Weight    | Part No. |
|---|----------------|----------------|----------------|----------------|------------------|-----------|----------|
|   | A              | X <sub>1</sub> | X <sub>2</sub> | L <sub>1</sub> | D <sub>max</sub> |           |          |
| 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 Holder

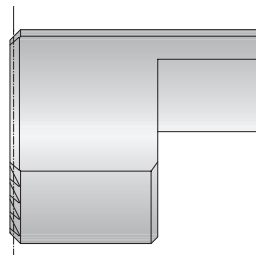
|   | Outside Turning Range |                | Insert Holder | Weight | Insert Form | Part No. |
|---|-----------------------|----------------|---------------|--------|-------------|----------|
|   | A                     | X <sub>1</sub> |               |        |             |          |
| m | 2.00 - 114.00         | 57.00          | 0.15 (kg)     | 20     | 502082      |          |

NOTE: Clockwise and neutral execution



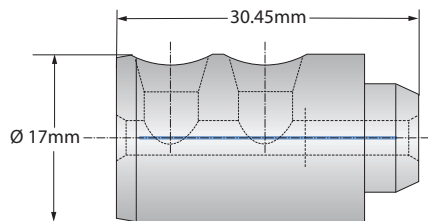
### Counterweight

|   | Counterweight  |           | Part No. |
|---|----------------|-----------|----------|
|   | X <sub>1</sub> | Weight    |          |
| m | 37.75          | 0.16 (kg) | 502183   |



### Coolant Delivery System

|   | Coolant Delivery System |          |
|---|-------------------------|----------|
|   | Weight                  | Part No. |
| m | 0.02 (kg)               | 501157   |



Key on B10-A: 1

B10-M: 12-13

B10-A: 71

B10-H

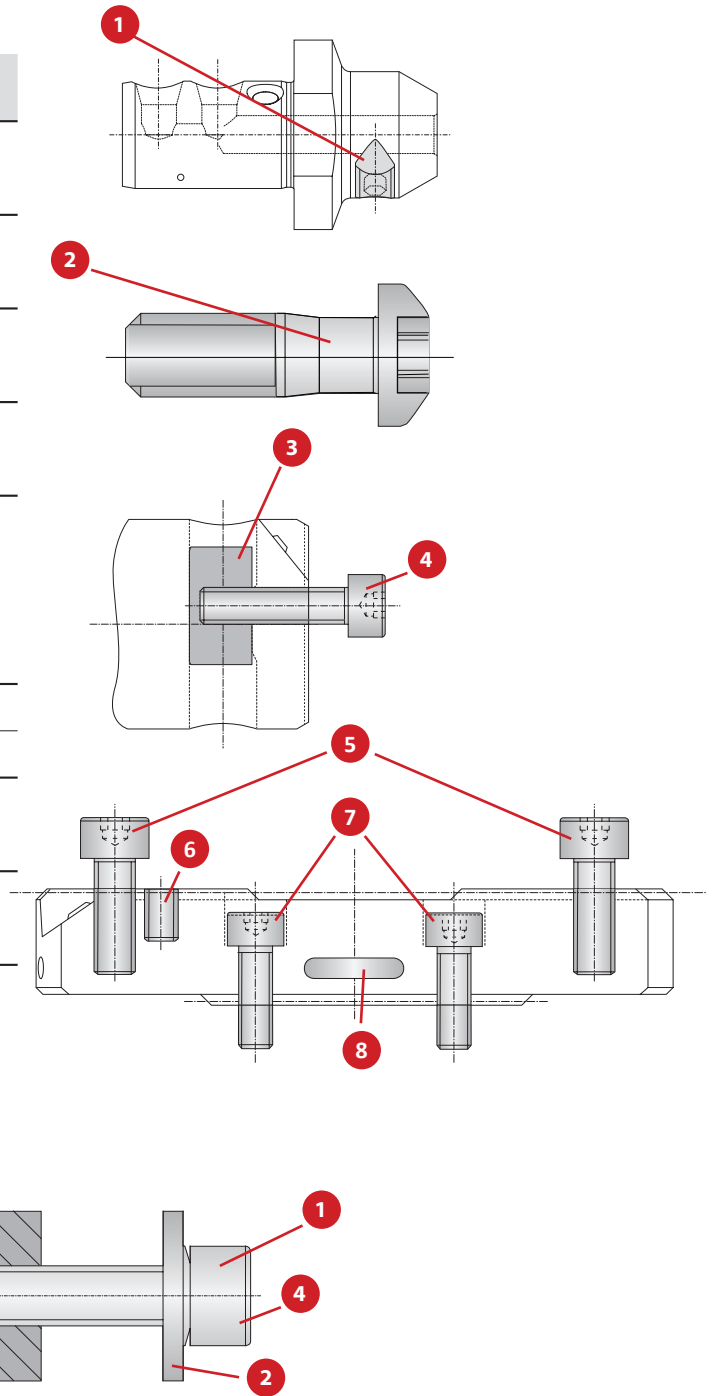
B10: VI-VII

m = Metric (mm)  
Inserts sold separately



Accessories

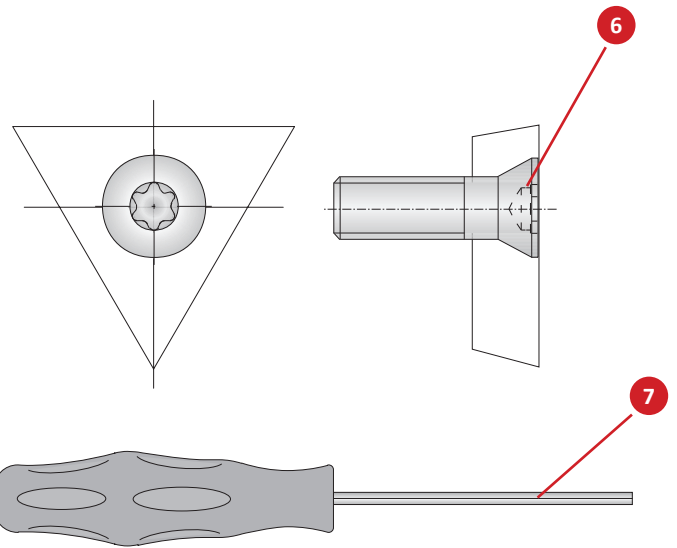
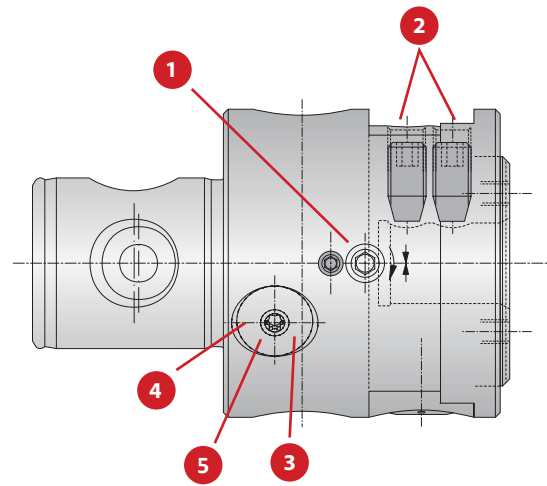
| No. | Part   | Size                   | Part No.    |
|-----|--|------------------------|-------------|
| 1   | Set screw  | s3                     | 415244      |
| 2   | Screw for securing insert holder                   | T25                    | 415112      |
| 3   | Clamping piece            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



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

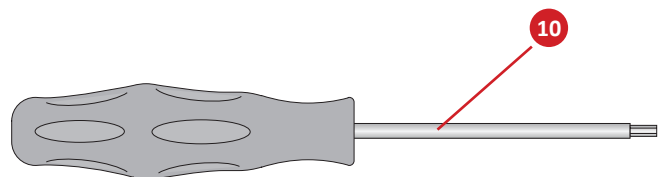
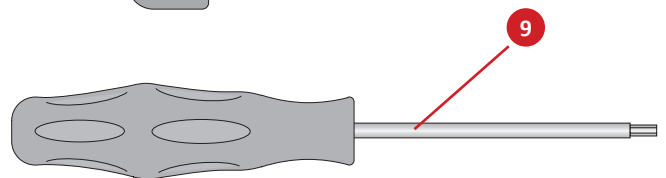
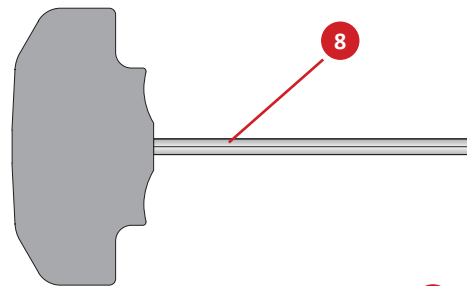
Accessories

| 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<br>Form 20<br>Form 101                            | T6<br>T7<br>T8        | 215377<br>115535<br>115676           |
| 7   | Hex driver                             | -  | s1.5<br>s3            | 215472<br>115630                     |
| 8   | Hex driver                             | -  | s4                    | 115576                               |
| 9   | Torx® driver                           | -  | T6<br>T7<br>T8<br>T20 | 115537<br>115591<br>115590<br>215150 |
| 10  | Torque screwdriver, Torx               | (0.6 Nm) Form 211<br>(0.9 Nm) Form 20<br>(1.2 Nm) Form 101 | T6<br>T7<br>T8        | 415507<br>415508<br>415514           |



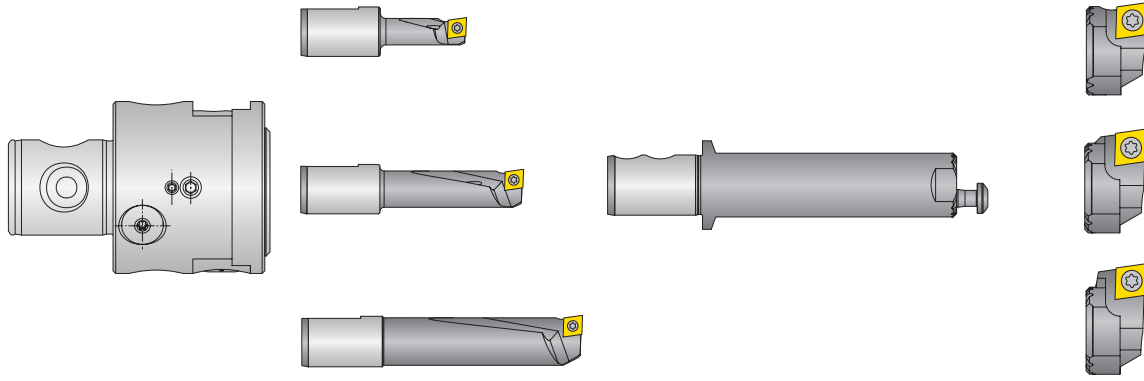
\*Always change two batteries

**NOTE:** Please use VARTA batteries (V392 SR41)




## Kit Components

Insert Form 101 | Diameter Range: 10.00 mm - 32.00 mm



Diameter Range: 10.00 mm - 32.00 mm

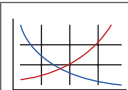
|   | Kit Components |   |                            |               |                    |                            |  | Kit No.       |
|---|----------------|---|----------------------------|---------------|--------------------|----------------------------|--|---------------|
|   | Boring Head    | Boring Range                                    | Boring Bars                | Boring Range  | Serrated Tool Body | Insert Holders             | Service Keys                               |               |
|  | 501001         | 10.00 - 11.00<br>14.00 - 15.00<br>18.00 - 19.00 | 502012<br>502014<br>502016 | 20.00 - 32.00 | 502045             | 502052<br>502054<br>502056 | 115576 (s4)<br>415121 (T25)<br>115590 (T8) | <b>103061</b> |

**NOTE:** Inserts sold separately

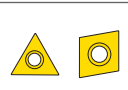


Key on B10-A-1

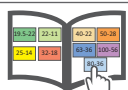
B10-M: 12-13




B10-H



B10: VI-VII

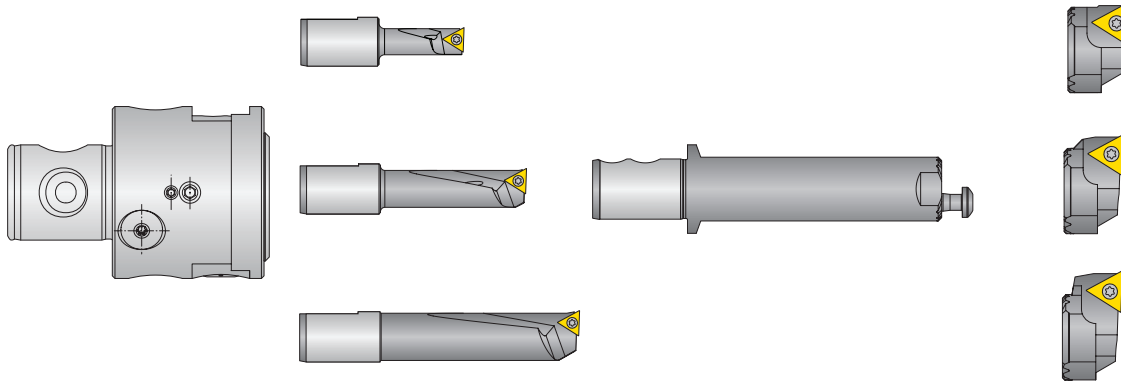


 = Metric (mm)  
Inserts sold separately

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email: [engineering.eu@alliedmachine.com](mailto:engineering.eu@alliedmachine.com)

## Kit Components

Insert Form 20 | Diameter Range: 10.00 mm - 32.00 mm



Diameter Range: 10.00 mm - 32.00 mm

|   |             | Kit Components |             |               |                    |                |              |         |
|---|-------------|----------------|-------------|---------------|--------------------|----------------|--------------|---------|
|   | Boring Head | Boring Range   | Boring Bars | Boring Range  | Serrated Tool Body | Insert Holders | Service Keys | Kit No. |
| m | 501001      | 10.00 - 11.00  | 502001      | 20.00 - 32.00 | 502045             | 502046         | 115576 (s4)  | 103062  |
|   |             | 14.00 - 15.00  | 502003      |               |                    | 502048         | 415121 (T25) |         |
|   |             | 18.00 - 19.00  | 502005      |               |                    | 502050         | 115591 (T7)  |         |

NOTE: Inserts sold separately



Key on B10-A-1

B10-M: 12-13

B10-H

B10: VI-VII

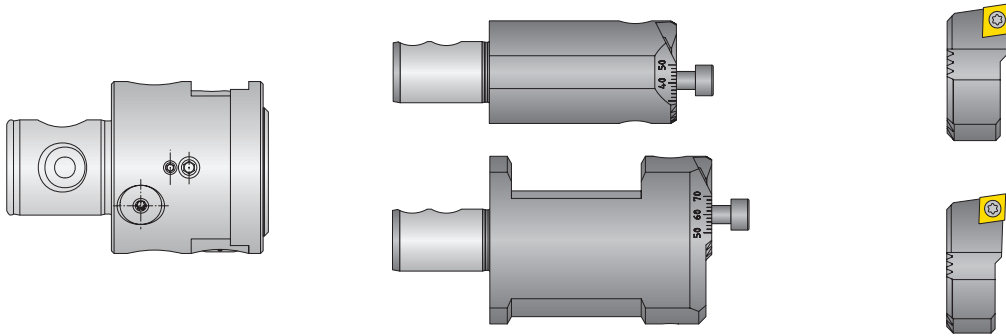
m = Metric (mm)

Inserts sold separately


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## Kit Components

Insert Form 101 | Diameter Range: 32.00 mm - 68.00 mm



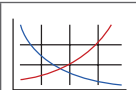
Diameter Range: 32.00 mm - 68.00 mm

|   | Boring Head | Kit Components |                    |                |              | Kit No.       |
|---|-------------|----------------|--------------------|----------------|--------------|---------------|
|   |             | Boring Range   | Serrated Tool Body | Insert Holders | Service Keys |               |
|  | 501001      | 32.00 - 50.00  | 501052             | 502058         | 115576 (s4)  | <b>103063</b> |
|   |             | 50.00 - 68.00  | 501053             | 502059         | 115590 (T8)  |               |

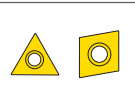
**NOTE:** Inserts sold separately



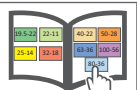
B10-M: 12-13




B10-H



B10: VI-VII



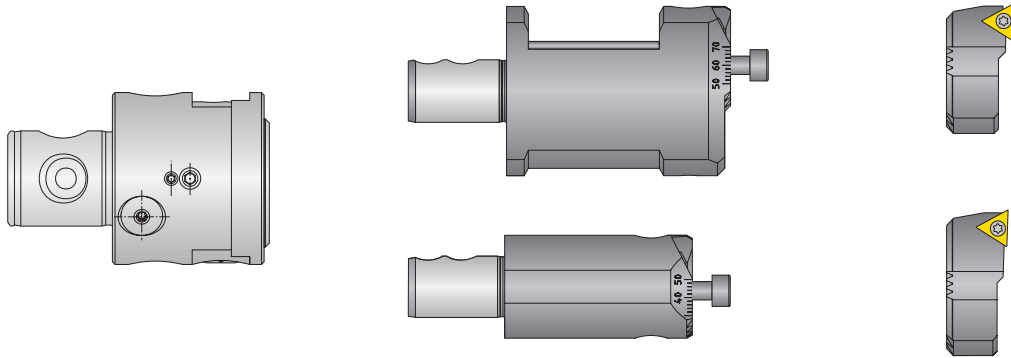
Key on B10-A-1

 = Metric (mm)  
Inserts sold separately

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email: [engineering.eu@alliedmachine.com](mailto:engineering.eu@alliedmachine.com)

## Kit Components

Insert Form 20 | Diameter Range: 32.00 mm - 68.00 mm



Diameter Range: 32.00 mm - 68.00 mm

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

**NOTE:** Inserts sold separately

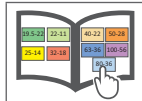
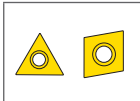
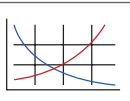


B10-M: 12-13

B10-H

B10: VI-VII

Key on B10-A-1



m = Metric (mm)

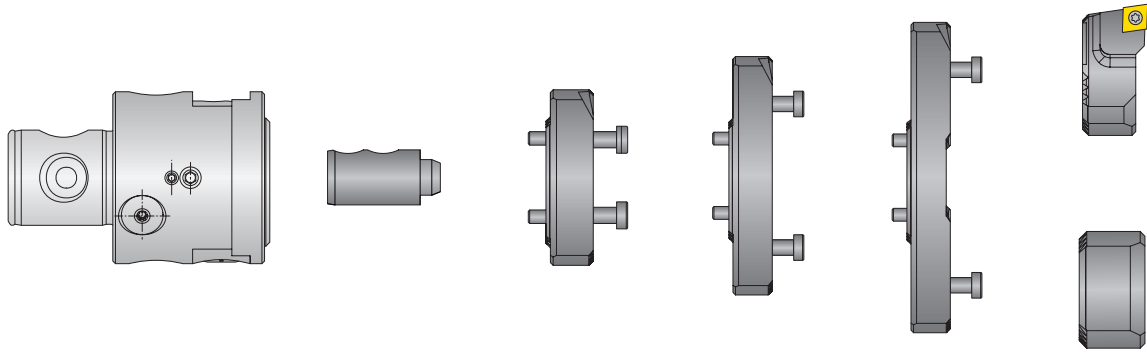
Inserts sold separately

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 email: [engineering.eu@alliedmachine.com](mailto:engineering.eu@alliedmachine.com)



## Kit Components

Insert Form 101 | Diameter Range: 68.00 mm - 152.00 mm



Diameter Range: 68.00 mm - 152.00 mm

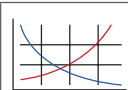
|   |             | Kit Components  |                 |               |               |                  |              |         |
|---|-------------|-----------------|-----------------|---------------|---------------|------------------|--------------|---------|
|   | Boring Head | Boring Range    |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

**NOTE:** Inserts sold separately

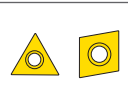


Key on B10-A-1

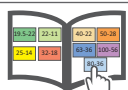
B10-M: 12-13



B10-H



B10: VI-VII

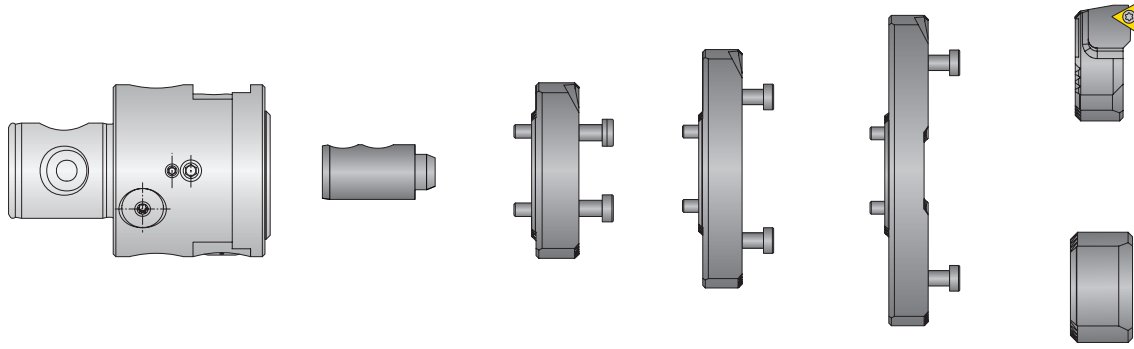


m = Metric (mm)  
Inserts sold separately

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## Kit Components

Insert Form 20 | Diameter Range: 68.00 mm - 152.00 mm



Diameter Range: 68.00 mm - 152.00 mm

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

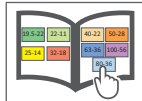
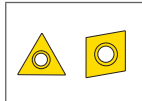
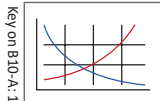
NOTE: Inserts sold separately



B10-M: 12-13

B10-H

B10: VI-VII



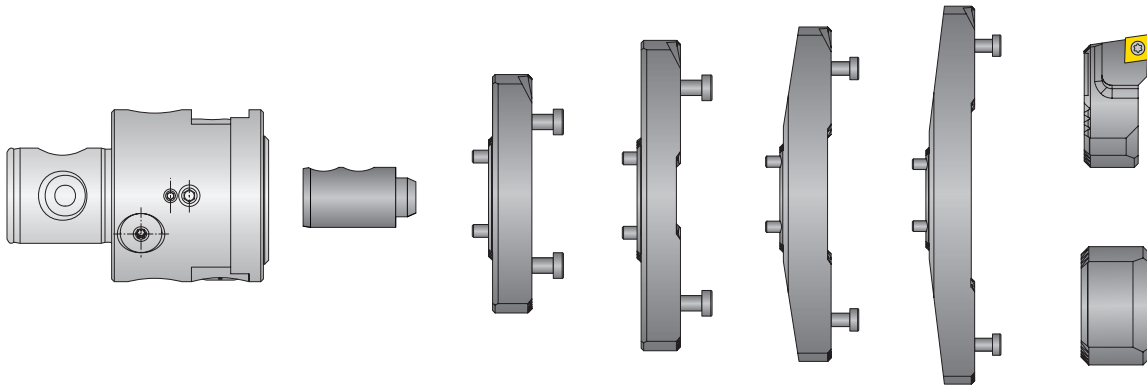
m = Metric (mm)

Inserts sold separately

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 email: [engineering.eu@alliedmachine.com](mailto:engineering.eu@alliedmachine.com)

## Kit Components

Insert Form 101 | Diameter Range: 96.00 mm - 208.00 mm



Diameter Range: 96.00 mm - 208.00 mm

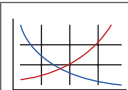
|   |             | Kit Components  |                 |               |               |                  |                            |         |
|---|-------------|-----------------|-----------------|---------------|---------------|------------------|----------------------------|---------|
|   | Boring Head | Boring Range    | Serrated Slides | Insert Holder | Counterweight | Coolant Delivery | Service Keys               | Kit No. |
| m | 501001      | 96.00 - 124.00  | 501055          | 502064        | 502165        | 501157           | 115576 (s4)<br>115590 (T8) | 103081  |
|   |             | 124.00 - 152.00 | 501056          |               |               |                  |                            |         |
|   |             | 152.00 - 180.00 | 501058          |               |               |                  |                            |         |
|   |             | 180.00 - 208.00 | 501059          |               |               |                  |                            |         |

**NOTE:** Inserts sold separately

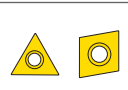


Key on B10-A-1

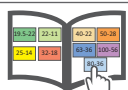
B10-M: 12-13



B10-H



B10: VI-VII

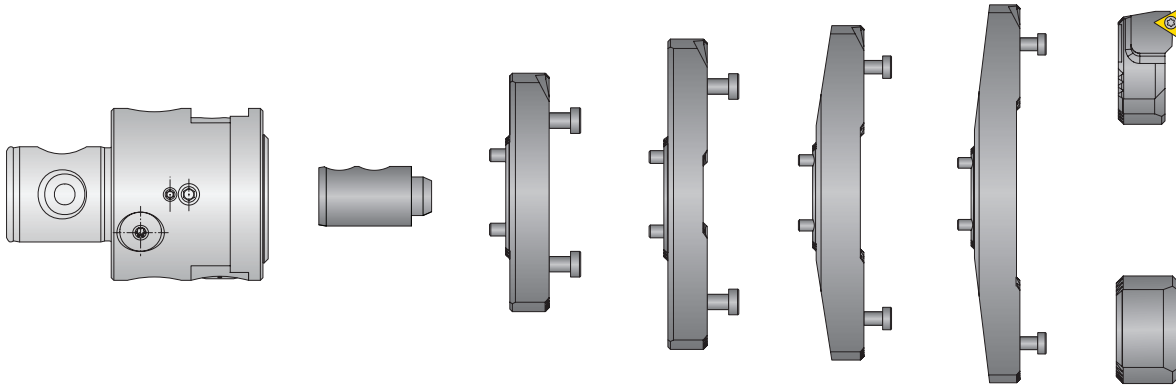


**m** = Metric (mm)  
Inserts sold separately

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## Kit Components

Insert Form 20 | Diameter Range: 96.00 mm - 208.00 mm



Diameter Range: 96.00 mm - 208.00 mm

|   |             | Kit Components  |                 |               |               |                  |                            |         |
|---|-------------|-----------------|-----------------|---------------|---------------|------------------|----------------------------|---------|
|   | Boring Head | Boring Range    | Serrated Slides | Insert Holder | Counterweight | Coolant Delivery | Service Keys               | Kit No. |
| m | 501001      | 96.00 - 124.00  | 501055          | 502069        | 502165        | 501157           | 115576 (s4)<br>115591 (T7) | 103080  |
|   |             | 124.00 - 152.00 | 501056          |               |               |                  |                            |         |
|   |             | 152.00 - 180.00 | 501058          |               |               |                  |                            |         |
|   |             | 180.00 - 208.00 | 501059          |               |               |                  |                            |         |

NOTE: Inserts sold separately

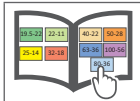
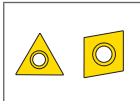
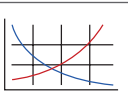


B10-M: 12-13

B10-H

B10: VI-VII

Key on B10-A-1



m = Metric (mm)

Inserts sold separately

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SECTION

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# B10-B

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Fine Boring

# Wohlhaupter® Fine Boring

410 | 464 | 364 | 564 | 310 | 537

► Diameter Range: 20.00 mm - 205.00 mm



**NOTE:** Metric items pictured

**NOTE:** 3E<sup>TECH+</sup> adjustment accuracy of 0.001 mm on diameter

**NOTE:** Digital and vernier adjustment accuracy of 0.002 mm on diameter

## Boring has never been more exciting.

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

### Unbalanced & Balanced Digital 3E<sup>TECH+</sup> Boring Heads

- 410 / 464 fine boring heads
- 410 Ø 20.00 mm - 29.00 mm
- 464 Ø 29.00 mm - 205.00 mm

### Balanced Analogue Boring Heads

- 364 / 464 fine boring heads
- 364 Ø 20.00 mm - 29.50 mm
- 464 Ø 29.00 mm - 205.00 mm

### Balanced Digital Boring Heads

- 564 fine boring heads
- Ø 50.00 mm - 205.00 mm

### Unbalanced Analogue Boring Heads

- 310 fine boring heads
- Ø 20.00 mm - 205.00 mm

### Analogue and Digital Cassettes

- 537 fine boring cassettes
- Ø 100.00 mm - 205.00 mm

## Applicable Industries



Aerospace



Agriculture



Automotive



Firearms



General  
Machining



Oil & Gas



Renewable  
Energy

Your safety and the safety of others is very important. This catalogue 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 catalogue, 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 catalogue. 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.

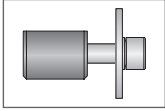
**NOTE** and **IMPORTANT** are also used. These are important that you read and follow but are not safety-related.

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

# Fine Boring Table of Contents

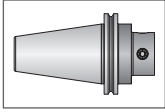
## Reference Icons

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



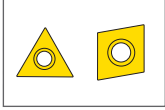
### Clamping Elements

For use with insert holders and boring heads



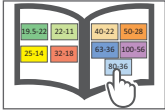
### Shanks

A variety of shanks for different machines



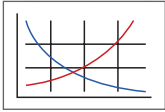
### Inserts

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



### MVS Connection Colour Guide

Detailed instructions and information regarding the MVS connection(s)



### Recommended Cutting Data

Speed and feed recommendations for optimum and safe boring



### Through Coolant Option

Indicates that the product is through coolant

## Digital 3E<sup>TECH+</sup> 410 / 464

|                             |       |
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## Balanced Analogue 364 / 464

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|------------------|---------|
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## Balanced Digital 564

|                  |         |
|------------------|---------|
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## Unbalanced Analogue 310

|                                 |         |
|---------------------------------|---------|
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| Serrated Shims   Insert Holders | 26      |
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## 537 Cassettes

|                                       |         |
|---------------------------------------|---------|
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| Analogue Cassettes                    | 30      |
| 3E <sup>TECH+</sup> Digital Cassettes | 31      |
| Serrated Tool Bodies   Insert Holders | 32      |
| 537   3E <sup>TECH+</sup> Accessories | 33      |

| Series | Diameter Range  |
|--------|-----------------|
|        | Metric (mm)     |
| 410    | 20.00 - 29.00   |
| 464    | 29.00 - 205.00  |
| 364    | 20.00 - 29.50   |
| 564    | 50.00 - 205.00  |
| 310    | 20.00 - 205.00  |
| 537    | 100.00 - 205.00 |



# 410 and 464 Product Overview



## Digital 3E<sup>TECH+</sup> 410 and 464 FINE BORING

Make easy diameter adjustments with our 3E<sup>TECH+</sup> digital readout module.

Wohlhaupter® 410 and 464 digital boring heads are equipped with a 3E<sup>TECH+</sup> docking port for easy digital adjustments. Boring heads from 29.00 mm offer precision boring with automatic balancing. Our boring heads are specifically engineered to minimise the residual imbalance produced by insert holder displacement. Wohlhaupter Alu-Line boring heads, ranging from 65.00 mm, offer a lightweight aluminium design with a wear-resistant coating that reduces weight on the spindle up to 50%. The insert holder can also be rotated for reverse machining jobs.

- Unbalanced 410 diameter range: 20.00 mm - 29.00 mm
- Balanced 464 diameter range: 29.00 mm - 205.00 mm
- Balanced 464 Alu-Line diameter range: 65.00 mm - 205.00 mm
  - Special coating on Alu-Line for wear-resistant surface
  - Alu-Line body reduces tool weight by 50%, reducing stress on the spindle
- Through coolant
- 3E<sup>TECH+</sup> and vernier diameter adjustment of 0.002 mm
- Internal balancing improves tool life and surface finish
- Insert holder can be rotated for back boring jobs
- Max cutting speed: 1,700 M/min

Highly accurate adjustments through **vernier** scale



**NOTE:** 3E<sup>TECH+</sup> adjustment accuracy of 0.001 mm on diameter

**NOTE:** Vernier adjustment accuracy of 0.002 mm on diameter

Versatile 3E<sup>TECH+</sup> digital readout compatible with other boring tools

**IMPORTANT:** Max spindle speed refers to maximum possible speed for an individual boring head and is not a recommended parameter. Refer to page B10-M: 12 for recommended application-specific parameters. Factory technical assistance is available for your specific applications through our Application Engineering department.  
email: [engineering.eu@alliedmachine.com](mailto:engineering.eu@alliedmachine.com)

# WOHLHAUPTER® 410 and 464 3E<sup>TECH+</sup> DIGITAL BORING HEADS

## Wohlhaupter 3E<sup>TECH+</sup>

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

- Make quick and easy micron-accurate diameter adjustments
- Easy-to-read digital display shows exact diameter adjustments
- Designed to be removed from boring tool before operation (if forgotten 3E<sup>TECH+</sup> will fall off at 500 RPM)
- Adjustments of 0.002 mm on diameter
- Water and dust resistant IP 56
- Coolant and chip resistant
- 3E<sup>TECH+</sup> will automatically turn off after 30 seconds of not using
- WEEE-Reg.-Nr. DE 15820388

- ✓ High-production fine boring
- ✓ Easy diameter adjustment with 3E<sup>TECH+</sup>
- ✓ Self-balancing 464 boring heads

| 410 & 464 BORING HEADS WITH 3E <sup>TECH+</sup> |          |
|---|----------|
| Diameter Range                                  | Part No. |
| 20.00 - 24.50                                   | 410001   |
| 24.50 - 29.00                                   | 410002   |
| 29.00 - 38.00                                   | 464003   |
| 38.00 - 50.00                                   | 464004   |
| 50.00 - 65.50                                   | 464005   |
| 65.00 - 83.00                                   | 464006   |
| 82.00 - 103.00                                  | 464007   |
| 100.00 - 130.00                                 | 464008   |
| 125.00 - 167.50                                 | 464009   |
| 162.50 - 205.00                                 | 464010   |



**NOTE:** 3E<sup>TECH+</sup> adjustment accuracy of 0.001 mm on diameter

**NOTE:** Vernier adjustment accuracy of 0.002 mm on diameter

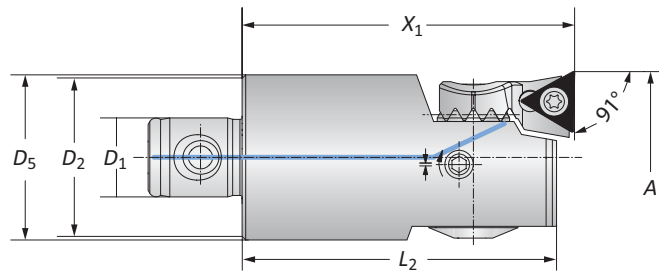
**IMPORTANT:** Max spindle speed refers to maximum possible speed for an individual boring head and is not a recommended parameter. Refer to page B10-M: 12 for recommended application-specific parameters. Factory technical assistance is available for your specific applications through our Application Engineering department.  
email: [engineering.eu@alliedmachine.com](mailto:engineering.eu@alliedmachine.com)

### 410 Unbalanced Boring Heads with 3E<sup>TECH+</sup>

Diameter Range: 20.00 mm - 29.00 mm



Form 101



Form 20

### 410 Unbalanced Boring Heads with 3E<sup>TECH+</sup>

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

\*Not suitable for indexable inserts with a radius of 0.80 mm

NOTE: 3E<sup>TECH+</sup> module, charging unit, insert holders, and inserts sold separately

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

| Part No. | Charging Unit* |
|----------|----------------|
| 536015   | 536016         |

NOTE: WEEE-Reg.-Nr. DE 15820388

\*Charging unit sold separately

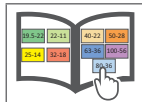
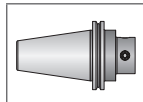
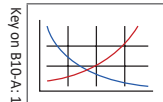


NOTE: 3E<sup>TECH+</sup> adjustment accuracy of 0.001 mm on diameter

B10-M: 12-13

B10-F

B10: VI-VII



m = Metric (mm)

**IMPORTANT:** Max spindle speed refers to maximum possible speed for an individual boring head and is not a recommended parameter. Refer to page B10-M: 12 for recommended application-specific parameters. Factory technical assistance is available for your specific applications through our Application Engineering department.  
email: [engineering.eu@alliedmachine.com](mailto:engineering.eu@alliedmachine.com)

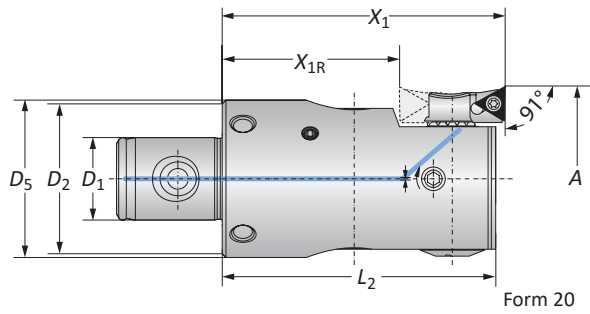


### 464 Balanced Boring Heads with 3E<sup>TECH+</sup>

Diameter Range: 29.00 mm - 65.50 mm



Form 101



Form 20

### 464 Balanced Boring Heads with 3E<sup>TECH+</sup>

| MVS Connection | Boring Range | Boring Head   |       |       |          |       | Weight    | Insert Form | Part No. |               |
|----------------|--------------|---------------|-------|-------|----------|-------|-----------|-------------|----------|---------------|
|                |              | $D_2$   $D_1$ | A     | $X_1$ | $X_{1R}$ | $L_2$ |           |             | $D_5$    | Insert Holder |
| m              | 25 - 14      | 29.00 - 38.00 | 56.00 | -     | 53.50    | 27.00 | 0.21 (kg) | 20          | 210059   | 464003        |
|                | 25 - 14      | 29.00 - 38.00 | 56.00 | -     | 53.50    | 27.00 | 0.21 (kg) | 101         | 210069   | 464003        |
|                | 32 - 18      | 38.00 - 50.00 | 66.00 | 38.00 | 63.50    | 34.00 | 0.41 (kg) | 20          | 264051   | 464004        |
|                | 32 - 18      | 38.00 - 50.00 | 66.00 | 38.00 | 63.50    | 34.00 | 0.41 (kg) | 101         | 264077   | 464004        |
|                | 40 - 22      | 50.00 - 65.50 | 75.00 | 47.00 | 72.50    | 42.00 | 0.80 (kg) | 20          | 210052   | 464005        |
|                | 40 - 22      | 50.00 - 65.50 | 75.00 | 47.00 | 72.50    | 42.00 | 0.80 (kg) | 101         | 210062   | 464005        |

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

NOTE: 3E<sup>TECH+</sup> module, charging unit, insert holders, and inserts sold separately

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

| Part No. | Charging Unit* |
|----------|----------------|
| 536015   | 536016         |

NOTE: WEEE-Reg.-Nr. DE 15820388

\*Charging unit sold separately



NOTE: 3E<sup>TECH+</sup> adjustment accuracy of 0.001 mm on diameter

B10-M: 12-13

B10-F

B10: VI-VII

Key on B10-A:1

m = Metric (mm)

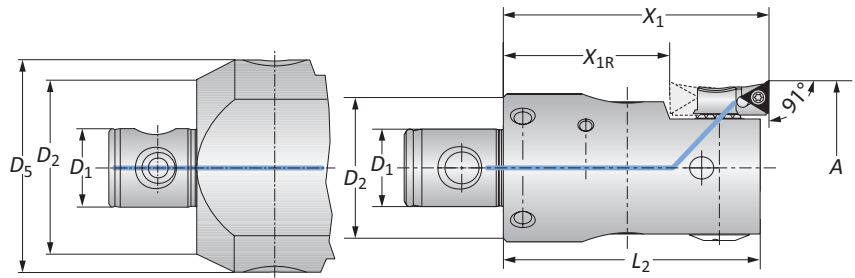
**IMPORTANT:** Max spindle speed refers to maximum possible speed for an individual boring head and is not a recommended parameter. Refer to page B10-M: 12 for recommended application-specific parameters. Factory technical assistance is available for your specific applications through our Application Engineering department.  
 email: [engineering.eu@alliedmachine.com](mailto:engineering.eu@alliedmachine.com)

### 464 Balanced Boring Heads with 3E<sup>TECH+</sup>

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



Form 101



Form 20

### 464 Balanced Alu-Line Boring Heads with 3E<sup>TECH+</sup>

| MVS Connection | Boring Range | Boring Head                     |       |                |                 |                | Weight    | Insert Form | Part No.       |               |
|----------------|--------------|---------------------------------|-------|----------------|-----------------|----------------|-----------|-------------|----------------|---------------|
|                |              | D <sub>2</sub>   D <sub>1</sub> | A     | X <sub>1</sub> | X <sub>1R</sub> | L <sub>2</sub> |           |             | D <sub>5</sub> | Insert Holder |
|                | 50 - 28      | 65.00 - 83.00                   | 75.00 | 39.00          | 73.00           | -              | 0.60 (kg) | 20          | 210020         | 464006        |
|                | 50 - 28      | 65.00 - 83.00                   | 75.00 | 39.00          | 73.00           | -              | 0.60 (kg) | 101         | 210063         | 464006        |
|                | 50 - 28      | 65.00 - 83.00                   | 75.00 | 39.00          | 73.00           | -              | 0.60 (kg) | 103         | 210064         | 464006        |
|                | 63 - 36      | 82.00 - 103.00                  | 90.00 | 54.00          | 88.00           | -              | 1.00 (kg) | 20          | 210020         | 464007        |
|                | 63 - 36      | 82.00 - 103.00                  | 90.00 | 54.00          | 88.00           | -              | 1.00 (kg) | 101         | 210063         | 464007        |
|                | 63 - 36      | 82.00 - 103.00                  | 90.00 | 54.00          | 88.00           | -              | 1.00 (kg) | 103         | 210064         | 464007        |
|                | 80 - 36      | 100.00 - 130.00                 | 90.00 | 54.00          | 88.00           | -              | 1.50 (kg) | 20          | 210020         | 464008        |
| m              | 80 - 36      | 100.00 - 130.00                 | 90.00 | 54.00          | 88.00           | -              | 1.50 (kg) | 101         | 210063         | 464008        |
|                | 80 - 36      | 100.00 - 130.00                 | 90.00 | 54.00          | 88.00           | -              | 1.50 (kg) | 103         | 210064         | 464008        |
|                | 80 - 36      | 125.00 - 167.50                 | 90.00 | 54.00          | 88.00           | 100.00         | 1.90 (kg) | 20          | 210020         | 464009        |
|                | 80 - 36      | 125.00 - 167.50                 | 90.00 | 54.00          | 88.00           | 100.00         | 1.90 (kg) | 101         | 210063         | 464009        |
|                | 80 - 36      | 125.00 - 167.50                 | 90.00 | 54.00          | 88.00           | 100.00         | 1.90 (kg) | 103         | 210064         | 464009        |
|                | 80 - 36      | 162.50 - 205.00                 | 90.00 | 54.00          | 88.00           | 135.00         | 2.50 (kg) | 20          | 210020         | 464010        |
|                | 80 - 36      | 162.50 - 205.00                 | 90.00 | 54.00          | 88.00           | 135.00         | 2.50 (kg) | 101         | 210063         | 464010        |
|                | 80 - 36      | 162.50 - 205.00                 | 90.00 | 54.00          | 88.00           | 135.00         | 2.50 (kg) | 103         | 210064         | 464010        |

NOTE: X<sub>1R</sub> = rotated insert holder for reverse machining

NOTE: 3E<sup>TECH+</sup> module, insert holders, and inserts sold separately

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

| Part No. | Charging Unit* |
|----------|----------------|
| 536015   | 536016         |

NOTE: WEEE-Reg.-Nr. DE 15820388

\*Charging unit sold separately

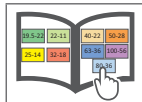
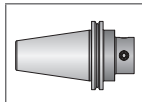
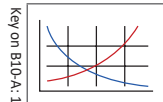


NOTE: 3E<sup>TECH+</sup> adjustment accuracy of 0.001 mm on diameter

B10-M: 12-13

B10-F

B10: VI-VII

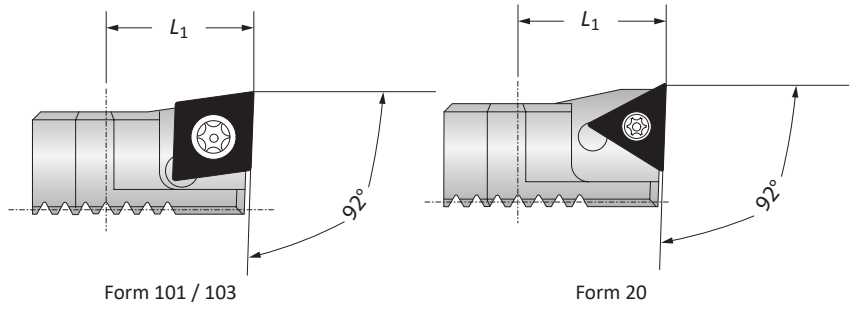
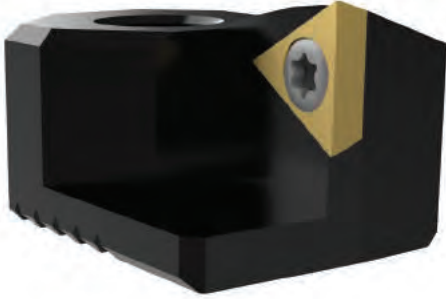



m = Metric (mm)

**IMPORTANT:** Max spindle speed refers to maximum possible speed for an individual boring head and is not a recommended parameter. Refer to page B10-M: 12 for recommended application-specific parameters. Factory technical assistance is available for your specific applications through our Application Engineering department.  
email: [engineering.eu@alliedmachine.com](mailto:engineering.eu@alliedmachine.com)

## Insert Holders for Abrasive Materials

Diameter Range: 65.00 mm - 205.00 mm



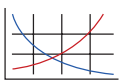
|   | Insert Holder  |        |             |          |               |
|---|----------------|--------|-------------|----------|---------------|
|   | $L_1$          | Weight | Insert Form | Part No. |               |
|  | 65.00 - 205.00 | 18.00  | 0.03 (kg)   | 20       | <b>211061</b> |
|   | 65.00 - 205.00 | 18.00  | 0.03 (kg)   | 101      | <b>211063</b> |
|   | 65.00 - 205.00 | 18.00  | 0.03 (kg)   | 103      | <b>211065</b> |

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

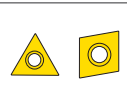
**NOTE:** When machining grey cast iron, we recommend using insert holders for abrasive materials with CBN inserts for optimised chip removal.

Key on B10-B: 1

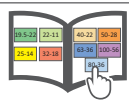
B10-M: 12-13




B10-H



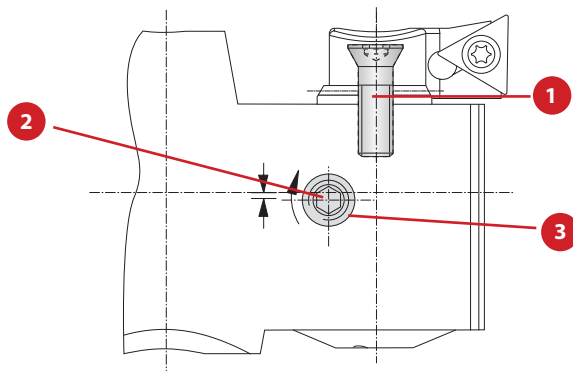
B10: VI-VII



 = Metric (mm)  
Inserts sold separately

Accessories

Screws | 3E<sup>TECH+</sup> Accessories



Screws

| Boring Head | Part No.               |                                  |                     |                               |           |
|-------------|------------------------|----------------------------------|---------------------|-------------------------------|-----------|
|             | 1<br>Countersunk Screw | Countersunk Screw<br>Service Key | 2<br>Clamping Screw | Clamping Screw<br>Service Key | 3<br>Ball |
| 410001      | 215323                 | T15 / H                          | 410151              | S2 / A                        | 364270    |
| 410002      | 215338                 | T15 / H                          | 410152              | s2 / A                        | 364270    |
| 464003      | 215338                 | T15 / H                          | 364138              | s2.5 / A                      | 364139    |
| 464004      | 215338                 | T15 / H                          | 115180              | s2.5 / A                      | -         |
| 464005      | 215338                 | T15 / H                          | 115505              | s3 / B                        | -         |
| 464006      | 215462                 | T20 / H                          | 315943              | s4 / B                        | -         |
| 464007      | 215462                 | T20 / H                          | 515178              | s4 / B                        | -         |
| 464008      | 215462                 | T20 / H                          | 515178              | s4 / B                        | -         |
| 464009      | 215462                 | T20 / H                          | 515178              | s4 / B                        | -         |
| 464010      | 215462                 | T20 / H                          | 515178              | s4 / B                        | -         |

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

| 1<br>Charging Unit |
|--------------------|
| Part No.           |
| 536016             |

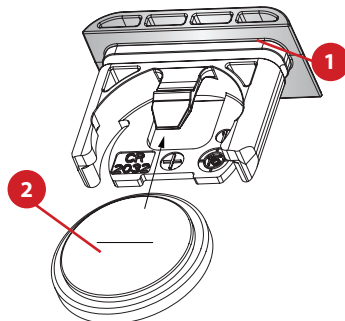
NOTE: Charging unit sold separately from 3E<sup>TECH+</sup>



NOTE: 3E<sup>TECH+</sup> adjustment accuracy of 0.001 mm on diameter

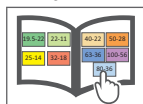
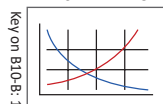
3E<sup>TECH</sup> Accessories

| 1<br>Sealing Ring | 2<br>Battery CR2032 |
|-------------------|---------------------|
| Part No.          | Part No.            |
| 215483            | 515491              |



B10-M: 12-13

B10: VI-VII





# 364 and 464 Product Overview

## Balanced Analogue 364 and 464 FINE BORING

### Analogue fine boring tools for high-production jobs

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

- 364 diameter range: 20.00 mm - 29.50 mm
- 464 diameter range: 29.00 mm - 205.00 mm
- 464 Alu-Line diameter range: 65.00 mm - 205.00 mm
  - Special coating on Alu-Line for wear-resistant surface
  - Alu-Line body reduces tool weight by 50%, reducing stress on the spindle
- Internal balancing improves tool life and surface finish
- Through coolant
- Vernier diameter adjustment of 0.002 mm
- Insert holder can be rotated for back boring jobs
- Max cutting speed: 1,000 M/min



**IMPORTANT:** Max spindle speed refers to maximum possible speed for an individual boring head and is not a recommended parameter. Refer to page B10-M: 12 for recommended application-specific parameters. Factory technical assistance is available for your specific applications through our Application Engineering department.  
email: [engineering.eu@alliedmachine.com](mailto:engineering.eu@alliedmachine.com)



# WOHLHAUPTER® 464 BALANCED ANALOG BORING HEADS

Analogue BORING HEAD PART NUMBER CONVERSION

| Diameter Range  | Old Part No. | NEW Part No. |
|-----------------|--------------|--------------|
| 20.00 - 24.50   | 364030       | No Change    |
| 24.50 - 29.50   | 364031       | No Change    |
| 29.00 - 38.00   | 364032       | 464033       |
| 38.00 - 50.00   | 364033       | 464034       |
| 50.00 - 65.50   | 364034       | 464035       |
| 65.00 - 83.00   | 364045       | 464036       |
| 82.00 - 103.00  | 364046       | 464037       |
| 100.00 - 130.00 | 364047       | 464038       |
| 125.00 - 167.50 | 364048       | 464039       |
| 162.50 - 205.00 | 364049       | 464040       |

✓ High-production fine boring

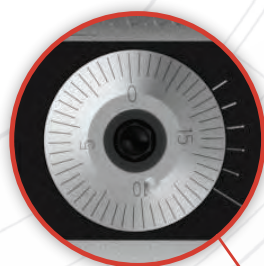
✓ Easy diameter adjustment

✓ Self-balancing

✓ Imperial and metric

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

Aluminium bodies with **wear-resistant** coating from 65.00 mm - 205.00 mm



Highly accurate adjustments through **vernier** scale



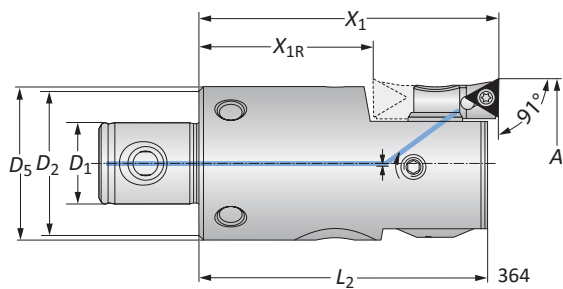
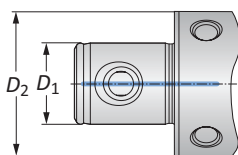
Equipped with **self-balancing** mechanism

### 364 / 464 Analogue Boring Heads

Diameter Range: 20.00 mm - 65.50 mm



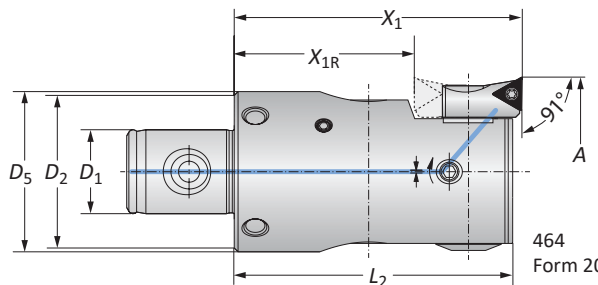
364 Form 101



364 Form 20



464 Form 101



464 Form 20

#### 364/464 Boring Heads

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

\*Not suitable for indexable inserts with a radius of 0.80 mm

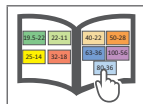
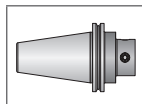
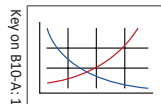
NOTE:  $X_{1R}$  = rotated insert holder for reverse machining

NOTE: Insert holders and inserts sold separately

B10-M: 12-13

B10-F

B10: VI-VII



**m** = Metric (mm)

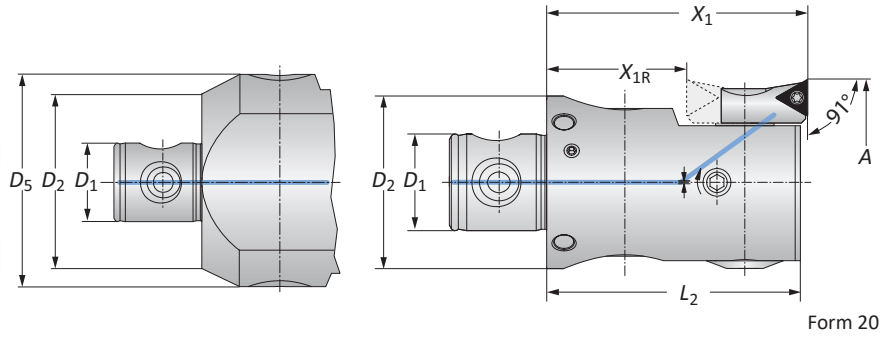
**IMPORTANT:** Max spindle speed refers to maximum possible speed for an individual boring head and is not a recommended parameter. Refer to page B10-M: 12 for recommended application-specific parameters. Factory technical assistance is available for your specific applications through our Application Engineering department.  
 email: [engineering.eu@alliedmachine.com](mailto:engineering.eu@alliedmachine.com)

### 464 Analogue Boring Heads

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



Form 101



Form 20

#### 464 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    | -      | 0.60 (kg)   | 20       | 210020 | 464036        |
|                | 50 - 28      | 65.00 - 83.00   | 75.00 | 39.00 | 72.50    | -      | 0.60 (kg)   | 101      | 210063 | 464036        |
|                | 50 - 28      | 65.00 - 83.00   | 75.00 | 39.00 | 72.50    | -      | 0.60 (kg)   | 103      | 210064 | 464036        |
|                | 63 - 36      | 82.00 - 103.00  | 90.00 | 54.00 | 87.50    | -      | 1.00 (kg)   | 20       | 210020 | 464037        |
|                | 63 - 36      | 82.00 - 103.00  | 90.00 | 54.00 | 87.50    | -      | 1.00 (kg)   | 101      | 210063 | 464037        |
|                | 63 - 36      | 82.00 - 103.00  | 90.00 | 54.00 | 87.50    | -      | 1.00 (kg)   | 103      | 210064 | 464037        |
|                | 80 - 36      | 100.00 - 130.00 | 90.00 | 54.00 | 87.50    | -      | 1.50 (kg)   | 20       | 210020 | 464038        |
| <b>m</b>       | 80 - 36      | 100.00 - 130.00 | 90.00 | 54.00 | 87.50    | -      | 1.50 (kg)   | 101      | 210063 | 464038        |
|                | 80 - 36      | 100.00 - 130.00 | 90.00 | 54.00 | 87.50    | -      | 1.50 (kg)   | 103      | 210064 | 464038        |
|                | 80 - 36      | 125.00 - 167.50 | 90.00 | 54.00 | 87.50    | 100.00 | 1.90 (kg)   | 20       | 210020 | 464039        |
|                | 80 - 36      | 125.00 - 167.50 | 90.00 | 54.00 | 87.50    | 100.00 | 1.90 (kg)   | 101      | 210063 | 464039        |
|                | 80 - 36      | 125.00 - 167.50 | 90.00 | 54.00 | 87.50    | 100.00 | 1.90 (kg)   | 103      | 210064 | 464039        |
|                | 80 - 36      | 162.50 - 205.00 | 90.00 | 54.00 | 87.50    | 135.00 | 2.50 (kg)   | 20       | 210020 | 464040        |
|                | 80 - 36      | 162.50 - 205.00 | 90.00 | 54.00 | 87.50    | 135.00 | 2.50 (kg)   | 101      | 210063 | 464040        |
|                | 80 - 36      | 162.50 - 205.00 | 90.00 | 54.00 | 87.50    | 135.00 | 2.50 (kg)   | 103      | 210064 | 464040        |

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

NOTE: Insert holders and inserts sold separately

B10-M: 12-13

B10-F

B10: VI-VII

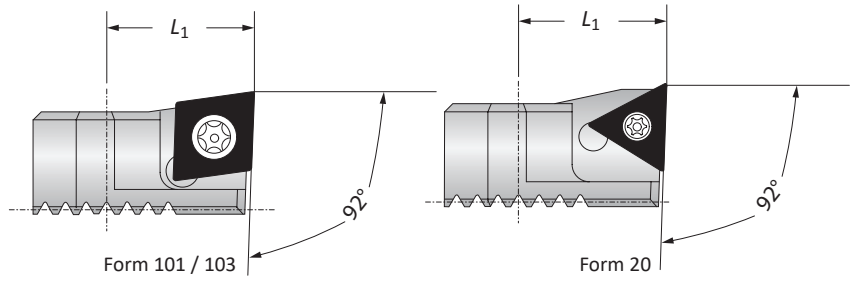
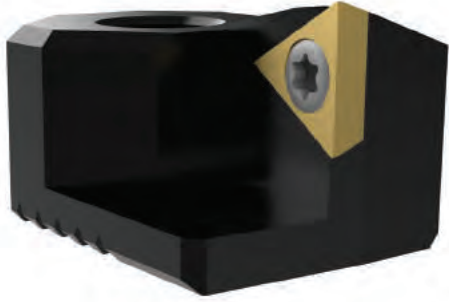
Key on B10-A:1

**m** = Metric (mm)

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 email: [engineering.eu@alliedmachine.com](mailto:engineering.eu@alliedmachine.com)

## Insert Holders for Abrasive Materials

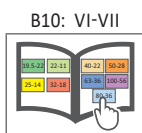
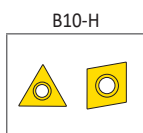
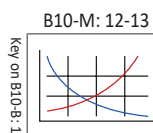
Diameter Range: 265.00 mm - 205.00 mm



|                | Insert Holder |           |             |               |
|----------------|---------------|-----------|-------------|---------------|
| Boring Range   | $L_1$         | Weight    | Insert Form | Part No.      |
| 65.00 - 205.00 | 18.00         | 0.03 (kg) | 20          | <b>211061</b> |
| 65.00 - 205.00 | 18.00         | 0.03 (kg) | 101         | <b>211063</b> |
| 65.00 - 205.00 | 18.00         | 0.03 (kg) | 103         | <b>211065</b> |

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

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

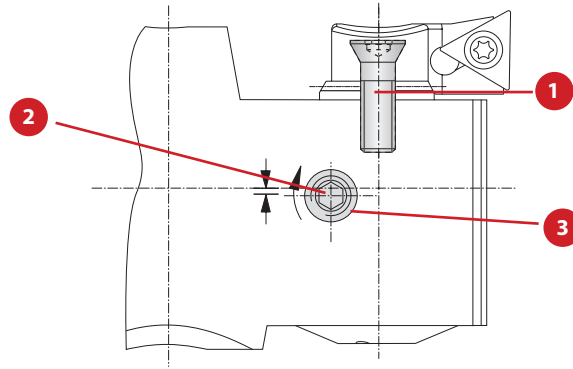


**m** = Metric (mm)

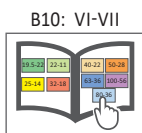
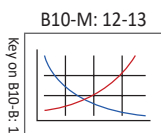
Inserts sold separately

Accessories

Screws



| Boring Head | Part No.               |                                  |                     |                               |           |
|-------------|------------------------|----------------------------------|---------------------|-------------------------------|-----------|
|             | 1<br>Countersunk Screw | Countersunk Screw<br>Service Key | 2<br>Clamping Screw | Clamping Screw<br>Service Key | 3<br>Ball |
| 364030      | 215323                 | T15 / H                          | 364260              | s2 / A                        | 364270    |
| 364031      | 215338                 | T15 / H                          | 364138              | s2.5 / A                      | 364139    |
| 464033      | 215338                 | T15 / H                          | 364138              | s2.5 / A                      | 364139    |
| 464034      | 215338                 | T15 / H                          | 115180              | s2.5 / A                      | -         |
| 464035      | 215338                 | T15 / H                          | 115505              | s3 / B                        | -         |
| 464036      | 215462                 | T20 / H                          | 315943              | s4 / B                        | -         |
| 464037      | 215462                 | T20 / H                          | 515178              | s4 / B                        | -         |
| 464038      | 215462                 | T20 / H                          | 515178              | s4 / B                        | -         |
| 464039      | 215462                 | T20 / H                          | 515178              | s4 / B                        | -         |
| 464040      | 215462                 | T20 / H                          | 515178              | s4 / B                        | -         |





# Balanced Digital 564 Product Overview

## Balanced Digital 564 FINE BORING

### Adjustable diameter for precise machining.

Wohlhaupter® Balance Digital 564 boring heads feature automatic balancing with an easy-to-read digital display. For diameter ranges above 65.00 mm, 564 boring heads are made of lightweight aluminium. 564 boring heads are specifically engineered to minimise the residual imbalance produced by insert holder displacement. Reverse boring applications can be achieved by rotating the insert holders.

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

- Diameter range: 50.00 mm - 205.00 mm
- Alu-Line diameter range: 65.00 mm - 205.00 mm
  - Special coating on Alu-Line for wear-resistant surface
  - Alu-Line body reduces tool weight by 50%, reducing stress on the spindle
- Digital readout advantage for diameter adjustments of 0.002 mm
- Through coolant
- Internal balancing improves tool life and surface finish
- Insert holder can be rotated for back boring jobs
- Max cutting speed: 2,000 M/min
- Max coolant pressure: 40 bar



**Aluminium Boring Head**  
65.00 mm - 205.00 mm

**Steel Boring Head**  
50.00 mm - 65.50 mm

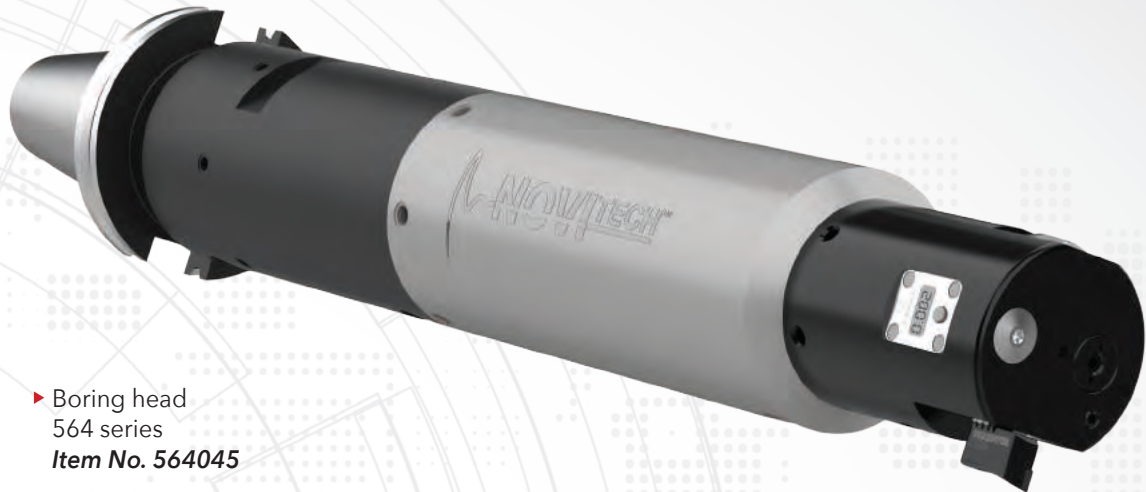
**NOTE:** Metric items pictured

**NOTE:** Digital adjustment accuracy of 0.002 mm on diameter

**IMPORTANT:** Max spindle speed refers to maximum possible speed for an individual boring head and is not a recommended parameter. Refer to page B10-M: 12 for recommended application-specific parameters. Factory technical assistance is available for your specific applications through our Application Engineering department.  
email: [engineering.eu@alliedmachine.com](mailto:engineering.eu@alliedmachine.com)



# WOHLHAUPTER® 564 BORING HEAD with NOVI<sup>TECH</sup>



- ▶ Boring head  
564 series  
**Item No. 564045**
- ▶ NOVI<sup>TECH</sup> vibration dampening  
intermediate module  
**Item No. 519005**

NOTE: Metric items pictured

NOTE: Digital adjustment accuracy of  
0.002 mm on diameter

The Wohlhaupter 564 boring head with the  
NOVI<sup>TECH</sup> vibration dampening module provided:



Excellent surface finish



Eliminated vibration and chatter

|                    |   | Measure               | 564 Boring Head<br>with NOVI <sup>TECH</sup> |
|--------------------|---|-----------------------|--|
| <b>Product:</b>    | Wohlhaupter 564 Boring Head<br>with NOVI <sup>TECH</sup>                    | RPM                   | 430 RPM                                      |
| <b>Objectives:</b> | 0.05 mm concentricity over the length<br>of two bores spaced 355.6 mm apart | Speed                 | 107.28 M/min                                 |
| <b>Material:</b>   | Cast iron   | Feed Rate             | 0.08 mm/rev                                  |
| <b>Hole Ø:</b>     | 79.375 mm   | Penetration Rate      | 33 mm/min                                    |
| <b>Depth:</b>      | 7xD   | Cycle Time (per hole) | 3 min 32 sec                                 |
|                    |   | Hole Finish           | 3.8 Ra                                       |

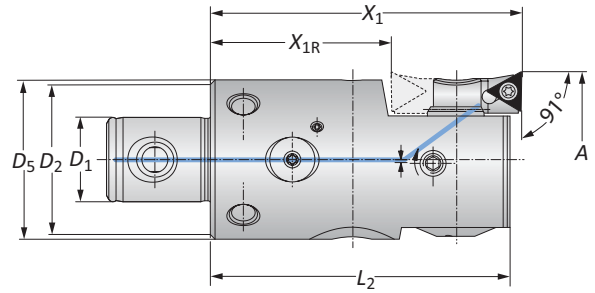
## Boring Heads

Diameter Range: 50.00 mm - 65.50 mm



**NOTE:** Metric item pictured  
**NOTE:** Digital adjustment accuracy of 0.002 mm on diameter

Form 101



Form 20

### 564 Digital Boring Heads

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

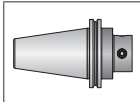
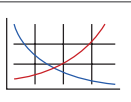
**NOTE:**  $X_{1R}$  = rotated insert holder for reverse machining  
**NOTE:** Insert holders and inserts sold separately

B10-M: 12-13

B10-F

B10: VI-VII

Key on B10-A:1



m = Metric (mm)

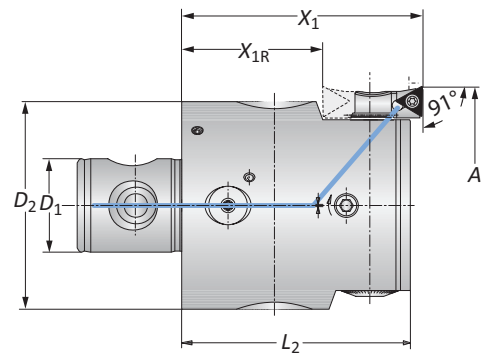
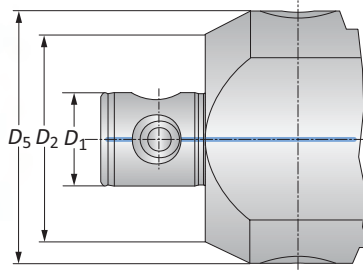
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 email: [engineering.eu@alliedmachine.com](mailto:engineering.eu@alliedmachine.com)

## Boring Heads

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



Form 101



Form 20

**NOTE:** Metric item pictured  
**NOTE:** Digital adjustment accuracy of 0.002 mm on diameter

### 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 |
| m              | 50 - 28         | 65.00 - 83.00   | 75.00 | 39.00 | 73.00    | -         | 0.60 (kg) | 20          | 210020   | 564045        |
|                | 50 - 28         | 65.00 - 83.00   | 75.00 | 39.00 | 73.00    | -         | 0.60 (kg) | 101         | 210063   | 564045        |
|                | 50 - 28         | 65.00 - 83.00   | 75.00 | 39.00 | 73.00    | -         | 0.60 (kg) | 103         | 210064   | 564045        |
|                | 63 - 36         | 82.00 - 103.00  | 90.00 | 54.00 | 88.00    | -         | 1.00 (kg) | 20          | 210020   | 564046        |
|                | 63 - 36         | 82.00 - 103.00  | 90.00 | 54.00 | 88.00    | -         | 1.00 (kg) | 101         | 210063   | 564046        |
|                | 63 - 36         | 82.00 - 103.00  | 90.00 | 54.00 | 88.00    | -         | 1.00 (kg) | 103         | 210064   | 564046        |
|                | 80 - 36         | 100.00 - 130.00 | 90.00 | 54.00 | 88.00    | -         | 1.50 (kg) | 20          | 210020   | 564047        |
|                | 80 - 36         | 100.00 - 130.00 | 90.00 | 54.00 | 88.00    | -         | 1.50 (kg) | 101         | 210063   | 564047        |
|                | 80 - 36         | 100.00 - 130.00 | 90.00 | 54.00 | 88.00    | -         | 1.50 (kg) | 103         | 210064   | 564047        |
|                | 80 - 36         | 125.00 - 167.50 | 90.00 | 54.00 | 88.00    | 100.00    | 1.90 (kg) | 20          | 210020   | 564048        |
|                | 80 - 36         | 125.00 - 167.50 | 90.00 | 54.00 | 88.00    | 100.00    | 1.90 (kg) | 101         | 210063   | 564048        |
|                | 80 - 36         | 125.00 - 167.50 | 90.00 | 54.00 | 88.00    | 100.00    | 1.90 (kg) | 103         | 210064   | 564048        |
| 80 - 36        | 162.50 - 205.00 | 90.00           | 54.00 | 88.00 | 135.00   | 2.50 (kg) | 20        | 210020      | 564049   |               |
| 80 - 36        | 162.50 - 205.00 | 90.00           | 54.00 | 88.00 | 135.00   | 2.50 (kg) | 101       | 210063      | 564049   |               |
| 80 - 36        | 162.50 - 205.00 | 90.00           | 54.00 | 88.00 | 135.00   | 2.50 (kg) | 103       | 210064      | 564049   |               |

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

B10-M: 12-13

B10-F

B10: VI-VII

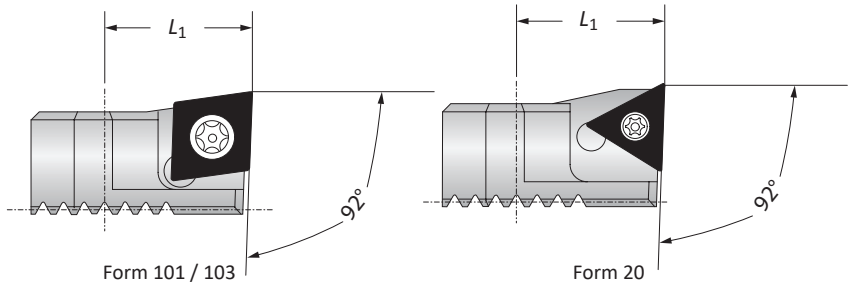
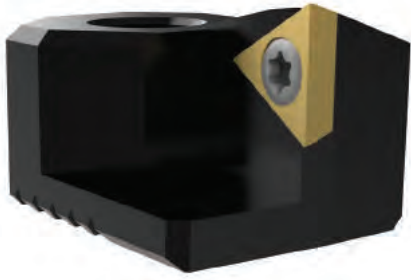
Key on B10-A:1

m = Metric (mm)

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 email: [engineering.eu@alliedmachine.com](mailto:engineering.eu@alliedmachine.com)

## Insert Holder for Abrasive Materials

Diameter Range: 65.00 mm - 205.00 mm

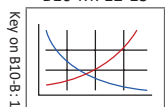


|   | Insert Holder  |       |           |             |               |
|---|----------------|-------|-----------|-------------|---------------|
|   | Boring Range   | $L_1$ | Weight    | Insert Form | Part No.      |
| m | 65.00 - 205.00 | 18.00 | 0.03 (kg) | 20          | <b>211061</b> |
|   | 65.00 - 205.00 | 18.00 | 0.03 (kg) | 101         | <b>211063</b> |
|   | 65.00 - 205.00 | 18.00 | 0.03 (kg) | 103         | <b>211065</b> |

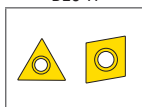
**NOTE:** Insert holders used for abrasive materials to protect boring head against chip wash

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

B10-M: 12-13



B10-H



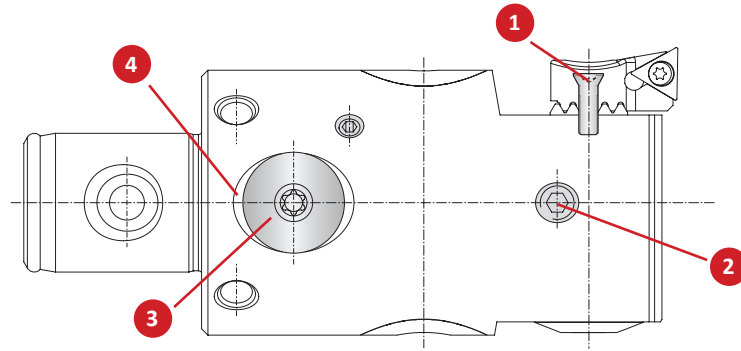
B10: VI-VII



m = Metric (mm)  
Inserts sold separately

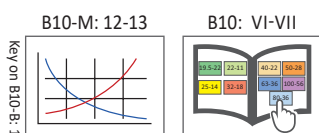
## Accessories

Screws | Battery Cover | Batteries



| Boring Head | Part No.               |                |                     |             |                    |             |                   |               |
|-------------|------------------------|----------------|---------------------|-------------|--------------------|-------------|-------------------|---------------|
|             | 1<br>Countersunk Screw | Service<br>Key | 2<br>Clamping Screw | Service Key | 3<br>Battery Cover | Service Key | 4<br>Sealing Ring | Battery*      |
| 564034      | <b>215338</b>          | T15 / H        | <b>115505</b>       | s3 / B      | <b>501016</b>      | T20 / H     | <b>415895</b>     | <b>415896</b> |
| 564045      | <b>215462</b>          | T20 / H        | <b>315943</b>       | s4 / B      | <b>501016</b>      | T20 / H     | <b>415895</b>     | <b>415896</b> |
| 564046      | <b>215462</b>          | T20 / H        | <b>515178</b>       | s4 / B      | <b>501016</b>      | T20 / H     | <b>415895</b>     | <b>415896</b> |
| 564047      | <b>215462</b>          | T20 / H        | <b>515178</b>       | s4 / B      | <b>501016</b>      | T20 / H     | <b>415895</b>     | <b>415896</b> |
| 564048      | <b>215462</b>          | T20 / H        | <b>515178</b>       | s4 / B      | <b>501016</b>      | T20 / H     | <b>415895</b>     | <b>415896</b> |
| 564049      | <b>215462</b>          | T20 / H        | <b>515178</b>       | s4 / B      | <b>501016</b>      | T20 / H     | <b>415895</b>     | <b>415896</b> |

\*Replace both batteries



# 310 Product Overview

## 310 FINE BORING

### Engineered with wear and tear in mind.

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

- Diameter range: 20.00 mm - 205.00 mm
- Alu-Line diameter range: 100.00 mm - 205.00 mm
  - Special coating on Alu-Line provides hard, durable surface
  - Alu-Line body reduces tool weight by 50%, reducing stress on the spindle
- Through coolant
- Vernier diameter adjustment of 0.002 mm
- Max cutting speed: 1,000 M/min



**IMPORTANT:** Max spindle speed refers to maximum possible speed for an individual boring head and is not a recommended parameter. Refer to page B10-M: 12 for recommended application-specific parameters. Factory technical assistance is available for your specific applications through our Application Engineering department.  
*email: [engineering.eu@alliedmachine.com](mailto:engineering.eu@alliedmachine.com)*



# WOHLHAUPTER® 310 BORING HEAD with NOVI<sup>TECH</sup>

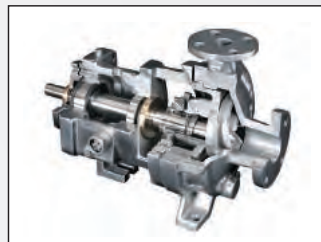
## Time is money, so make it count.

If you want to improve your machining processes, cycle time is a key factor to examine. Our customer was experiencing lengthy cycle times while machining pumps from grey cast iron. The parts required three bored holes, each with a 304.8 mm depth and a 558.8 mm reach.

In order to free up machine time, the customer questioned if their process could be more efficient. The main objectives were to decrease the current cycle time and to maintain a 4 Ra finish, which was required to perform the burnishing process that followed.

The previous tooling ran at a slow 11.938 mm/min and a slow 84-minute cycle time to bore the three holes on each part. With our **Wohlhaupter 310 boring head** utilising the **NOVI<sup>TECH</sup> vibration dampening module**, the customer increased to a more efficient 95.25 mm/min and slashed the cycle time to 10.5 minutes (an 87% decrease). Along with the increased speed, the Wohlhaupter tooling also achieved a 4 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?**



|                    |  | Measure               | Competitor Boring Head | 310 Boring Head w/ NOVI <sup>TECH</sup> |
|--------------------|--|-----------------------|------------------------|---|
| <b>Product:</b>    | Wohlhaupter 310 Boring Head with NOVI <sup>TECH</sup>    | RPM                   | 39                     | 469                                     |
| <b>Objectives:</b> | (1) Decrease cycle time<br>(2) Maintain 4 Ra hole finish | Speed Rate            | 17.069 M/min           | 205.74 M/min                            |
| <b>Industry:</b>   | Oil & gas/petrochemical                                  | Feed Rate             | 0.305 mm/rev           | 0.203 mm/rev                            |
| <b>Part:</b>       | Pump   | Penetration Rate      | 11.938 mm/min          | 92.25 mm/min                            |
| <b>Material:</b>   | Grey cast iron   | Cycle Time (per hole) | 27 min 54 sec          | 3 min 32 sec                            |
| <b>Hole Ø:</b>     | 139.7 mm   | Hole Finish           | 4 Ra                   | 3.8 Ra                                  |
| <b>Hole Depth:</b> | 304.8 mm   |                       |                        |   |

► Boring head  
310 series  
Item No. 310008

► NOVI<sup>TECH</sup>  
vibration dampening  
intermediate module  
Item No. 519005



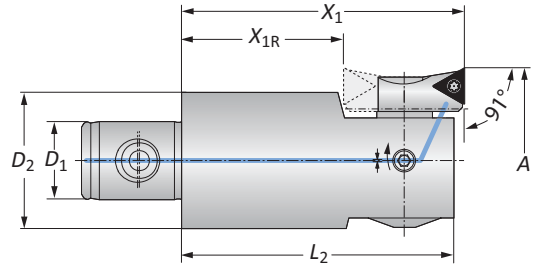
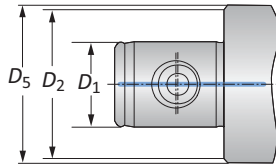
The Wohlhaupter 310 boring head with the NOVI<sup>TECH</sup> vibration dampening module provided:

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

74 minute  
cycle time reduction

## Boring Heads

Diameter Range: 20.00 mm - 103.00 mm



Form 101 / 103

Form 20

### 310 Boring Heads

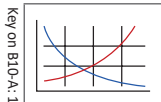
| MVS Connection | Boring Range   | Boring Head   |       |       |          |           | Weight | Insert Form | Part No. |               |
|----------------|----------------|---------------|-------|-------|----------|-----------|--------|-------------|----------|---------------|
|                |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

\*Not suitable for indexable inserts with a radius of 0.80 mm

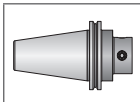
NOTE:  $X_{1R}$  = rotated insert holder for reverse machining

NOTE: Insert holders and inserts sold separately

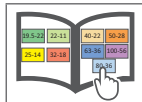
B10-M: 12-13



B10-F



B10: VI-VII



Key on B10-A:1

$\text{m}$  = Metric (mm)

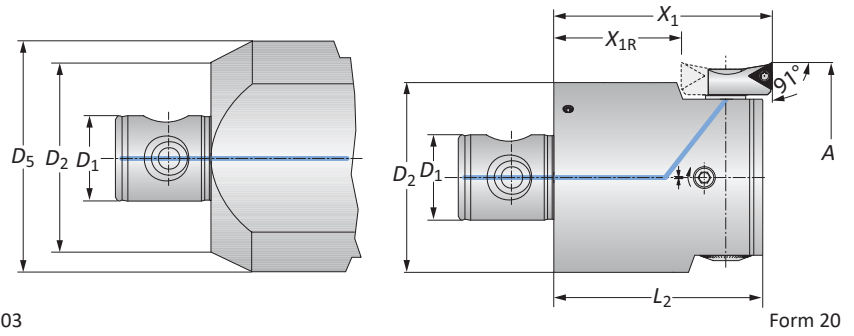
**IMPORTANT:** Max spindle speed refers to maximum possible speed for an individual boring head and is not a recommended parameter. Refer to page B10-M: 12 for recommended application-specific parameters. Factory technical assistance is available for your specific applications through our Application Engineering department.  
 email: [engineering.eu@alliedmachine.com](mailto:engineering.eu@alliedmachine.com)

## Boring Heads

Alu-Line | Diameter Range: 100.00 mm - 205.00 mm




Form 101 / 103



Form 20

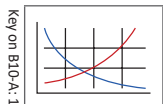
### Alu-Line 310 Boring Heads

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

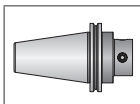
NOTE:  $X_{1R}$  = rotated insert holder for reverse machining

NOTE: Insert holders and inserts sold separately

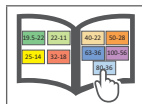
B10-M: 12-13



B10-F



B10: VI-VII

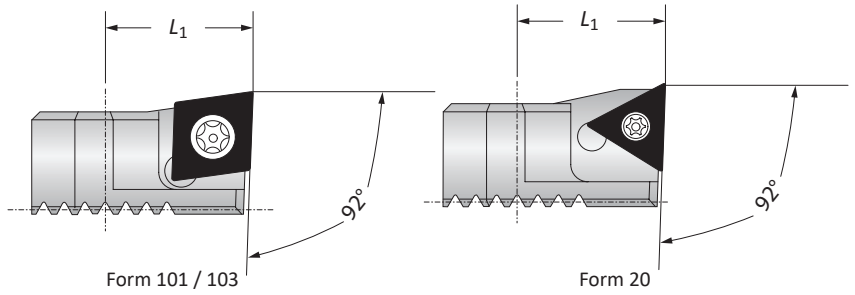
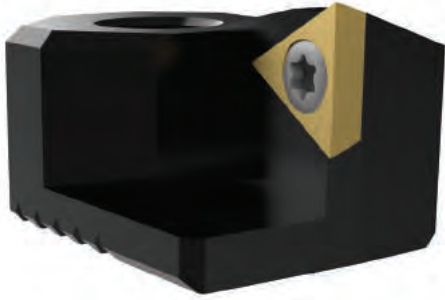


 = Metric (mm)

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 email: [engineering.eu@alliedmachine.com](mailto:engineering.eu@alliedmachine.com)

## Insert Holders for Abrasive Materials | Serrated Shims

Diameter Range: 53.00 mm - 205.00 mm

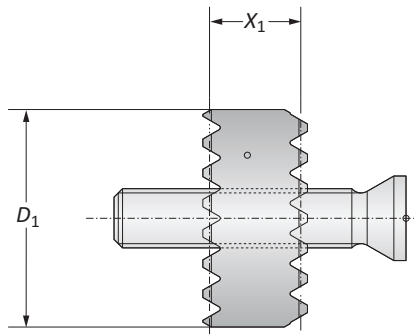


### Insert Holders

| Boring Range |                | Insert Holder $L_1$ | Weight    | Insert Form | Part No.      |
|--------------|----------------|---------------------|-----------|-------------|---------------|
| m            | 53.00 - 205.00 | 18.00               | 0.03 (kg) | 20          | <b>211061</b> |
|              | 53.00 - 205.00 | 18.00               | 0.03 (kg) | 101         | <b>211063</b> |
|              | 53.00 - 205.00 | 18.00               | 0.03 (kg) | 103         | <b>211065</b> |

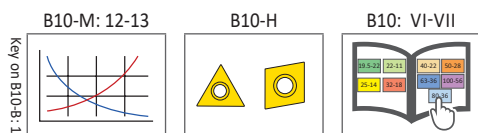
**NOTE:** Insert holders used for abrasive materials to protect boring head against chip wash

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



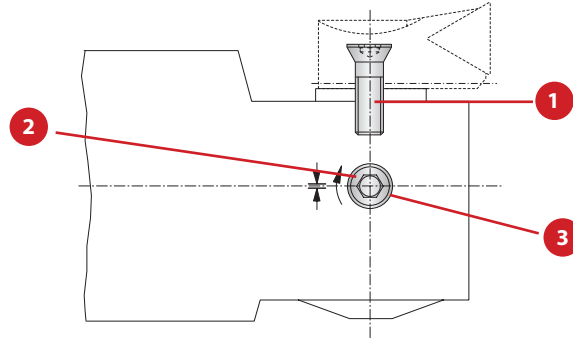
### Serrated Shims

| Boring Range | Additional Boring Range | Serrated Shim |       | Weight | Part No.              |                   |               |
|--------------|-------------------------|---------------|-------|--------|-----------------------|-------------------|---------------|
|              |                         | $X_1$         | $D_1$ |        | Serrated Shim & Screw | Replacement Screw |               |
| m            | 29.00 - 54.00           | 8.00          | 4.00  | 12.00  | 0.01 (kg)             | <b>310070</b>     | <b>415360</b> |
|              | 29.00 - 54.00           | 12.00         | 6.00  | 12.00  | 0.01 (kg)             | <b>310071</b>     | <b>415342</b> |
|              | 53.00 - 205.00          | 10.00         | 5.00  | 18.00  | 0.01 (kg)             | <b>310074</b>     | <b>515595</b> |
|              | 53.00 - 205.00          | 15.00         | 7.50  | 18.00  | 0.01 (kg)             | <b>310075</b>     | <b>515596</b> |

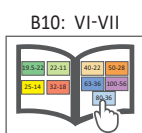
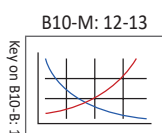


Accessories

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      | 215462              | 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      | -        |



# 537 Product Overview



## 537 Cassettes FINE BORING

### Engineered for easy precision.

537 fine boring cassettes offer high accuracy and are available in an easy-to-use digital or Analogue version. The digital version features a docking port to attach the 3E<sup>TECH+</sup> digital readout module for  $\mu$ -accurate diameter adjustments while the Analogue cassettes provide highly accurate adjustments through the vernier scale. 537 cassettes are made of hardened steel and can be used on serrated tool bodies and slides from 100.00 mm - 3255.00 mm. The insert holder can be rotated easily for reverse machining applications.

Experience **digital precision boring** for yourself.

- Diameter range: 100.00 mm - 205.00 mm
- Cassette can be used on large diameter serrated slides (**pg. B10-G: 8**): 200.00 mm - 3255.00 mm
- Through coolant
- 3E<sup>TECH+</sup> module provides a simple digital readout
- Analogue version with a vernier scale
- Max cutting speed: 900 M/min



**NOTE:** 3E<sup>TECH+</sup> adjustment accuracy of 0.001 mm on diameter

**NOTE:** Vernier adjustment accuracy of 0.002 mm on diameter

**IMPORTANT:** Max spindle speed refers to maximum possible speed for an individual boring head and is not a recommended parameter. Refer to page B10-M: 12 for recommended application-specific parameters. Factory technical assistance is available for your specific applications through our Application Engineering department.  
email: [engineering.eu@alliedmachine.com](mailto:engineering.eu@alliedmachine.com)



# 537 BORING CASSETTES



**NEW** vernier scale  
on both Analogue  
and digital cassettes

**NEW** digital 537  
cassettes with 3E<sup>TECH</sup>  
docking port

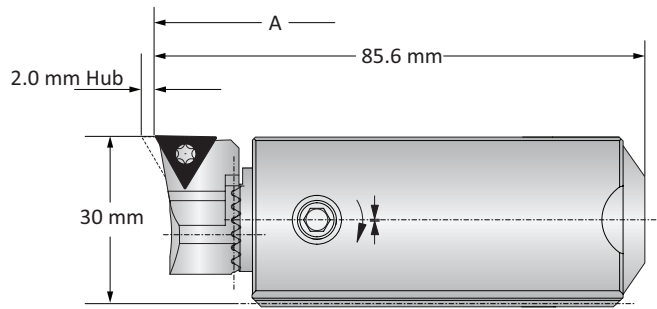
- ✓ Convenient tool handling
- ✓ Large range of applications
- ✓ Hardened steel bodies

## 537 Analogue Cassettes

Diameter Range: 100.00 mm - 205.00 mm



Form 101 / 103



Form 20

### Analogue 537 Cassettes

|   | Boring Range    | Weight    | Insert Form | Part No.      |                |               |
|---|-----------------|-----------|-------------|---------------|----------------|---------------|
|   |                 |           |             | Insert Holder | Clamping Piece | Cassette*     |
| Ⓜ | 100.00 - 205.00 | 0.60 (kg) | 20          | <b>210020</b> | <b>137026</b>  | <b>537051</b> |
|   | 100.00 - 205.00 | 0.60 (kg) | 101         | <b>210063</b> | <b>137026</b>  | <b>537051</b> |
|   | 100.00 - 205.00 | 0.60 (kg) | 103         | <b>210064</b> | <b>137026</b>  | <b>537051</b> |

\*Required serrated tool body sold separately

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

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

B10-M: 12-13

B10-F

B10: VI-VII

Key on B10-A:1

Ⓜ = Metric (mm)

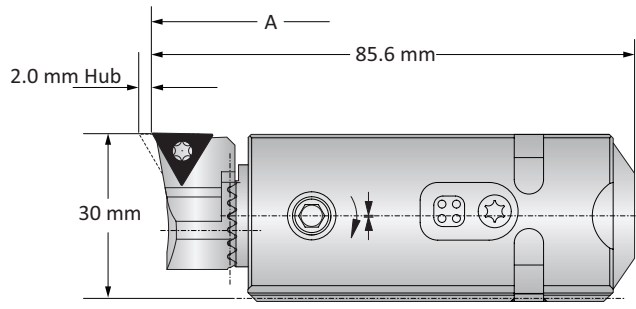
**IMPORTANT:** Max spindle speed refers to maximum possible speed for an individual boring head and is not a recommended parameter. Refer to page B10-M: 12 for recommended application-specific parameters. Factory technical assistance is available for your specific applications through our Application Engineering department.  
 email: [engineering.eu@alliedmachine.com](mailto:engineering.eu@alliedmachine.com)

### 537 Cassettes with 3E<sup>TECH+</sup>

Diameter Range: 100.00 mm - 205.00 mm



Form 101 / 103



Form 20

#### Digital 537 Cassettes

|   | Boring Range    | Weight    | Insert Form | Part No.      |                |               |
|---|-----------------|-----------|-------------|---------------|----------------|---------------|
|   |                 |           |             | Insert Holder | Clamping Piece | Cassette*     |
| Ⓜ | 100.00 - 205.00 | 0.60 (kg) | 20          | <b>210020</b> | <b>137026</b>  | <b>537052</b> |
|   | 100.00 - 205.00 | 0.60 (kg) | 101         | <b>210063</b> | <b>137026</b>  | <b>537052</b> |
|   | 100.00 - 205.00 | 0.60 (kg) | 103         | <b>210064</b> | <b>137026</b>  | <b>537052</b> |

\*Required serrated tool body sold separately

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

**NOTE:** 3E<sup>TECH+</sup> digital readout module, charging unit, insert holders, inserts, and clamping pieces ***sold separately***

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

| Part No.      | Charging Unit* |
|---------------|----------------|
| <b>536015</b> | <b>536016</b>  |

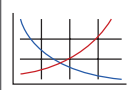
**NOTE:** WEEE-Reg.-Nr. DE 15820388

\*Charging unit sold separately

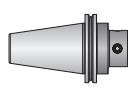


**NOTE:** 3E<sup>TECH+</sup> adjustment accuracy of 0.001 mm on diameter

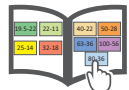
B10-M: 12-13



B10-F



B10: VI-VII



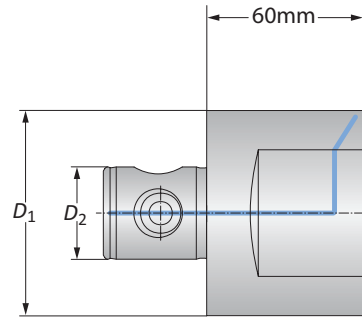
Key on B10-A: 1

Ⓜ = Metric (mm)

**IMPORTANT:** Max spindle speed refers to maximum possible speed for an individual boring head and is not a recommended parameter. Refer to page B10-M: 12 for recommended application-specific parameters. Factory technical assistance is available for your specific applications through our Application Engineering department.  
 email: [engineering.eu@alliedmachine.com](mailto:engineering.eu@alliedmachine.com)

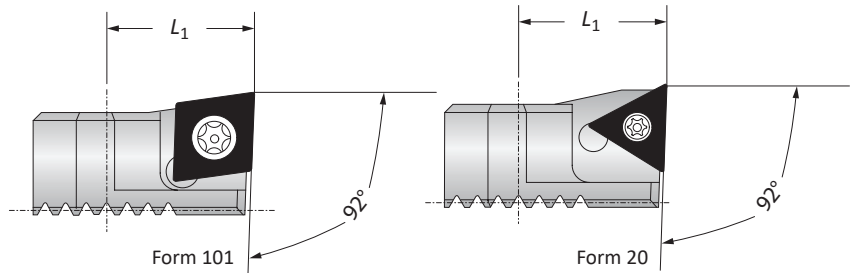
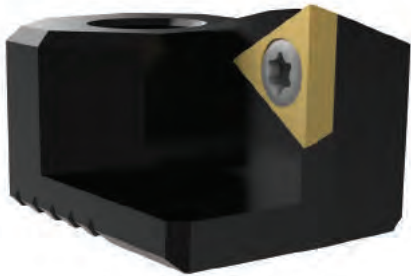
## Serrated Tool Bodies | Insert Holders for Abrasive Materials

Diameter Range: 100.00 mm - 205.00 mm



### Serrated Tool Bodies

| MVS Connection |               | Serrated Tool Body |          |
|----------------|---------------|--------------------|----------|
|                | $D_2$   $D_1$ | Boring Range       | Part No. |
| m              | 80 - 36       | 100.00 - 155.00    | 148007   |
|                | 80 - 36       | 150.00 - 205.00    | 148009   |



### Insert Holders for Abrasive Materials

|   |                 | Insert Holder |           |             |          |
|---|-----------------|---------------|-----------|-------------|----------|
|   |                 | $L_1$         | Weight    | Insert Form | Part No. |
| m | 100.00 - 205.00 | 18.00         | 0.03 (kg) | 20          | 211061   |
|   | 100.00 - 205.00 | 18.00         | 0.03 (kg) | 101         | 211063   |
|   | 100.00 - 205.00 | 18.00         | 0.03 (kg) | 103         | 211065   |

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

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

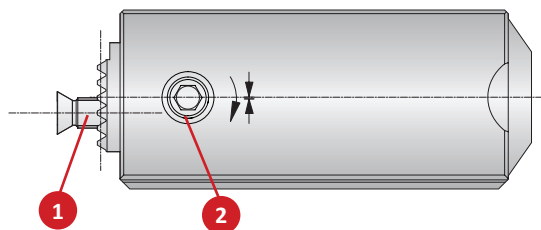
B10-M: 12-13

B10-H

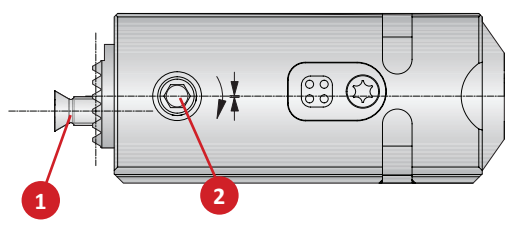
B10: VI-VII

m = Metric (mm)

537 Accessories | 3E<sup>TECH</sup> Accessories | Clamping Pieces



537 Analogue Cassette



537 3E<sup>TECH</sup> Cassette

537 Accessories

| Cassette Part No. | 1 Countersunk Screw |             | 2 Clamping Screw |             |
|-------------------|---------------------|-------------|------------------|-------------|
|                   | Part No.            | Service Key | Part No.         | Service Key |
| 537051            | 215462              | T20 / H     | 115249           | s4 / F      |
| 537052            | 215462              | T20 / H     | 315789           | s4 / F      |

3E<sup>TECH</sup> Accessories

|               |
|---------------|
| 1             |
| Charging Unit |
| Part No.      |
| 536016        |

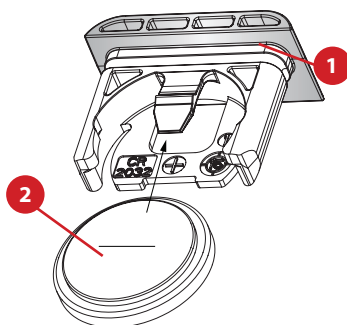


NOTE: Charging unit sold separately from 3E<sup>TECH</sup>

NOTE: 3E<sup>TECH</sup> adjustment accuracy of 0.0001" or 0.001 mm on diameter

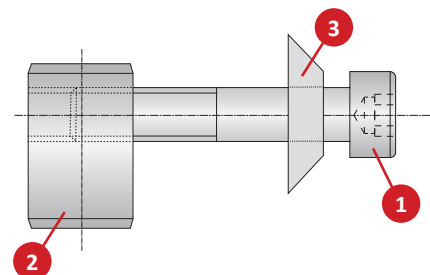
3E<sup>TECH</sup> Accessories

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

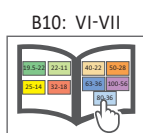
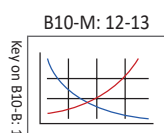



537 Clamping Pieces

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



NOTE: Clamping pieces sold separately



 = Metric (mm)  
Inserts sold separately









SECTION

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# B10-C

---

Combi-Line Rough and Finish Boring

# Wohlhaupter® Rough and Finish Boring

## Combi-Line

► Diameter Range: 24.50 mm - 201.00 mm



## One tool. Two operations.

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

Your safety and the safety of others is very important. This catalogue 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 catalogue, 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 catalogue. 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

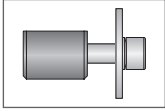


Renewable  
Energy

# Combi-Line Rough and Finish Boring Table of Contents

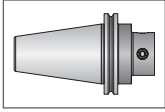
## Reference Icons

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



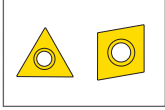
### Clamping Elements

For use with insert holders and boring heads



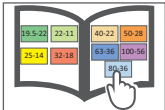
### Shanks

A variety of shanks for different machines



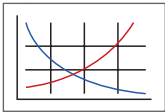
### Inserts

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



### MVS Connection Colour Guide

Detailed instructions and information regarding the MVS connection(s)



### Recommended Cutting Data

Speed and feed recommendations for optimum and safe boring



### Through Coolant Option

Indicates that the product is through coolant

## Combi-Line Introduction

|  |       |
|--|-------|
| Product Overview . . . . .   | 2 - 3 |
| Material Removal Percentages   Tool Usage   Same Level Cutting . . . . . | 4     |
| Boring Heads and Insert Holders . . . . .                                | 5     |
| Accessories . . . . .  | 6     |

| Series         | Diameter Range |
|----------------|----------------|
|                | Metric (mm)    |
| Combi-Line 401 | 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: 24.50 mm - 201.00 mm
- Reduce cycle and tool changing time
- Available in semi-standard same level or height displaced insert holders
- Through coolant
- 0.002 mm vernier adjustment on finishing insert holder
- Max spindle speed: 1524 m/min



**IMPORTANT:** Max spindle speed refers to maximum possible speed for an individual boring head and is not a recommended parameter. Refer to page B10-M: 12 for recommended application-specific parameters. Factory technical assistance is available for your specific applications through our Application Engineering department.  
email: [engineering.eu@alliedmachine.com](mailto:engineering.eu@alliedmachine.com)



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

**Application:** Ductile Cast Iron

**Finish Diameter:** 50 mm (+/- 0.013 mm)

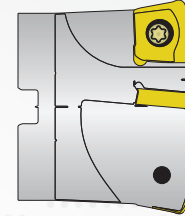
**Pre-Hole Diameter:** 45 mm

**Boring Depth:** 209 mm

**Hole Finish:** 0.8 Ra



| Measure               | 1st Process Option   |  |
|-----------------------|--|--|
|                       | Step 1 Rough 49 mm<br>Competitor 1.5" High Feed Milling Tool | Step 2 Finish 50 mm<br>Wohlhaupter 310 Boring Head |
| Speed                 | 2500 RPM   | 1165 PRM   |
| Feed Rate             | 3886.2 mm/min  | 11.8 mm/min  |
| 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 310 Boring Head

| Measure               | 2nd Process Option                                       |  |
|-----------------------|--|--|
|                       | Step 1 Rough 49 mm<br>Wohlhaupter Twin Cutter at 49 mm Ø | Step 2 Finish 50 mm<br>Wohlhaupter 310 Boring Head |
| Speed                 | 990 RPM  | 1165 PRM   |
| Feed Rate             | 301.88 mm/min  | 11.8 mm/min  |
| Total Passes          | 1  | 1  |
| Cycle Time (per hole) | 0.69 min   | 1.77 min   |
| Tool Change Time      | 15 sec   |  |
| Cycle Time (per part) | <b>2 min 46 sec</b>                                      |  |



Wohlhaupter Twin Cutter



Wohlhaupter 310 Boring Head

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

| Measure               | 3rd Process Option Finish 50 mm<br>Wohlhaupter Combi-Line |
|-----------------------|---|
| Speed                 | 1165 RPM  |
| Feed Rate             | 11.8 mm/min   |
| 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



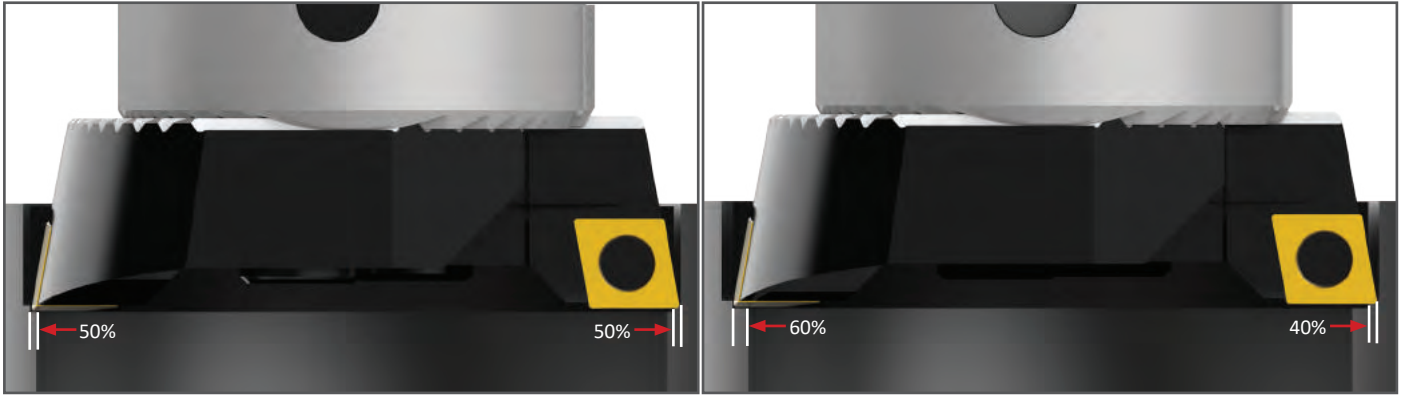
*60 seconds of  
total cycle time saved*



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

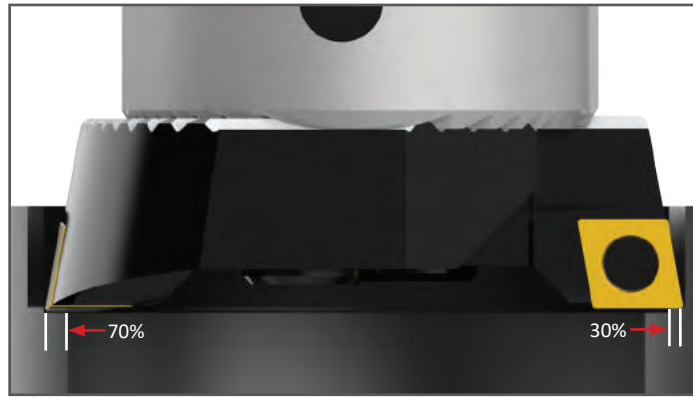
Material Removal Percentages | Tool Usage | Same-Level Cutting

Material Removal Percentages



Material removal up to 4.00 mm on diameter: **50% roughing 50% finishing**

Material removal up to 4.00 mm - 7.00 mm on diameter: **60% roughing 40% finishing**



Material removal up to 7.00 mm - 10.00 mm on diameter: **70% roughing 30% finishing**

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

**IMPORTANT:** Consult application engineering for technical support when using Combi-Line tools in holes with interruptions.  
 email: [engineering.eu@alliedmachine.com](mailto:engineering.eu@alliedmachine.com)

Tool Usage

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

Same-Level Cutting (0.08 mm Height Displacement)

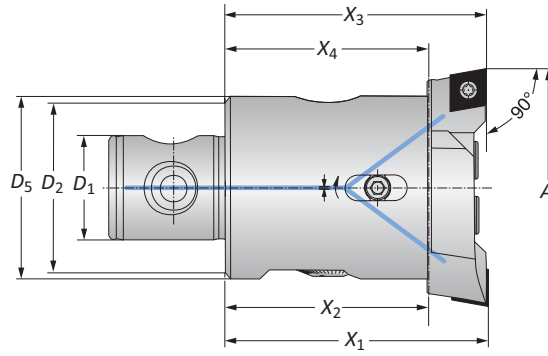
- With length-to-diameter ratios greater than 4:1, same-level insert holders are recommended to reduce the risk of vibration.
- Same-level cutting inserts will create a 0.08 mm step between the roughing and finishing sides.
- Boring blind holes may require the use of same-level insert holders. (If a true 90° flat bottom is required, a secondary operation to clean up the bottom step may be needed.)
- Combi-Line should be applied as a single-effective cutting tool even when same-level insert holders are used.


## Boring Heads and Insert Holders

Diameter Range: 24.50 mm - 201.00 mm

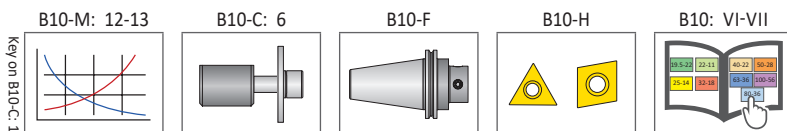


**COMBI LINE**



| Connection  | Boring Range | Boring Head     |       |       |       |       | Weight | Insert Form | Part No. |        |                          |
|---|--------------|-----------------|-------|-------|-------|-------|--------|-------------|----------|--------|--------------------------|
|   |              | $D_2   D_1$     | A     | $X_1$ | $X_3$ | $X_2$ |        |             | $X_4$    | $D_5$  | (x2)*<br>Insert Holder** |
|   | 22 - 11      | 24.50 - 29.50   | 46.00 | 45.75 | 34.00 | 33.75 | -      | 0.10 (kg)   | 101      | 402029 | 401003                   |
|   | 25 - 14      | 29.00 - 37.00   | 56.00 | 55.75 | 41.00 | 40.75 | 26.00  | 0.20 (kg)   | 101      | 402009 | 401004                   |
|   | 25 - 14      | 29.00 - 37.00   | 56.00 | 55.75 | 41.00 | 40.75 | 26.00  | 0.20 (kg)   | 103      | 402011 | 401004                   |
|   | 25 - 14      | 36.00 - 44.00   | 56.00 | 55.75 | 41.00 | 40.75 | 30.00  | 0.30 (kg)   | 101      | 402017 | 401005                   |
|   | 25 - 14      | 36.00 - 44.00   | 56.00 | 55.75 | 41.00 | 40.75 | 30.00  | 0.30 (kg)   | 103      | 402019 | 401005                   |
|   | 32 - 18      | 43.00 - 54.00   | 66.00 | 65.70 | 48.00 | 47.70 | 34.00  | 0.40 (kg)   | 103      | 402021 | 401006                   |
|  | 40 - 22      | 53.00 - 66.00   | 75.00 | 74.70 | 55.00 | 54.70 | -      | 0.70 (kg)   | 103      | 402005 | 401007                   |
|   | 50 - 28      | 65.00 - 83.00   | 75.00 | 74.70 | 55.00 | 54.70 | -      | 1.10 (kg)   | 103      | 402013 | 401008                   |
|   | 63 - 36      | 82.00 - 103.00  | 90.00 | 89.70 | 70.00 | 69.70 | -      | 2.20 (kg)   | 103      | 402001 | 401009                   |
|   | 80 - 36      | 102.00 - 127.00 | 90.00 | 89.70 | 66.00 | 65.70 | 85.00  | 3.00 (kg)   | 103      | 402025 | 401010                   |
|   | 80 - 36      | 127.00 - 152.00 | 90.00 | 89.70 | 66.00 | 65.70 | 85.00  | 3.10 (kg)   | 103      | 402026 | 401010                   |
|   | 80 - 36      | 151.00 - 176.00 | 90.00 | 89.70 | 66.00 | 65.70 | 134.00 | 3.80 (kg)   | 103      | 402025 | 401011                   |
|   | 80 - 36      | 176.00 - 201.00 | 90.00 | 89.70 | 66.00 | 65.70 | 134.00 | 3.90 (kg)   | 103      | 402026 | 401011                   |

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



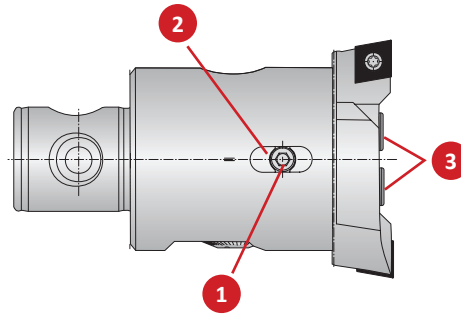
 = Metric (mm)

Inserts sold separately

**IMPORTANT:** Max spindle speed refers to maximum possible speed for an individual boring head and is not a recommended parameter. Refer to page B10-M: 12 for recommended application-specific parameters. Factory technical assistance is available for your specific applications through our Application Engineering department.  
 email: [engineering.eu@alliedmachine.com](mailto:engineering.eu@alliedmachine.com)

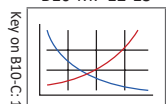
**Accessories**

Screws | Clamping Elements

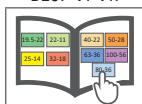


| Boring Head Part No. | Part No.         |             |                     |                |             |
|----------------------|------------------|-------------|---------------------|----------------|-------------|
|                      | 1<br>Clamp Screw | Service Key | 2<br>Clamping Piece | 3<br>Cap Screw | Service Key |
| 401003               | <b>401223</b>    | s2.5 / A    | –                   | <b>401323</b>  | s3 / B      |
| 401004               | <b>401224</b>    | s2.5 / B    | <b>401204</b>       | <b>401324</b>  | s4 / B      |
| 401005               | <b>401225</b>    | s2.5 / B    | <b>401205</b>       | <b>401324</b>  | s4 / B      |
| 401006               | <b>401226</b>    | s3 / B      | <b>401206</b>       | <b>401324</b>  | s4 / B      |
| <b>m</b> 401007      | <b>401227</b>    | s3 / B      | <b>401207</b>       | <b>401327</b>  | s5 / B      |
| 401008               | <b>115288</b>    | s4 / B      | <b>401208</b>       | <b>401329</b>  | s6 / B      |
| 401009               | <b>215501</b>    | s4 / B      | <b>401209</b>       | <b>401329</b>  | s6 / B      |
| 401010               | <b>401230</b>    | s4 / B      | <b>401210</b>       | <b>019183</b>  | s8 / C      |
| 401011               | <b>401230</b>    | s4 / B      | <b>401210</b>       | <b>019183</b>  | s8 / C      |

B10-M: 12-13



B10: VI-VII



**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 | VolCut

▶ Diameter Range: 19.50 mm - 245.00 mm



## Variety of tooling. Versatile operations.

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

Your safety and the safety of others is very important. This catalogue 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

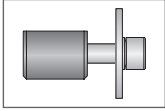


Renewable  
Energy

# Rough Machining Table of Contents

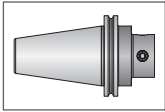
## Reference Icons

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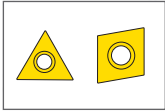
### Clamping Elements

For use with insert holders and boring heads



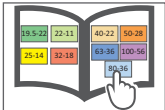
### Shanks

A variety of shanks for different machines



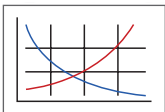
### Inserts

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



### MVS Connection Colour Guide

Detailed instructions and information regarding the MVS connection(s)



### Recommended Cutting Data

Speed and feed recommendations for optimum and safe boring



### Though Coolant Option

Indicates that the product is through coolant

## Introduction

Product Overview . . . . . 2 - 4

## Twin Cutters

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Reverse Machining Tools . . . . . 20

## VolCut Tooling

VolCut Insert Holders . . . . . 21

VolCut Technical Information . . . . . 22

Accessories . . . . . 23

| Series            | Diameter Range |
|-------------------|----------------|
|                   | Metric (mm)    |
| Twin Cutters      | 19.50 - 205.00 |
| Chamfering        | 19.00 - 216.00 |
| Radial Grooving   | 20.00 - 79.00  |
| Axial Grooving    | 20.00 - 205.00 |
| Reverse Machining | 29.00 - 245.00 |



# Rough Machining Product Preview

## Roughing Tools ROUGH MACHINING

### Versatile tools for a variety of applications.

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

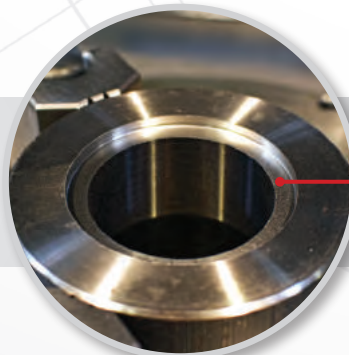
## Roughing Applications



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



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

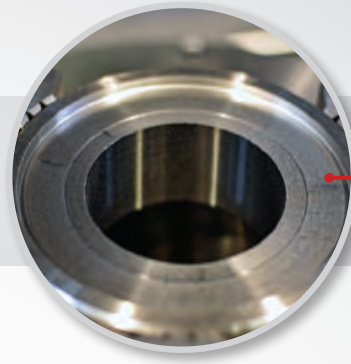


First Tangential Cut



▶ **Tangential Cutter Assembly:**

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

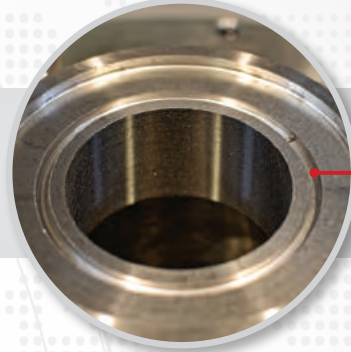


Second Tangential Cut



▶ **Axial Grooving Assembly:**

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

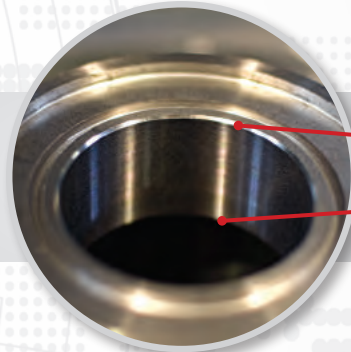


Axial Groove Cut



▶ **Chamfer Assembly:**

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



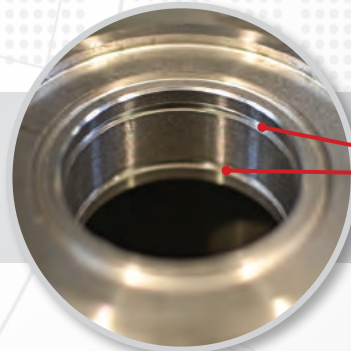
Top Chamfer

Bottom Chamfer



▶ **Radial Grooving Assembly:**

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



Grooves



▶ **Finished Application**

Case Study

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

Application: Ductile Cast Iron

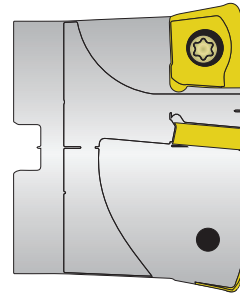
Finish Diameter: 49 mm

Pre-Hole Diameter: 45 mm

Boring Depth: 209 mm



| Measure               | Rough 49 mm<br>Competitor 1.5" High Feed Milling Tool |
|-----------------------|---|
| Speed                 | 2500 RPM  |
| Feed Rate             | 3886.2 mm/min   |
| Total Passes          | 77  |
| Cycle Time (per part) | <b>1.93 min</b>                                       |



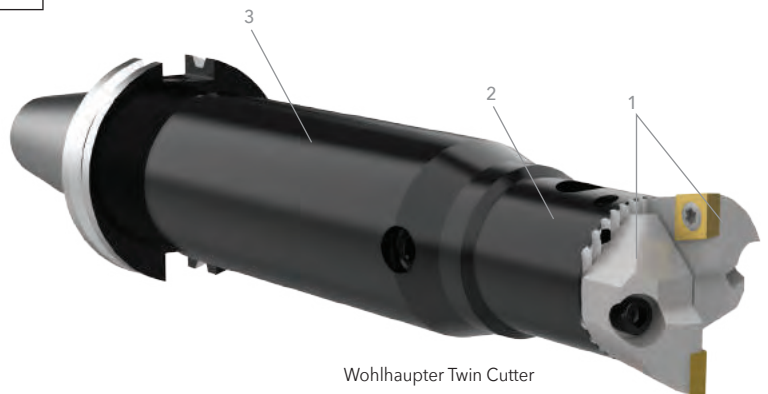
1.5" High Feed Milling Tool

OUR **SOLUTION**  
Wohlhaupter® Twin Cutter

| Measure               | Rough 49 mm<br>Wohlhaupter Twin Cutter |
|-----------------------|--|
| Speed                 | 900 RPM                                |
| Feed Rate             | 301.8 mm/min                           |
| 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*

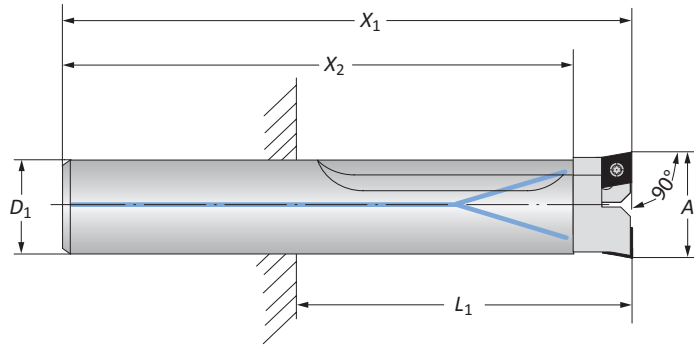


Wohlhaupter Twin Cutter



### Twin Cutters Same Level

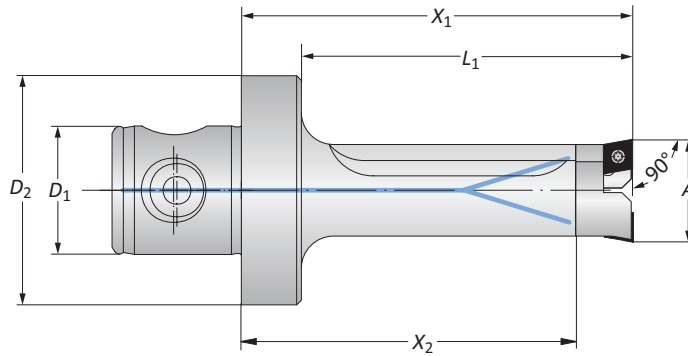
90° | Diameter Range: 19.50 mm - 30.00 mm



#### Twin Cutters Same Level

| Connection | Boring Range  | Twin Cutter |        |        | Weight    | Insert Form | Part No.      |               |
|------------|---------------|-------------|--------|--------|-----------|-------------|---------------|---------------|
|            |               | $X_1$       | $X_2$  | $L_1$  |           |             | Insert Holder | Serrated Body |
| $D_1$      | $A$           |             |        |        |           |             |               |               |
| 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        |

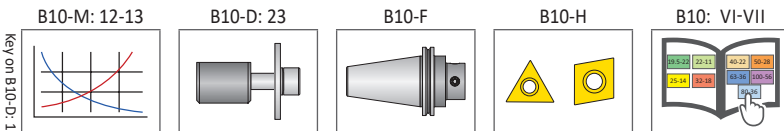
**NOTE:** Insert holders sold in quantities of 1, and inserts sold separately



#### Twin Cutters Same Level

| Connection    | Boring Range  | Twin Cutter |       |       | Weight    | Insert Form | Part No.      |               |
|---------------|---------------|-------------|-------|-------|-----------|-------------|---------------|---------------|
|               |               | $X_1$       | $X_2$ | $L_1$ |           |             | Insert Holder | Serrated Body |
| $D_2$   $D_1$ | $A$           |             |       |       |           |             |               |               |
| 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



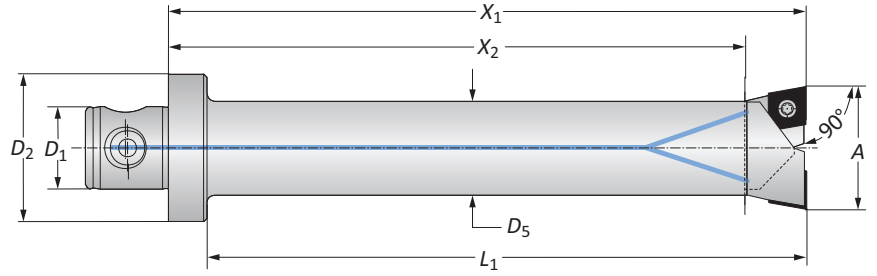
$\text{m}$  = Metric (mm)

Inserts sold separately

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## Twin Cutters Same Level

90° | 5xD | Diameter Range: 29.00 mm - 66.00 mm



| Connection | Boring Range | Twin Cutter   |        |        |        | Weight | Insert Form | Part No. |        |               |
|------------|--------------|---------------|--------|--------|--------|--------|-------------|----------|--------|---------------|
|            |              | $D_2   D_1$   | A      | $X_1$  | $X_2$  |        |             | $L_1$    | $D_5$  | Insert Holder |
| 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-M: 12-13

B10-D: 23

B10-F

B10-H

B10: VI-VII

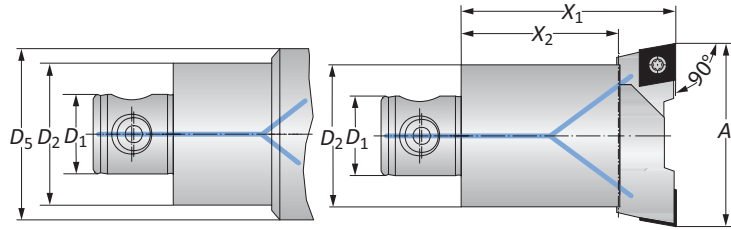
M = Metric (mm)

Inserts sold separately

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## Twin Cutters Same Level

90° | Diameter Range: 29.00 mm - 103.00 mm



| Connection | Boring Range | Twin Cutter    |       |       | Weight | Insert Form | Part No. |        |               |
|------------|--------------|----------------|-------|-------|--------|-------------|----------|--------|---------------|
|            |              | $D_2   D_1$    | A     | $X_1$ |        |             | $X_2$    | $D_5$  | Insert Holder |
| M          | 25 - 14      | 29.00 - 37.00  | 56.00 | 42.00 | -      | 0.20 (kg)   | 103      | 151001 | 148001        |
|            | 25 - 14      | 36.00 - 44.00  | 56.00 | 42.00 | 30.00  | 0.20 (kg)   | 103      | 151002 | 148002        |
|            | 32 - 18      | 36.00 - 44.00  | 56.00 | 42.00 | 30.00  | 0.40 (kg)   | 103      | 151002 | 148017        |
|            | 32 - 18      | 43.00 - 54.00  | 66.00 | 46.00 | 36.00  | 0.40 (kg)   | 103      | 151023 | 148003        |
|            | 32 - 18      | 43.00 - 54.00  | 66.00 | 46.00 | 36.00  | 0.40 (kg)   | 104      | 151003 | 148003        |
|            | 40 - 22      | 43.00 - 54.00  | 66.00 | 46.00 | 36.00  | 0.70 (kg)   | 103      | 151023 | 148018        |
|            | 40 - 22      | 43.00 - 54.00  | 66.00 | 46.00 | 36.00  | 0.70 (kg)   | 104      | 151003 | 148018        |
|            | 40 - 22      | 53.00 - 66.00  | 75.00 | 55.00 | -      | 0.70 (kg)   | 103      | 151024 | 148004        |
|            | 40 - 22      | 53.00 - 66.00  | 75.00 | 55.00 | -      | 0.70 (kg)   | 104      | 151004 | 148004        |
|            | 50 - 28      | 65.00 - 83.00  | 75.00 | 55.00 | -      | 1.10 (kg)   | 103      | 151025 | 148005        |
|            | 50 - 28      | 65.00 - 83.00  | 75.00 | 55.00 | -      | 1.10 (kg)   | 104      | 151005 | 148005        |
|            | 63 - 36      | 82.00 - 103.00 | 90.00 | 60.00 | -      | 1.90 (kg)   | 103      | 151026 | 148006        |
|            | 63 - 36      | 82.00 - 103.00 | 90.00 | 60.00 | -      | 1.90 (kg)   | 104      | 151086 | 148006        |
|            | 63 - 36      | 82.00 - 103.00 | 90.00 | 60.00 | -      | 1.90 (kg)   | 105      | 151006 | 148006        |

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

Key on B10-D-1

B10-M: 12-13

B10-D: 23

B10-F

B10-H

B10: VI-VII

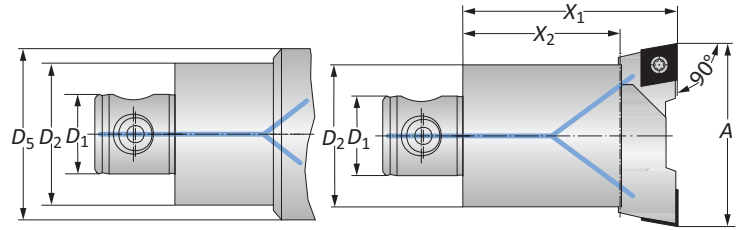
M = Metric (mm)

Inserts sold separately

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## Twin Cutters Same Level

90° | Diameter Range: 100.00 mm - 205.00 mm



| Connection | Boring Range | Twin Cutter     |       |       | Weight | Insert Form | Part No. |        |               |
|------------|--------------|-----------------|-------|-------|--------|-------------|----------|--------|---------------|
|            |              | $D_2   D_1$     | A     | $X_1$ |        |             | $X_2$    | $D_5$  | Insert Holder |
| m          | 80 - 36      | 100.00 - 130.00 | 90.00 | 60.00 | -      | 3.00 (kg)   | 103      | 151027 | 148007        |
|            | 80 - 36      | 100.00 - 130.00 | 90.00 | 60.00 | -      | 3.00 (kg)   | 104      | 151087 | 148007        |
|            | 80 - 36      | 100.00 - 130.00 | 90.00 | 60.00 | -      | 3.00 (kg)   | 105      | 151007 | 148007        |
|            | 80 - 36      | 125.00 - 155.00 | 90.00 | 60.00 | -      | 3.20 (kg)   | 103      | 151028 | 148007        |
|            | 80 - 36      | 125.00 - 155.00 | 90.00 | 60.00 | -      | 3.20 (kg)   | 104      | 151088 | 148007        |
|            | 80 - 36      | 125.00 - 155.00 | 90.00 | 60.00 | -      | 3.20 (kg)   | 105      | 151008 | 148007        |
|            | 80 - 36      | 150.00 - 205.00 | 90.00 | 60.00 | 125.00 | 4.00 (kg)   | 103      | 151028 | 148009        |
|            | 80 - 36      | 150.00 - 205.00 | 90.00 | 60.00 | 125.00 | 4.00 (kg)   | 104      | 151088 | 148009        |
|            | 80 - 36      | 150.00 - 205.00 | 90.00 | 60.00 | 125.00 | 4.00 (kg)   | 105      | 151008 | 148009        |

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

Key on B10-D-1

B10-M: 12-13

B10-D: 23

B10-F

B10-H

B10: VI-VII

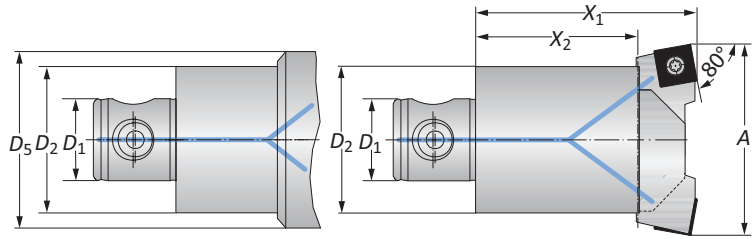
m = Metric (mm)

Inserts sold separately

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## Twin Cutters Same Level

80° | Diameter Range: 29.00 mm - 205.00 mm



| Connection | Boring Range    | Twin Cutter     |       |        | Weight    | Insert Form | Part No. |        |               |
|------------|-----------------|-----------------|-------|--------|-----------|-------------|----------|--------|---------------|
|            |                 | $D_2$   $D_1$   | A     | $X_1$  |           |             | $X_2$    | $D_5$  | Insert Holder |
| m          | 25 - 14         | 29.00 - 37.00   | 56.00 | 42.00  | –         | 0.20 (kg)   | 112      | 151011 | 148001        |
|            | 25 - 14         | 36.00 - 44.00   | 56.00 | 42.00  | 30.00     | 0.20 (kg)   | 112      | 151012 | 148002        |
|            | 32 - 18         | 36.00 - 44.00   | 62.00 | 42.00  | 30.00     | 0.40 (kg)   | 112      | 151012 | 148017        |
|            | 32 - 18         | 43.00 - 54.00   | 66.00 | 46.00  | 36.00     | 0.40 (kg)   | 113      | 151013 | 148003        |
|            | 40 - 22         | 43.00 - 54.00   | 66.00 | 46.00  | 36.00     | 0.70 (kg)   | 113      | 151013 | 148018        |
|            | 40 - 22         | 53.00 - 66.00   | 75.00 | 55.00  | –         | 0.70 (kg)   | 113      | 151014 | 148004        |
|            | 50 - 28         | 65.00 - 83.00   | 75.00 | 55.00  | –         | 1.10 (kg)   | 113      | 151015 | 148005        |
|            | 63 - 36         | 82.00 - 103.00  | 90.00 | 60.00  | –         | 2.30 (kg)   | 113      | 151036 | 148006        |
|            | 80 - 36         | 100.00 - 130.00 | 90.00 | 60.00  | –         | 3.00 (kg)   | 113      | 151037 | 148007        |
|            | 80 - 36         | 125.00 - 155.00 | 90.00 | 60.00  | –         | 3.20 (kg)   | 113      | 151038 | 148007        |
| 80 - 36    | 150.00 - 205.00 | 90.00           | 60.00 | 125.00 | 4.00 (kg) | 113         | 151038   | 148009 |               |

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

Key on B10-D-1

B10-M: 12-13

B10-D: 23

B10-F

B10-H

B10: VI-VII

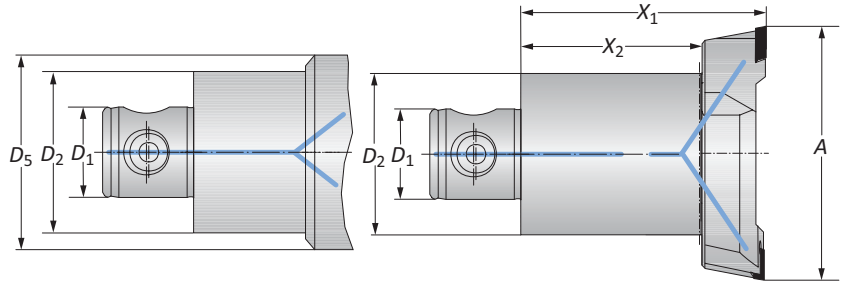
m = Metric (mm)

Inserts sold separately

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## Twin Cutters Same Level Tangential Inserts

Diameter Range: 53.00 mm - 205.00 mm



| Connection | Boring Range | Twin Cutter     |       |       | Weight | Insert Form | Part No. |        |               |
|------------|--------------|-----------------|-------|-------|--------|-------------|----------|--------|---------------|
|            |              | $D_2$   $D_1$   | $A$   | $X_1$ |        |             | $X_2$    | $D_5$  | Insert Holder |
| M          | 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        |
|            | 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

Key on B10-D-1

B10-M: 12-13

B10-D: 23

B10-F

B10-H

B10: VI-VII

M = Metric (mm)

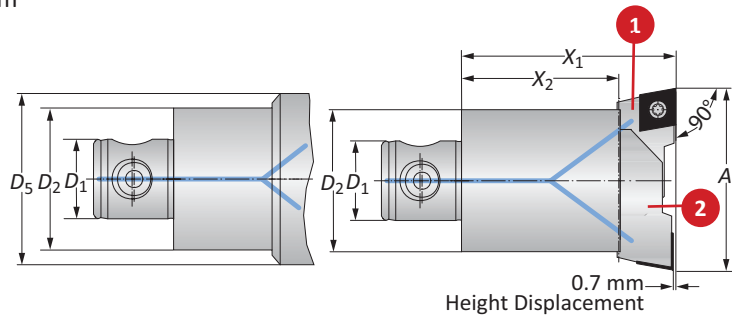
Inserts sold separately

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## Twin Cutters Height Displaced

90° | Diameter Range: 29.00 mm - 103.00 mm



| Connection | Boring Range | Twin Cutter    |       |       | Weight | Insert Form | Part No. |        |                 |                            |
|------------|--------------|----------------|-------|-------|--------|-------------|----------|--------|-----------------|----------------------------|
|            |              | $D_2   D_1$    | A     | $X_1$ |        |             | $X_2$    | $D_5$  | 1 Insert Holder | 2. Insert Holder (-0.7 mm) |
| 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

Key on B10-D-1

B10-M: 12-13

B10-D: 23

B10-F

B10-H

B10: VI-VII

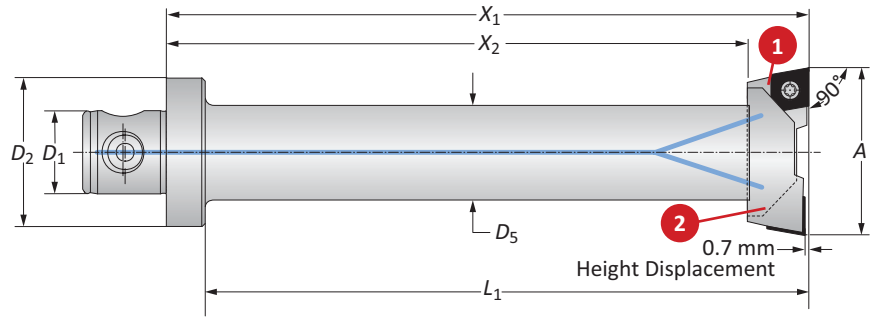
m = Metric (mm)

Inserts sold separately

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## Twin Cutters Height Displaced

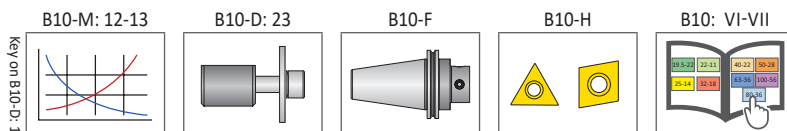
90° | 5xD | Diameter Range: 29.00 mm - 66.00 mm



| Connection | Boring Range | Twin Cutter   |        |        |        |       | Weight    | Insert Form | Part No. |                  |                            |
|------------|--------------|---------------|--------|--------|--------|-------|-----------|-------------|----------|------------------|----------------------------|
|            |              | $D_2$   $D_1$ | A      | $X_1$  | $X_2$  | $L_1$ |           |             | $D_5$    | 1. Insert Holder | 2. Insert Holder (-0.7 mm) |
| 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



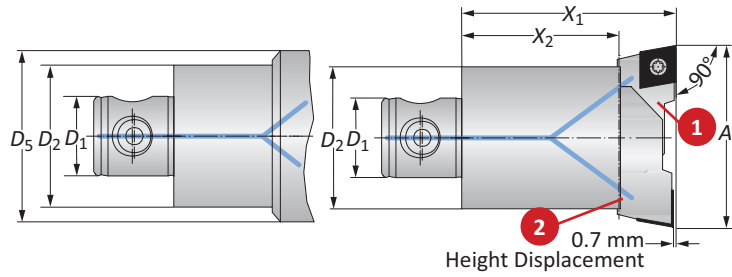
m = Metric (mm)

Inserts sold separately

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 email: [engineering.eu@alliedmachine.com](mailto:engineering.eu@alliedmachine.com)

## Twin Cutters Height Displaced

90° | Diameter Range: 100.00 mm - 205.00 mm



| Connection | Boring Range | Twin Cutter     |       |       | Weight | Insert Form | Part No. |        |                  |                            |
|------------|--------------|-----------------|-------|-------|--------|-------------|----------|--------|------------------|----------------------------|
|            |              | $D_2   D_1$     | A     | $X_1$ |        |             | $X_2$    | $D_5$  | 1. Insert Holder | 2. Insert Holder (-0.7 mm) |
| 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

Key on B10-D-1

B10-M: 12-13

B10-D: 23

B10-F

B10-H

B10: VI-VII

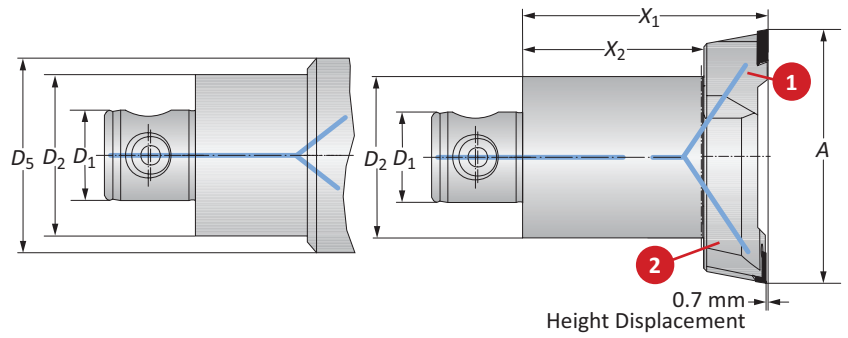
M = Metric (mm)

Inserts sold separately

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 email: [engineering.eu@alliedmachine.com](mailto:engineering.eu@alliedmachine.com)

## Twin Cutters Height Displaced Tangential Inserts

Diameter Range: 53.00 mm - 205.00 mm



| Connection | Boring Range | Twin Cutter     |       |       | Weight | Insert Form | Part No. |        |                  |                            |
|------------|--------------|-----------------|-------|-------|--------|-------------|----------|--------|------------------|----------------------------|
|            |              | $D_2   D_1$     | $A$   | $X_1$ |        |             | $X_2$    | $D_5$  | 1. Insert Holder | 2. Insert Holder (-0.7 mm) |
| m          | 40 - 22      | 53.00 - 66.00   | 75.00 | 55.00 | -      | 0.70 (kg)   | 04       | 151022 | 268009           | 148004                     |
|            | 50 - 28      | 65.00 - 83.00   | 75.00 | 55.00 | -      | 1.00 (kg)   | 04       | 151032 | 268010           | 148005                     |
|            | 50 - 28      | 65.00 - 83.00   | 75.00 | 55.00 | -      | 1.00 (kg)   | 05       | 151043 | 268019           | 148005                     |
|            | 63 - 36      | 82.00 - 103.00  | 90.00 | 60.00 | -      | 2.20 (kg)   | 04       | 151034 | 268020           | 148006                     |
|            | 63 - 36      | 82.00 - 103.00  | 90.00 | 60.00 | -      | 2.20 (kg)   | 05       | 151035 | 268021           | 148006                     |
|            | 80 - 36      | 100.00 - 130.00 | 90.00 | 60.00 | -      | 3.00 (kg)   | 05       | 151009 | 268022           | 148007                     |
|            | 80 - 36      | 125.00 - 155.00 | 90.00 | 60.00 | -      | 3.10 (kg)   | 05       | 151010 | 268023           | 148007                     |
|            | 80 - 36      | 150.00 - 205.00 | 90.00 | 60.00 | 125.00 | 4.00 (kg)   | 05       | 151010 | 268023           | 148009                     |

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

Key on B10-D-1

B10-M: 12-13

B10-D: 23

B10-F

B10-H

B10: VI-VII

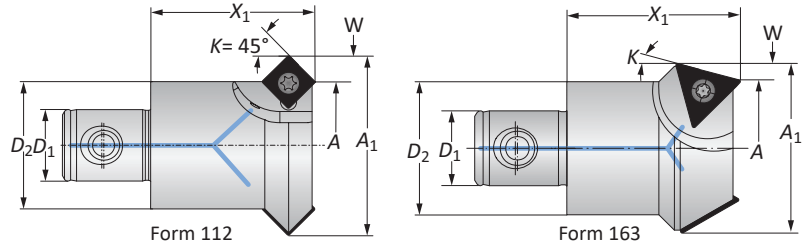
m = Metric (mm)

Inserts sold separately

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 email: [engineering.eu@alliedmachine.com](mailto:engineering.eu@alliedmachine.com)

## Chamfering Tools

Diameter Range: 25 .00 mm - 32.00 mm



| Connection  | Approach Angle | Boring Range | Cutter Diameter | Chamfering Tool |      | Weight    | Insert Form | Number of Inserts | Part No. |
|-------------|----------------|--------------|-----------------|-----------------|------|-----------|-------------|-------------------|----------|
|             |                |              |                 | $X_1$           | $W$  |           |             |                   |          |
| $D_2   D_1$ | $K$            | $A$          | $A_1$           | $X_1$           | $W$  |           |             |                   |          |
| 25 - 14     | 15°            | 25.00        | 33.00           | 31.00           | 4.00 | 0.15 (kg) | 163         | 2                 | 201087   |
| 25 - 14     | 45°            | 20.00        | 33.00           | 31.00           | 6.50 | 0.15 (kg) | 112         | 2                 | 201082   |
| 32 - 18     | 15°            | 32.00        | 40.00           | 41.00           | 4.00 | 0.20 (kg) | 163         | 2                 | 201088   |
| 32 - 18     | 30°            | 25.00        | 41.00           | 41.00           | 8.00 | 0.20 (kg) | 163         | 2                 | 201089   |
| 32 - 18     | 45°            | 32.00        | 45.00           | 41.00           | 6.50 | 0.20 (kg) | 112         | 3                 | 201083   |

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

**NOTE:** Inserts sold separately

Key on B10-D-1

B10-M: 12-13

B10-D: 23

B10-F

B10-H

B10: VI-VII

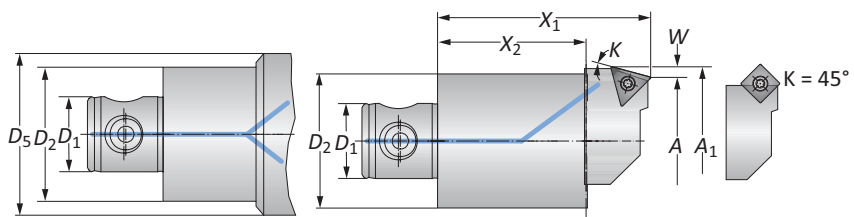
 = Metric (mm)

Inserts sold separately

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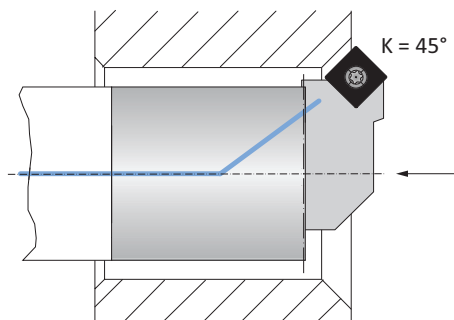
## Chamfering Tools

Metric | Diameter Range: 19.00 mm - 71.00 mm



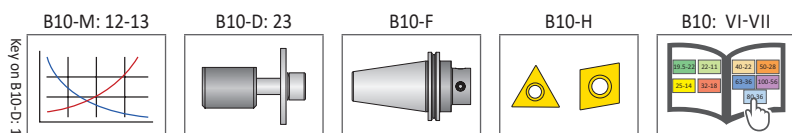
Form 161  
Form 163

Form 113



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

\*Insert holder cannot be used for reverse machining.  
**NOTE:** K 45° for front and reverse side chamfering above  $\varnothing$  31.00 mm  
**NOTE:** Insert holders and inserts sold separately



Ⓜ = Metric (mm)

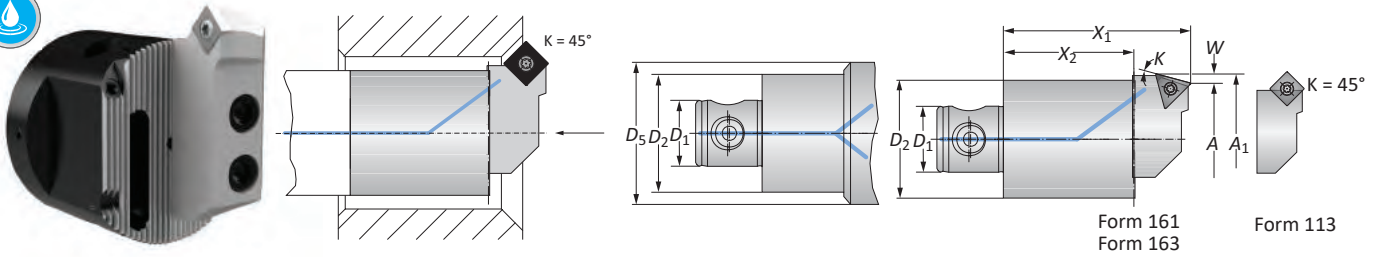
Inserts sold separately

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## Chamfering Tools

Diameter Range: 50.00 mm - 216.00 mm



| Connection | Approach Angle | Boring Range    | Chamfering Range | Chamfering Tool |       |        |       | Weight    | Insert Form | Part No. |        |
|------------|----------------|-----------------|------------------|-----------------|-------|--------|-------|-----------|-------------|----------|--------|
|            |                |                 |                  | $D_2   D_1$     | K     | A      | $A_1$ |           |             | $X_1$    | $X_2$  |
| 50 - 28    | 15°            | 50.00 - 68.00   | 58.00 - 76.00    | 80.00           | 55.00 | -      | 4.00  | 1.00 (kg) | 163         | 201061   | 148005 |
| 50 - 28    | 20°            | 50.00 - 68.00   | 60.00 - 78.00    | 80.00           | 55.00 | -      | 5.00  | 1.00 (kg) | 163         | 201021   | 148005 |
| 50 - 28    | 30°            | 50.00 - 68.00   | 65.00 - 83.00    | 80.00           | 55.00 | -      | 7.50  | 1.00 (kg) | 163         | 201071   | 148005 |
| 50 - 28    | 45°            | 55.00 - 73.00   | 70.00 - 88.00    | 80.00           | 55.00 | -      | 7.50  | 1.00 (kg) | 113         | 201010   | 148005 |
| 63 - 36    | 15°            | 68.00 - 89.00   | 76.00 - 97.00    | 90.00           | 60.00 | -      | 4.00  | 1.90 (kg) | 163         | 201062   | 148006 |
| 63 - 36    | 20°            | 68.00 - 89.00   | 78.00 - 99.00    | 90.00           | 60.00 | -      | 5.00  | 1.90 (kg) | 163         | 201022   | 148006 |
| 63 - 36    | 30°            | 68.00 - 89.00   | 83.00 - 104.00   | 90.00           | 60.00 | -      | 7.50  | 1.90 (kg) | 163         | 201072   | 148006 |
| 63 - 36    | 45°            | 72.00 - 93.00   | 87.00 - 108.00   | 90.00           | 60.00 | -      | 7.50  | 1.90 (kg) | 113         | 201011   | 148006 |
| 80 - 36    | 15°            | 89.00 - 119.00  | 97.00 - 127.00   | 90.00           | 60.00 | -      | 4.00  | 2.60 (kg) | 163         | 201063   | 148007 |
| 80 - 36    | 15°            | 119.00 - 149.00 | 127.00 - 159.00  | 90.00           | 60.00 | -      | 4.00  | 2.70 (kg) | 163         | 201064   | 148007 |
| 80 - 36    | 15°            | 144.00 - 199.00 | 152.00 - 207.00  | 90.00           | 60.00 | 125.00 | 4.00  | 3.60 (kg) | 163         | 201064   | 148009 |
| 80 - 36    | 20°            | 89.00 - 119.00  | 99.00 - 129.00   | 90.00           | 60.00 | -      | 5.00  | 2.60 (kg) | 163         | 201023   | 148007 |
| 80 - 36    | 20°            | 119.00 - 149.00 | 129.00 - 159.00  | 90.00           | 60.00 | -      | 5.00  | 2.70 (kg) | 163         | 201024   | 148007 |
| 80 - 36    | 20°            | 144.00 - 199.00 | 154.00 - 209.00  | 90.00           | 60.00 | 125.00 | 5.00  | 3.60 (kg) | 163         | 201024   | 148009 |
| 80 - 36    | 30°            | 89.00 - 119.00  | 104.00 - 134.00  | 90.00           | 60.00 | -      | 7.50  | 2.60 (kg) | 163         | 201073   | 148007 |
| 80 - 36    | 30°            | 119.00 - 149.00 | 134.00 - 164.00  | 90.00           | 60.00 | -      | 7.50  | 2.70 (kg) | 163         | 201074   | 148007 |
| 80 - 36    | 30°            | 144.00 - 199.00 | 159.00 - 214.00  | 90.00           | 60.00 | 125.00 | 7.50  | 3.60 (kg) | 163         | 201074   | 148009 |
| 80 - 36    | 45°            | 92.00 - 122.00  | 107.00 - 137.00  | 90.00           | 60.00 | -      | 7.50  | 2.60 (kg) | 113         | 201012   | 148007 |
| 80 - 36    | 45°            | 121.00 - 151.00 | 136.00 - 166.00  | 90.00           | 60.00 | -      | 7.50  | 2.70 (kg) | 113         | 201013   | 148007 |
| 80 - 36    | 45°            | 146.00 - 201.00 | 161.00 - 216.00  | 90.00           | 60.00 | 125.00 | 7.50  | 3.60 (kg) | 113         | 201013   | 148009 |

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

Key on B10-D-1


B10-M: 12-13

B10-D: 23

B10-F

B10-H

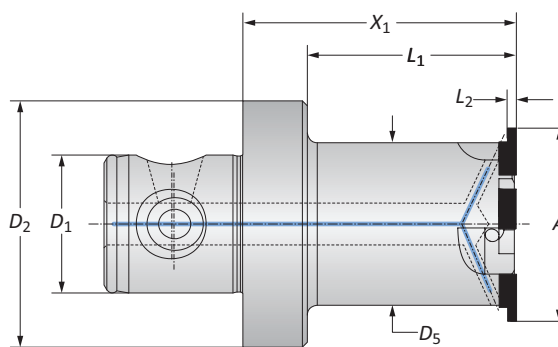
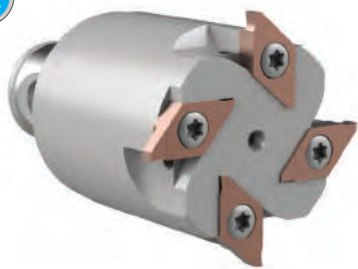
B10: VI-VII

 = Metric (mm)  
 Inserts sold separately

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## Grooving Tools for Circular Milling

Diameter Range:  $\varnothing > 20.00$  mm



| Connection | Cutter Diameter | Grooving Tool |       |       | Groove Width | Groove Depth | Number of Inserts | Weight | Insert Form | Part No. |        |
|------------|-----------------|---------------|-------|-------|--------------|--------------|-------------------|--------|-------------|----------|--------|
|            |                 | $D_2$   $D_1$ | A     | $X_1$ |              |              |                   |        |             |          | $L_1$  |
| m          | 50 - 28         | 20.00         | 55.00 | 40.00 | 17.00        | max 2.37     | max 1.50          | 2      | 0.40 (kg)   | 89       | 143051 |
|            | 50 - 28         | 20.00         | 95.00 | 82.00 | 17.00        | max 2.37     | max 1.50          | 2      | 0.40 (kg)   | 89       | 143052 |
|            | 50 - 28         | 39.00         | 55.00 | 42.00 | 33.00        | max 3.37     | max 2.50          | 4      | 0.60 (kg)   | 90       | 143053 |
|            | 32 - 18         | 39.00         | 40.00 | 40.00 | 33.00        | max 3.37     | max 2.50          | 4      | 0.30 (kg)   | 90       | 143054 |
|            | 50 - 28         | 49.00         | 55.00 | 40.00 | 43.00        | max 3.37     | max 2.50          | 5      | 0.70 (kg)   | 90       | 143055 |
|            | 40 - 22         | 49.00         | 40.00 | 40.00 | 43.00        | max 3.37     | max 2.50          | 5      | 0.50 (kg)   | 90       | 143056 |
|            | 50 - 28         | 63.00         | 40.00 | 40.00 | 53.00        | max 5.87     | max 4.70          | 6      | 0.70 (kg)   | 91       | 143057 |
|            | 63 - 36         | 79.00         | 40.00 | 40.00 | 69.00        | max 5.87     | max 4.70          | 8      | 1.20 (kg)   | 91       | 143058 |

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

B10-M: 12-13

B10-D: 23

B10-F

B10-H

B10: VI-VII

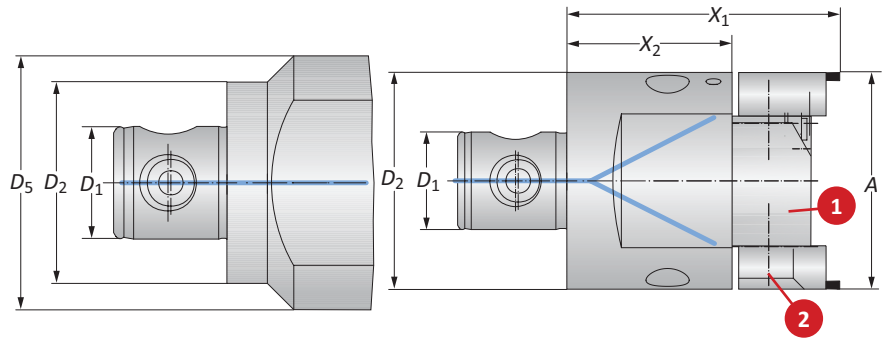
m = Metric (mm)

Inserts sold separately

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## Axial Grooving Tools

Diameter Range: 20.00 mm - 205.00 mm



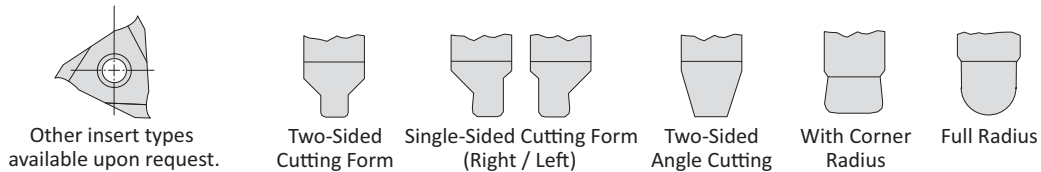
| Connection | Boring Range | Grooving Tool   |        |       |        | Weight    | Part No. |                  |             |                  |
|------------|--------------|-----------------|--------|-------|--------|-----------|----------|------------------|-------------|------------------|
|            |              | $D_2   D_1$     | A      | $X_1$ | $X_2$  |           | $D_5$    | 1. Support Block | Insert Form | 2. Insert Holder |
| M          | 50 - 28      | 20.00 - 58.00   | 83.00  | 55.00 | 63.00  | 1.30 (kg) | –        | 304              | 226030      | 148010           |
|            | 80 - 36      | 57.00 - 84.00   | 100.00 | 60.00 | –      | 2.60 (kg) | 226011   | 304              | 226031      | 148007           |
|            | 80 - 36      | 82.00 - 155.00  | 100.00 | 60.00 | 125.00 | 3.70 (kg) | 226012   | 304              | 226031      | 148009           |
|            | 80 - 36      | 153.00 - 205.00 | 100.00 | 60.00 | 125.00 | 3.70 (kg) | 226013   | 304              | 226031      | 148009           |

**NOTE:** Groove width is 0.039" - 0.276" (1.00 mm - 7.00 mm). (With Twin Cutter and diameter offset up to 12.00 mm is possible.) | Groove depth is 0.039" - 0.236" (1.00 mm - 6.00 mm)

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

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

Examples of recessing replaceable inserts:



Other insert types available upon request.

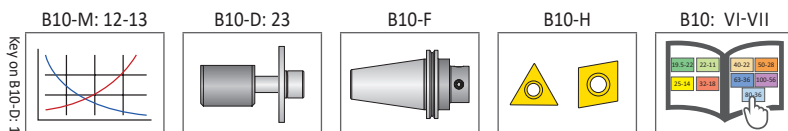
Two-Sided Cutting Form

Single-Sided Cutting Form (Right / Left)

Two-Sided Angle Cutting

With Corner Radius

Full Radius



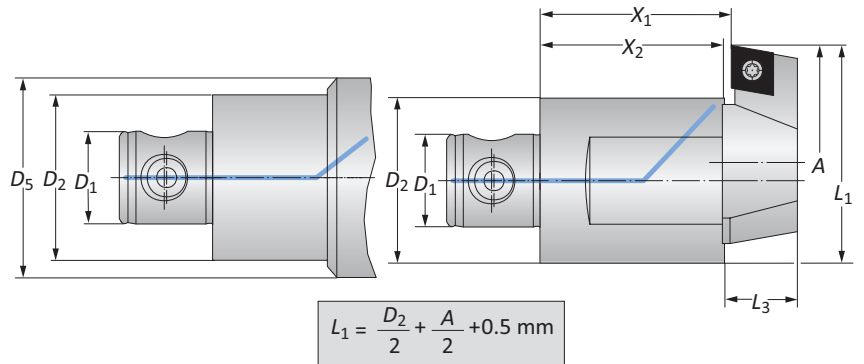
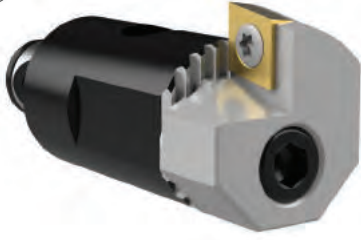
M = Metric (mm)

Inserts sold separately

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## Reverse Machining Tools

Diameter Range: 29.00 mm - 245.00 mm



| Connection | Boring Range | Reverse Machining               |       |                |                | D <sub>5</sub> | Weight    | Insert Form | Part No.       |               |
|------------|--------------|---------------------------------|-------|----------------|----------------|----------------|-----------|-------------|----------------|---------------|
|            |              | D <sub>2</sub>   D <sub>1</sub> | A     | X <sub>1</sub> | X <sub>2</sub> |                |           |             | L <sub>3</sub> | Insert Holder |
| M          | 25 - 14      | 29.00 - 37.00                   | 40.00 | 39.00          | 14.00          | -              | 0.20 (kg) | 103         | 251001         | 148011        |
|            | 25 - 14      | 34.00 - 42.00                   | 40.00 | 39.00          | 14.00          | -              | 0.20 (kg) | 103         | 251002         | 148011        |
|            | 25 - 14      | 36.00 - 44.00                   | 40.00 | 39.00          | 14.00          | -              | 0.20 (kg) | 103         | 251002         | 148012        |
|            | 25 - 14      | 44.00 - 52.00                   | 40.00 | 39.00          | 18.00          | -              | 0.20 (kg) | 104         | 251003         | 148012        |
|            | 32 - 18      | 43.00 - 54.00                   | 40.00 | 39.00          | 18.00          | -              | 0.30 (kg) | 104         | 251003         | 148013        |
|            | 32 - 18      | 55.00 - 66.00                   | 40.00 | 39.00          | 18.00          | -              | 0.40 (kg) | 104         | 251004         | 148013        |
|            | 40 - 22      | 53.00 - 72.00                   | 40.00 | 39.00          | 18.00          | -              | 0.50 (kg) | 104         | 251004         | 148014        |
|            | 40 - 22      | 66.00 - 85.00                   | 40.00 | 39.00          | 18.00          | -              | 0.50 (kg) | 104         | 251005         | 148014        |
|            | 50 - 28      | 70.00 - 95.00                   | 56.00 | 55.00          | 22.00          | -              | 1.10 (kg) | 104         | 251006         | 148015        |
|            | 50 - 28      | 92.00 - 117.00                  | 56.00 | 55.00          | 22.00          | -              | 1.30 (kg) | 104         | 251007         | 148015        |
| G          | 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

Key on B10-D-1

B10-M: 12-13

B10-D: 23

B10-F

B10-H

B10: VI-VII

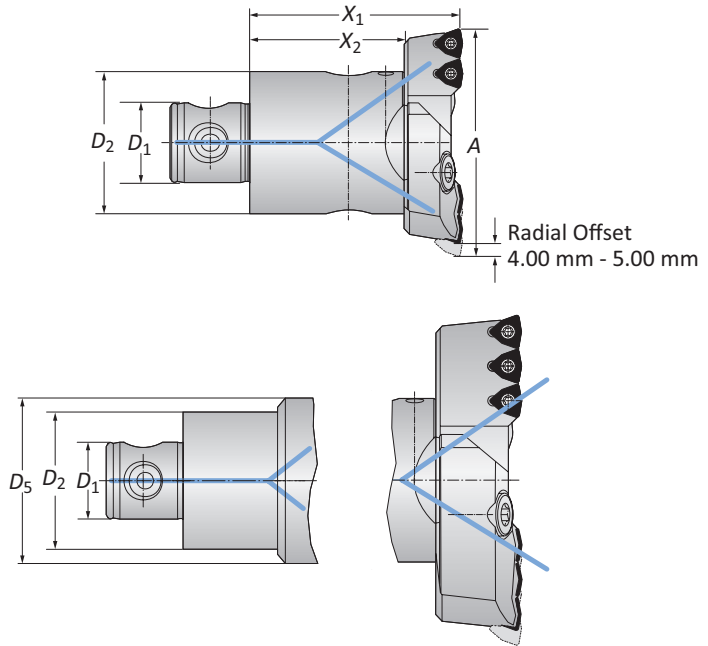
M = Metric (mm)

Inserts sold separately

**IMPORTANT:** Max spindle speed refers to maximum possible speed for an individual boring head and is not a recommended parameter. Refer to page B10-M: 12 for recommended application-specific parameters. Factory technical assistance is available for your specific applications through our Application Engineering department.  
 email: [engineering.eu@alliedmachine.com](mailto:engineering.eu@alliedmachine.com)

## VolCut Insert Holders

Diameter Range: 65.00 mm - 3255.00 mm



### Serrated Bodies with VolCut Insert Holders



| Connection | Boring Range                    |                 | Serrated Body       |                |                | Weight | Number of Inserts | Insert Form | Part No.       |                      |               |
|------------|---------------------------------|-----------------|---------------------|----------------|----------------|--------|-------------------|-------------|----------------|----------------------|---------------|
|            | D <sub>2</sub>   D <sub>1</sub> | A               | A <sub>min</sub> ** | X <sub>1</sub> | X <sub>2</sub> |        |                   |             | D <sub>5</sub> | VolCut Insert Holder | Serrated Body |
| m          | 50 - 28                         | 65.00 - 83.00   | 65.00 - 70.00       | 74.00          | 55.00          | -      | 1.10 (kg)         | 2           | 464            | 151019               | 148005        |
|            | 63 - 36                         | 82.00 - 103.00  | 82.00 - 87.00       | 89.00          | 60.00          | -      | 2.20 (kg)         | 3           | 464            | 151039               | 148006        |
|            | 80 - 36                         | 100.00 - 130.00 | 100.00 - 105.00     | 89.00          | 60.00          | -      | 3.00 (kg)         | 3           | 464            | 151059               | 148007        |
|            | 80 - 36                         | 125.00 - 155.00 | 125.00 - 130.00     | 89.00          | 60.00          | -      | 3.20 (kg)         | 3           | 464            | 151069               | 148007        |
|            | 80 - 36                         | 150.00 - 205.00 | 150.00 - 155.00     | 89.00          | 60.00          | 125.00 | 5.10 (kg)         | 3           | 464            | 151069               | 148009        |
| ⚠ D60      | 200.00 - 3255.00                | -               | -                   | -              | -              | -      | -                 | 3           | 464            | 149030               | *             |

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

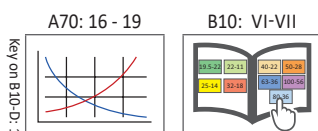
\*For large diameter serrated slides, please contact Application Eng. on enquiries.eu@alliedmachine.com and see section B10-G in the Wohlhaupter® MultiBore® System Tools catalogue.

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

### IC Inserts

| Carbide Grade | Geometry  | Part No.   | WSP-Screw   |
|---------------|-----------|--|---|
|               |           | <br>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 Allied Master Product Catalogue for recommended cutting data, cutting materials, and geometries.

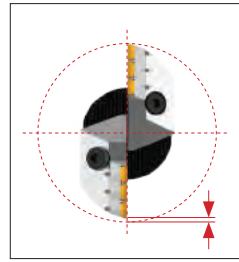


m = Metric (mm)

**WARNING** For large diameter boring with VolCut insert holders please:  
 - Contact our Application Engineering department before purchasing (email: [engineering.eu@alliedmachine.com](mailto:engineering.eu@alliedmachine.com))  
 - Refer to section B10-G in the Wohlhaupter® MultiBore® System Tools catalogue.

## VolCut Technical Information

Setup Instructions | Minimum Pilot Calculation



**Step 1:**  
Loosen the mounting screws on both cartridges.

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

**Step 3:**  
Tighten the mounting screws on the cartridge to 15-19 Nm.

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

**Step 5:**  
Tighten the mounting screws on the cartridge to 15-19 Nm.

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

### Minimum Pilot Calculation

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

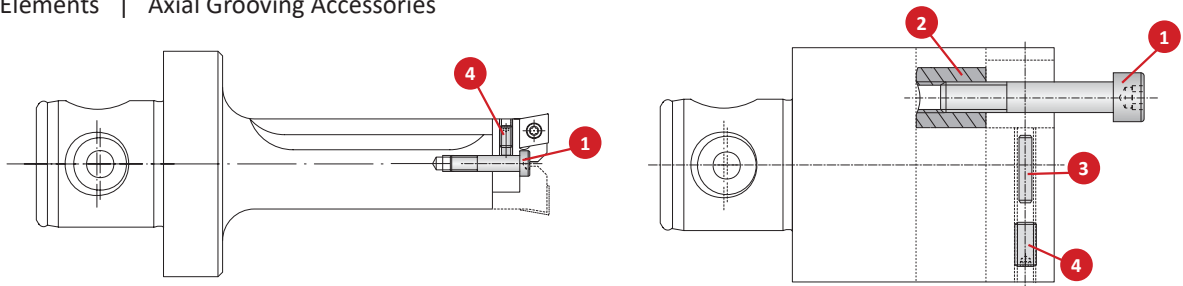
| Insert Holder | Diameter Range         | Opening Range |
|---------------|------------------------|---------------|
| 151019        | 65.00 mm - 70.00 mm    | 15.24 mm      |
|               | 70.00 mm - 83.00 mm    | 47.75 mm      |
| 151039        | 82.00 mm - 87.00 mm    | 15.24 mm      |
|               | 87.00 mm - 103.00 mm   | 68.07 mm      |
| 151059        | 100.00 mm - 105.00 mm  | 15.24 mm      |
|               | 105.00 mm - 130.00 mm  | 68.07 mm      |
| 151069        | 125.00 mm - 130.00 mm  | 15.24 mm      |
|               | 130.00 mm - 205.00 mm  | 68.07 mm      |
| 149030        | 200.00 mm - 3255.00 mm | 68.07 mm      |

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



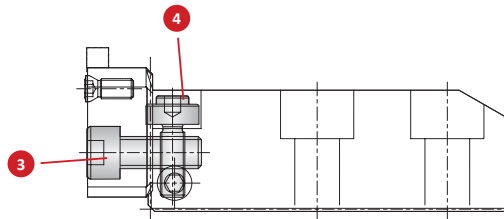
## Accessories

### Clamping Elements | Axial Grooving Accessories



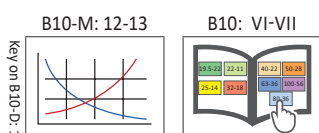
#### Clamping Elements

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



#### Axial Grooving Accessories

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



 = Metric (mm)



SECTION

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# B10-E

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Intermediate Modules

# Wohlhaupter® Intermediate Modules

NOVI<sup>TECH</sup>® | Reducers | Extensions



## Increase Tool Stability with Intermediate Modules

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

Your safety and the safety of others is very important. This catalogue 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 catalogue, 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 catalogue. 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



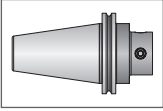
Oil & Gas



Renewable  
Energy

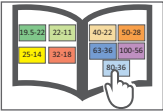
### Reference Icons

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



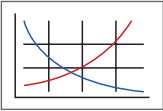
#### Shanks

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



#### Through Coolant Option

Indicates that the product is through coolant

## Intermediate Modules Table of Contents

### Introduction

Product Overview . . . . . 2 - 3

**NOVI<sup>TECH</sup>® Vibration Damping Modules** . . . . . 4 - 5

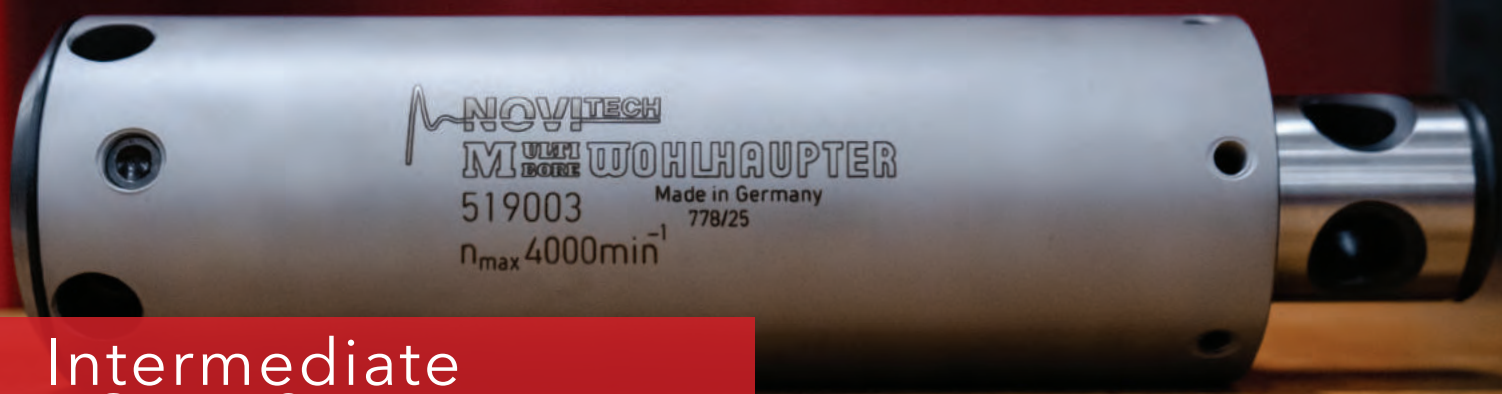
**248 Adapters** . . . . . 6 - 7

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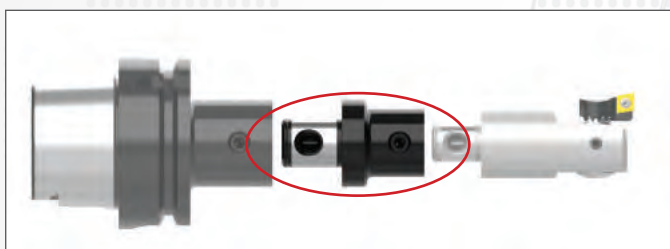


# Intermediate Modules Product Overview



## 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
- ▶ Aluminium components available to reduce stress on the spindle



# WOHLHAUPTER® FINE BORING HEAD with NOVI<sup>TECH</sup>®

## Are you looking for more from your tooling?

After facing problems with chatter and chipping inserts, our customer, who machines fueling machine head rotors from ASTM A276 - 304L in the nuclear power industry, sought a better solution to their machining process.

The customer turned to Allied for help finding a new solution. Once the causes of insert failure and chatter were identified, our experienced team was able to create the best assembly suitable for the application. Using **Wohlhaupter's analogue balanced fine boring head** paired with the **NOVI<sup>TECH</sup> vibration dampening module**, they were able to eliminate the issues our customers were facing.

With the previous tooling, the customer achieved only 12 minutes of tool life, but with Allied's Wohlhaupter assembly, they achieved more than four times the life for 65 minutes!

Allied's Wohlhaupter assembly improved the machining process by making it more consistent and saved the customer money by reducing the cost per hole. If you are looking to save time and money, **give us a call, and we will help you find the right solution.**



|                    |  | Measure  | Competitor Boring Head | Wohlhaupter Fine Boring Head with NOVI <sup>TECH</sup> |
|--------------------|--|--|------------------------|--|
| <b>Product:</b>    | Wohlhaupter analogue balanced fine boring head with NOVI <sup>TECH</sup> | RPM  | 106                    | 372  |
| <b>Objectives:</b> | (1) Decrease cycle time<br>(2) Improve process                           | Speed Rate   | 40 M/min               | 140 M/min  |
| <b>Industry:</b>   | Renewable energy/energy  | Feed Rate  | 0.076 mm/rev           | 0.16 mm/rev  |
| <b>Part:</b>       | Nuclear fueling machine head rotor                                       | Penetration Rate   | 9 mm/min               | 60 mm/min  |
| <b>Material:</b>   | ASTM A276-304L   | Cycle Time   | 2 hr 10 min            | 17 min   |
| <b>Hole Ø:</b>     | 120 mm   | Tool Life  | 12 min                 | 65 min   |
| <b>Hole Depth:</b> | 1040 mm  | Wohlhaupter offered <b>93.32%</b> cost per hole savings over the competitor tooling. |                        |  |

- ▶ Analogue balanced fine boring head
- ▶ Boring insert  
Item No. 297994WHC111
- ▶ NOVI<sup>TECH</sup> vibration dampening intermediate module  
Item No. 519004

*86.92%  
cycle time reduction*



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

- ✓ Increased penetration rate
- ✓ Decreased cycle time
- ✓ Increased tool life
- ✓ Decreased cost per hole



# THE DEEP HOLE **10xD BORING SOLUTION** YOU'VE BEEN LOOKING FOR



## OUR **SOLUTION**

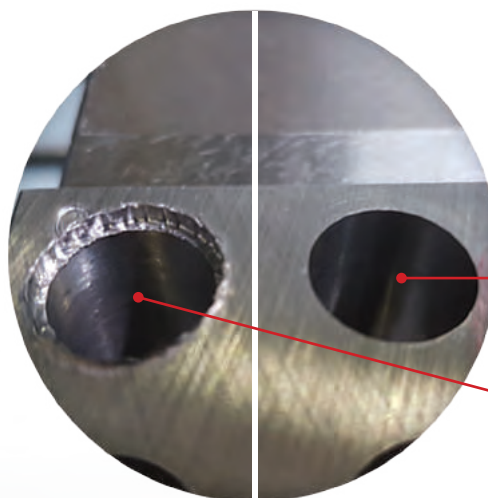
- ▶ Machine up to **10xD**
- ▶ Connect quickly and easily with the **MVS connection**
- ▶ Utilise existing **Wohlhaupter**® components
- ▶ **Increase** your productivity, surface quality, and process reliability
- ▶ **Increase** your tool and spindle life

## YOUR **ADVANTAGE**

Dampening module with viscoelastic bearing

Absorber mass

## THE SURFACE QUALITY TELLS IT ALL



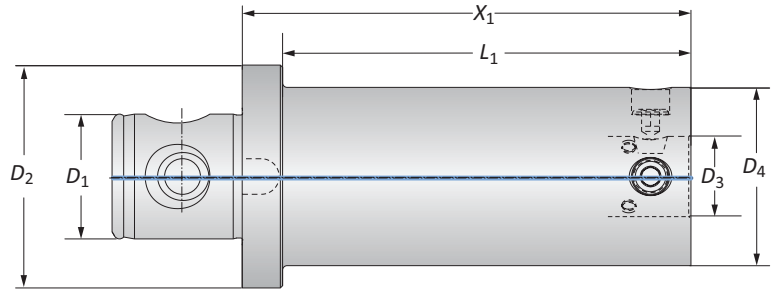
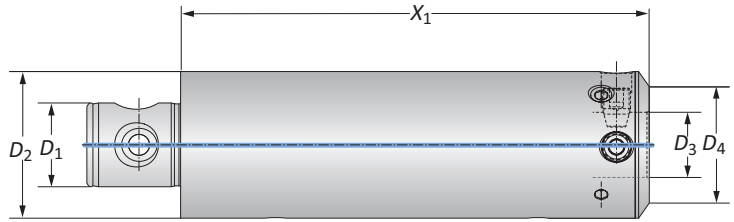
When our customer was machining alloy steel to 9xD, the NOVITECH provided reliable machining, which achieved high surface quality (Ra = 1 µm).

Wohlhaupter NOVITECH with VarioBore precision boring head

Standard tool construction with steel extension

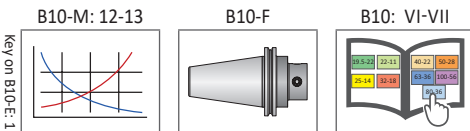
## NOVI<sup>TECH</sup>® Vibration Damping Intermediate Modules

Machining Diameter: 50.00 mm - 205.00 mm



|   | MVS Connection                  |                                 | NOVI <sup>TECH</sup> |                | Weight    | 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> |           |          |
| Ⓜ | 50 - 28*                        | 40 - 22                         | 200.00               | -              | 2.80 (kg) | 519002   |
|   | 63 - 36                         | 50 - 28                         | 200.00               | -              | 5.70 (kg) | 519003   |
|   | 80 - 36                         | 63 - 36                         | 200.00               | -              | 7.50 (kg) | 519004   |
|   | 80 - 36                         | 80 - 36                         | 200.00               | -              | 7.50 (kg) | 519005   |
|   | 100 - 56                        | 80 - 36                         | 200.00               | 182.00         | 9.90 (kg) | 519006   |

\*D<sub>2</sub> = 49.50 mm



Ⓜ = Metric (mm)

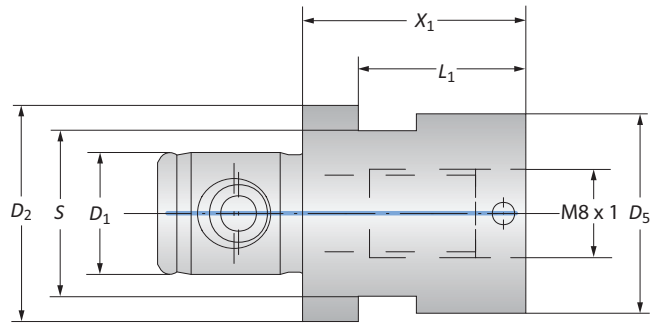
**IMPORTANT:** Max spindle speed refers to maximum possible speed for an individual boring head and is not a recommended parameter. Refer to page B10-M: 12 for recommended application-specific parameters. Factory technical assistance is available for your specific applications through our Application Engineering department. [email: engineering.eu@alliedmachine.com](mailto:engineering.eu@alliedmachine.com)

**⚠ WARNING Exceeding weight capacity for machine tool spindle and tool changer can cause machine damage and/or serious injury. To prevent:**  
 -Consult machine tool builder for machine's weight limitations.  
 -Refer to example on page B10-M: 11 for calculating tool assembly weight  
 Factory technical assistance is also available for specific applications through our Application Engineering department. [email: engineering.eu@alliedmachine.com](mailto:engineering.eu@alliedmachine.com)

**⚠ WARNING Tool failure can cause serious injury. To prevent:**  
 -Do not exceed recommended 10xD length-to-diameter ratio or exceed 4 total components (including shank)  
 -When using Alu-Line® components, do not exceed recommended 5xD length-to-diameter ratio  
 -When using tool steel components, do not exceed recommended 6xD length-to-diameter ratio  
 -When using heavy metal components, do not exceed recommended 8xD length-to-diameter ratio  
 -When using a carbide shank, do not exceed recommended 9xD length-to-diameter ratio  
 -When using a NOVITECH® module, do not exceed recommended 10xD length-to-diameter ratio  
 -Refer to examples on pages B10-M: 8-10 for calculating length-to-diameter ratio  
 Factory technical assistance is available for your specific applications through our Application Engineering department. [email: engineering.eu@alliedmachine.com](mailto:engineering.eu@alliedmachine.com)

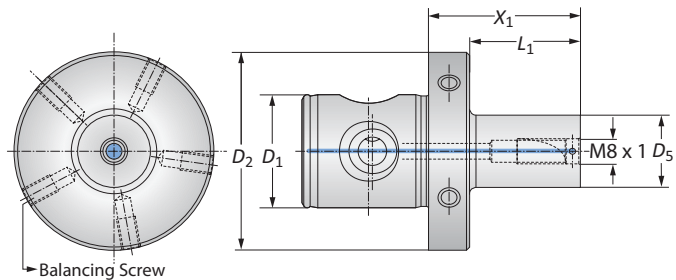
## 248 Adapters

Adapters | Balanced Adapters



### Adapters

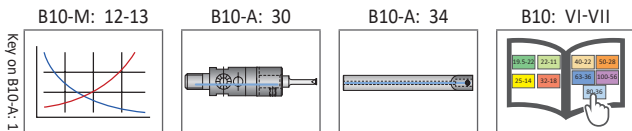
| MVS Connection | Boring Connection | Adapter       |       |       |       | Weight    | Service Key | Part No. |
|----------------|-------------------|---------------|-------|-------|-------|-----------|-------------|----------|
|                |                   | $D_2$   $D_1$ | $X_1$ | $L_1$ | $S$   |           |             |          |
| $19.5 - 11$    | M8 x 1            | 20.00         | 15.00 | 15/P  | 18.00 | 0.05 (kg) | 15 S / P    | 219168   |
| $23 - 11$      | M8 x 1            | 20.00         | -     | 19/P  | 23.00 | 0.07 (kg) | 19 S / P    | 219169   |



### Balanced Adapters

| MVS Connection | Boring Connection | Adapter       |       |       | Weight    | Balancing Screw | Part No. |
|----------------|-------------------|---------------|-------|-------|-----------|-----------------|----------|
|                |                   | $D_2$   $D_1$ | $X_1$ | $L_1$ |           |                 |          |
| $50 - 28$      | M8 x 1            | 32.00         | 19.00 | 15.00 | 0.35 (kg) | M6 x 1 x 10     | 219185   |
| $50 - 28$      | M8 x 1            | 48.00         | 35.00 | 18.00 | 0.40 (kg) | M6 x 1 x 10     | 219176   |
| $50 - 28$      | M8 x 1            | 48.00         | 35.00 | 23.00 | 0.45 (kg) | M6 x 1 x 10     | 219177   |

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



$\text{m}$  = Metric (mm)

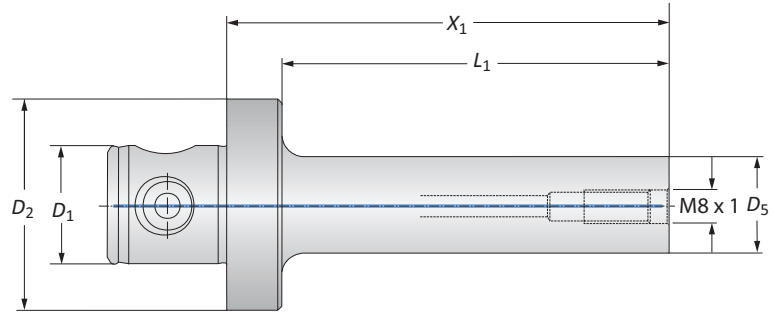
**IMPORTANT:** Max spindle speed refers to maximum possible speed for an individual boring head and is not a recommended parameter. Refer to page B10-M: 12 for recommended application-specific parameters. Factory technical assistance is available for your specific applications through our Application Engineering department. [email: engineering.eu@alliedmachine.com](mailto:engineering.eu@alliedmachine.com)


**WARNING** Exceeding weight capacity for machine tool spindle and tool changer can cause machine damage and/or serious injury. To prevent:  
 -Consult machine tool builder for machine's weight limitations.  
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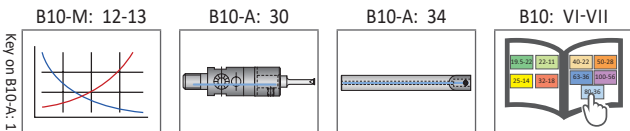
**WARNING** Tool failure can cause serious injury. To prevent:  
 -Do not exceed recommended 10xD length-to-diameter ratio or exceed 4 total components (including shank)  
 -When using Alu-Line® components, do not exceed recommended 5xD length-to-diameter ratio  
 -When using tool steel components, do not exceed recommended 6xD length-to-diameter ratio  
 -When using heavy metal components, do not exceed recommended 8xD length-to-diameter ratio  
 -When using a carbide shank, do not exceed recommended 9xD length-to-diameter ratio  
 -When using a NOVITECH® module, do not exceed recommended 10xD length-to-diameter ratio  
 -Refer to examples on pages B10-M: 8-10 for calculating length-to-diameter ratio  
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## 248 Adapters

### Vibration Reducing Heavy Metal Adapters



| MVS Connection  | Adapter     |                   |        |       |       |           |          |
|---|-------------|-------------------|--------|-------|-------|-----------|----------|
|   | $D_2   D_1$ | Boring Connection | $X_1$  | $L_1$ | $D_5$ | Weight    | Part No. |
|  | 50 - 28     | M8 x 1            | 68.00  | 55.00 | 15.00 | 0.80 (kg) | 248147   |
|   | 50 - 28     | M8 x 1            | 84.00  | 71.00 | 19.00 | 1.00 (kg) | 248148   |
|   | 50 - 28     | M8 x 1            | 104.00 | 91.00 | 23.00 | 1.30 (kg) | 248149   |



 = Metric (mm)

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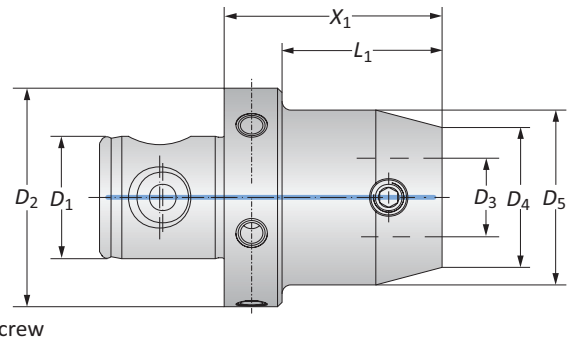
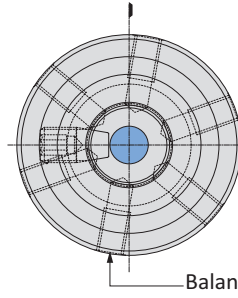
**⚠ WARNING Exceeding weight capacity for machine tool spindle and tool changer can cause machine damage and/or serious injury. To prevent:**  
 -Consult machine tool builder for machine's weight limitations.  
 -Refer to example on page B10-M: 11 for calculating tool assembly weight  
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**⚠ WARNING Tool failure can cause serious injury. To prevent:**  
 -Do not exceed recommended 10xD length-to-diameter ratio or exceed 4 total components (including shank)  
 -When using Alu-Line® components, do not exceed recommended 5xD length-to-diameter ratio  
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 -When using heavy metal components, do not exceed recommended 8xD length-to-diameter ratio  
 -When using a carbide shank, do not exceed recommended 9xD length-to-diameter ratio  
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Reducers

Balanced

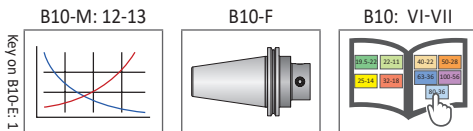


Balancing Screw

| MVS Connection                  |                                 | Reducer        |                |                |           | Weight      | Balancing Screw | 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> |           |             |                 |          |
| 25 - 14                         | 19.5 - 11                       | 30.00          | 21.00          | -              | 0.10 (kg) | -           | 219034          |          |
| 25 - 14                         | 22 - 11                         | 30.00          | 21.00          | -              | 0.20 (kg) | -           | 219035          |          |
| 32 - 18                         | 22 - 11                         | 12.00          | 0.50           | -              | 0.10 (kg) | -           | 219036          |          |
| 32 - 18                         | 25 - 14                         | 30.00          | 21.00          | -              | 0.10 (kg) | -           | 219037          |          |
| 40 - 22                         | 22 - 11                         | 12.00          | 0.50           | -              | 0.20 (kg) | -           | 219038          |          |
| 40 - 22                         | 25 - 14                         | 30.00          | 21.00          | -              | 0.20 (kg) | -           | 219039          |          |
| 40 - 22                         | 32 - 18                         | 30.00          | -              | 40.00          | 0.50 (kg) | -           | 219040          |          |
| 50 - 28                         | 19.5 - 11                       | 54.00          | 41.00          | -              | 0.40 (kg) | M6 x 1 x 10 | 219051          |          |
| 50 - 28                         | 22 - 11                         | 14.00          | 0.50           | -              | 0.30 (kg) | M6 x 1 x 10 | 219041          |          |
| 50 - 28                         | 22 - 11                         | 54.00          | 41.00          | -              | 0.40 (kg) | M6 x 1 x 10 | 219052          |          |
| 50 - 28                         | 25 - 14                         | 14.00          | 0.50           | -              | 0.30 (kg) | M6 x 1 x 7  | 119094          |          |
| 50 - 28                         | 25 - 14                         | 59.00          | 46.00          | -              | 0.40 (kg) | M6 x 1 x 10 | 119054          |          |
| 50 - 28                         | 25 - 14                         | 59.00          | 46.00          | 32.00          | 0.50 (kg) | M6 x 1 x 10 | 119055          |          |
| 50 - 28                         | 25 - 14                         | 119.00         | 106.00         | 32.00          | 0.90 (kg) | M6 x 1 x 10 | 119010          |          |
| 50 - 28                         | 25 - 14                         | 119.00         | 106.00         | 36.00          | 1.00 (kg) | M6 x 1 x 10 | 219030*         |          |
| 50 - 28                         | 32 - 18                         | 49.00          | 36.00          | 35.00          | 0.90 (kg) | M6 x 1 x 10 | 219085          |          |
| 50 - 28                         | 32 - 18                         | 109.00         | 96.00          | 35.00          | 1.00 (kg) | M6 x 1 x 10 | 219086          |          |
| 50 - 28                         | 32 - 18                         | 109.00         | 96.00          | 40.00          | 1.10 (kg) | M6 x 1 x 10 | 119012          |          |
| 50 - 28                         | 32 - 18                         | 109.00         | 96.00          | 46.00          | 1.30 (kg) | M6 x 1 x 10 | 219032*         |          |
| 50 - 28                         | 40 - 22                         | 40.00          | 27.00          | -              | 0.50 (kg) | M6 x 1 x 10 | 219087          |          |
| 50 - 28                         | 40 - 22                         | 100.00         | 87.00          | 47.00          | 1.30 (kg) | M6 x 1 x 10 | 219088          |          |
| 50 - 28                         | 63 - 36                         | 50.00          | -              | -              | 1.00 (kg) | M6 x 1 x 10 | 119059          |          |

\*Reinforced reducer

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



Ⓜ = Metric (mm)

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**⚠ WARNING** Exceeding weight capacity for machine tool spindle and tool changer can cause machine damage and/or serious injury. To prevent:  
 -Consult machine tool builder for machine's weight limitations.  
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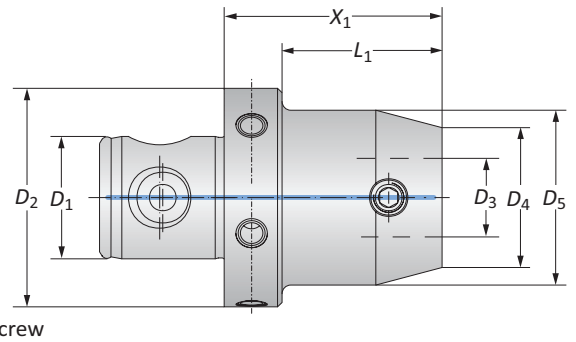
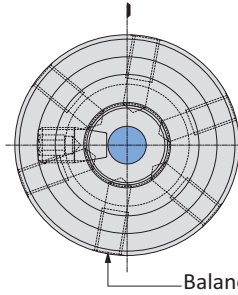
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 -When using Alu-Line® components, do not exceed recommended 5xD length-to-diameter ratio  
 -When using tool steel components, do not exceed recommended 6xD length-to-diameter ratio  
 -When using heavy metal components, do not exceed recommended 8xD length-to-diameter ratio  
 -When using a carbide shank, do not exceed recommended 9xD length-to-diameter ratio  
 -When using a NOVITECH® module, do not exceed recommended 10xD length-to-diameter ratio  
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## Reducers

Balanced

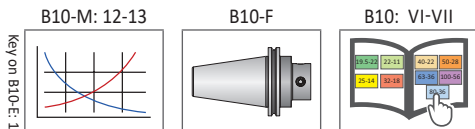


| MVS Connection                  |                                 | Reducer        |                |                | Weight    | Balancing Screw | Part No. |
|---------------------------------|---------------------------------|----------------|----------------|----------------|-----------|-----------------|----------|
| 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          | -              | 0.60 (kg) | M6 x 1 x 10     | 219053   |
| 63 - 36                         | 22 - 11                         | 14.00          | 0.50           | -              | 0.60 (kg) | M6 x 1 x 10     | 219042   |
| 63 - 36                         | 22 - 11                         | 54.00          | 41.00          | -              | 0.70 (kg) | M6 x 1 x 10     | 219054   |
| 63 - 36                         | 25 - 14                         | 14.00          | 0.50           | -              | 0.60 (kg) | M6 x 1 x 10     | 119095   |
| 63 - 36                         | 25 - 14                         | 59.00          | 46.00          | -              | 0.70 (kg) | M6 x 1 x 10     | 119060   |
| 63 - 36                         | 25 - 14                         | 59.00          | 46.00          | 32.00          | 0.80 (kg) | M6 x 1 x 10     | 119061   |
| 63 - 36                         | 25 - 14                         | 119.00         | 106.00         | 32.00          | 1.10 (kg) | M6 x 1 x 15     | 119019   |
| 63 - 36                         | 25 - 14                         | 119.00         | 106.00         | 36.00          | 1.30 (kg) | M6 x 1 x 10     | 219031*  |
| 63 - 36                         | 32 - 18                         | 49.00          | 36.00          | 35.00          | 0.70 (kg) | M6 x 1 x 10     | 219089   |
| 63 - 36                         | 32 - 18                         | 109.00         | 96.00          | 35.00          | 1.20 (kg) | M6 x 1 x 10     | 219090   |
| 63 - 36                         | 32 - 18                         | 109.00         | 96.00          | 40.00          | 1.40 (kg) | M6 x 1 x 10     | 119021   |
| 63 - 36                         | 32 - 18                         | 109.00         | 96.00          | 46.00          | 1.60 (kg) | M6 x 1 x 10     | 219033*  |
| 63 - 36                         | 40 - 22                         | 40.00          | 27.00          | -              | 0.80 (kg) | M6 x 1 x 10     | 219091   |
| 63 - 36                         | 40 - 22                         | 100.00         | 87.00          | 47.00          | 1.60 (kg) | M6 x 1 x 15     | 219092   |
| 63 - 36                         | 40 - 22                         | 150.00         | 137.00         | 50.00          | 2.40 (kg) | M6 x 1 x 15     | 119067   |
| 63 - 36                         | 50 - 28                         | 40.00          | -              | 63.00          | 1.00 (kg) | M6 x 1 x 10     | 119064   |
| 63 - 36                         | 50 - 28                         | 40.00          | 27.00          | -              | 0.80 (kg) | M6 x 1 x 10     | 119096** |
| 63 - 36                         | 50 - 28                         | 100.00         | -              | 63.00          | 2.40 (kg) | M6 x 1 x 15     | 119025   |
| 63 - 36                         | 50 - 28                         | 100.00         | 87.00          | -              | 1.70 (kg) | M6 x 1 x 10     | 119097** |
| 80 - 36                         | 63 - 36                         | 50.00          | -              | 80.00          | 1.60 (kg) | M6 x 1 x 15     | 119098   |
| 100 - 56                        | 80 - 36                         | 70.00          | 52.00          | -              | 3.60 (kg) | M8 x 1.25 x 20  | 219066   |

\* Reinforced reducer

\*\*For milling applications

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



Key on B10-E: 1

= Metric (mm)

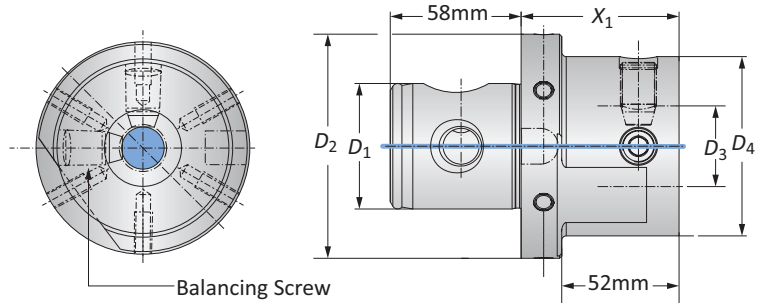
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## Reducer

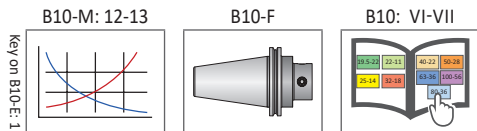
Balanced Alu-Line



Balancing Screw

| MVS Connection      | Reducer     |             | Weight | Balancing Screw | Part No.       |        |
|---------------------|-------------|-------------|--------|-----------------|----------------|--------|
|                     | $D_2   D_1$ | $D_4   D_3$ |        |                 |                | $X_1$  |
| $\text{m}$ 100 - 56 | 80 - 36     | 70.00       | 52.00  | 1.30 (kg)       | M8 x 1.25 x 20 | 319013 |

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



$\text{m}$  = Metric (mm)

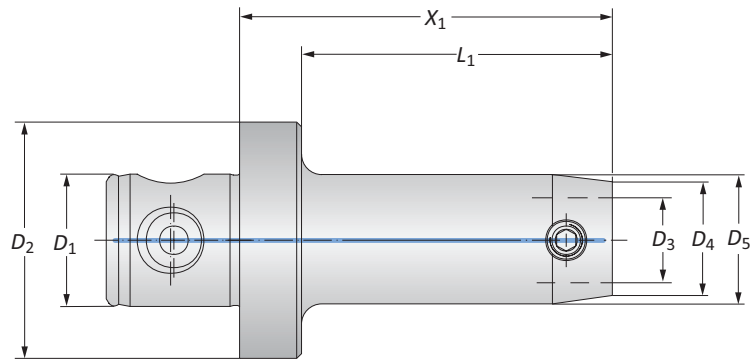
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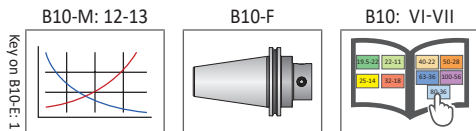
## Heavy Metal Reducers

### 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     | 90.00               | 77.00  | –     | 1.00 (kg) | 219055   |
| 50 - 28        | 22 - 11       | 110.00              | 97.00  | 23.00 | 1.30 (kg) | 219056   |
| 50 - 28        | 25 - 14       | 124.00              | 111.00 | 28.00 | 1.70 (kg) | 219057   |
| 50 - 28        | 25 - 14       | 144.00              | 131.00 | 32.00 | 2.30 (kg) | 219058   |
| 50 - 28        | 25 - 14       | 164.00              | 151.00 | 35.00 | 2.90 (kg) | 219059   |
| 50 - 28        | 32 - 18       | 154.00              | 141.00 | 37.00 | 2.90 (kg) | 219093   |
| 50 - 28        | 32 - 18       | 154.00              | 141.00 | 42.00 | 3.70 (kg) | 219060   |

**NOTE:** Heavy metal reducers are used to reduce vibration when machining deep boring applications. When using heavy metal reducers, the maximum cutting speed ( $V_c$ ) is 200 M/min. If steel extensions are also used, reduce the cutting speed by 50% and use replaceable inserts where  $r = 0.10$  mm.



 = Metric (mm)

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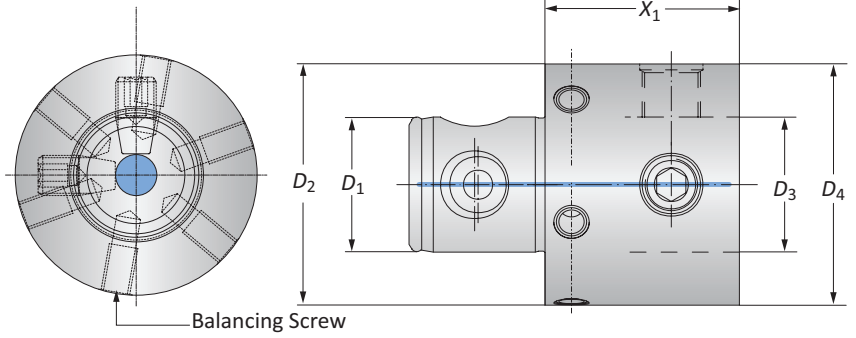
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 -When using heavy metal components, do not exceed recommended 8xD length-to-diameter ratio  
 -When using a carbide shank, do not exceed recommended 9xD length-to-diameter ratio  
 -When using a NOVITECH® module, do not exceed recommended 10xD length-to-diameter ratio  
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Extensions

Balanced



|   | MVS Connection                  |                                 | Extension | Weight     | Balancing Screw | Part No. |
|---|---------------------------------|---------------------------------|-----------|------------|-----------------|----------|
|   | D <sub>2</sub>   D <sub>1</sub> | D <sub>4</sub>   D <sub>3</sub> |           |            |                 |          |
|   | 19.5 - 11                       | 19.5 - 11                       | 40.00     | 0.10 (kg)  | -               | 219043   |
|   | 22 - 11                         | 22 - 11                         | 40.00     | 0.10 (kg)  | -               | 219044   |
|   | 25 - 14                         | 25 - 14                         | 25.00     | 0.10 (kg)  | -               | 219068   |
|   | 25 - 14                         | 25 - 14                         | 40.00     | 0.10 (kg)  | -               | 119001   |
|   | 32 - 18                         | 32 - 18                         | 40.00     | 0.20 (kg)  | -               | 119002   |
|   | 40 - 22                         | 40 - 22                         | 40.00     | 0.40 (kg)  | -               | 119003   |
|   | 50 - 28                         | 50 - 28                         | 40.00     | 0.60 (kg)  | M6 x 1 x 10     | 119004   |
|   | 50 - 28*                        | 50 - 28*                        | 75.00     | 1.10 (kg)  | M6 x 1 x 10     | 219097   |
|   | 50 - 28                         | 50 - 28                         | 75.00     | 1.10 (kg)  | M6 x 1 x 10     | 219082   |
|   | 50 - 28                         | 50 - 28                         | 100.00    | 1.50 (kg)  | M6 x 1 x 10     | 119058   |
| Ⓜ | 63 - 36                         | 63 - 36                         | 50.00     | 1.10 (kg)  | M6 x 1 x 10     | 119005   |
|   | 63 - 36                         | 63 - 36                         | 75.00     | 1.70 (kg)  | M6 x 1 x 15     | 219083   |
|   | 63 - 36                         | 63 - 36                         | 125.00    | 2.90 (kg)  | M6 x 1 x 15     | 119065   |
|   | 80 - 36                         | 80 - 36                         | 50.00     | 1.90 (kg)  | M6 x 1 x 15     | 119006   |
|   | 80 - 36                         | 80 - 36                         | 75.00     | 2.80 (kg)  | M6 x 1 x 15     | 219084   |
|   | 80 - 36                         | 80 - 36                         | 125.00    | 4.80 (kg)  | M6 x 1 x 15     | 119066   |
|   | 80 - 36                         | 80 - 36                         | 200.00    | 7.40 (kg)  | M8 x 1.25 x 21  | 219094   |
|   | 80 - 36                         | 80 - 36                         | 275.00    | 10.10 (kg) | M8 x 1.25 x 21  | 119069   |
|   | 100 - 56                        | 100 - 56                        | 75.00     | 4.30 (kg)  | M8 x 1.25 x 20  | 219095   |
|   | 100 - 56                        | 100 - 56                        | 100.00    | 5.60 (kg)  | M8 x 1.25 x 20  | 219061   |
|   | 100 - 56                        | 100 - 56                        | 150.00    | 8.10 (kg)  | M8 x 1.25 x 20  | 219096   |
|   | 100 - 56                        | 100 - 56                        | 200.00    | 10.20 (kg) | M8 x 1.25 x 20  | 219062   |
|   | 100 - 56                        | 100 - 56                        | 300.00    | 14.60 (kg) | M8 x 1.25 x 20  | 219063   |

\*D<sub>2</sub> / D<sub>4</sub> = 49.50 mm for boring 50.00 mm diameter applications  
 NOTE: Balance refers to a specific residual imbalance of ≤ 10 g mm/kg

B10-M: 12-13

B10-F

B10: VI-VII

Key on B10-E: 1

Ⓜ = Metric (mm)

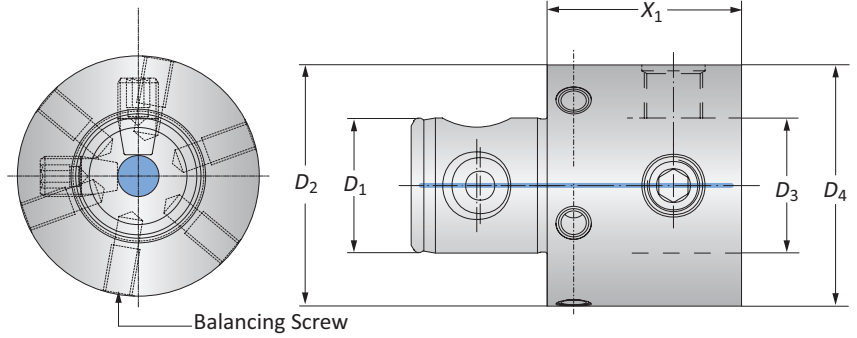
**IMPORTANT:** Max spindle speed refers to maximum possible speed for an individual boring head and is not a recommended parameter. Refer to page B10-M: 12 for recommended application-specific parameters. Factory technical assistance is available for your specific applications through our Application Engineering department. email: [engineering.eu@alliedmachine.com](mailto:engineering.eu@alliedmachine.com)

**⚠ WARNING** Exceeding weight capacity for machine tool spindle and tool changer can cause machine damage and/or serious injury. To prevent:  
 -Consult machine tool builder for machine's weight limitations.  
 -Refer to example on page B10-M: 11 for calculating tool assembly weight  
 Factory technical assistance is also available for specific applications through our Application Engineering department. email: [engineering.eu@alliedmachine.com](mailto:engineering.eu@alliedmachine.com)

**⚠ WARNING** Tool failure can cause serious injury. To prevent:  
 -Do not exceed recommended 10xD length-to-diameter ratio or exceed 4 total components (including shank)  
 -When using Alu-Line® components, do not exceed recommended 5xD length-to-diameter ratio  
 -When using tool steel components, do not exceed recommended 6xD length-to-diameter ratio  
 -When using heavy metal components, do not exceed recommended 8xD length-to-diameter ratio  
 -When using a carbide shank, do not exceed recommended 9xD length-to-diameter ratio  
 -When using a NOVITECH® module, do not exceed recommended 10xD length-to-diameter ratio  
 -Refer to examples on pages B10-M: 8-10 for calculating length-to-diameter ratio  
 Factory technical assistance is available for your specific applications through our Application Engineering department. email: [engineering.eu@alliedmachine.com](mailto:engineering.eu@alliedmachine.com)

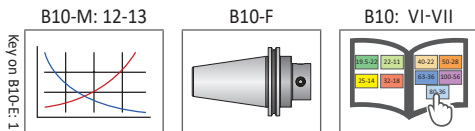
## Extensions

### Balanced Alu-Line



| MVS Connection |               | Modules |           |                 |          |  |
|----------------|---------------|---------|-----------|-----------------|----------|--|
| $D_2$   $D_1$  | $D_4$   $D_3$ | $X_1$   | Weight    | Balancing Screw | Part No. |  |
| 50 - 28        | 50 - 28       | 40.00   | 0.20 (kg) | M6 x 1 x 8      | 319021   |  |
| 50 - 28        | 50 - 28       | 75.00   | 0.40 (kg) | M6 x 1 x 10     | 319022   |  |
| 50 - 28        | 50 - 28       | 100.00  | 0.60 (kg) | M6 x 1 x 10     | 319023   |  |
| 63 - 36        | 63 - 36       | 50.00   | 0.40 (kg) | M6 x 1 x 8      | 319002   |  |
| 63 - 36        | 63 - 36       | 125.00  | 1.10 (kg) | M6 x 1 x 10     | 319003   |  |
| 80 - 36        | 80 - 36       | 50.00   | 0.70 (kg) | M6 x 1 x 10     | 319004   |  |
| 80 - 36        | 80 - 36       | 75.00   | 1.00 (kg) | M6 x 1 x 10     | 319016   |  |
| 80 - 36        | 80 - 36       | 125.00  | 1.80 (kg) | M6 x 1 x 10     | 319005   |  |
| 80 - 36        | 80 - 36       | 200.00  | 2.70 (kg) | M6 x 1 x 10     | 319017   |  |
| 80 - 36        | 80 - 36       | 275.00  | 3.70 (kg) | M6 x 1 x 10     | 319006   |  |
| 100 - 56       | 100 - 56      | 75.00   | 1.50 (kg) | M8 x 1.25 x 20  | 319019   |  |
| 100 - 56       | 100 - 56      | 100.00  | 2.20 (kg) | M8 x 1.25 x 20  | 319007   |  |
| 100 - 56       | 100 - 56      | 150.00  | 3.00 (kg) | M8 x 1.25 x 20  | 319018   |  |
| 100 - 56       | 100 - 56      | 200.00  | 3.80 (kg) | M8 x 1.25 x 20  | 319008   |  |
| 100 - 56       | 100 - 56      | 300.00  | 5.40 (kg) | M8 x 1.25 x 20  | 319009   |  |

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



$\text{mm}$  = Metric (mm)

**IMPORTANT:** Max spindle speed refers to maximum possible speed for an individual boring head and is not a recommended parameter. Refer to page B10-M: 12 for recommended application-specific parameters. Factory technical assistance is available for your specific applications through our Application Engineering department. [email: engineering.eu@alliedmachine.com](mailto:engineering.eu@alliedmachine.com)

**WARNING** Exceeding weight capacity for machine tool spindle and tool changer can cause machine damage and/or serious injury. To prevent:  
 -Consult machine tool builder for machine's weight limitations.  
 -Refer to example on page B10-M: 11 for calculating tool assembly weight  
 Factory technical assistance is also available for specific applications through our Application Engineering department. [email: engineering.eu@alliedmachine.com](mailto:engineering.eu@alliedmachine.com)

**WARNING** Tool failure can cause serious injury. To prevent:  
 -Do not exceed recommended 10xD length-to-diameter ratio or exceed 4 total components (including shank)  
 -When using Alu-Line® components, do not exceed recommended 5xD length-to-diameter ratio  
 -When using tool steel components, do not exceed recommended 6xD length-to-diameter ratio  
 -When using heavy metal components, do not exceed recommended 8xD length-to-diameter ratio  
 -When using a carbide shank, do not exceed recommended 9xD length-to-diameter ratio  
 -When using a NOVITECH® module, do not exceed recommended 10xD length-to-diameter ratio  
 -Refer to examples on pages B10-M: 8-10 for calculating length-to-diameter ratio  
 Factory technical assistance is available for your specific applications through our Application Engineering department. [email: engineering.eu@alliedmachine.com](mailto:engineering.eu@alliedmachine.com)

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SECTION

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# B10-F

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Master Shanks with MVS Connection

# Wohlhaupter® Master Shanks with MVS Connection



## The MVS Connection

Wohlhaupter MVS connection shanks provide a high level of accuracy when building or replacing components. Our master shanks adapt to any machine tool spindle, making it easy to find the shank you need.

Your safety and the safety of others is very important. This catalogue 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 catalogue, 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 catalogue. 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

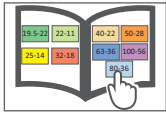


Renewable Energy

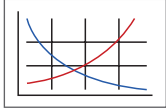
## Master Shanks with MVS Connection Table of Contents

### Reference Icons

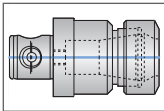
The following icons will appear throughout the catalogue to help you navigate between products.



**MVS Connection Colour 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

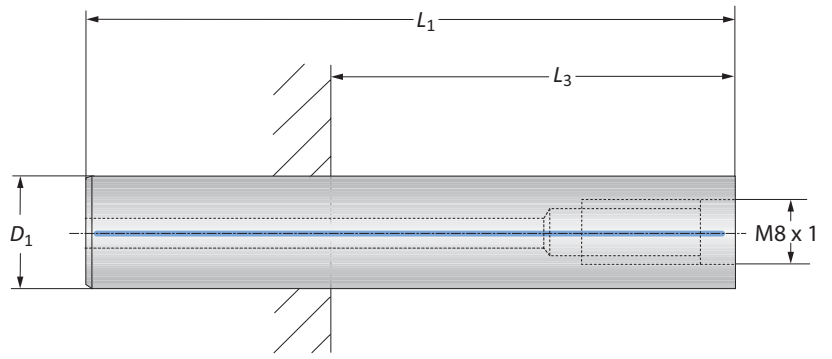
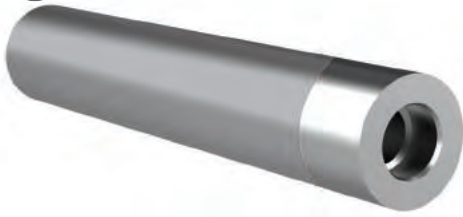


**Through Coolant Option**  
Indicates that the product is through coolant

|  |         |
|--|---------|
| <b>248 Shanks</b> . . . . .                                    | 2       |
| <b>Carbide Shanks</b> . . . . .                                | 3       |
| <b>HSK Shanks (DIN 69893)</b> . . . . .                        | 4       |
| <b>Polygon Shaft Shanks (PSC) (ISO26623-1)</b> . . . . .       | 5       |
| <b>CAT Shanks with Metric Threads</b> . . . . .                | 6       |
| <b>Dual Contact SK Shanks (DIN 69871-AD / BD)</b> . . . . .    | 7       |
| <b>SK Shanks (DIN 69871-AD / B-D)</b> . . . . .                | 8       |
| <b>Dual Contact BT Shanks (JIS B 6339)</b> . . . . .           | 9       |
| <b>BT Shanks (JIS B 6339)</b> . . . . .                        | 10      |
| <b>NMTB Shanks</b> . . . . .                                   | 11      |
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## 248 Shanks

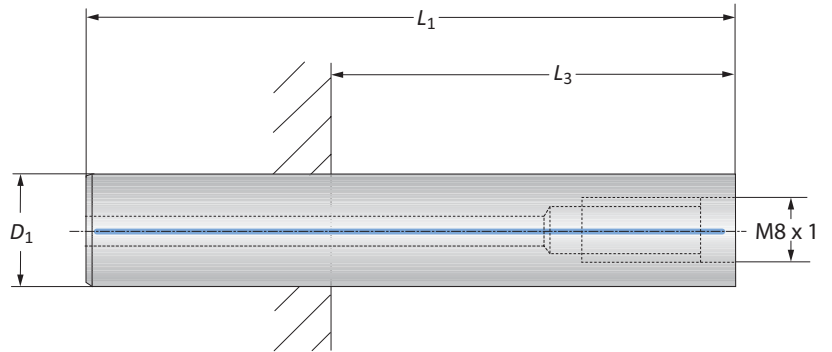
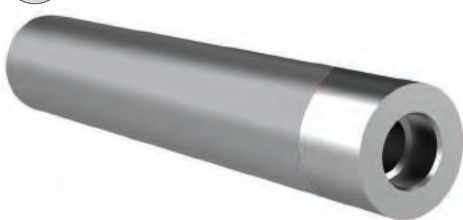
Steel | Carbide



### Steel Shanks

| Connection | Shank |        |            | $L_3$ min* |          |           |           | Weight | Part No. |
|------------|-------|--------|------------|------------|----------|-----------|-----------|--------|----------|
|            | $D_1$ | $L_1$  | $L_3$ max* | SK 40+50   | HSK-A 63 | HSK-A 100 |           |        |          |
| M8 x 1     | 15.00 | 85.00  | 37.00      | –          | –        | –         | 0.10 (kg) | 248136 |          |
| M8 x 1     | 18.00 | 100.00 | 52.00      | –          | 5.00     | 12.00     | 0.20 (kg) | 248137 |          |
| M8 x 1     | 23.00 | 117.00 | 69.00      | –          | 22.00    | 29.00     | 0.40 (kg) | 248138 |          |

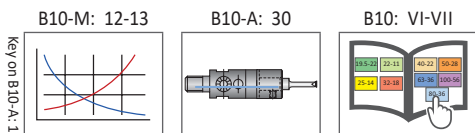
\* $L_3$  dimensions apply to collet chucks



### Carbide Shanks

| Connection | Shank |        |            | $L_3$ min* |        |          |           | Weight    | Part No. |
|------------|-------|--------|------------|------------|--------|----------|-----------|-----------|----------|
|            | $D_1$ | $L_1$  | $L_3$ max* | SK 40      | SK 50  | HSK-A 63 | HSK-A 100 |           |          |
| M8 x 1     | 15.00 | 130.00 | 82.00      | 20.00      | 20.00  | 35.00    | 42.00     | 0.30 (kg) | 248142   |
| M8 x 1     | 18.00 | 155.00 | 107.00     | 39.00      | 21.00  | 60.00    | 67.00     | 0.60 (kg) | 248143   |
| M8 x 1     | 23.00 | 180.00 | 132.00     | 64.00      | 46.00  | 85.00    | 92.00     | 1.10 (kg) | 248144   |
| M8 x 1     | 23.00 | 242.00 | 194.00     | 126.00     | 108.00 | 147.00   | 154.00    | 1.40 (kg) | 248145   |

\* $L_3$  dimensions apply to collet chucks



Ⓜ = Metric (mm)

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

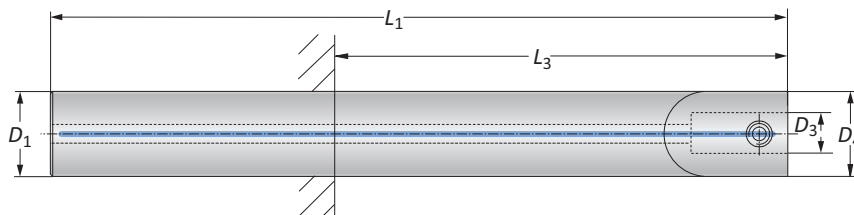
- Consult machine tool builder for machine's weight limitations.
- Refer to example on page B10-M: 11 for calculating tool assembly weight
- Factory technical assistance is also available for specific applications through our Application Engineering department. *email: engineering.eu@alliedmachine.com*

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

- Do not exceed recommended 10xD length-to-diameter ratio or exceed 4 total components (including shank)
- When using Alu-Line® components, do not exceed recommended 5xD length-to-diameter ratio
- When using tool steel components, do not exceed recommended 6xD length-to-diameter ratio
- When using heavy metal reducers, do not exceed recommended 8xD length-to-diameter ratio
- When using a carbide shank, do not exceed recommended 9xD length-to-diameter ratio
- When using a NOVITECH® module, do not exceed recommended 10xD length-to-diameter ratio
- Refer to examples on pages B10-M: 8-10 for calculating length-to-diameter ratio
- Factory technical assistance is available for your specific applications through our Application Engineering department. *email: engineering.eu@alliedmachine.com*

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## Carbide Master Shanks

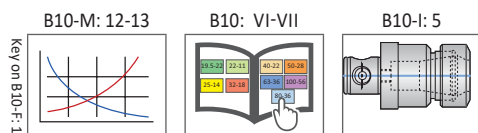


| Connection | Shank         |        |       | $L_3$ min |        |        |          | Weight    | Part No.  |           |
|------------|---------------|--------|-------|-----------|--------|--------|----------|-----------|-----------|-----------|
|            | $D_4$   $D_3$ | $L_1$  | $D_1$ | $L_3$ max | SK 40  | SK 50  | HSK-A 63 |           |           | HSK-A 100 |
| M          | 18 - 11       | 155.00 | 18.00 | 107.00    | 39.00  | 26.00  | 60.00    | 67.00     | 0.50 (kg) | 299009*   |
|            | 22 - 11       | 140.00 | 22.00 | 92.00     | 28.00  | 28.00  | 45.00    | 52.00     | 0.70 (kg) | 299001*   |
|            | 22 - 11       | 190.00 | 22.00 | 142.00    | 74.00  | 56.00  | 95.00    | 102.00    | 0.90 (kg) | 299002*   |
|            | 22 - 11       | 231.00 | 22.00 | 183.00    | 115.00 | 97.00  | 136.00   | 143.00    | 1.10 (kg) | 299003*   |
|            | 25 - 14       | 165.00 | 25.00 | 117.00    | 49.00  | 36.00  | 70.00    | 77.00     | 1.00 (kg) | 299004*   |
|            | 25 - 14       | 215.00 | 25.00 | 167.00    | 99.00  | 81.00  | 120.00   | 127.00    | 1.30 (kg) | 299005*   |
|            | 32 - 18       | 210.00 | 32.00 | -         | 136.00 | 136.00 | 139.00   | 137.00    | 2.10 (kg) | 299006**  |
|            | 32 - 18       | 260.00 | 32.00 | -         | 186.00 | 186.00 | 189.00   | 187.00    | 2.60 (kg) | 299007**  |
| 40 - 22    | 415.00        | 40.00  | -     | -         | 333.00 | -      | 333.00   | 5.20 (kg) | 299008**  |           |

**NOTE:** Adapter shanks are used for extensions up to 10xD

\*Recommended clamping element: collet chuck ISO 15488 (DIN 6499-B) (pg. B10-I: 5)

\*\*Recommended clamping element: collet chuck ISO 10897 (DIN 6388) (pg. B10-I: 5)



M = Metric (mm)

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

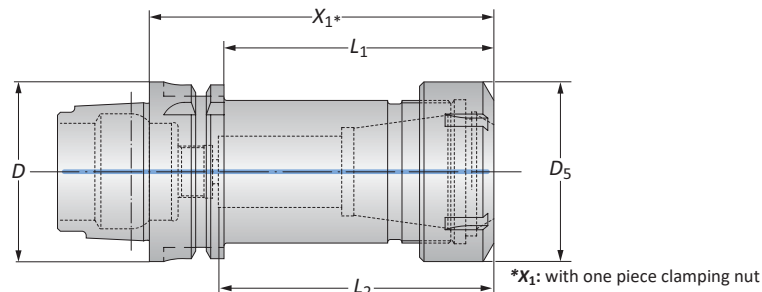
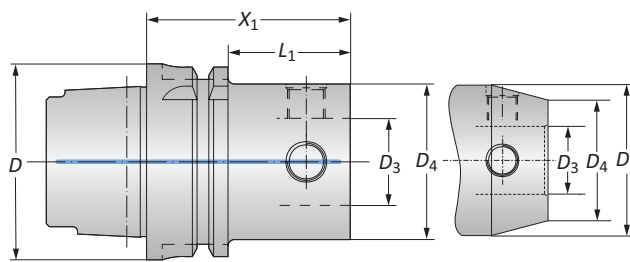
- Consult machine tool builder for machine's weight limitations.
- Refer to example on page B10-M: 11 for calculating tool assembly weight
- Factory technical assistance is also available for specific applications through our Application Engineering department. *email: engineering.eu@alliedmachine.com*

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

- Do not exceed recommended 10xD length-to-diameter ratio or exceed 4 total components (including shank)
- When using Alu-Line® components, do not exceed recommended 5xD length-to-diameter ratio
- When using tool steel components, do not exceed recommended 6xD length-to-diameter ratio
- When using heavy metal reducers, do not exceed recommended 8xD length-to-diameter ratio
- When using a carbide shank, do not exceed recommended 9xD length-to-diameter ratio
- When using a NOVI<sup>TECH</sup>® module, do not exceed recommended 10xD length-to-diameter ratio
- Refer to examples on pages B10-M: 8-10 for calculating length-to-diameter ratio
- Factory technical assistance is available for your specific applications through our Application Engineering department. *email: engineering.eu@alliedmachine.com*

## HSK Master Shanks (DIN 69893)

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> |            |          |
| 40         | 40 - 22    | 56.00  | -                               | -              | -              | 0.40 (kg)  | 246016   |
| 40         | 50 - 28    | 70.00  | -                               | -              | -              | 0.70 (kg)  | 246004   |
| 50         | 40 - 22    | 56.00  | 30.00                           | -              | -              | 0.60 (kg)  | 246015   |
| 50         | 50 - 28    | 65.00  | -                               | -              | -              | 0.80 (kg)  | 245011   |
| 63         | 25 - 14    | 46.00  | 20.00                           | -              | -              | 0.70 (kg)  | 246012   |
| 63         | 32 - 18    | 56.00  | 30.00                           | -              | -              | 0.80 (kg)  | 246013   |
| 63         | 40 - 22    | 56.00  | 30.00                           | -              | -              | 0.80 (kg)  | 246014   |
| 63         | 50 - 28    | 65.00  | 39.00                           | -              | -              | 1.10 (kg)  | 245012   |
| 63         | 63 - 36    | 80.00  | -                               | -              | -              | 1.50 (kg)  | 245013   |
| 63         | 80 - 36    | 80.00  | -                               | -              | -              | 2.10 (kg)  | 246009   |
| 63         | ER 40      | 120.00 | 94.00                           | 95.00          | 63.00          | 1.70 (kg)  | 252090** |
| 100        | 50 - 28    | 65.00  | 36.00                           | -              | -              | 2.40 (kg)  | 245014   |
| 100        | 50 - 28    | 180.00 | 151.00                          | -              | 60.00          | 5.00 (kg)  | 246020   |
| 100        | 50 - 28*   | 180.00 | 151.00                          | -              | -              | 4.00 (kg)  | 246021   |
| 100        | 63 - 36    | 80.00  | 51.00                           | -              | -              | 2.90 (kg)  | 245015   |
| 100        | 63 - 36    | 205.00 | 176.00                          | -              | 78.00          | 7.80 (kg)  | 246019   |
| 100        | 63 - 36    | 205.00 | 176.00                          | -              | -              | 7.80 (kg)  | 246022   |
| 100        | 80 - 36    | 80.00  | 51.00                           | -              | -              | 3.70 (kg)  | 245016   |
| 100        | 80 - 36    | 255.00 | 226.00                          | -              | 90.00          | 12.60 (kg) | 246018   |
| 100        | 80 - 36    | 255.00 | 226.00                          | -              | -              | 10.40 (kg) | 246023   |
| 100        | 100 - 56   | 100.00 | -                               | -              | -              | 5.00 (kg)  | 246010   |
| 100        | 100 - 56   | 300.00 | 221.00                          | -              | -              | 17.50 (kg) | 246017   |
| 100        | ER 40      | 120.00 | 91.00                           | 88.00          | 63.00          | 3.50 (kg)  | 252091** |

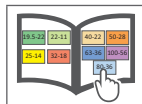
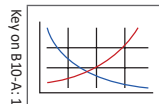
**NOTE:** Balanced refers to a specific residual imbalance of ≤4.00 gmm/kg

\*D<sub>4</sub> = 49.50 mm

\*\*Balanced without clamping nut

B10-M: 12-13

B10: VI-VII



Key on B10-A:1

Ⓜ = Metric (mm)

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

- Consult machine tool builder for machine's weight limitations.
- Refer to example on page B10-M: 11 for calculating tool assembly weight
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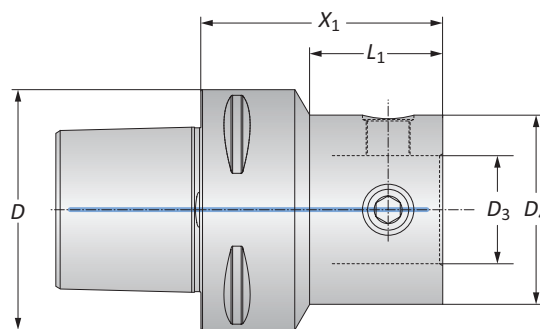
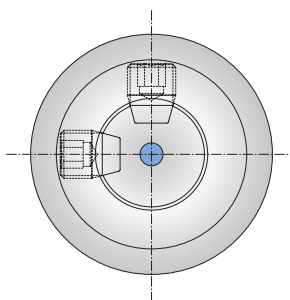
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- When using tool steel components, do not exceed recommended 6xD length-to-diameter ratio
- When using heavy metal reducers, do not exceed recommended 8xD length-to-diameter ratio
- When using a carbide shank, do not exceed recommended 9xD length-to-diameter ratio
- When using a NOVITECH® module, do not exceed recommended 10xD length-to-diameter ratio
- Refer to examples on pages B10-M: 8-10 for calculating length-to-diameter ratio
- Factory technical assistance is available for your specific applications through our Application Engineering department. *email: engineering.eu@alliedmachine.com*



## Polygon Shaft Master Shanks (PSC) (ISO 26623-1)

Balanced



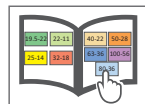
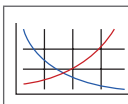
| PSC | Connection | Shank |             | Weight | Part No. |           |        |
|-----|------------|-------|-------------|--------|----------|-----------|--------|
|     |            | $D$   | $D_4   D_3$ |        |          | $X_1$     | $L_1$  |
| m   | 40 - 22    | 50    | 40 - 22     | 54.00  | 31.10    | 0.70 (kg) | 227014 |
|     | 50 - 28    | 50    | 50 - 28     | 65.00  | -        | 1.00 (kg) | 227001 |
|     | 63 - 36    | 50    | 63 - 36     | 80.00  | -        | 1.50 (kg) | 227002 |
|     | 80 - 36    | 50    | 80 - 36     | 80.00  | -        | 2.50 (kg) | 227012 |
|     | 25 - 14    | 63    | 25 - 14     | 54.00  | 21.10    | 0.90 (kg) | 227010 |
|     | 32 - 18    | 63    | 32 - 18     | 54.00  | 23.00    | 1.00 (kg) | 227009 |
|     | 40 - 22    | 63    | 40 - 22     | 65.00  | 36.40    | 1.10 (kg) | 227008 |
|     | 50 - 28    | 63    | 50 - 28     | 65.00  | 39.00    | 1.30 (kg) | 227003 |
|     | 63 - 36    | 63    | 63 - 36     | 80.00  | -        | 1.80 (kg) | 227004 |
|     | 80 - 36    | 63    | 80 - 36     | 80.00  | -        | 2.60 (kg) | 227005 |
|     | 50 - 28    | 80    | 50 - 28     | 65.00  | 25.00    | 2.20 (kg) | 227011 |
|     | 63 - 36    | 80    | 63 - 36     | 80.00  | 45.10    | 2.60 (kg) | 227006 |
|     | 80 - 36    | 80    | 80 - 36     | 80.00  | -        | 3.30 (kg) | 227007 |

**NOTE:** Balanced refers to a specific residual imbalance of  $\leq 4.00$  gmm/kg

B10-M: 12-13

B10: VI-VII

Key on B10-F: 1



m = Metric (mm)

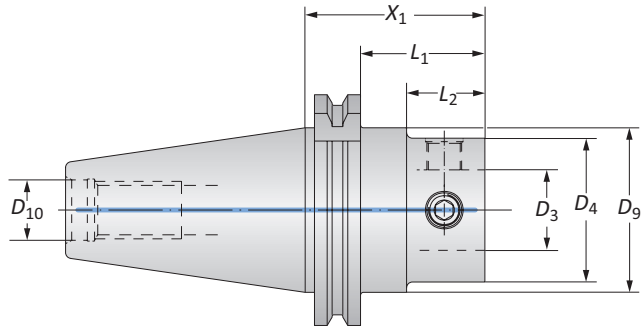
**WARNING** Exceeding weight capacity for machine tool spindle and tool changer can cause machine damage and/or serious injury. To prevent:

- Consult machine tool builder for machine's weight limitations.
- Refer to example on page B10-M: 11 for calculating tool assembly weight
- Factory technical assistance is also available for specific applications through our Application Engineering department. *email: engineering.eu@alliedmachine.com*

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

- Do not exceed recommended 10xD length-to-diameter ratio or exceed 4 total components (including shank)
- When using Alu-Line® components, do not exceed recommended 5xD length-to-diameter ratio
- When using tool steel components, do not exceed recommended 6xD length-to-diameter ratio
- When using heavy metal reducers, do not exceed recommended 8xD length-to-diameter ratio
- When using a carbide shank, do not exceed recommended 9xD length-to-diameter ratio
- When using a NOVI<sup>TECH</sup>® module, do not exceed recommended 10xD length-to-diameter ratio
- Refer to examples on pages B10-M: 8-10 for calculating length-to-diameter ratio
- Factory technical assistance is available for your specific applications through our Application Engineering department. *email: engineering.eu@alliedmachine.com*

CAT Master Shanks with Metric Threads



| Taper Size | Connection<br>$D_4   D_3$ | Shank  |       |       |       |          | Weight    | Part No.      |
|------------|---------------------------|--------|-------|-------|-------|----------|-----------|---------------|
|            |                           | $X_1$  | $L_1$ | $L_2$ | $D_9$ | $D_{10}$ |           |               |
| 40         | 50 - 28                   | 62.00  | 42.90 | -     | 44.45 | M16 x 2  | 1.30 (kg) | 132022T016960 |
| 40         | 63 - 36                   | 82.00  | 62.90 | -     | 44.45 | M16 x 2  | 1.80 (kg) | 132066T016960 |
| 50         | 50 - 28                   | 62.00  | 42.90 | 27.00 | 69.85 | M24 x 3  | 3.40 (kg) | 132022T016962 |
| 50         | 63 - 36                   | 72.00  | 52.90 | 37.00 | 69.85 | M24 x 3  | 3.70 (kg) | 132066T016962 |
| 50         | 80 - 36                   | 72.00  | 52.90 | -     | 69.85 | M24 x 3  | 4.20 (kg) | 132088T016962 |
| 50         | 100 - 56                  | 105.00 | 85.90 | -     | 69.85 | M24 x 3  | 5.20 (kg) | 132076T016962 |

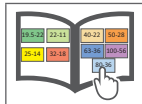
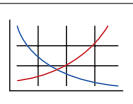
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B10-M: 12-13

B10: VI-VII

Key on B10-A:1

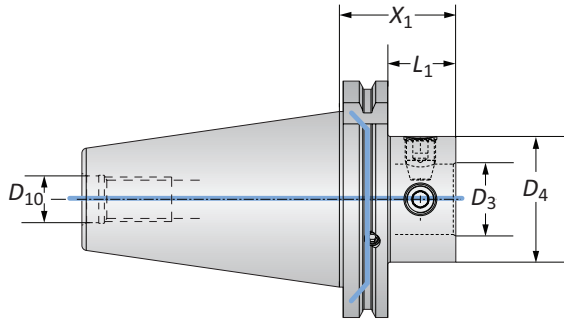
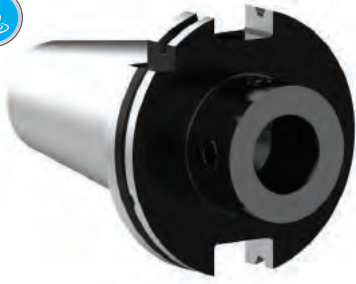


Ⓜ = Metric (mm)

**⚠ WARNING** Exceeding weight capacity for machine tool spindle and tool changer can cause machine damage and/or serious injury. To prevent:  
 -Consult machine tool builder for machine's weight limitations.  
 -Refer to example on page B10-M: 11 for calculating tool assembly weight  
 Factory technical assistance is also available for specific applications through our Application Engineering department. *email: engineering.eu@alliedmachine.com*

**⚠ WARNING** Tool failure can cause serious injury. To prevent:  
 -Do not exceed recommended 10xD length-to-diameter ratio or exceed 4 total components (including shank)  
 -When using Alu-Line® components, do not exceed recommended 5xD length-to-diameter ratio  
 -When using tool steel components, do not exceed recommended 6xD length-to-diameter ratio  
 -When using heavy metal reducers, do not exceed recommended 8xD length-to-diameter ratio  
 -When using a carbide shank, do not exceed recommended 9xD length-to-diameter ratio  
 -When using a NOVITECH® module, do not exceed recommended 10xD length-to-diameter ratio  
 -Refer to examples on pages B10-M: 8-10 for calculating length-to-diameter ratio  
 Factory technical assistance is available for your specific applications through our Application Engineering department. *email: engineering.eu@alliedmachine.com*

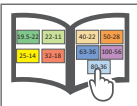
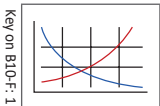
## Dual Contact SK Master Shanks (DIN 69871-AD / B-D)



| Taper Size | Connection    | Shank    |       |          | Weight  | Part No.  |        |
|------------|---------------|----------|-------|----------|---------|-----------|--------|
|            | $D_4$   $D_3$ | $X_1$    | $L_1$ | $D_{10}$ |         |           |        |
| m          | 40            | 50 - 28  | 46.00 | 26.90    | M16 x 2 | 1.10 (kg) | 353064 |
|            | 40            | 63 - 36  | 66.00 | 46.90    | M16 x 2 | 1.50 (kg) | 353065 |
|            | 50            | 50 - 28  | 46.00 | 26.90    | M24 x 3 | 2.90 (kg) | 353066 |
|            | 50            | 63 - 36  | 56.00 | 36.90    | M24 x 3 | 3.20 (kg) | 353067 |
|            | 50            | 80 - 36  | 56.00 | 36.90    | M24 x 3 | 3.70 (kg) | 353068 |
|            | 50            | 100 - 56 | 90.00 | 70.90    | M24 x 3 | 5.30 (kg) | 353069 |

B10-M: 12-13

B10: VI-VII



m = Metric (mm)

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

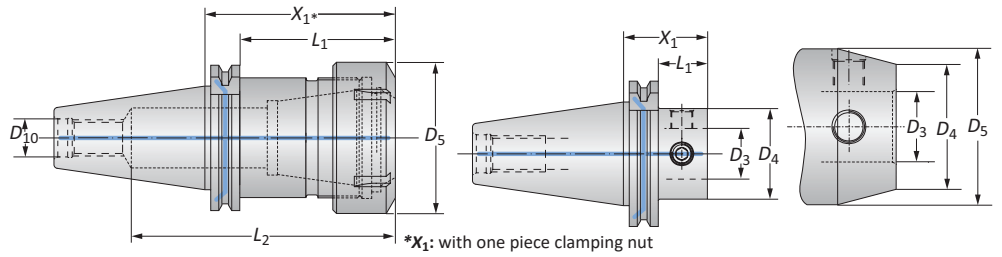
- Consult machine tool builder for machine's weight limitations.
  - Refer to example on page B10-M: 11 for calculating tool assembly weight
- Factory technical assistance is also available for specific applications through our Application Engineering department. *email: engineering.eu@alliedmachine.com*

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

- Do not exceed recommended 10xD length-to-diameter ratio or exceed 4 total components (including shank)
  - When using Alu-Line® components, do not exceed recommended 5xD length-to-diameter ratio
  - When using tool steel components, do not exceed recommended 6xD length-to-diameter ratio
  - When using heavy metal reducers, do not exceed recommended 8xD length-to-diameter ratio
  - When using a carbide shank, do not exceed recommended 9xD length-to-diameter ratio
  - When using a NOVI<sup>TECH</sup>® module, do not exceed recommended 10xD length-to-diameter ratio
  - Refer to examples on pages B10-M: 8-10 for calculating length-to-diameter ratio
- Factory technical assistance is available for your specific applications through our Application Engineering department. *email: engineering.eu@alliedmachine.com*

## SK Master Shanks (DIN 69871-AD / B-D)

Balanced



| Taper Size | Connection<br><i>D</i> <sub>4</sub>   <i>D</i> <sub>3</sub> | Shank                 |                       |                       |                       |                        | Weight     | Part No. |
|------------|---|-----------------------|-----------------------|-----------------------|-----------------------|------------------------|------------|----------|
|            |   | <i>X</i> <sub>1</sub> | <i>L</i> <sub>1</sub> | <i>L</i> <sub>2</sub> | <i>D</i> <sub>5</sub> | <i>D</i> <sub>10</sub> |            |          |
| 30         | 40 - 22   | 46.00                 | 26.90                 | -                     | -                     | M12 x 1.75             | 0.50 (kg)  | 327001   |
| 30         | 50 - 28   | 58.00                 | 38.90                 | -                     | -                     | M12 x 1.75             | 0.80 (kg)  | 327002   |
| 40         | 32 - 18   | 55.00                 | 35.90                 | -                     | 40.00                 | M16 x 2                | 1.10 (kg)  | 327003   |
| 40         | 40 - 22   | 46.00                 | 26.90                 | -                     | -                     | M16 x 2                | 1.00 (kg)  | 327004   |
| 40         | 50 - 28   | 46.00                 | 26.90                 | -                     | -                     | M16 x 2                | 1.10 (kg)  | 327005   |
| 40         | 63 - 36   | 66.00                 | 46.90                 | -                     | -                     | M16 x 2                | 1.40 (kg)  | 327006   |
| 40         | 80 - 36   | 66.00                 | 46.90                 | -                     | -                     | M16 x 2                | 1.90 (kg)  | 327007   |
| 40         | ER 40   | 80.00                 | 60.90                 | 116.00                | 63.00                 | M16 x 2                | 1.30 (kg)  | 259079** |
| 50         | 50 - 28   | 46.00                 | 26.90                 | -                     | -                     | M24 x 3                | 2.90 (kg)  | 327017   |
| 50         | 50 - 28   | 186.00                | 166.90                | -                     | 60.00                 | M24 x 3                | 6.00 (kg)  | 327025   |
| 50         | 50 - 28*  | 186.00                | 166.90                | -                     | -                     | M24 x 3                | 4.90 (kg)  | 327033   |
| 50         | 63 - 36   | 56.00                 | 36.90                 | -                     | -                     | M24 x 3                | 3.20 (kg)  | 327018   |
| 50         | 63 - 36   | 206.00                | 186.90                | -                     | 78.00                 | M24 x 3                | 8.90 (kg)  | 327026   |
| 50         | 63 - 36   | 206.00                | 186.90                | -                     | -                     | M24 x 3                | 6.90 (kg)  | 327034   |
| 50         | 80 - 36   | 56.00                 | 36.90                 | -                     | -                     | M24 x 3                | 3.70 (kg)  | 327010   |
| 50         | 80 - 36   | 256.00                | 236.90                | -                     | 90.00                 | M24 x 3                | 13.60 (kg) | 327027   |
| 50         | 100 - 56  | 90.00                 | 70.90                 | -                     | -                     | M24 x 3                | 5.30 (kg)  | 327011   |
| 50         | 100 - 56  | 290.00                | 270.90                | -                     | -                     | M24 x 3                | 17.10 (kg) | 327028   |
| 50         | ER 40   | 80.00                 | 55.20                 | 134.00                | 63.00                 | M24 x 3                | 3.10 (kg)  | 259080** |

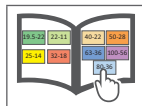
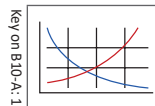
NOTE: Balanced refers to a specific residual imbalance of ≤4.00 gmm/kg

\* *D*<sub>4</sub> = (49.50 mm)

\*\*Balanced without clamping nut

B10-M: 12-13

B10: VI-VII



Ⓜ = Metric (mm)

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

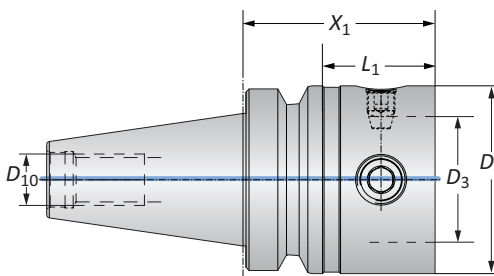
- Consult machine tool builder for machine's weight limitations.
  - Refer to example on page B10-M: 11 for calculating tool assembly weight
- Factory technical assistance is also available for specific applications through our Application Engineering department. *email: engineering.eu@alliedmachine.com*

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

- Do not exceed recommended 10xD length-to-diameter ratio or exceed 4 total components (including shank)
  - When using Alu-Line® components, do not exceed recommended 5xD length-to-diameter ratio
  - When using tool steel components, do not exceed recommended 6xD length-to-diameter ratio
  - When using heavy metal reducers, do not exceed recommended 8xD length-to-diameter ratio
  - When using a carbide shank, do not exceed recommended 9xD length-to-diameter ratio
  - When using a NOVITECH® module, do not exceed recommended 10xD length-to-diameter ratio
- Refer to examples on pages B10-M: 8-10 for calculating length-to-diameter ratio  
 Factory technical assistance is available for your specific applications through our Application Engineering department. *email: engineering.eu@alliedmachine.com*

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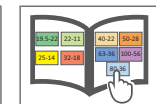
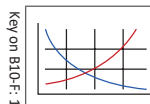
## Dual Contact BT Master Shanks (JIS B 6339)



| Taper Size | Connection    |          | Shank |          |         | Weight    | Part No. |
|------------|---------------|----------|-------|----------|---------|-----------|----------|
|            | $D_4$   $D_3$ | $X_1$    | $L_1$ | $D_{10}$ |         |           |          |
| mm         | 40            | 50 - 28  | 54.00 | 27.00    | M16 x 2 | 1.20 (kg) | 353070   |
|            | 40            | 63 - 36  | 64.00 | 37.00    | M16 x 2 | 1.50 (kg) | 353071   |
|            | 50            | 50 - 28  | 65.00 | 26.80    | M24 x 3 | 4.00 (kg) | 353072   |
|            | 50            | 63 - 36  | 75.00 | 36.80    | M24 x 3 | 4.20 (kg) | 353073   |
|            | 50            | 80 - 36  | 75.00 | 36.80    | M24 x 3 | 4.80 (kg) | 353074   |
|            | 50            | 100 - 56 | 90.00 | 51.80    | M24 x 3 | 5.50 (kg) | 353075   |

B10-M: 12-13

B10: VI-VII



mm = Metric (mm)

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

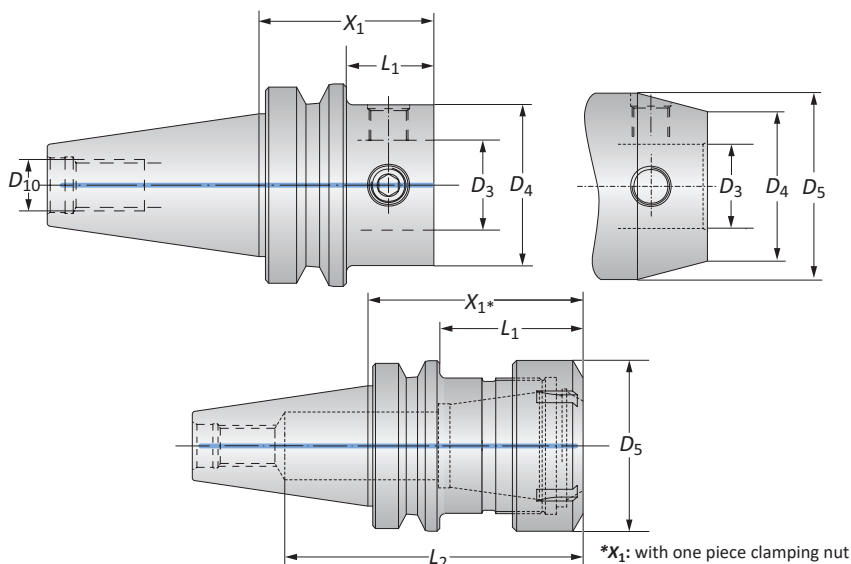
- Consult machine tool builder for machine's weight limitations.
  - Refer to example on page B10-M: 11 for calculating tool assembly weight
- Factory technical assistance is also available for specific applications through our Application Engineering department. *email: engineering.eu@alliedmachine.com*

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

- Do not exceed recommended 10xD length-to-diameter ratio or exceed 4 total components (including shank)
  - When using Alu-Line® components, do not exceed recommended 5xD length-to-diameter ratio
  - When using tool steel components, do not exceed recommended 6xD length-to-diameter ratio
  - When using heavy metal reducers, do not exceed recommended 8xD length-to-diameter ratio
  - When using a carbide shank, do not exceed recommended 9xD length-to-diameter ratio
  - When using a NOVITECH® module, do not exceed recommended 10xD length-to-diameter ratio
  - Refer to examples on pages B10-M: 8-10 for calculating length-to-diameter ratio
- Factory technical assistance is available for your specific applications through our Application Engineering department. *email: engineering.eu@alliedmachine.com*

## BT Master Shanks (JIS B 6339)

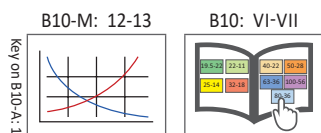
Balanced



| Taper Size | Connection<br>$D_4   D_3$ | Shank |       |        |       | $D_5$      | $D_{10}$  | Weight  | Part No. |
|------------|---------------------------|-------|-------|--------|-------|------------|-----------|---------|----------|
|            |                           | $X_1$ | $L_1$ | $L_2$  |       |            |           |         |          |
| 30         | 40 - 22                   | 40.00 | 18.00 | -      | -     | M12 x 1.75 | 0.50 (kg) | 327012  |          |
| 30         | 50 - 28                   | 46.00 | 24.00 | -      | -     | M12 x 1.75 | 0.60 (kg) | 327013  |          |
| 40         | 40 - 22                   | 46.00 | 19.00 | -      | -     | M16 x 2    | 1.10 (kg) | 327016  |          |
| 40         | 50 - 28                   | 54.00 | 27.00 | -      | -     | M16 x 2    | 1.20 (kg) | 327019  |          |
| 40         | 63 - 36                   | 64.00 | 37.00 | -      | -     | M16 x 2    | 1.50 (kg) | 327020  |          |
| 40         | ER 40                     | 70.00 | 43.00 | 104.00 | 63.00 | M16 x 2    | 1.20 (kg) | 259081* |          |
| 50         | 50 - 28                   | 65.00 | 26.80 | -      | -     | M24 x 3    | 3.90 (kg) | 327021  |          |
| 50         | 63 - 36                   | 75.00 | 36.80 | -      | -     | M24 x 3    | 4.20 (kg) | 327022  |          |
| 50         | 80 - 36                   | 75.00 | 36.80 | -      | -     | M24 x 3    | 4.70 (kg) | 327023  |          |
| 50         | 100 - 56                  | 90.00 | 51.80 | -      | -     | M24 x 3    | 5.50 (kg) | 327024  |          |
| 50         | ER 40                     | 80.00 | 41.80 | 135.00 | 63.00 | M24 x 3    | 3.80 (kg) | 259082* |          |

NOTE: Balanced refers to a specific residual imbalance of  $\leq 4.00$  gmm/kg

\*Balanced without clamping nut



$\text{m}$  = Metric (mm)

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

- Consult machine tool builder for machine's weight limitations.
- Refer to example on page B10-M: 11 for calculating tool assembly weight
- Factory technical assistance is also available for specific applications through our Application Engineering department. *email: engineering.eu@alliedmachine.com*

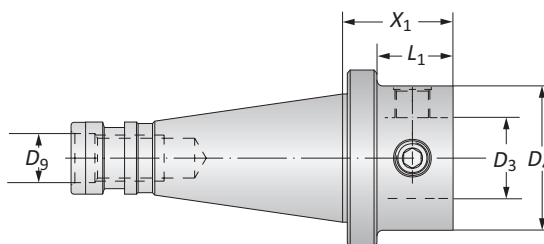
**WARNING** Tool failure can cause serious injury. To prevent:

- Do not exceed recommended 10xD length-to-diameter ratio or exceed 4 total components (including shank)
- When using Alu-Line® components, do not exceed recommended 5xD length-to-diameter ratio
- When using tool steel components, do not exceed recommended 6xD length-to-diameter ratio
- When using heavy metal reducers, do not exceed recommended 8xD length-to-diameter ratio
- When using a carbide shank, do not exceed recommended 9xD length-to-diameter ratio
- When using a NOVITECH® module, do not exceed recommended 10xD length-to-diameter ratio
- Refer to examples on pages B10-M: 8-10 for calculating length-to-diameter ratio
- Factory technical assistance is available for your specific applications through our Application Engineering department. *email: engineering.eu@alliedmachine.com*

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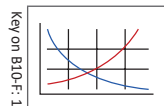
## NMTB Master Shanks



| Taper Size | Connection    |          | Shank |       |                    | Weight    | Part No.      |
|------------|---------------|----------|-------|-------|--------------------|-----------|---------------|
|            | $D_4$   $D_3$ | $X_1$    | $L_1$ | $D_9$ |                    |           |               |
| M          | 40            | 50 - 28  | 38.00 | 26.40 | $\frac{5}{8}$ - 11 | 1.30 (kg) | 132022T004498 |
|            | 40            | 63 - 36  | 48.00 | 36.40 | $\frac{5}{8}$ - 11 | 1.50 (kg) | 132066T004498 |
|            | 50            | 50 - 28  | 42.00 | 26.80 | 1 - 8              | 3.00 (kg) | 132022T004480 |
|            | 50            | 63 - 36  | 52.00 | 36.80 | 1 - 8              | 3.50 (kg) | 132066T004480 |
|            | 50            | 80 - 36  | 52.00 | 36.80 | 1 - 8              | 4.00 (kg) | 132088T004480 |
|            | 50            | 100 - 56 | 90.00 | 74.80 | 1 - 8              | 4.90 (kg) | 132076T004480 |

B10-M: 12-13

B10: VI-VII



M = Metric (mm)

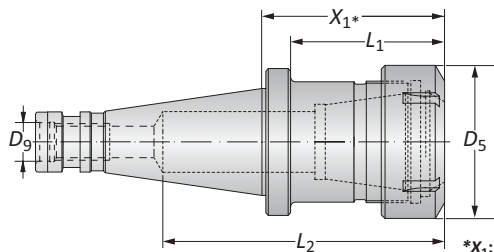
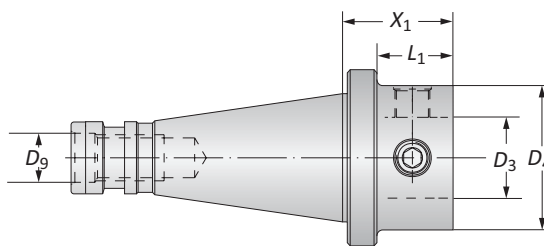
**WARNING** Exceeding weight capacity for machine tool spindle and tool changer can cause machine damage and/or serious injury. To prevent:

- Consult machine tool builder for machine's weight limitations.
  - Refer to example on page B10-M: 11 for calculating tool assembly weight
- Factory technical assistance is also available for specific applications through our Application Engineering department. *email: engineering.eu@alliedmachine.com*

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

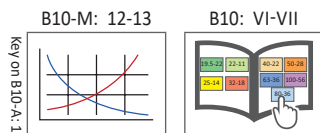
- Do not exceed recommended 10xD length-to-diameter ratio or exceed 4 total components (including shank)
  - When using Alu-Line® components, do not exceed recommended 5xD length-to-diameter ratio
  - When using tool steel components, do not exceed recommended 6xD length-to-diameter ratio
  - When using heavy metal reducers, do not exceed recommended 8xD length-to-diameter ratio
  - When using a carbide shank, do not exceed recommended 9xD length-to-diameter ratio
  - When using a NOVI<sup>TECH</sup>® module, do not exceed recommended 10xD length-to-diameter ratio
- Refer to examples on pages B10-M: 8-10 for calculating length-to-diameter ratio
- Factory technical assistance is available for your specific applications through our Application Engineering department. *email: engineering.eu@alliedmachine.com*

## DIN 2080 Master Shanks



\*X<sub>1</sub>: with one piece clamping nut

| Taper Size | Connection                      | Shank          |                |                |                |                | Weight  | Part No.  |               |
|------------|---------------------------------|----------------|----------------|----------------|----------------|----------------|---------|-----------|---------------|
|            | D <sub>4</sub>   D <sub>3</sub> | X <sub>1</sub> | L <sub>1</sub> | L <sub>2</sub> | D <sub>5</sub> | D <sub>9</sub> |         |           |               |
| m          | 40                              | 50 - 28        | 38.00          | 26.40          | –              | –              | M16 x 2 | 1.30 (kg) | 132022T010229 |
|            | 40                              | 63 - 36        | 48.00          | 36.40          | –              | –              | M16 x 2 | 1.50 (kg) | 132066T010229 |
|            | 50                              | 50 - 28        | 42.00          | 26.80          | –              | –              | M24 x 3 | 3.00 (kg) | 132022T003704 |
|            | 50                              | 63 - 36        | 52.00          | 36.80          | –              | –              | M24 x 3 | 3.50 (kg) | 132066T003704 |
|            | 50                              | 80 - 36        | 52.00          | 36.80          | –              | –              | M24 x 3 | 4.00 (kg) | 132088T003704 |
|            | 50                              | 100 - 56       | 90.00          | 74.80          | –              | –              | M24 x 3 | 4.90 (kg) | 132076T003704 |
|            | 50                              | ER 40          | 80.00          | 64.80          | 134.00         | 63.00          | M24 x 3 | 3.30 (kg) | 259084        |

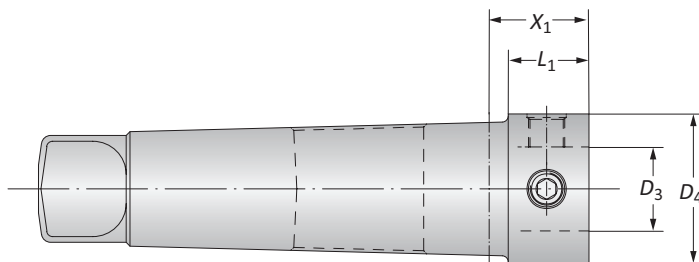


m = Metric (mm)

**⚠ WARNING** Exceeding weight capacity for machine tool spindle and tool changer can cause machine damage and/or serious injury. To prevent:  
 -Consult machine tool builder for machine's weight limitations.  
 -Refer to example on page B10-M: 11 for calculating tool assembly weight  
 Factory technical assistance is also available for specific applications through our Application Engineering department. *email: engineering.eu@alliedmachine.com*

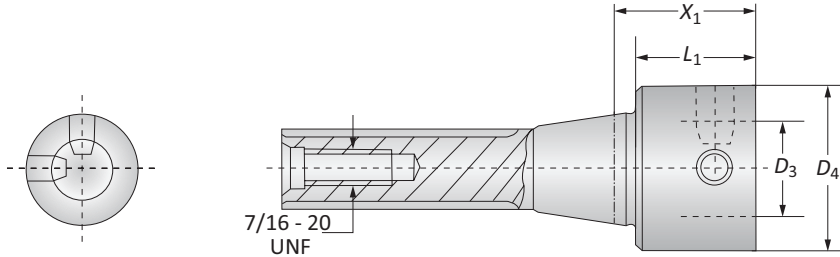
**⚠ WARNING** Tool failure can cause serious injury. To prevent:  
 -Do not exceed recommended 10xD length-to-diameter ratio or exceed 4 total components (including shank)  
 -When using Alu-Line® components, do not exceed recommended 5xD length-to-diameter ratio  
 -When using tool steel components, do not exceed recommended 6xD length-to-diameter ratio  
 -When using heavy metal reducers, do not exceed recommended 8xD length-to-diameter ratio  
 -When using a carbide shank, do not exceed recommended 9xD length-to-diameter ratio  
 -When using a NOVITECH® module, do not exceed recommended 10xD length-to-diameter ratio  
 -Refer to examples on pages B10-M: 8-10 for calculating length-to-diameter ratio  
 Factory technical assistance is available for your specific applications through our Application Engineering department. *email: engineering.eu@alliedmachine.com*

DIN 1806 Morse Taper Master Shanks | R8 Master Shanks



DIN 1806 Master Shanks

| Morse Taper Size | Connection<br>$D_4   D_3$ | Shank |       | Weight    | Part No.      |
|------------------|---------------------------|-------|-------|-----------|---------------|
|                  |                           | $X_1$ | $L_1$ |           |               |
| 4                | 50 - 28                   | 43.00 | 36.50 | 1.10 (kg) | 132022T003590 |
| 5                | 50 - 28                   | 33.00 | 26.70 | 1.80 (kg) | 132022T003920 |
| 5                | 63 - 36                   | 53.00 | 46.70 | 2.20 (kg) | 132066T003920 |

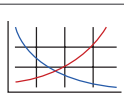


| Connection<br>$D_4   D_3$ | $X_1$ | $L_1$ | Weight    | Part No.      |
|---------------------------|-------|-------|-----------|---------------|
|                           |       |       |           |               |
| 63 - 36                   | 60.00 | 51.00 | 1.30 (kg) | 132066T007166 |

B10-M: 12-13

B10: VI-VII

Key on B10-F: 1



|       |       |       |       |
|-------|-------|-------|-------|
| 19.75 | 22.25 | 40.25 | 50.25 |
| 25.24 | 33.38 | 49.28 | 59.56 |

 = 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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  - Refer to example on page B10-M: 11 for calculating tool assembly weight
- Factory technical assistance is also available for specific applications through our Application Engineering department. *email: engineering.eu@alliedmachine.com*

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

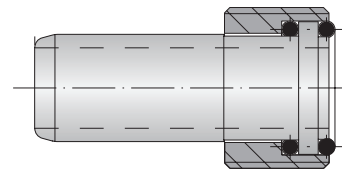
- Do not exceed recommended 10xD length-to-diameter ratio or exceed 4 total components (including shank)
  - When using Alu-Line® components, do not exceed recommended 5xD length-to-diameter ratio
  - When using tool steel components, do not exceed recommended 6xD length-to-diameter ratio
  - When using heavy metal reducers, do not exceed recommended 8xD length-to-diameter ratio
  - When using a carbide shank, do not exceed recommended 9xD length-to-diameter ratio
  - When using a NOVITECH® module, do not exceed recommended 10xD length-to-diameter ratio
  - Refer to examples on pages B10-M: 8-10 for calculating length-to-diameter ratio
- Factory technical assistance is available for your specific applications through our Application Engineering department. *email: engineering.eu@alliedmachine.com*

**Accessories**

Coolant Adapter Sets | Service Keys | ISO 15488 (DIN 6499-B) Collet Chuck Accessories

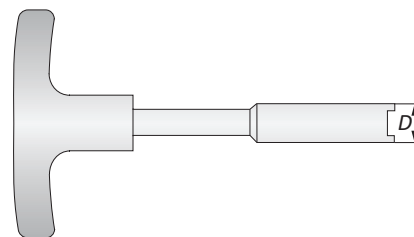
**Coolant Adapter Sets**

| HSK Shank Size | Thread           | Part No. |
|----------------|------------------|----------|
| 32             | M10 x 1.5 x 1.0  | 262002   |
| 40             | M12 x 1.75 x 1.0 | 262003   |
| 50             | M16 x 2 x 1.0    | 262004   |
| 63             | M18 x 2.5 x 1.0  | 262005   |
| 80             | M20 x 2.5 x 1.5  | 262006   |
| 100            | M24 x 3 x 1.5    | 262007   |



**Service Keys**

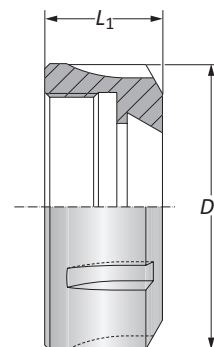
| HSK Shank Size | D     | Part No. |
|----------------|-------|----------|
| 32             | 8.50  | 315234   |
| 40             | 10.50 | 315235   |
| 50             | 14.50 | 215726   |
| 63             | 16.50 | 215727*  |
| 80             | 18.00 | 415127   |
| 100            | 22.00 | 215728   |



\*Two piece

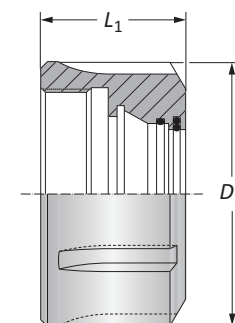
**ISO 15488 (DIN 6499-B) One Piece Clamping Nut**

| Nominal Size | Clamping Nut   |                | Part No. |
|--------------|----------------|----------------|----------|
|              | L <sub>1</sub> | D <sub>1</sub> |          |
| ER 40        | 25.50          | 63.00          | 215926   |



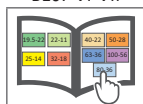
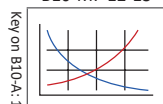
**ISO 15488 (DIN 6499-B) Sealing Disk Clamping Nut**

| Nominal Size | Sealing Disk Clamping Nut |                | Part No. |
|--------------|---------------------------|----------------|----------|
|              | L <sub>1</sub>            | D <sub>1</sub> |          |
| ER 40        | 34.00                     | 63.00          | 278001   |



B10-M: 12-13

B10: VI-VII



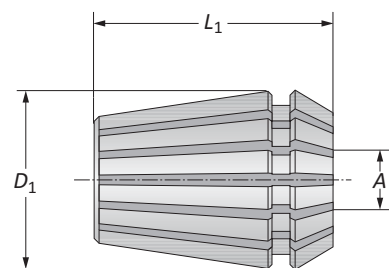
m = Metric (mm)

## Accessories

### ISO 15488 (DIN 6499-B) Collet Chuck Accessories

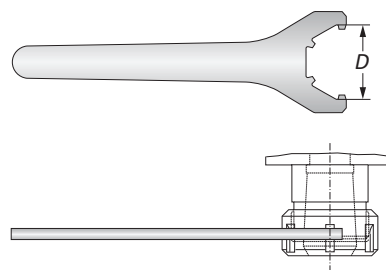
#### ISO 15488 (DIN6499-B) Collets

|   | Clamping Range |       | Collet |  | Part No. |
|---|----------------|-------|--------|--|----------|
|   | A              | $L_1$ | $D_1$  |  |          |
| m | 15.00 - 14.00  | 46.00 | 40.00  |  | 071790   |
|   | 18.00 - 17.00  | 46.00 | 40.00  |  | 071793   |
|   | 20.00 - 19.00  | 46.00 | 40.00  |  | 071795   |
|   | 23.00 - 22.00  | 46.00 | 40.00  |  | 071798   |



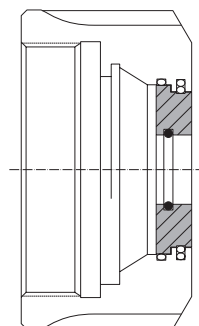
#### ISO 15488 (DIN 6499-B) Service Keys

|   | Service Key  |       | Part No. |
|---|--------------|-------|----------|
|   | Nominal Size | D     |          |
| m | ER 40        | 63.00 | 215931   |

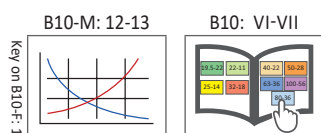
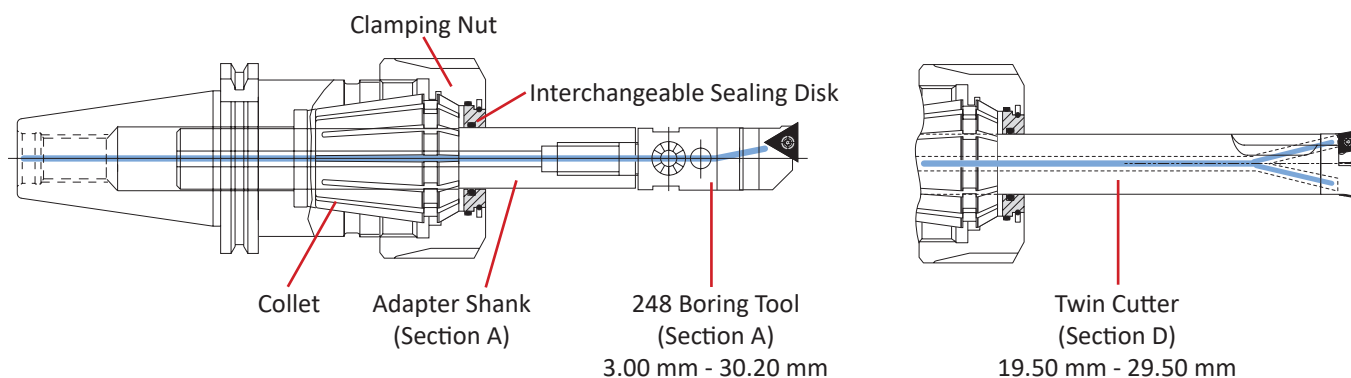


#### ISO 15488 (DIN 6499-B) Sealing Disks

|   | Clamping Range |       | Part No. |
|---|----------------|-------|----------|
|   | A              | $D_1$ |          |
| m | 15.00 - 14.50  |       | 278029   |
|   | 18.00 - 17.50  |       | 278035   |
|   | 20.00 - 19.50  |       | 278039   |
|   | 23.00 - 22.50  |       | 278045   |



### Application with clamping nuts and sealing disks when using central coolant feed:



m = Metric (mm)

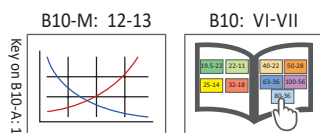
## Accessories

### Mounting Fixtures



| Mounting Fixture |           |          |
|------------------|-----------|----------|
| Code             | Type      | Part No. |
| Basic Body*      | -         | 098060   |
| Adapter          | 30 Taper  | 098073   |
| Adapter          | 40 Taper  | 098061   |
| Adapter          | 50 Taper  | 098062   |
| Adapter          | HSK-A 32  | 098063   |
| Adapter          | HSK-A 40  | 098064   |
| Adapter          | HSK-A 50  | 098065   |
| Adapter          | HSK-A 63  | 098066   |
| Adapter          | HSK-A 80  | 098067   |
| Adapter          | HSK-A 100 | 098068   |
| Adapter          | PSC 50    | 098069   |
| Adapter          | PSC 63    | 098070   |
| Adapter          | PSC 80    | 098071   |

\*Basic body and adapters sold separately



Ⓜ = Metric (mm)

**⚠ WARNING** Exceeding weight capacity for machine tool spindle and tool changer can cause machine damage and/or serious injury. To prevent:  
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 -When using tool steel components, do not exceed recommended 6xD length-to-diameter ratio  
 -When using heavy metal reducers, do not exceed recommended 8xD length-to-diameter ratio  
 -When using a carbide shank, do not exceed recommended 9xD length-to-diameter ratio  
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 -Refer to examples on pages B10-M: 8-10 for calculating length-to-diameter ratio  
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SECTION

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# B10-G

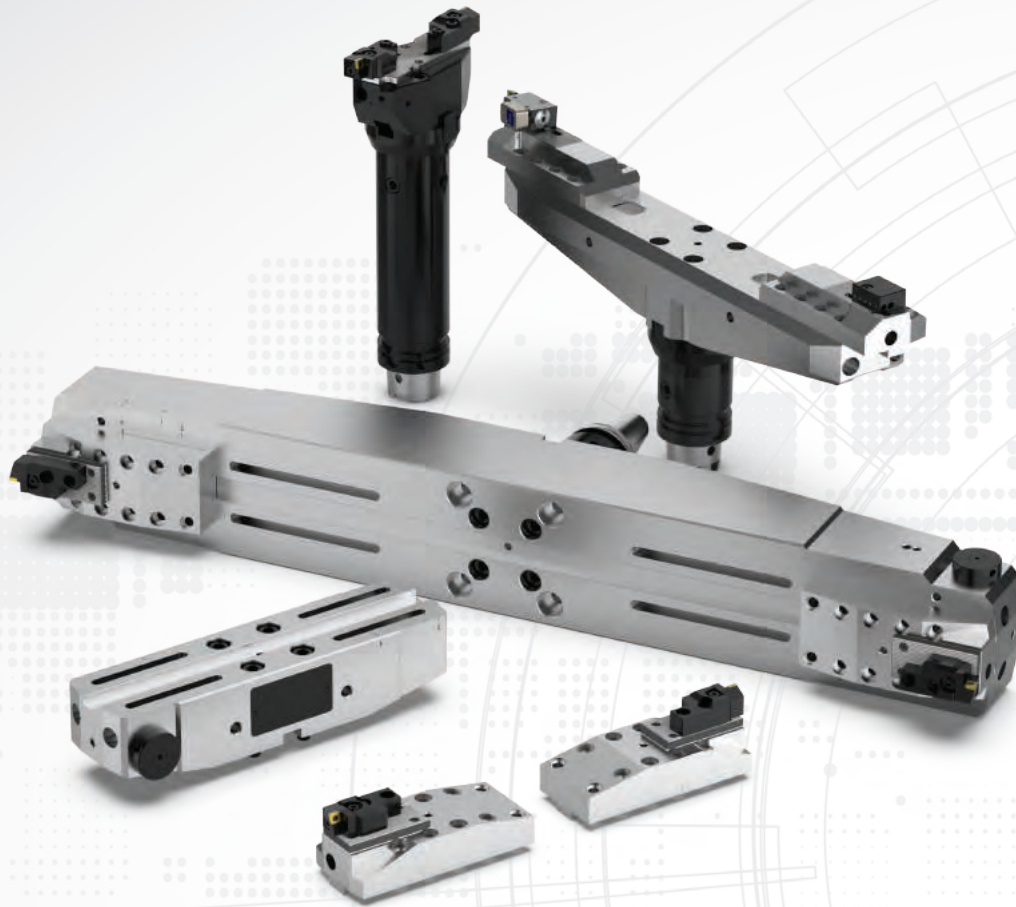
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Large Diameter Boring

# Wohlhaupter® Large Diameter Boring

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

▶ Diameter Range: 200.00 mm - 3255.00 mm



## Boring Big?

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

Your safety and the safety of others is very important. This catalogue 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 catalogue, 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 catalogue. 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

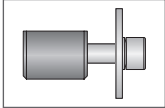


Renewable  
Energy

# Large Diameter Boring Table of Contents

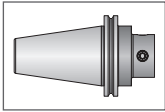
## Reference Icons

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



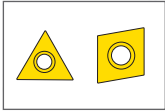
### Clamping Elements

For use with insert holders and boring heads



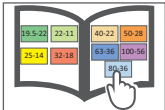
### Shanks

A variety of shanks for different machines



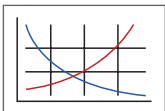
### Inserts

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



### MVS Connection Colour Guide

Detailed instructions and information regarding the MVS connection(s)



### Recommended Cutting Data

Speed and feed recommendations for optimum and safe boring



### Through Coolant Option

Indicates that the product is through coolant

## Introduction

Product Overview . . . . . 2 - 3

## Serrated Slides

Alu-Line Basic D 40 Serrated Slides . . . . . 4  
 Alu-Line Basic D 60 Serrated Slides . . . . . 5  
 Alu-Line Eco D 60 Serrated Slides . . . . . 6  
 Alu-Line Flex D 60 Serrated Slides . . . . . 7

**Serrated Adapter with MVS Connection . . . . . 8 - 9**

## 537 Boring Cassettes

537 Analogue Cassettes . . . . . 10  
 537 Digital Cassettes with 3E<sup>TECH</sup> . . . . . 11

## Insert Holders

Insert Holders for Rough Machining . . . . . 12 - 13  
 Insert Holders for Height Adjustments and Axial Grooving . . . . . 14

## Holding Arbors and Shanks

MVS Holding Arbors D40/D60 . . . . . 15  
 Master Shanks D40/D60 . . . . . 16 - 19

**Accessories . . . . . 20 - 25**

| Series            | Diameter Range   |
|-------------------|------------------|
|                   | Metric (mm)      |
| Basic D 40 Slides | 200.00 - 520.00  |
| Basic D 60 Slides | 200.00 - 505.00  |
| Eco D 60 Slides   | 465.00 - 1020.00 |
| Flex D 60 Slides  | 500.00 - 3255.00 |



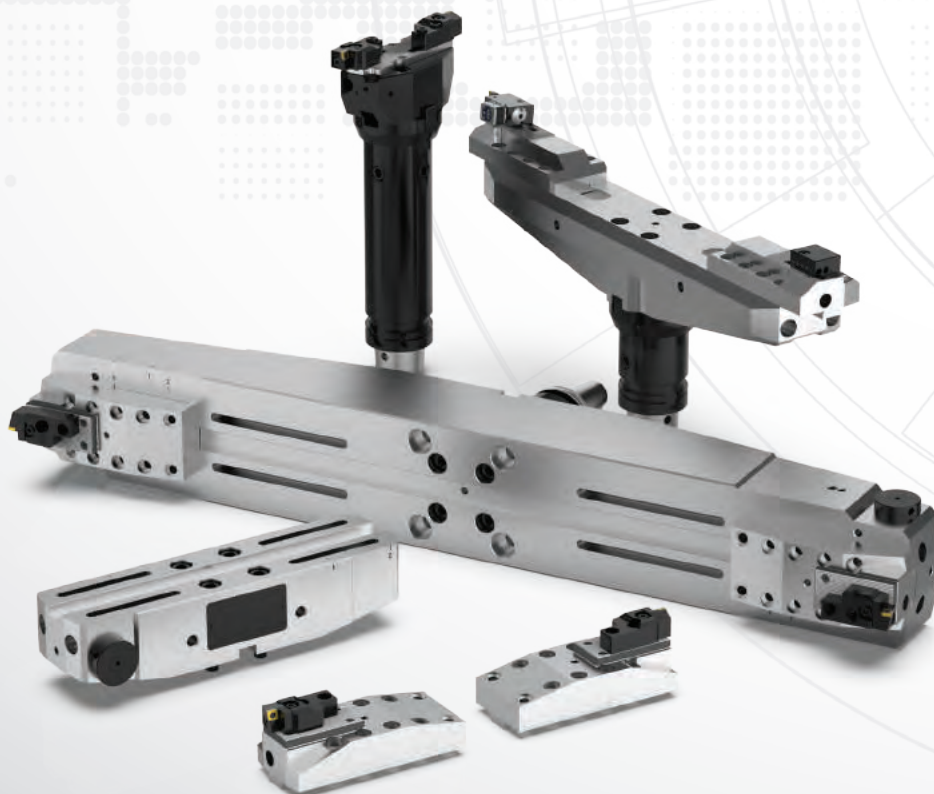
# Large Diameter Boring

## 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: 200.00 mm - 3255.00 mm
- Basic, Eco, and Flex serrated slides
- Roughing, finishing, or combined roughing and finishing can be achieved in one pass
- Digital readout cassettes available for quick and easy adjustments
- Alu-Line serrated slides and tool bodies are made of lightweight aluminium

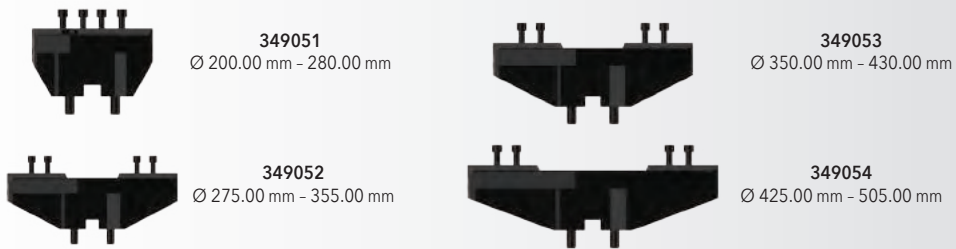




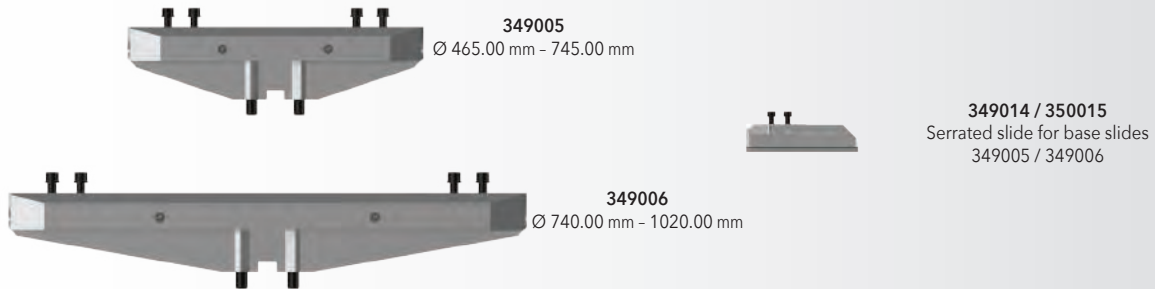
► **Basic D 40 Serrated Slides for Finish Boring**



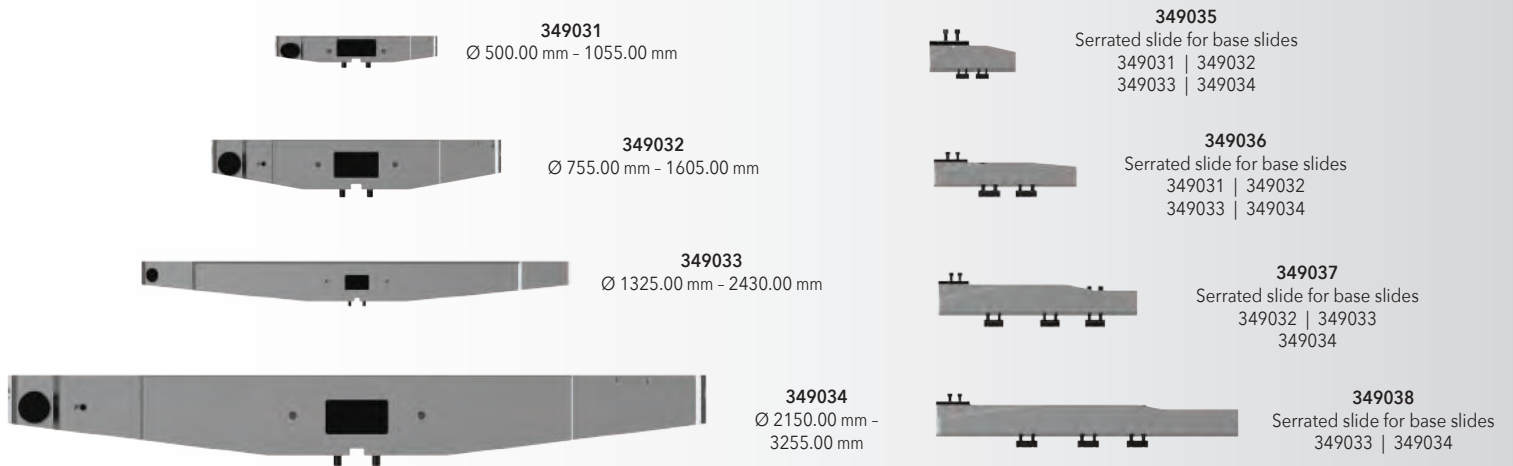
► **Basic D 60 Serrated Slides for Rough and Finish Boring**



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

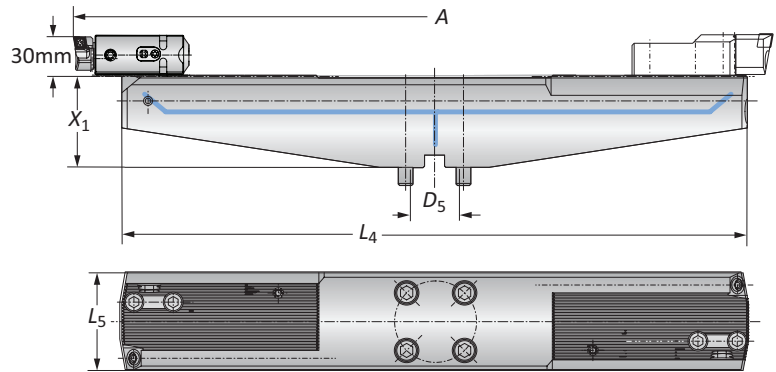


► **Flex D 60 Serrated Slides for Rough and Finish Boring**

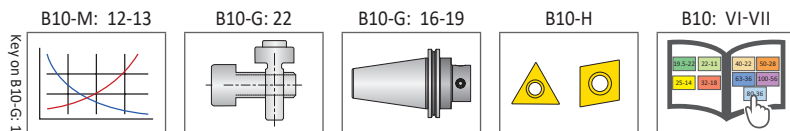


## Alu-Line Basic D 40 Serrated Slides

Diameter Range: 200.00 mm - 520.00 mm



|   | Connection | Boring Range    | Serrated Slide |        |       | Weight    | Part No. |
|---|------------|-----------------|----------------|--------|-------|-----------|----------|
|   | $D_5$      | $A$             | $X_1$          | $L_4$  | $L_5$ |           |          |
| Ⓜ | D 40       | 200.00 - 280.00 | 75.00          | 190.00 | 80.00 | 2.80 (kg) | 349021   |
|   | D 40       | 280.00 - 360.00 | 75.00          | 270.00 | 80.00 | 3.80 (kg) | 349022   |
|   | D 40       | 360.00 - 440.00 | 75.00          | 350.00 | 80.00 | 5.00 (kg) | 349023   |
|   | D 40       | 440.00 - 520.00 | 75.00          | 430.00 | 80.00 | 6.00 (kg) | 349024   |



Ⓜ = Metric (mm)

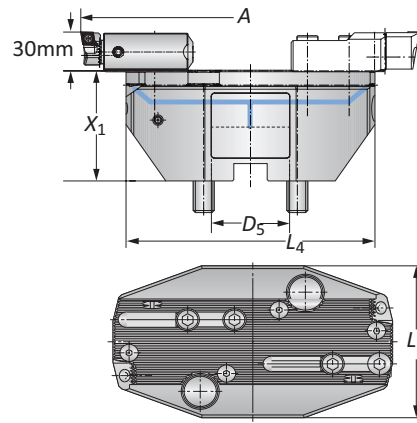
**⚠ WARNING** Exceeding weight capacity for machine tool spindle and tool changer can cause machine damage and/or serious injury. To prevent:  
 -Do not exceed recommended 10xD length-to-diameter ratio or exceed 4 total components (including shank)  
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 -Do not exceed recommended 10xD length-to-diameter ratio or exceed 4 total components (including shank)  
 -When using Alu-Line® components, do not exceed recommended 5xD length-to-diameter ratio  
 -When using tool steel components, do not exceed recommended 6xD length-to-diameter ratio  
 -When using heavy metal components, do not exceed recommended 8xD length-to-diameter ratio  
 -When using a carbide shank, do not exceed recommended 9xD length-to-diameter ratio  
 -When using a NOVITECH module, do not exceed recommended 10xD length-to-diameter ratio  
 -Refer to examples on pages B10-M: 8-10 for calculating length-to-diameter ratio  
 Factory technical assistance is available for your specific applications through our Application Engineering department. *email: [engineering.eu@alliedmachine.com](mailto:engineering.eu@alliedmachine.com)*



## Alu-Line Basic D 60 Serrated Slides

Diameter Range: 200.00 mm - 505.00 mm



|   | Connection | Boring Range    | Serrated Slide |        |        | Weight    | Part No. |
|---|------------|-----------------|----------------|--------|--------|-----------|----------|
|   | $D_5$      | $A$             | $X_1$          | $L_4$  | $L_5$  |           |          |
| Ⓜ | 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-G: I

B10-M: 12-13

B10-G: 23

B10-G: 16-19

B10-H

B10: VI-VII

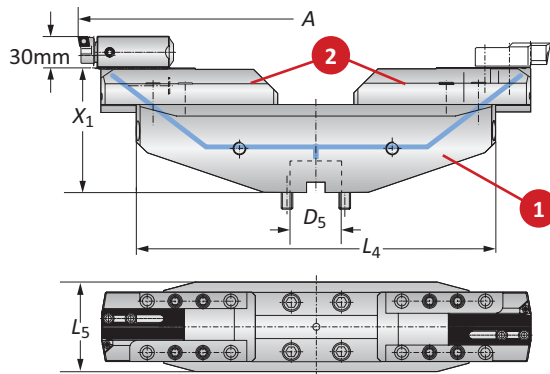
Ⓜ = Metric (mm)

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 -When using heavy metal components, do not exceed recommended 8xD length-to-diameter ratio  
 -When using a carbide shank, do not exceed recommended 9xD length-to-diameter ratio  
 -When using a NOVITECH module, do not exceed recommended 10xD length-to-diameter ratio  
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 Factory technical assistance is available for your specific applications through our Application Engineering department. *email: engineering.eu@alliedmachine.com*

## Alu-Line Eco D 60 Serrated Slides

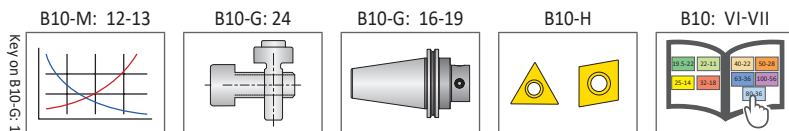
Diameter Range: 465.00 mm - 1020.00 mm



| Connection | Boring Range | Serrated Slide   |        |        | 1 Base Slide |            | 2 Serrated Slide (Alu-Line)* |           | 2 Serrated Slide (steel)** |           |        |
|------------|--------------|------------------|--------|--------|--------------|------------|------------------------------|-----------|----------------------------|-----------|--------|
|            |              | $D_5$            | $A$    | $X_1$  | $L_4$        | $L_5$      | Weight                       | Part No.  | Weight                     | Part No.  | Weight |
| M          | D 60         | 465.00 - 745.00  | 155.00 | 447.00 | 129.00       | 11.80 (kg) | 349005                       | 2.20 (kg) | 349015                     | 5.70 (kg) | 349014 |
|            | D 60         | 740.00 - 1020.00 | 155.00 | 722.00 | 129.00       | 18.00 (kg) | 349006                       | 2.20 (kg) | 349015                     | 5.70 (kg) | 349014 |

\*Finish boring: serrated slide in Alu-Line

\*\*Rough boring: serrated slide in steel



M = Metric (mm)

**WARNING** Exceeding weight capacity for machine tool spindle and tool changer can cause machine damage and/or serious injury. To prevent:  
 -Consult machine tool builder for machine's weight limitations.  
 -Refer to example on page B10-M: 11 for calculating tool assembly weight  
 Factory technical assistance is also available for specific applications through our Application Engineering department. *email: [engineering.eu@alliedmachine.com](mailto:engineering.eu@alliedmachine.com)*

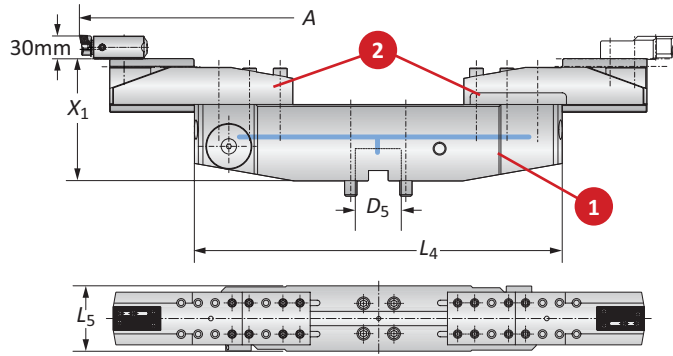
**WARNING** Tool failure can cause serious injury. To prevent:  
 -Do not exceed recommended 10xD length-to-diameter ratio or exceed 4 total components (including shank)  
 -When using Alu-Line® components, do not exceed recommended 5xD length-to-diameter ratio  
 -When using tool steel components, do not exceed recommended 6xD length-to-diameter ratio  
 -When using heavy metal components, do not exceed recommended 8xD length-to-diameter ratio  
 -When using a carbide shank, do not exceed recommended 9xD length-to-diameter ratio  
 -When using a NOVITECH module, do not exceed recommended 10xD length-to-diameter ratio  
 -Refer to examples on pages B10-M: 8-10 for calculating length-to-diameter ratio  
 Factory technical assistance is available for your specific applications through our Application Engineering department. *email: [engineering.eu@alliedmachine.com](mailto:engineering.eu@alliedmachine.com)*

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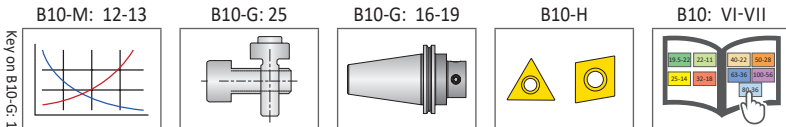


## Alu-Line Flex D 60 Serrated Slides

Diameter Range: 500.00 mm - 3255.00 mm



| Connection | Boring Range | Serrated Slide    |        |         | Weight (1 + 2) | Part No.    |        |              |
|------------|--------------|-------------------|--------|---------|----------------|-------------|--------|--------------|
|            |              | $D_5$             | $A$    | $X_1$   |                | $L_4$       | $L_5$  | 1 Base Slide |
| m          | D 60         | 500.00 - 780.00   | 160.00 | 480.00  | 130.00         | 24.20 (kg)  | 349031 | 349035       |
|            | D 60         | 950.00 - 1055.00  | 185.00 | 480.00  | 130.00         | 41.30 (kg)  | 349031 | 349036       |
|            | D 60         | 775.00 - 1055.00  | 185.00 | 755.00  | 155.00         | 42.50 (kg)  | 349032 | 349035       |
|            | D 60         | 1050.00 - 1330.00 | 210.00 | 755.00  | 155.00         | 59.60 (kg)  | 349032 | 349036       |
|            | D 60         | 1442.00 - 1605.00 | 225.00 | 755.00  | 155.00         | 86.30 (kg)  | 349032 | 349037       |
|            | D 60         | 1325.00 - 1605.00 | 210.00 | 1305.00 | 185.00         | 88.20 (kg)  | 349033 | 349035       |
|            | D 60         | 1325.00 - 1880.00 | 235.00 | 1305.00 | 185.00         | 105.30 (kg) | 349033 | 349036       |
|            | D 60         | 1600.00 - 2155.00 | 250.00 | 1305.00 | 185.00         | 132.00 (kg) | 349033 | 349037       |
|            | D 60         | 1990.00 - 2430.00 | 255.00 | 1305.00 | 185.00         | 169.80 (kg) | 349033 | 349038       |
|            | D 60         | 2150.00 - 2430.00 | 235.00 | 2130.00 | 225.00         | 192.50 (kg) | 349034 | 349035       |
|            | D 60         | 2150.00 - 2705.00 | 260.00 | 2130.00 | 225.00         | 209.60 (kg) | 349034 | 349036       |
|            | D 60         | 2150.00 - 2980.00 | 275.00 | 2130.00 | 225.00         | 236.00 (kg) | 349034 | 349037       |
|            | D 60         | 2150.00 - 3255.00 | 280.00 | 2130.00 | 225.00         | 274.00 (kg) | 349034 | 349038       |



m = Metric (mm)

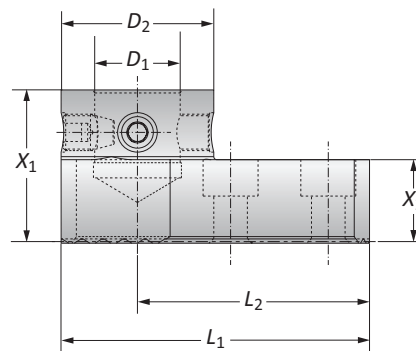
**WARNING** Exceeding weight capacity for machine tool spindle and tool changer can cause machine damage and/or serious injury. To prevent:  
 -Consult machine tool builder for machine's weight limitations.  
 -Refer to example on page B10-M: 11 for calculating tool assembly weight  
 Factory technical assistance is also available for specific applications through our Application Engineering department. *email: engineering.eu@alliedmachine.com*

**WARNING** Tool failure can cause serious injury. To prevent:  
 -Do not exceed recommended 10xD length-to-diameter ratio or exceed 4 total components (including shank)  
 -When using Alu-Line® components, do not exceed recommended 5xD length-to-diameter ratio  
 -When using tool steel components, do not exceed recommended 6xD length-to-diameter ratio  
 -When using heavy metal components, do not exceed recommended 8xD length-to-diameter ratio  
 -When using a carbide shank, do not exceed recommended 9xD length-to-diameter ratio  
 -When using a NOVITECH module, do not exceed recommended 10xD length-to-diameter ratio  
 -Refer to examples on pages B10-M: 8-10 for calculating length-to-diameter ratio  
 Factory technical assistance is available for your specific applications through our Application Engineering department. *email: engineering.eu@alliedmachine.com*

## Serrated Adapter with MVS Connection

### Mounting Adapter

| MVS Connection | Mounting Adapters |       |        |       | Weight    | Part No. |
|----------------|-------------------|-------|--------|-------|-----------|----------|
|                | $D_2$   $D_1$     | $X_1$ | $X_2$  | $L_1$ |           |          |
| 50 - 28        | 50.00             | 27.00 | 101.00 | 76.00 | 1.30 (kg) | 349046   |



### Inside Boring

| Slide              | Boring Heads         | ID Bore Range<br>mm |
|--------------------|----------------------|---------------------|
| 349051             | 310005/464006/564045 | 215.00 - 313.00     |
| 349052             | 310005/464006/564045 | 290.00 - 388.00     |
| 349053             | 310005/464006/564045 | 365.00 - 463.00     |
| 349054             | 310005/464006/564045 | 440.00 - 538.00     |
| 349005 with 349015 | 310005/464006/564045 | 480.00 - 778.00     |

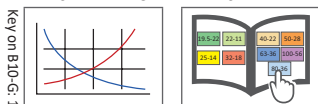
### Outside Boring

| Slide              | Boring Heads         | OD Bore Range<br>mm |
|--------------------|----------------------|---------------------|
| 349051             | 310005/464006/565045 | 67.00 - 165.00      |
| 349052             | 310005/464006/565045 | 142.00 - 240.00     |
| 349053             | 310005/464006/565045 | 217.00 - 315.00     |
| 349054             | 310005/464006/565045 | 292.00 - 390.00     |
| 349005 with 349015 | 310005/464006/565045 | 332.00 - 630.00     |

NOTE: LH only spindle rotation

B10-M: 12-13

B10: VI-VII



= Metric (mm)

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

- Consult machine tool builder for machine's weight limitations.
- Refer to example on page B10-M: 11 for calculating tool assembly weight
- Factory technical assistance is also available for specific applications through our Application Engineering department. *email: engineering.eu@alliedmachine.com*

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

- Do not exceed recommended 10xD length-to-diameter ratio or exceed 4 total components (including shank)
- When using Alu-Line® components, do not exceed recommended 5xD length-to-diameter ratio
- When using tool steel components, do not exceed recommended 6xD length-to-diameter ratio
- When using heavy metal components, do not exceed recommended 8xD length-to-diameter ratio
- When using a carbide shank, do not exceed recommended 9xD length-to-diameter ratio
- When using a NOVITECH module, do not exceed recommended 10xD length-to-diameter ratio
- Refer to examples on pages B10-M: 8-10 for calculating length-to-diameter ratio
- Factory technical assistance is available for your specific applications through our Application Engineering department. *email: engineering.eu@alliedmachine.com*

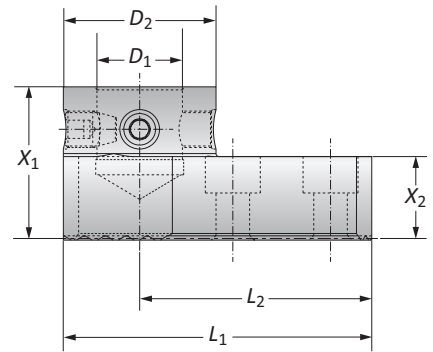




## Serrated Adapter with MVS Connection

### Mounting Adapter

| MVS Connection | Mounting Adapters               |                |                |                | Weight    | Part No. |
|----------------|---------------------------------|----------------|----------------|----------------|-----------|----------|
|                | D <sub>2</sub>   D <sub>1</sub> | X <sub>1</sub> | X <sub>2</sub> | L <sub>1</sub> |           |          |
| 50 - 28        | 50.00                           | 27.00          | 101.00         | 76.00          | 1.30 (kg) | 349046   |



### Inside Boring

| Slide              | Boring Heads         | ID Bore Range<br>mm |
|--------------------|----------------------|---------------------|
| 349051             | 310005/464006/564045 | 65.00 - 128.00      |
| 349052             | 310005/464006/564045 | 105.00 - 203.00     |
| 349053             | 310005/464006/564045 | 180.00 - 278.00     |
| 349054             | 310005/464006/564045 | 255.00 - 353.00     |
| 349005 with 349015 | 310005/464006/564045 | 295.00 - 593.00     |

### Outside Boring

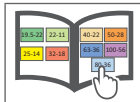
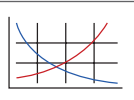
| Slide              | Boring Heads         | OD Bore Range<br>mm |
|--------------------|----------------------|---------------------|
| 349051             | 310005/464006/564045 | -                   |
| 349052             | 310005/464006/564045 | 0.00 - 55.00        |
| 349053             | 310005/464006/564045 | 32.00 - 130.00      |
| 349054             | 310005/464006/564045 | 107.00 - 205.00     |
| 349005 with 349015 | 310005/464006/564045 | 147.00 - 445.00     |

NOTE: LH only spindle rotation

B10-M: 12-13

B10: VI-VII

Key on B10-G: 1



= Metric (mm)

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

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

-Refer to example on page B10-M: 11 for calculating tool assembly weight

Factory technical assistance is also available for specific applications through our Application Engineering department. *email: engineering.eu@alliedmachine.com*

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

-Do not exceed recommended 10xD length-to-diameter ratio or exceed 4 total components (including shank)

-When using Alu-Line® components, do not exceed recommended 5xD length-to-diameter ratio

-When using tool steel components, do not exceed recommended 6xD length-to-diameter ratio

-When using heavy metal components, do not exceed recommended 8xD length-to-diameter ratio

-When using a carbide shank, do not exceed recommended 9xD length-to-diameter ratio

-When using a NOVITECH® module, do not exceed recommended 10xD length-to-diameter ratio

-Refer to examples on pages B10-M: 8-10 for calculating length-to-diameter ratio

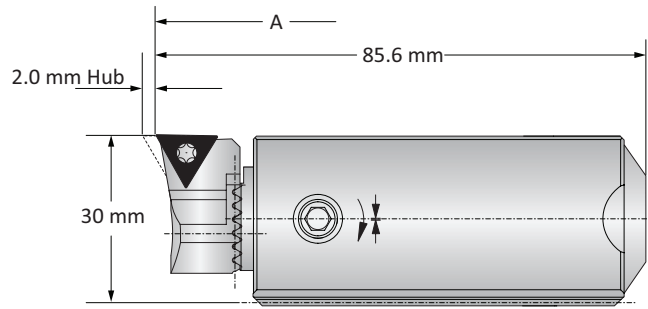
Factory technical assistance is available for your specific applications through our Application Engineering department. *email: engineering.eu@alliedmachine.com*

### 537 Analogue Cassettes

Diameter Range: 100.00 mm - 3255.00 mm

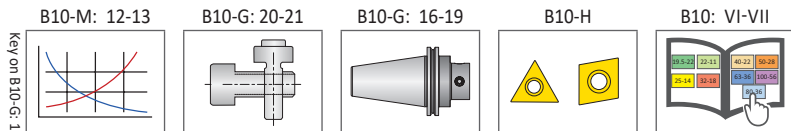


Form 101



Form 20

| Slide Type           | Boring Range     |           | Insert Form | Part No.      |                |          |
|----------------------|------------------|-----------|-------------|---------------|----------------|----------|
|                      | A                | Weight    |             | Insert Holder | Clamping Piece | Cassette |
| Serrated Tool Bodies | 100.00 - 205.00  | 0.60 (kg) | 20          | 210020        | 137026         | 537051   |
|                      | 100.00 - 205.00  | 0.60 (kg) | 101         | 210063        | 137026         | 537051   |
|                      | 100.00 - 205.00  | 0.60 (kg) | 103         | 210064        | 137026         | 537051   |
| Basic / Eco Slides   | 200.00 - 1020.00 | 0.60 (kg) | 20          | 210020        | 137027         | 537051   |
|                      | 200.00 - 1020.00 | 0.60 (kg) | 101         | 210063        | 137027         | 537051   |
|                      | 200.00 - 1020.00 | 0.60 (kg) | 103         | 210064        | 137027         | 537051   |
| Flex Slides          | 500.00 - 3255.00 | 0.60 (kg) | 20          | 210020        | 137019         | 537051   |
|                      | 500.00 - 3255.00 | 0.60 (kg) | 101         | 210063        | 137019         | 537051   |
|                      | 500.00 - 3255.00 | 0.60 (kg) | 103         | 210064        | 137019         | 537051   |



Key on B10-G: 1

**m** = Metric (mm)

Inserts sold separately

**WARNING** Exceeding weight capacity for machine tool spindle and tool changer can cause machine damage and/or serious injury. To prevent:  
 -Consult machine tool builder for machine's weight limitations.  
 -Refer to example on page B10-M: 11 for calculating tool assembly weight  
 Factory technical assistance is also available for specific applications through our Application Engineering department. *email: [engineering.eu@alliedmachine.com](mailto:engineering.eu@alliedmachine.com)*

**WARNING** Tool failure can cause serious injury. To prevent:  
 -Do not exceed recommended 10xD length-to-diameter ratio or exceed 4 total components (including shank)  
 -When using Alu-Line® components, do not exceed recommended 5xD length-to-diameter ratio  
 -When using tool steel components, do not exceed recommended 6xD length-to-diameter ratio  
 -When using heavy metal components, do not exceed recommended 8xD length-to-diameter ratio  
 -When using a carbide shank, do not exceed recommended 9xD length-to-diameter ratio  
 -When using a NOVITECH module, do not exceed recommended 10xD length-to-diameter ratio  
 -Refer to examples on pages B10-M: 8-10 for calculating length-to-diameter ratio  
 Factory technical assistance is available for your specific applications through our Application Engineering department. *email: [engineering.eu@alliedmachine.com](mailto:engineering.eu@alliedmachine.com)*

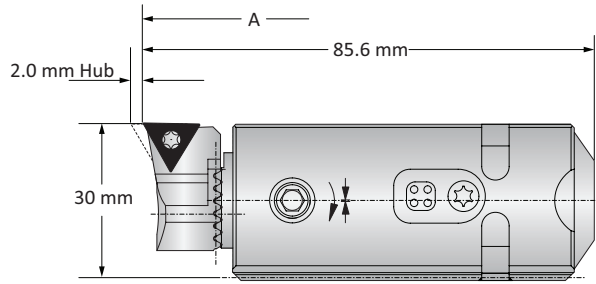


### 537 Digital Cassettes with 3E<sup>TECH+</sup>

Diameter Range: 100.00 mm - 3255.00 mm



Form 101



Form 20

| Slide Type           | Boring Range     |           | Insert Form | Part No.      |                 |          |
|----------------------|------------------|-----------|-------------|---------------|-----------------|----------|
|                      | A                | Weight    |             | Insert Holder | Clamping Pieces | Cassette |
| Serrated Tool Bodies | 100.00 - 205.00  | 0.60 (kg) | 20          | 210020        | 137026          | 537052   |
|                      | 100.00 - 205.00  | 0.60 (kg) | 101         | 210063        | 137026          | 537052   |
|                      | 100.00 - 205.00  | 0.60 (kg) | 103         | 210064        | 137026          | 537052   |
| Basic / Eco Slides   | 200.00 - 1020.00 | 0.60 (kg) | 20          | 210020        | 137027          | 537052   |
|                      | 200.00 - 1020.00 | 0.60 (kg) | 101         | 210063        | 137027          | 537052   |
|                      | 200.00 - 1020.00 | 0.60 (kg) | 103         | 210064        | 137027          | 537052   |
| Flex Slides          | 500.00 - 3255.00 | 0.60 (kg) | 20          | 210020        | 137019          | 537052   |
|                      | 500.00 - 3255.00 | 0.60 (kg) | 101         | 210063        | 137019          | 537052   |
|                      | 500.00 - 3255.00 | 0.60 (kg) | 103         | 210064        | 137019          | 537052   |

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

| Part No. | Charging Unit* |
|----------|----------------|
| 536015   | 536016         |

NOTE: WEEE-Reg.-Nr. DE 15820388

\*Charging unit sold separately



NOTE: 3E<sup>TECH+</sup> adjustment accuracy of 0.001 mm on diameter

Key on B10-G-1

B10-M: 12-13

B10-G: 20-21

B10-G: 16-19

B10-H

B10: VI-VII

Ⓜ = 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:**

- Do not exceed recommended 10xD length-to-diameter ratio or exceed 4 total components (including shank)
  - When using Alu-Line® components, do not exceed recommended 5xD length-to-diameter ratio
  - When using tool steel components, do not exceed recommended 6xD length-to-diameter ratio
  - When using heavy metal components, do not exceed recommended 8xD length-to-diameter ratio
  - When using a carbide shank, do not exceed recommended 9xD length-to-diameter ratio
  - When using a NOVITECH module, do not exceed recommended 10xD length-to-diameter ratio
  - Refer to examples on pages B10-M: 8-10 for calculating length-to-diameter ratio
- Factory technical assistance is also available for specific applications through our Application Engineering department. *email: [engineering.eu@alliedmachine.com](mailto:engineering.eu@alliedmachine.com)*

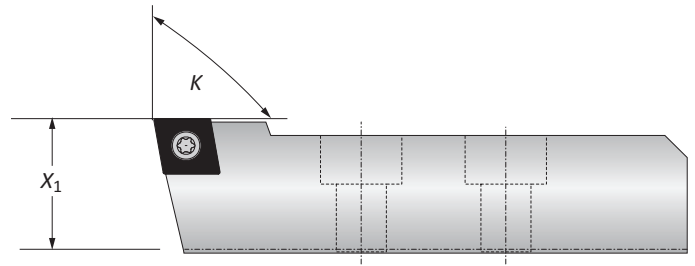
**⚠ WARNING Tool failure can cause serious injury. To prevent:**

- Do not exceed recommended 10xD length-to-diameter ratio or exceed 4 total components (including shank)
  - When using Alu-Line® components, do not exceed recommended 5xD length-to-diameter ratio
  - When using tool steel components, do not exceed recommended 6xD length-to-diameter ratio
  - When using heavy metal components, do not exceed recommended 8xD length-to-diameter ratio
  - When using a carbide shank, do not exceed recommended 9xD length-to-diameter ratio
  - When using a NOVITECH module, do not exceed recommended 10xD length-to-diameter ratio
  - Refer to examples on pages B10-M: 8-10 for calculating length-to-diameter ratio
- Factory technical assistance is available for your specific applications through our Application Engineering department. *email: [engineering.eu@alliedmachine.com](mailto:engineering.eu@alliedmachine.com)*

## Insert Holders for Rough Machining

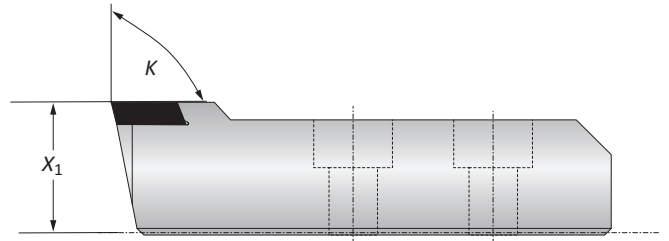
### 90° Insert Holders

| Insert Holder |                | Weight    | ISO Code   | Insert Form | Part No.      |
|---------------|----------------|-----------|------------|-------------|---------------|
| K             | X <sub>1</sub> |           |            |             |               |
| m             | 90° 30.00      | 0.60 (kg) | CC..09T3.. | 103         | <b>149090</b> |
|               | 90° 30.00      | 0.60 (kg) | CC..1204.. | 104         | <b>149099</b> |
|               | 90° 29.30      | 0.60 (kg) | CC..1204.. | 104         | <b>149083</b> |
|               | 90° 30.00      | 0.60 (kg) | CC..1605.. | 105         | <b>149093</b> |



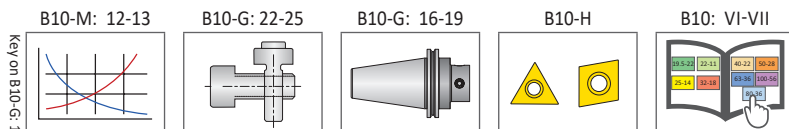
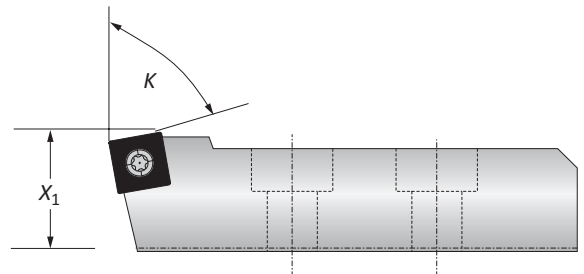
### 90° Tangential Insert Holders

| Insert Holder |                | Weight    | ISO Code   | Insert Form | Part No.      |
|---------------|----------------|-----------|------------|-------------|---------------|
| K             | X <sub>1</sub> |           |            |             |               |
| m             | 90° 30.00      | 0.60 (kg) | Tangential | 05          | <b>149010</b> |
|               | 90° 29.30      | 0.60 (kg) | Tangential | 05          | <b>149020</b> |



### 80° Insert Holders

| Insert Holder |                | Weight    | ISO Code   | Insert Form | Part No.      |
|---------------|----------------|-----------|------------|-------------|---------------|
| K             | X <sub>1</sub> |           |            |             |               |
| m             | 80° 30.00      | 0.60 (kg) | SC..1204.. | 113         | <b>149089</b> |
|               | 80° 30.00      | 0.60 (kg) | SC..150512 | 114         | <b>149094</b> |
|               | 80° 30.00      | 0.60 (kg) | SN..1506.. | 134         | <b>149096</b> |



Key on B10-G: 1

m = Metric (mm)

Inserts sold separately

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

- Consult machine tool builder for machine's weight limitations.
- Refer to example on page B10-M: 11 for calculating tool assembly weight
- Factory technical assistance is also available for specific applications through our Application Engineering department. *email: [engineering.eu@alliedmachine.com](mailto:engineering.eu@alliedmachine.com)*

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

- Do not exceed recommended 10xD length-to-diameter ratio or exceed 4 total components (including shank)
- When using Alu-Line® components, do not exceed recommended 5xD length-to-diameter ratio
- When using tool steel components, do not exceed recommended 6xD length-to-diameter ratio
- When using heavy metal components, do not exceed recommended 8xD length-to-diameter ratio
- When using a carbide shank, do not exceed recommended 9xD length-to-diameter ratio
- When using a NOVI<sup>TECH</sup> module, do not exceed recommended 10xD length-to-diameter ratio
- Refer to examples on pages B10-M: 8-10 for calculating length-to-diameter ratio
- Factory technical assistance is available for your specific applications through our Application Engineering department. *email: [engineering.eu@alliedmachine.com](mailto:engineering.eu@alliedmachine.com)*

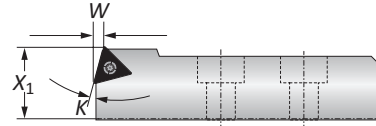
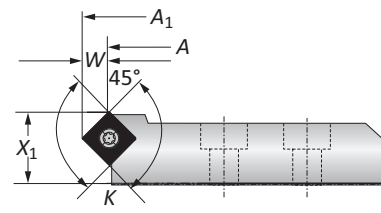
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## Insert Holders for Rough Machining | Boring Range Examples

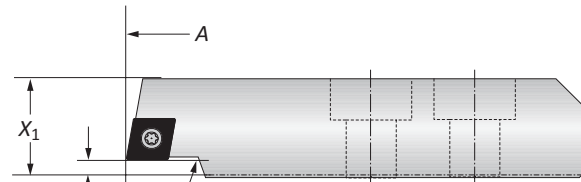
### Chamfering Insert Holders

| m | Insert Holder |                |                    |      | Weight    | ISO Code   | Insert Form | Part No. |
|---|---------------|----------------|--------------------|------|-----------|------------|-------------|----------|
|   | K             | X <sub>1</sub> | A / A <sub>1</sub> | W    |           |            |             |          |
|   | 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   |



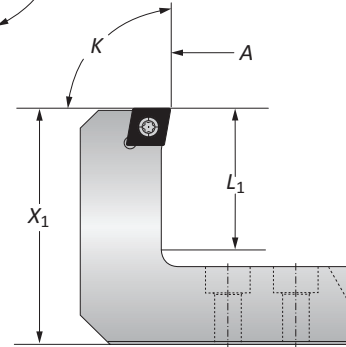
### Back-Boring Insert Holders

| m | Insert Holder |                |                |        | Weight    | ISO Code   | Insert Form | Part No. |
|---|---------------|----------------|----------------|--------|-----------|------------|-------------|----------|
|   | K             | X <sub>1</sub> | X <sub>2</sub> | A      |           |            |             |          |
|   | 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

| m | Insert Holder |                |                |        | Weight    | ISO Code   | Insert Form | Part No. |
|---|---------------|----------------|----------------|--------|-----------|------------|-------------|----------|
|   | K             | X <sub>1</sub> | L <sub>1</sub> | A      |           |            |             |          |
|   | 90°           | 90.00          | 62.00          | -50.00 | 1.00 (kg) | CC..1204.. | 104         | 149040   |

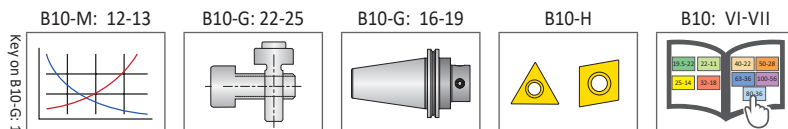


### Boring Range Examples

| m | Serrated Slide |                 | Insert Holder   |                     | Total Bore Range |
|---|----------------|-----------------|-----------------|---------------------|------------------|
|   | Part No.       | Bore Range      | Part No.        | Modified Bore Range |                  |
|   |                | 349051          | 200.00 - 280.00 | 201065              |                  |
|   | 349051         | 200.00 - 280.00 | 251010          | +40.00              | 240.00 - 320.00  |
|   | 349051         | 200.00 - 280.00 | 149040          | -50.00              | 150.00 - 230.00  |

**NOTE:** Boring range for serrated slides or base slides are found on pg. B10-G: 4 - 7

**NOTE:** Additional insert holders available upon request



m = Metric (mm)

Inserts sold separately

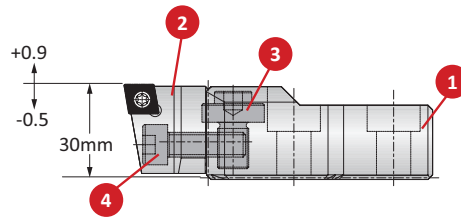
**WARNING** Exceeding weight capacity for machine tool spindle and tool changer can cause machine damage and/or serious injury. To prevent:

- Consult machine tool builder for machine's weight limitations.
  - Refer to example on page B10-M: 11 for calculating tool assembly weight
- Factory technical assistance is also available for specific applications through our Application Engineering department. *email: engineering.eu@alliedmachine.com*

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

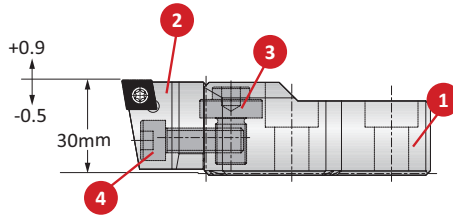
- Do not exceed recommended 10xD length-to-diameter ratio or exceed 4 total components (including shank)
  - When using Alu-Line® components, do not exceed recommended 5xD length-to-diameter ratio
  - When using tool steel components, do not exceed recommended 6xD length-to-diameter ratio
  - When using heavy metal components, do not exceed recommended 8xD length-to-diameter ratio
  - When using a carbide shank, do not exceed recommended 9xD length-to-diameter ratio
  - When using a NOVITECH module, do not exceed recommended 10xD length-to-diameter ratio
  - Refer to examples on pages B10-M: 8-10 for calculating length-to-diameter ratio
- Factory technical assistance is available for your specific applications through our Application Engineering department. *email: engineering.eu@alliedmachine.com*

## Insert Holders for Height Adjustments and Axial Grooving



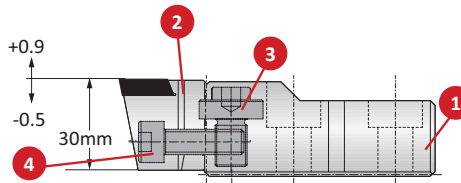
Insert Form 103

| Boring Range     | 1 Support |             | 2 Insert Holder |          | 3 Adjusting Screw |          | 4 Fixing Screw |  |
|------------------|-----------|-------------|-----------------|----------|-------------------|----------|----------------|--|
|                  | Part No.  | Insert Form | Part No.        | Part No. | Service Key       | Part No. | Service Key    |  |
| 200.00 - 3255.00 | 149055    | 103         | 149058          | 315355   | s6 / B            | 070369   | s6 / B         |  |



Insert Form 104

| Boring Range     | 1 Support |             | 2 Insert Holder |          | 3 Adjusting Screw |          | 4 Fixing Screw |  |
|------------------|-----------|-------------|-----------------|----------|-------------------|----------|----------------|--|
|                  | Part No.  | Insert Form | Part No.        | Part No. | Service Key       | Part No. | Service Key    |  |
| 200.00 - 3255.00 | 149055    | 104         | 149056          | 315355   | s6 / B            | 070369   | s6 / B         |  |

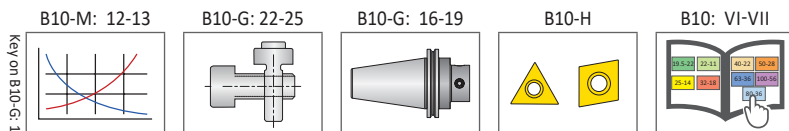
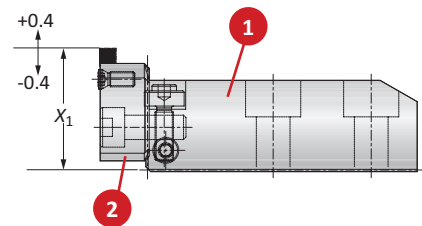


Insert Form 05

| Boring Range     | 1 Support |             | 2 Insert Holder |          | 3 Adjusting Screw |          | 4 Fixing Screw |  |
|------------------|-----------|-------------|-----------------|----------|-------------------|----------|----------------|--|
|                  | Part No.  | Insert Form | Part No.        | Part No. | Service Key       | Part No. | Service Key    |  |
| 200.00 - 3255.00 | 149055    | 05          | 149085          | 315355   | s6 / B            | 070369   | s6 / B         |  |

### Insert Holder for Axial Grooving

| Insert Holder | 1 Support | 2 Insert Holder | Weight    | Insert Form |
|---------------|-----------|-----------------|-----------|-------------|
| $X_1$         | Part No.  | Part No.        |           |             |
| 40.00         | 226014    | 226031          | 0.30 (kg) | 304         |



m = Metric (mm)  
Inserts sold separately

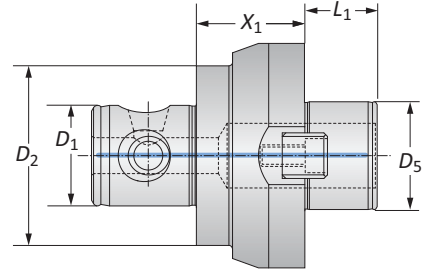
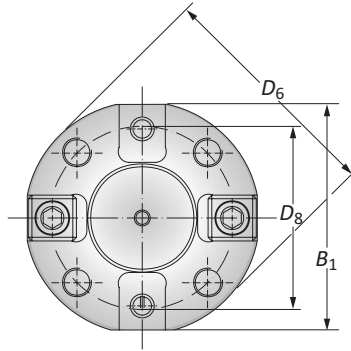
**WARNING** Exceeding weight capacity for machine tool spindle and tool changer can cause machine damage and/or serious injury. To prevent:  
 -Consult machine tool builder for machine's weight limitations.  
 -Refer to example on page B10-M: 11 for calculating tool assembly weight  
 Factory technical assistance is also available for specific applications through our Application Engineering department. *email: engineering.eu@alliedmachine.com*

**WARNING** Tool failure can cause serious injury. To prevent:  
 -Do not exceed recommended 10xD length-to-diameter ratio or exceed 4 total components (including shank)  
 -When using Alu-Line® components, do not exceed recommended 5xD length-to-diameter ratio  
 -When using tool steel components, do not exceed recommended 6xD length-to-diameter ratio  
 -When using heavy metal components, do not exceed recommended 8xD length-to-diameter ratio  
 -When using a carbide shank, do not exceed recommended 9xD length-to-diameter ratio  
 -When using a NOVITECH module, do not exceed recommended 10xD length-to-diameter ratio  
 -Refer to examples on pages B10-M: 8-10 for calculating length-to-diameter ratio  
 Factory technical assistance is available for your specific applications through our Application Engineering department. *email: engineering.eu@alliedmachine.com*

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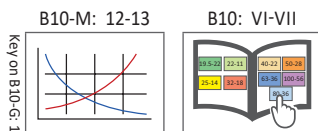


MVS Holding Arbors D 40 / D 60



| MVS Connection      | Holding Arbor Connection | Holding Arbor |       |       |        |        |        | Weight    | Part No.                 |
|---------------------|--------------------------|---------------|-------|-------|--------|--------|--------|-----------|--------------------------|
|                     |                          | $X_1$         | $L_1$ | $D_5$ | $D_6$  | $D_8$  | $B_1$  |           |                          |
| $D_2   D_1$         |                          |               |       |       |        |        |        |           |                          |
| 80 - 36             | D 40 Alu-Line            | 19.00         | 30.00 | 40.00 | 89.00  | 66.70  | 80.00  | 0.50 (kg) | 309001 <sup>(1)(2)</sup> |
| 80 - 36             | D 60                     | 60.00         | 40.00 | 60.00 | 129.10 | 101.60 | 125.00 | 4.10 (kg) | 209060 <sup>(1)</sup>    |
| <b>III</b> 100 - 56 | D 40 Alu-Line            | 30.00         | 30.00 | 40.00 | 89.00  | 66.70  | 80.00  | 1.00 (kg) | 309041 <sup>(2)</sup>    |
| 100 - 56            | D 60                     | 60.00         | 40.00 | 60.00 | 129.10 | 101.60 | 125.00 | 6.30 (kg) | 209043                   |
| 100 - 56            | D 60 Alu-Line            | 60.00         | 40.00 | 60.00 | 129.10 | 101.60 | 125.00 | 2.20 (kg) | 309043 <sup>(2)</sup>    |

- (1) For light machining only
- (2) Lightweight aluminium construction only in connection with our serrated slides  
 Basic D 40 Serrated Slides:  $\varnothing$  200.00 - 520.00 mm (Page B10-E: 4)  
 Basic D 60 Serrated Slides:  $\varnothing$  200.00 - 505.00 mm (Page B10-E: 5)



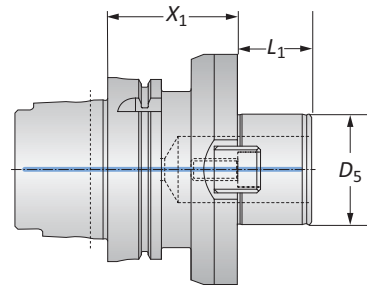
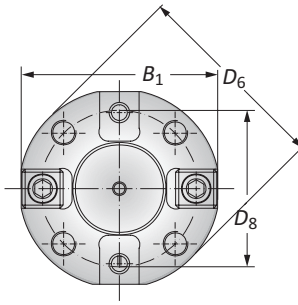
**III** = Metric (mm)

**WARNING** Exceeding weight capacity for machine tool spindle and tool changer can cause machine damage and/or serious injury. To prevent:  
 -Consult machine tool builder for machine's weight limitations.  
 -Refer to example on page B10-M: 11 for calculating tool assembly weight  
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**WARNING** Tool failure can cause serious injury. To prevent:  
 -Do not exceed recommended 10xD length-to-diameter ratio or exceed 4 total components (including shank)  
 -When using Alu-Line® components, do not exceed recommended 5xD length-to-diameter ratio  
 -When using tool steel components, do not exceed recommended 6xD length-to-diameter ratio  
 -When using heavy metal components, do not exceed recommended 8xD length-to-diameter ratio  
 -When using a carbide shank, do not exceed recommended 9xD length-to-diameter ratio  
 -When using a NOVITECH module, do not exceed recommended 10xD length-to-diameter ratio  
 -Refer to examples on pages B10-M: 8-10 for calculating length-to-diameter ratio  
 Factory technical assistance is available for your specific applications through our Application Engineering department. *email: engineering.eu@alliedmachine.com*

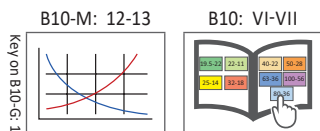
## Master Shanks D 40 / D 60

### HSK-A (DIN 69 893) Shanks



### HSK-A (DIN 69 893) Shanks

| Taper Size | Connection | Shank |       |       |        |        |        |           | Weight | Part No. |
|------------|------------|-------|-------|-------|--------|--------|--------|-----------|--------|----------|
|            |            | $X_1$ | $L_1$ | $D_5$ | $D_6$  | $D_8$  | $B_1$  |           |        |          |
| 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 |          |



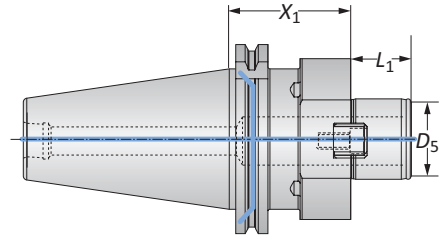
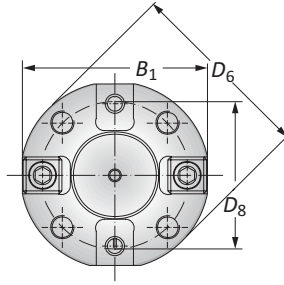
Ⓜ = Metric (mm)

**⚠ WARNING** Exceeding weight capacity for machine tool spindle and tool changer can cause machine damage and/or serious injury. To prevent:  
 -Consult machine tool builder for machine's weight limitations.  
 -Refer to example on page B10-M: 11 for calculating tool assembly weight  
 Factory technical assistance is also available for specific applications through our Application Engineering department. *email: [engineering.eu@alliedmachine.com](mailto:engineering.eu@alliedmachine.com)*


**⚠ WARNING** Tool failure can cause serious injury. To prevent:  
 -Do not exceed recommended 10xD length-to-diameter ratio or exceed 4 total components (including shank)  
 -When using Alu-Line® components, do not exceed recommended 5xD length-to-diameter ratio  
 -When using tool steel components, do not exceed recommended 6xD length-to-diameter ratio  
 -When using heavy metal components, do not exceed recommended 8xD length-to-diameter ratio  
 -When using a carbide shank, do not exceed recommended 9xD length-to-diameter ratio  
 -When using a NOVI<sup>TECH</sup> module, do not exceed recommended 10xD length-to-diameter ratio  
 -Refer to examples on pages B10-M: 8-10 for calculating length-to-diameter ratio  
 Factory technical assistance is available for your specific applications through our Application Engineering department. *email: [engineering.eu@alliedmachine.com](mailto:engineering.eu@alliedmachine.com)*

## Master Shanks D 40

### CAT 50 Shank with Metric Threads



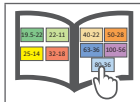
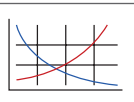
### CAT 50 Shanks with Metric Threads

| Taper Size   | Connection | Shank |       |       |       |       |       | Weight    | Part No.      |
|--|------------|-------|-------|-------|-------|-------|-------|-----------|---------------|
|  |            | $X_1$ | $L_1$ | $D_5$ | $D_6$ | $D_8$ | $B_1$ |           |               |
|  50 | D 40       | 60.00 | 30.00 | 40.00 | 89.00 | 66.70 | 80.00 | 4.60 (kg) | <b>326083</b> |

B10-M: 12-13

B10: VI-VII

Key on B10-G: I



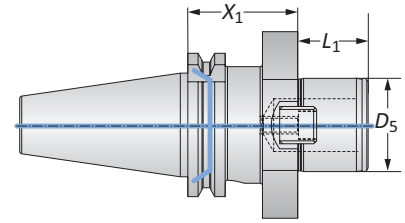
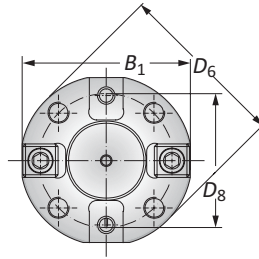
 = Metric (mm)

**⚠ WARNING** Exceeding weight capacity for machine tool spindle and tool changer can cause machine damage and/or serious injury. To prevent:  
 -Consult machine tool builder for machine's weight limitations.  
 -Refer to example on page B10-M: 11 for calculating tool assembly weight  
 Factory technical assistance is also available for specific applications through our Application Engineering department. *email: [engineering.eu@alliedmachine.com](mailto:engineering.eu@alliedmachine.com)*

**⚠ WARNING** Tool failure can cause serious injury. To prevent:  
 -Do not exceed recommended 10xD length-to-diameter ratio or exceed 4 total components (including shank)  
 -When using Alu-Line® components, do not exceed recommended 5xD length-to-diameter ratio  
 -When using tool steel components, do not exceed recommended 6xD length-to-diameter ratio  
 -When using heavy metal components, do not exceed recommended 8xD length-to-diameter ratio  
 -When using a carbide shank, do not exceed recommended 9xD length-to-diameter ratio  
 -When using a NOVITECH module, do not exceed recommended 10xD length-to-diameter ratio  
 -Refer to examples on pages B10-M: 8-10 for calculating length-to-diameter ratio  
 Factory technical assistance is available for your specific applications through our Application Engineering department. *email: [engineering.eu@alliedmachine.com](mailto:engineering.eu@alliedmachine.com)*

## Master Shanks D 40 / D 60

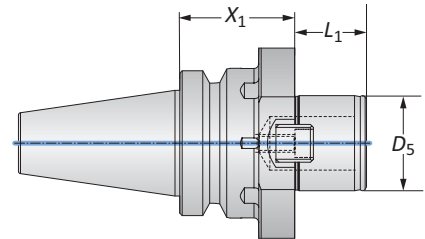
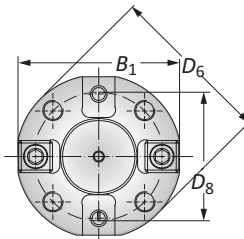
SK (DIN 69 871-AD/B) | BT / JIS B 6339 Shanks



### SK (DIN 69 871-AD/B) Shanks

| Taper Size | Connection | Shank |       |       |       |        |        |        | Weight    | Part No.      |
|------------|------------|-------|-------|-------|-------|--------|--------|--------|-----------|---------------|
|            |            | $X_1$ | $L_1$ | $D_5$ | $D_6$ | $D_8$  | $B_1$  |        |           |               |
| 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

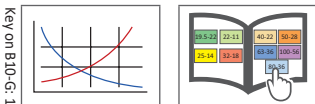


### BT / JIS B 6339 Shanks

| Taper Size | Connection | Shank |       |       |       |       |        |       | Weight    | Part No. |
|------------|------------|-------|-------|-------|-------|-------|--------|-------|-----------|----------|
|            |            | $X_1$ | $L_1$ | $D_5$ | $D_6$ | $D_8$ | $B_1$  |       |           |          |
| m          | 40         | D 40  | 50.00 | 30.00 | 40.00 | 89.00 | 66.70  | 80.00 | 1.80 (kg) | 326084   |
|            | 50         | D 40  | 55.00 | 30.00 | 40.00 | 89.00 | 66.70  | 80.00 | 4.50 (kg) | 326082   |
|            | 50         | D 60  | 80.00 | 40.00 | 60.00 | 19.10 | 101.60 | -     | 8.00 (kg) | 326062   |

B10-M: 12-13

B10: VI-VII



m = Metric (mm)

**WARNING** Exceeding weight capacity for machine tool spindle and tool changer can cause machine damage and/or serious injury. To prevent:  
 -Consult machine tool builder for machine's weight limitations.  
 -Refer to example on page B10-M: 11 for calculating tool assembly weight  
 Factory technical assistance is also available for specific applications through our Application Engineering department. *email: engineering.eu@alliedmachine.com*

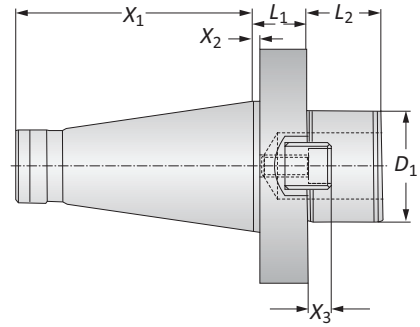
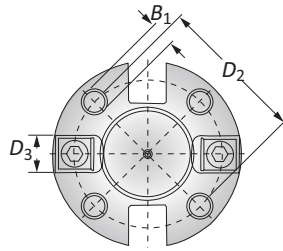
**WARNING** Tool failure can cause serious injury. To prevent:  
 -Do not exceed recommended 10xD length-to-diameter ratio or exceed 4 total components (including shank)  
 -When using Alu-Line® components, do not exceed recommended 5xD length-to-diameter ratio  
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 -When using heavy metal components, do not exceed recommended 8xD length-to-diameter ratio  
 -When using a carbide shank, do not exceed recommended 9xD length-to-diameter ratio  
 -When using a NOVITECH module, do not exceed recommended 10xD length-to-diameter ratio  
 -Refer to examples on pages B10-M: 8-10 for calculating length-to-diameter ratio  
 Factory technical assistance is available for your specific applications through our Application Engineering department. *email: engineering.eu@alliedmachine.com*

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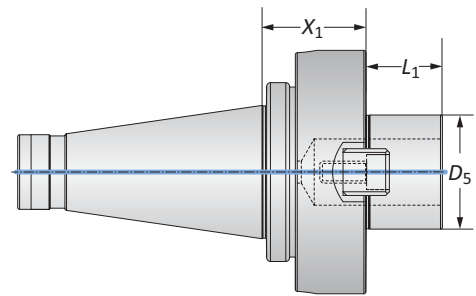
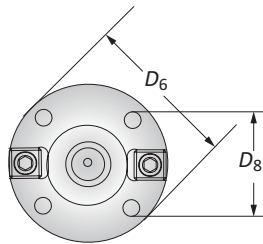
## Master Shanks D 60

NMTB Shanks | DIN 2080 Shanks



### NMTB Shanks

| Taper Size | Connection | Shank  |       |       |       |       |       |        |       |       | Weight    | Part No.      |
|------------|------------|--------|-------|-------|-------|-------|-------|--------|-------|-------|-----------|---------------|
|            |            | $X_1$  | $X_2$ | $L_1$ | $L_2$ | $D_1$ | $X_3$ | $D_2$  | $D_3$ | $B_1$ |           |               |
| 50         | D 60       | 126.80 | 3.20  | 29.00 | 40.00 | 60.00 | 12.50 | 101.60 | 25.40 | M16   | 8.00 (kg) | 198051T004480 |



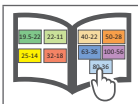
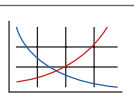
### DIN 2080 Shanks

| Taper Size | Connection | Shank |       |       |        |        |       | Weight    | Part No. |
|------------|------------|-------|-------|-------|--------|--------|-------|-----------|----------|
|            |            | $X_1$ | $L_1$ | $D_5$ | $D_6$  | $D_8$  | $B_1$ |           |          |
| 50         | D 60       | 55.00 | 40.00 | 60.00 | 128.00 | 101.60 | -     | 6.80 (kg) | 326035   |

B10-M: 12-13

B10: VI-VII

Key on B10-G: 1



= Metric (mm)

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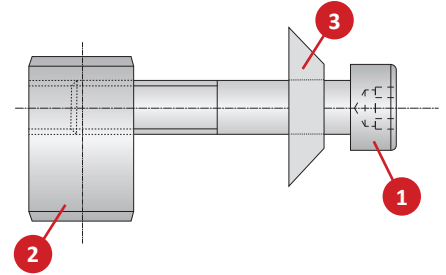
**⚠ WARNING** Tool failure can cause serious injury. To prevent:  
 -Do not exceed recommended 10xD length-to-diameter ratio or exceed 4 total components (including shank)  
 -When using Alu-Line® components, do not exceed recommended 5xD length-to-diameter ratio  
 -When using tool steel components, do not exceed recommended 6xD length-to-diameter ratio  
 -When using heavy metal components, do not exceed recommended 8xD length-to-diameter ratio  
 -When using a carbide shank, do not exceed recommended 9xD length-to-diameter ratio  
 -When using a NOVITECH™ module, do not exceed recommended 10xD length-to-diameter ratio  
 -Refer to examples on pages B10-M: 8-10 for calculating length-to-diameter ratio  
 Factory technical assistance is available for your specific applications through our Application Engineering department. *email: [engineering.eu@alliedmachine.com](mailto:engineering.eu@alliedmachine.com)*

## 537 Accessories

Clamping Pieces | Counter Weight | Insert Holders for Abrasive Materials

### 537 Clamping Pieces

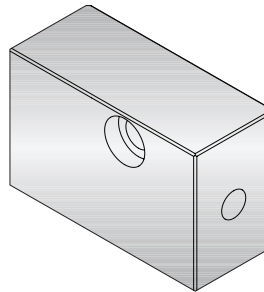
| Slide Type           | Complete Part No. | Service Key |        | Replacement Components |                   |                  |
|----------------------|-------------------|-------------|--------|------------------------|-------------------|------------------|
|                      |            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



**NOTE:** Clamping pieces sold separately

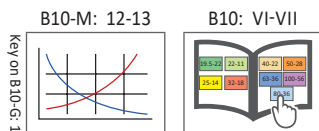
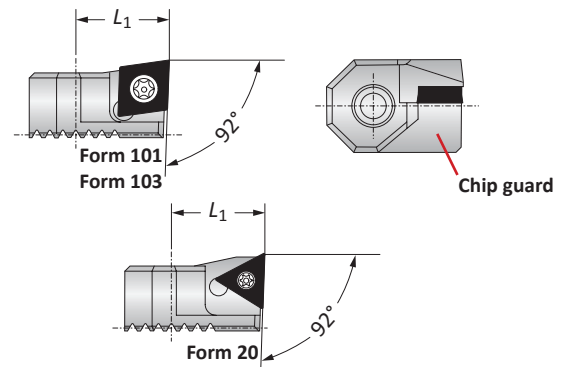
### 537 Counter Weight

| Boring Range              | Part No.      |
|---------------------------|---------------|
| <b>m</b> 100.00 - 3255.00 | <b>537055</b> |



### Insert Holders for Abrasive Materials

| Boring Range              | L <sub>1</sub> | Weight    | Insert Form | Part No.      |
|---------------------------|----------------|-----------|-------------|---------------|
| <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> |



**m** = Metric (mm)

Inserts sold separately

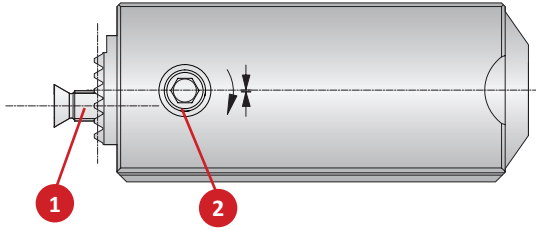
**WARNING** Exceeding weight capacity for machine tool spindle and tool changer can cause machine damage and/or serious injury. To prevent:  
 -Consult machine tool builder for machine's weight limitations.  
 -Refer to example on page B10-M: 11 for calculating tool assembly weight  
 Factory technical assistance is also available for specific applications through our Application Engineering department. *email: [engineering.eu@alliedmachine.com](mailto:engineering.eu@alliedmachine.com)*

**WARNING** Tool failure can cause serious injury. To prevent:  
 -Do not exceed recommended 10xD length-to-diameter ratio or exceed 4 total components (including shank)  
 -When using Alu-Line® components, do not exceed recommended 5xD length-to-diameter ratio  
 -When using tool steel components, do not exceed recommended 6xD length-to-diameter ratio  
 -When using heavy metal components, do not exceed recommended 8xD length-to-diameter ratio  
 -When using a carbide shank, do not exceed recommended 9xD length-to-diameter ratio  
 -When using a NOVITECH module, do not exceed recommended 10xD length-to-diameter ratio  
 -Refer to examples on pages B10-M: 8-10 for calculating length-to-diameter ratio  
 Factory technical assistance is available for your specific applications through our Application Engineering department. *email: [engineering.eu@alliedmachine.com](mailto:engineering.eu@alliedmachine.com)*

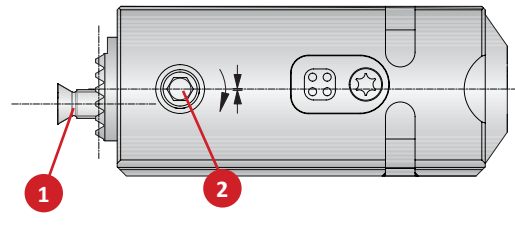


## 537 Accessories | 3E<sup>TECH+</sup> Accessories

### Accessories



537 Analogue Cassette



537 Digital Cassette

### 537 Accessories

| Cassette Part No. | 1 Countersunk Screw |             | 2 Clamping Screw |             |
|-------------------|---------------------|-------------|------------------|-------------|
|                   | Part No.            | Service Key | Part No.         | Service Key |
| 537051            | 215462              | T20 / H     | 115249           | s4 / F      |
| 537052            | 215462              | T20 / H     | 315789           | s4 / F      |

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

| 1<br>Charging Unit |
|--------------------|
| Part No.           |
| 536016             |

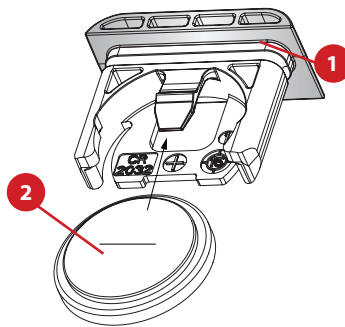
**NOTE:** Charging unit sold separately from 3E<sup>TECH+</sup>



**NOTE:** 3E<sup>TECH+</sup> adjustment accuracy of 0.001 mm on diameter

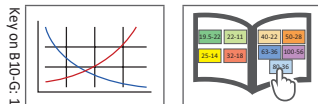
### 3E<sup>TECH</sup> Accessories

| 1<br>Sealing Ring | 2<br>Battery CR2032 |
|-------------------|---------------------|
| Part No.          | Part No.            |
| 215483            | 515491              |



B10-M: 12-13

B10: VI-VII



**m** = Metric (mm)

Inserts sold separately

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

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

-Refer to example on page B10-M: 11 for calculating tool assembly weight

Factory technical assistance is also available for specific applications through our Application Engineering department. *email: engineering.eu@alliedmachine.com*

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

-Do not exceed recommended 10xD length-to-diameter ratio or exceed 4 total components (including shank)

-When using Alu-Line® components, do not exceed recommended 5xD length-to-diameter ratio

-When using tool steel components, do not exceed recommended 6xD length-to-diameter ratio

-When using heavy metal components, do not exceed recommended 8xD length-to-diameter ratio

-When using a carbide shank, do not exceed recommended 9xD length-to-diameter ratio

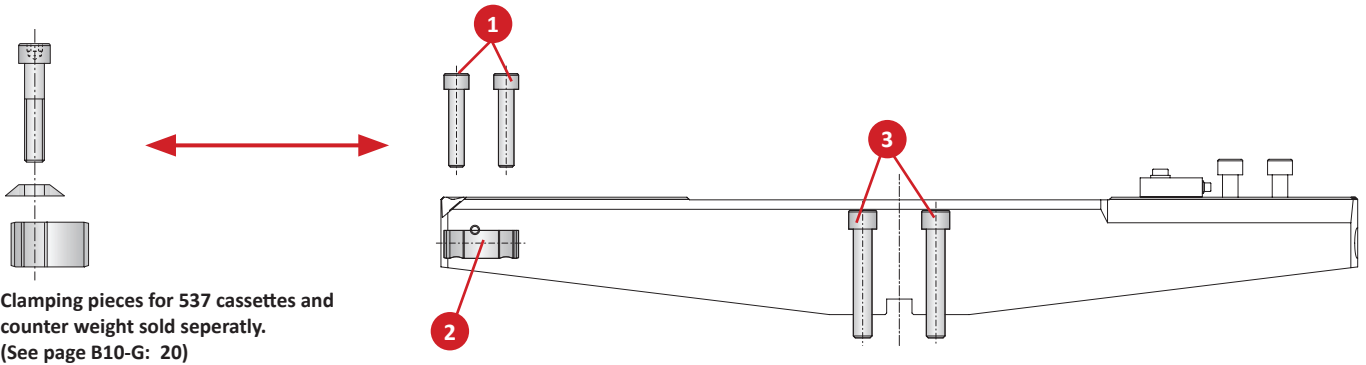
-When using a NOVITECH module, do not exceed recommended 10xD length-to-diameter ratio

-Refer to examples on pages B10-M: 8-10 for calculating length-to-diameter ratio

Factory technical assistance is available for your specific applications through our Application Engineering department. *email: engineering.eu@alliedmachine.com*

## Serrated Slide Basic D 40 Accessories

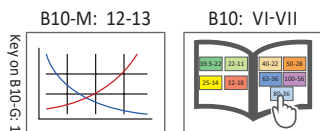
### Clamping Pieces



Clamping pieces for 537 cassettes and counter weight sold separately. (See page B10-G: 20)

### Clamping Pieces

| Connection | Serrated Slide | 1 Cap Screw |             | 2 Clamping Nut | 3 Thread Pin |             | Cap Screw |             |         |
|------------|----------------|-------------|-------------|----------------|--------------|-------------|-----------|-------------|---------|
|            | Part No.       | Part No.    | Service Key | Part No.       | Part No.     | Service Key | Part No.  | Service Key |         |
| 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 |



m = Metric (mm)

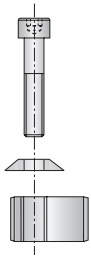
**WARNING** Exceeding weight capacity for machine tool spindle and tool changer can cause machine damage and/or serious injury. To prevent:  
 -Consult machine tool builder for machine's weight limitations.  
 -Refer to example on page B10-M: 11 for calculating tool assembly weight  
 Factory technical assistance is also available for specific applications through our Application Engineering department. *email: [engineering.eu@alliedmachine.com](mailto:engineering.eu@alliedmachine.com)*

**WARNING** Tool failure can cause serious injury. To prevent:  
 -Do not exceed recommended 10xD length-to-diameter ratio or exceed 4 total components (including shank)  
 -When using Alu-Line® components, do not exceed recommended 5xD length-to-diameter ratio  
 -When using tool steel components, do not exceed recommended 6xD length-to-diameter ratio  
 -When using heavy metal components, do not exceed recommended 8xD length-to-diameter ratio  
 -When using a carbide shank, do not exceed recommended 9xD length-to-diameter ratio  
 -When using a NOVITECH module, do not exceed recommended 10xD length-to-diameter ratio  
 -Refer to examples on pages B10-M: 8-10 for calculating length-to-diameter ratio  
 Factory technical assistance is available for your specific applications through our Application Engineering department. *email: [engineering.eu@alliedmachine.com](mailto:engineering.eu@alliedmachine.com)*

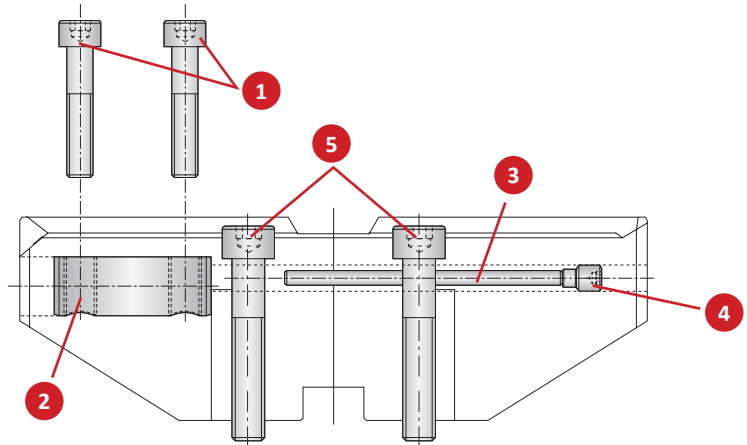


## Serrated Slide Basic D 60 Accessories

Clamping Pieces | Cover Plates



Clamping pieces for 537 cassettes and counter weight sold separately. (See page B10-G: 20)

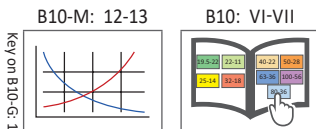
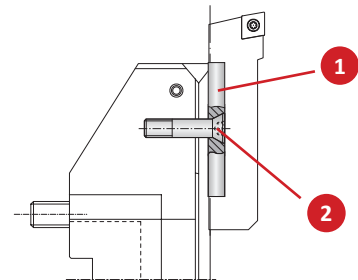


### Clamping Pieces

| Connection | Serrated Slide Part No. | 1 Cap Screw |             | 2 Clamping Nut Part No. | 3 Adjustment Pin Part No. | 4 Thread Pin |             | 5 Cap Screw |             |         |
|------------|-------------------------|-------------|-------------|-------------------------|---------------------------|--------------|-------------|-------------|-------------|---------|
|            |                         | Part No.    | Service Key |                         |                           | Part No.     | Service Key | Part No.    | Service Key |         |
| 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 | 2 Countersunk Screw |             |        |
|------------|-------------------------|---------------|---------------------|-------------|--------|
|            |                         | Part No.      | Part No.            | Service Key |        |
| m          | D 60                    | 349051        | 349016              | 063106      | s4 / B |
|            | D 60                    | 349052        | 349017              | 063106      | s4 / B |
|            | D 60                    | 349053        | 349017              | 063106      | s4 / B |
|            | D 60                    | 349054        | 349017              | 063106      | s4 / B |



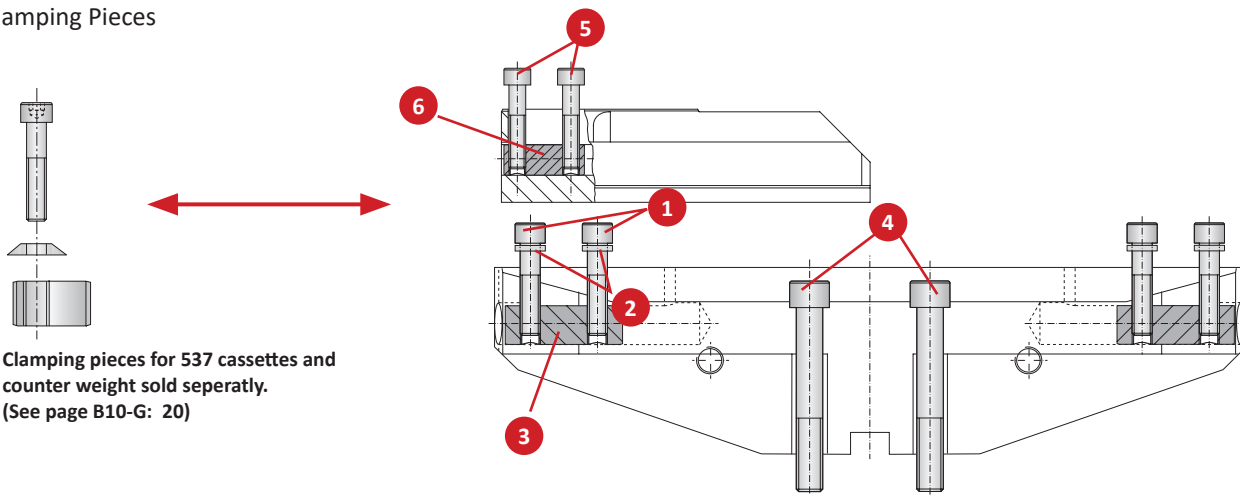
m = Metric (mm)

**WARNING** Exceeding weight capacity for machine tool spindle and tool changer can cause machine damage and/or serious injury. To prevent:  
 -Consult machine tool builder for machine's weight limitations.  
 -Refer to example on page B10-M: 11 for calculating tool assembly weight  
 Factory technical assistance is also available for specific applications through our Application Engineering department. *email: engineering.eu@alliedmachine.com*

**WARNING** Tool failure can cause serious injury. To prevent:  
 -Do not exceed recommended 10xD length-to-diameter ratio or exceed 4 total components (including shank)  
 -When using Alu-Line® components, do not exceed recommended 5xD length-to-diameter ratio  
 -When using tool steel components, do not exceed recommended 6xD length-to-diameter ratio  
 -When using heavy metal components, do not exceed recommended 8xD length-to-diameter ratio  
 -When using a carbide shank, do not exceed recommended 9xD length-to-diameter ratio  
 -When using a NOVITECH module, do not exceed recommended 10xD length-to-diameter ratio  
 -Refer to examples on pages B10-M: 8-10 for calculating length-to-diameter ratio  
 Factory technical assistance is available for your specific applications through our Application Engineering department. *email: engineering.eu@alliedmachine.com*

## Serrated Slide Eco D 60 Accessories

### Clamping Pieces



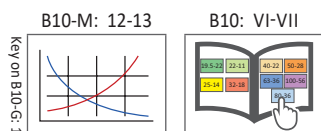
Clamping pieces for 537 cassettes and counter weight sold separately. (See page B10-G: 20)

### Base Slide Clamping Pieces

| Connection | Base Slide<br>Part No. | 1 Cap Screw |             | 2 Disc   | 3 Clamping Nut | 4 Cap Screw |             |
|------------|------------------------|-------------|-------------|----------|----------------|-------------|-------------|
|            |                        | Part No.    | Service Key | Part No. | Part No.       | Part No.    | Service Key |
| D 60       | 349005                 | 115771      | s10 / C     | 115737   | 415181         | 077128      | s14 / C     |
|            | 349006                 | 115771      | s10 / C     | 115737   | 415181         | 077128      | s14 / C     |

### Serrated Slide Clamping Pieces

| Serrated Slide<br>Part No. | 5 Cap Screw |             | 6 Clamping Nut |
|----------------------------|-------------|-------------|----------------|
|                            | Part No.    | Service Key | Part No.       |
| 349014                     | 115118      | s8 / B      | 115669         |
| 349015                     | 115118      | s8 / B      | 115669         |



Ⓜ = Metric (mm)

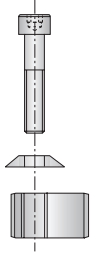
**⚠ WARNING** Exceeding weight capacity for machine tool spindle and tool changer can cause machine damage and/or serious injury. To prevent:  
 -Consult machine tool builder for machine's weight limitations.  
 -Refer to example on page B10-M: 11 for calculating tool assembly weight  
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**⚠ WARNING** Tool failure can cause serious injury. To prevent:  
 -Do not exceed recommended 10xD length-to-diameter ratio or exceed 4 total components (including shank)  
 -When using Alu-Line® components, do not exceed recommended 5xD length-to-diameter ratio  
 -When using tool steel components, do not exceed recommended 6xD length-to-diameter ratio  
 -When using heavy metal components, do not exceed recommended 8xD length-to-diameter ratio  
 -When using a carbide shank, do not exceed recommended 9xD length-to-diameter ratio  
 -When using a NOVITECH module, do not exceed recommended 10xD length-to-diameter ratio  
 -Refer to examples on pages B10-M: 8-10 for calculating length-to-diameter ratio  
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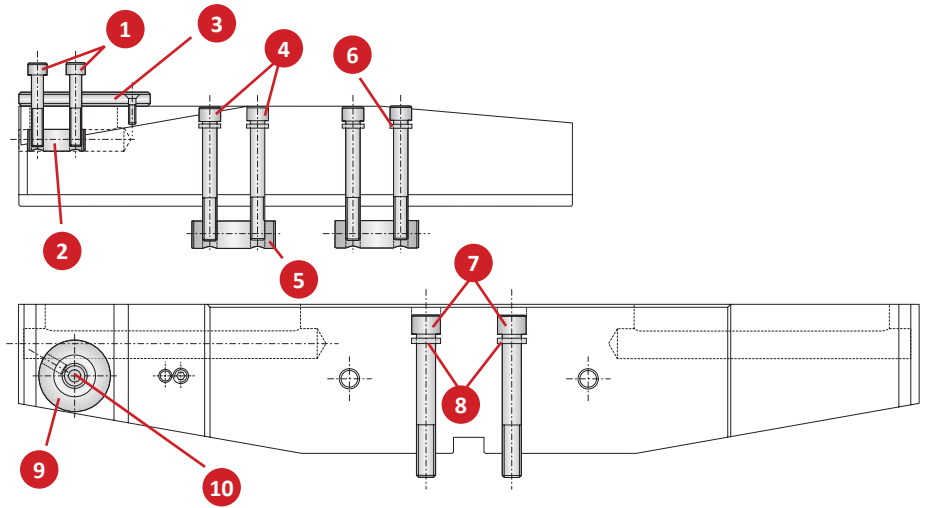


## Serrated Slide Flex D 60 Accessories

### Clamping Pieces



Clamping pieces for 537 cassettes and counter weight sold separately. (See page B10-G: 20)

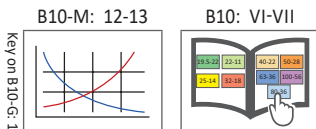


### Serrated Slide Clamping Pieces

| Serrated Slide | 1 Cap Screw |             | 2 Clamping Nut |             | 3 Adapter |             | 4 Cap Screw |             | 5 Clamping Nut |             | 6 Disk   |             |
|----------------|-------------|-------------|----------------|-------------|-----------|-------------|-------------|-------------|----------------|-------------|----------|-------------|
|                | Part No.    | Service Key | Part No.       | Service Key | Part No.  | Service Key | Part No.    | Service Key | Part No.       | Service Key | Part No. | Service Key |
| m              | 349035      | 115307      | s8 / B         | 115669      | 349043    | s4 / B      | 315186      | s10 / C     | 349202         | 415898      | 115737   | s6 / B      |
|                | 349036      | 115307      | s8 / B         | 115669      | 349043    | s4 / B      | 077110      | s10 / C     | 415181         | 415898      | 115737   | s6 / B      |
|                | 349037      | 115307      | s8 / B         | 115669      | 349043    | s4 / B      | 315403      | s10 / C     | 415181         | 415898      | 115737   | s6 / B      |
|                | 349038      | 115307      | s8 / B         | 115669      | 349043    | s4 / B      | 315415      | s10 / C     | 415181         | 415898      | 115737   | s6 / B      |

### Base Slide Clamping Pieces

| Connection | Base Slide |             | 7 Cap Screw |             | 8 Disk   |             | 9 Injector |             | 10 Countersunk Screw |             |
|------------|------------|-------------|-------------|-------------|----------|-------------|------------|-------------|----------------------|-------------|
|            | Part No.   | Service Key | Part No.    | Service Key | Part No. | Service Key | Part No.   | Service Key | Part No.             | Service Key |
| m          | D 60       | 349031      | 115736      | s14 / C     | 068168   | s14 / C     | 349201     | s14 / C     | 415898               | s6 / B      |
|            | D 60       | 349032      | 415913      | s14 / C     | 068168   | s14 / C     | 349201     | s14 / C     | 415898               | s6 / B      |
|            | D 60       | 349033      | 215509      | s14 / C     | 068168   | s14 / C     | 349201     | s14 / C     | 415898               | s6 / B      |
|            | D 60       | 349034      | 415636      | s14 / C     | 068168   | s14 / C     | 349201     | s14 / C     | 415898               | s6 / B      |



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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 -Refer to example on page B10-M: 11 for calculating tool assembly weight  
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 -When using tool steel components, do not exceed recommended 6xD length-to-diameter ratio  
 -When using heavy metal components, do not exceed recommended 8xD length-to-diameter ratio  
 -When using a carbide shank, do not exceed recommended 9xD length-to-diameter ratio  
 -When using a NOVITECH module, do not exceed recommended 10xD length-to-diameter ratio  
 -Refer to examples on pages B10-M: 8-10 for calculating length-to-diameter ratio  
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SECTION

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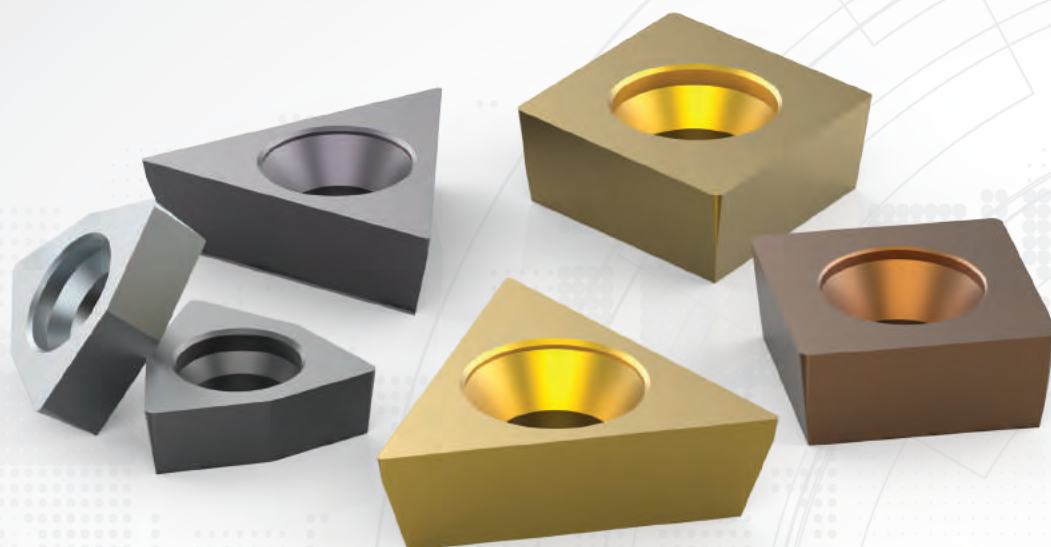
# B10-H

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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 to 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 catalogue 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 catalogue, 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 catalogue. 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.

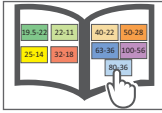
**NOTE** and **IMPORTANT** are also used. These are important that you read and follow but are not safety-related.

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

# Wohlhaupter® Inserts Table of Contents

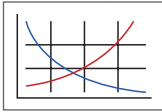
## Reference Icons

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



### MVS Connection Colour Guide

Detailed instructions and information regarding the MVS connection(s)



### Recommended Cutting Data

Speed and feed recommendations for optimum and safe boring

## Product Nomenclature

|                                 |   |
|---------------------------------|---|
| Wohlhaupter Insert Nomenclature | 2 |
| ISO Insert Nomenclature         | 3 |

## Insert Grades

## Insert Geometries

## Insert Forms

|                                     |         |
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| Form 20                             | 16 - 17 |
| Form 161 and 163                    | 18      |
| Form 47                             | 19      |
| Form 101, 103, 104, and 105         | 20 - 23 |
| Form 101, 103 and 104               | 24 - 25 |
| Form 39                             | 26 - 27 |
| Form 112, 113, and 114              | 28      |
| Form 04 and 05                      | 29      |
| Grooving Insert Form 89, 90, and 91 | 30 - 31 |
| Grooving Insert Form 304            | 32 - 34 |
| Grooving Insert Form 325            | 35      |

## Insert Accessories

## Technical Information

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| Surface Finish and General Formulas | 38      |
| Wiper Geometries                    | 39      |
| Recommended Cutting Data            | 40 - 41 |

## Wear Patterns

# 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.alliedmahcine.com/bis](http://www.alliedmahcine.com/bis)



## Wohlhaupter Insert 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> | <b>D</b> |
| 1           | 2         | 3        | 4        |   | 5          | 6        | 7        |

| 1. Wohlhaupter Insert Form |     |
|----------------------------|-----|
| 211                        | 262 |
| 20                         | 264 |
| 161                        | 112 |
| 163                        | 113 |
| 47                         | 114 |
| 101                        | 04  |
| 103                        | 05  |
| 104                        | 89  |
| 105                        | 90  |
| 123                        | 91  |
| 124                        | 304 |
| 39                         | 325 |
| 75                         |     |

| 2. Corner Radius |  |
|------------------|--|
| Metric (mm)      |  |
| 005 = 0.05 mm    |  |
| 01 = 0.10 mm     |  |
| 02 = 0.20 mm     |  |
| 03 = 0.30 mm     |  |
| 04 = 0.40 mm     |  |
| 06 = 0.60 mm     |  |
| 08 = 0.80 mm     |  |
| 12 = 1.20 mm     |  |
| 16 = 1.60 mm     |  |
| 20 = 2.00 mm     |  |
| 24 = 2.40 mm     |  |

| 3. Tolerance Group |                |             |
|--------------------|----------------|-------------|
| Metric (mm)        |                |             |
| <b>G</b>           | Length of edge | ±0.025      |
|                    | IC             | ±0.025      |
| <b>M</b>           | Thickness      | ±0.13       |
|                    | Length of edge | ±0.08-0.15* |
| <b>F</b>           | IC             | ±0.05-0.10* |
|                    | Thickness      | ±0.13       |
| <b>C</b>           | Length of edge | ±0.013      |
|                    | IC             | ±0.005      |
| <b>F</b>           | 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 |  |
| 108         | 155     | 880        | 711     | 720 | 741 |  |
| 109         | 158     | 811        |         | 730 | 742 |  |
| 112         | 161     |            |         | 735 | 745 |  |
| 114         | 174W    |            |         |     | 747 |  |
| 121         | 192     |            |         |     | 748 |  |
| 122         | 199     |            |         |     | 749 |  |
| 126         | 200     |            |         |     | 768 |  |
| 127         | 650     |            |         |     |     |  |
| 128         | 711     |            |         |     |     |  |
| 129         | 840     |            |         |     |     |  |
| 145         | 850     |            |         |     |     |  |
| 146         | 860     |            |         |     |     |  |

| 6. / 7. Optional Information |  |
|------------------------------|--|
| <b>W</b> = Wiper Geometry    |  |
| <b>D</b> = Double Tipped     |  |
| <b>T</b> = Triple Tipped     |  |

# 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    |
|-------------------------|
| <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       |

| 2. Clearance Angle |
|--------------------|
| <b>B</b> = 5°      |
| <b>C</b> = 7°      |
| <b>N</b> = 0°      |
| <b>P</b> = 11°     |
| <b>O</b> = 10°     |

| 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. Mounting Style                |  |
|----------------------------------|--|
| <b>T</b> = One-sided countersunk | Cylindrical fixing hole<br>Countersunk 40° - 60° |
| <b>H</b> = One-sided chipbreaker | Cylindrical fixing hole<br>Countersunk 70° - 90° |
| <b>W</b> = Without chipbreaker   | Cylindrical fixing hole<br>Countersunk 40° - 60° |
| <b>X</b> = Special design        | Special insert design                            |
| <b>A</b> = Without chipbreaker   | Cylindrical fixing hole<br>Without countersunk   |

| 5. Insert Size / Cutting Edge |    |    |    |    |     |    |    |
|-------------------------------|----|----|----|----|-----|----|----|
| Metric (mm)                   | C  | D  | R  | S  | T   | V  | W  |
| 3.97 mm                       |    |    |    |    | 006 |    | 03 |
| 5.00 mm                       |    |    |    |    | F20 |    |    |
| 6.00 mm                       |    |    |    |    | F21 |    |    |
| 6.35 mm                       | 06 |    |    |    | 11  | 11 |    |
| 7.94 mm                       |    |    |    | 07 |     |    |    |
| 9.52 mm                       | 09 | 11 |    | 09 | 16  | 16 |    |
| 10.00 mm                      |    | 10 |    |    |     |    |    |
| 12.00 mm                      | 12 | 12 |    |    |     |    |    |
| 12.70 mm                      | 16 | 15 |    | 12 |     |    |    |
| 15.87 mm                      |    |    | 15 | 15 |     |    |    |
| 16.00 mm                      |    |    | 16 |    |     |    |    |
| 19.05 mm                      |    | 19 |    | 19 |     |    |    |
| 20.00 mm                      |    |    | 20 |    |     |    |    |
| 25.00 mm                      |    |    | 25 |    |     |    |    |
| 25.40 mm                      |    |    |    | 25 |     |    |    |

| 6. Insert Thickness |
|---------------------|
| <b>Metric (mm)</b>  |
| <b>01</b> = 1.59 mm |
| <b>02</b> = 2.38 mm |
| <b>T2</b> = 2.78 mm |
| <b>03</b> = 3.18 mm |
| <b>T3</b> = 3.97 mm |
| <b>04</b> = 4.76 mm |
| <b>05</b> = 5.56 mm |
| <b>06</b> = 6.35 mm |
| <b>07</b> = 7.94 mm |

| 7. Corner Radius     |
|----------------------|
| <b>Metric (mm)</b>   |
| <b>005</b> = 0.05 mm |
| <b>01</b> = 0.10 mm  |
| <b>02</b> = 0.20 mm  |
| <b>03</b> = 0.30 mm  |
| <b>04</b> = 0.40 mm  |
| <b>06</b> = 0.60 mm  |
| <b>08</b> = 0.80 mm  |
| <b>12</b> = 1.20 mm  |
| <b>16</b> = 1.60 mm  |
| <b>20</b> = 2.00 mm  |
| <b>24</b> = 2.40 mm  |

## Wohlhaupter Insert Grades

### Uncoated Carbide

#### Uncoated Carbide

| Cutting Material | Description   | Material | ISO Application |    |    |    |    |    |    |    |
|------------------|---|----------|-----------------|----|----|----|----|----|----|----|
|                  |   |          | 05              | 10 | 15 | 20 | 25 | 30 | 35 | 40 |
| WHW01<br>(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        |                 |    |    |    |    |    |    |    |
|                  |   | H        |                 |    |    |    |    |    |    |    |
| WHW16<br>(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        |                 |    |    |    |    |    |    |    |
|                  |   | H        |                 |    |    |    |    |    |    |    |
| WHW20<br>(HW)    | <ul style="list-style-type: none"> <li>Tough fine-grain carbide</li> <li>Finishing, roughing &amp; grooving</li> <li>Steel &amp; cast materials, cast steel</li> <li>Non-ferrous materials &amp; difficult-to-machine alloys</li> </ul> | P        |                 |    |    |    |    |    |    |    |
|                  |   | M        |                 |    |    |    |    |    |    |    |
|                  |   | K        |                 |    |    |    |    |    |    |    |
|                  |   | N        |                 |    |    |    |    |    |    |    |
|                  |   | S        |                 |    |    |    |    |    |    |    |
|                  |   | H        |                 |    |    |    |    |    |    |    |



## Wohlhaupter Insert Grades

### Coated Carbide

#### Coated Carbide

| Cutting Material | Description  | Material | ISO Application |    |    |    |    |    |    |    |
|------------------|--|----------|-----------------|----|----|----|----|----|----|----|
|                  |  |          | 05              | 10 | 15 | 20 | 25 | 30 | 35 | 40 |
| WHC05<br>(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<br>(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<br>(HC)    | <ul style="list-style-type: none"> <li>Multilayer PVD coating</li> <li>Finishing &amp; roughing</li> <li>Stainless steels</li> </ul>   | P        |                 |    |    |    |    |    |    |    |
|                  |  | M        |                 |    |    |    |    |    |    |    |
|                  |  | K        |                 |    |    |    |    |    |    |    |
|                  |  | N        |                 |    |    |    |    |    |    |    |
|                  |  | S        |                 |    |    |    |    |    |    |    |
|                  |  | H        |                 |    |    |    |    |    |    |    |
| WHC20<br>(HC)    | <ul style="list-style-type: none"> <li>Multilayer CVD coating</li> <li>Finishing</li> <li>Steels &amp; stainless steels</li> </ul>   | P        |                 |    |    |    |    |    |    |    |
|                  |  | M        |                 |    |    |    |    |    |    |    |
|                  |  | K        |                 |    |    |    |    |    |    |    |
|                  |  | N        |                 |    |    |    |    |    |    |    |
|                  |  | S        |                 |    |    |    |    |    |    |    |
|                  |  | H        |                 |    |    |    |    |    |    |    |
| WHC30<br>(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<br>(HC)    | <ul style="list-style-type: none"> <li>Multilayer MT CVD coating</li> <li>Roughing &amp; finishing</li> <li>Steels, stainless steels &amp; cast materials</li> </ul>   | P        |                 |    |    |    |    |    |    |    |
|                  |  | M        |                 |    |    |    |    |    |    |    |
|                  |  | K        |                 |    |    |    |    |    |    |    |
|                  |  | N        |                 |    |    |    |    |    |    |    |
|                  |  | S        |                 |    |    |    |    |    |    |    |
|                  |  | H        |                 |    |    |    |    |    |    |    |
| WHC81<br>(HC)    | <ul style="list-style-type: none"> <li>Thick MT CVD coating with adominal AL203</li> <li>High cutting speeds possible</li> <li>Excellent choice for cast materials</li> </ul>                                      | P        |                 |    |    |    |    |    |    |    |
|                  |  | M        |                 |    |    |    |    |    |    |    |
|                  |  | K        |                 |    |    |    |    |    |    |    |
|                  |  | N        |                 |    |    |    |    |    |    |    |
|                  |  | S        |                 |    |    |    |    |    |    |    |
|                  |  | H        |                 |    |    |    |    |    |    |    |
| WHC88<br>(HC)    | <ul style="list-style-type: none"> <li>Multilayer PVD coating</li> <li>Finishing &amp; roughing</li> <li>Universal usage</li> </ul>  | P        |                 |    |    |    |    |    |    |    |
|                  |  | M        |                 |    |    |    |    |    |    |    |
|                  |  | K        |                 |    |    |    |    |    |    |    |
|                  |  | N        |                 |    |    |    |    |    |    |    |
|                  |  | S        |                 |    |    |    |    |    |    |    |
|                  |  | H        |                 |    |    |    |    |    |    |    |

## Wohlhaupter Insert Grades

Coated Carbide

Coated Carbide

| Cutting Material | Description  | Material | ISO Application |    |    |    |    |    |    |    |
|------------------|--|----------|-----------------|----|----|----|----|----|----|----|
|                  |  |          | 05              | 10 | 15 | 20 | 25 | 30 | 35 | 40 |
| WHC98<br>(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        |                 |    |    |    |    |    |    |    |
| WHC111<br>(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        |                 |    |    |    |    |    |    |    |
|                  |  | H        |                 |    |    |    |    |    |    |    |
| WHC114<br>(HC)   | <ul style="list-style-type: none"> <li>Multilayer PVD coating</li> <li>Finishing &amp; roughing</li> <li>Steels, stainless steels, &amp; difficult-to-machine materials</li> </ul>   | P        |                 |    |    |    |    |    |    |    |
|                  |  | M        |                 |    |    |    |    |    |    |    |
|                  |  | K        |                 |    |    |    |    |    |    |    |
|                  |  | N        |                 |    |    |    |    |    |    |    |
|                  |  | S        |                 |    |    |    |    |    |    |    |
|                  |  | H        |                 |    |    |    |    |    |    |    |
| WHC136<br>(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        |                 |    |    |    |    |    |    |    |
|                  |  | H        |                 |    |    |    |    |    |    |    |
| WHC164<br>(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        |                 |    |    |    |    |    |    |    |
|                  |  | H        |                 |    |    |    |    |    |    |    |
| WHC168<br>(HC)   | <ul style="list-style-type: none"> <li>Multilayer 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        |                 |    |    |    |    |    |    |    |
|                  |  | H        |                 |    |    |    |    |    |    |    |
| WHC170<br>(HC)   | <ul style="list-style-type: none"> <li>Multilayer MT CVD coating</li> <li>Excellent toughness</li> <li>First choice for strong interruptions</li> <li>Cast materials and steel</li> </ul>  | P        |                 |    |    |    |    |    |    |    |
|                  |  | M        |                 |    |    |    |    |    |    |    |
|                  |  | K        |                 |    |    |    |    |    |    |    |
|                  |  | N        |                 |    |    |    |    |    |    |    |
|                  |  | S        |                 |    |    |    |    |    |    |    |
|                  |  | H        |                 |    |    |    |    |    |    |    |
| WHC198<br>(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        |                 |    |    |    |    |    |    |    |
|                  |  | H        |                 |    |    |    |    |    |    |    |
| WHC190<br>(HC)   | <ul style="list-style-type: none"> <li>Newest generation multilayer PVD coating</li> <li>Finishing &amp; roughing</li> <li>Extremely universal &amp; the first choice for poor machining conditions</li> <li>Excellent in cast steels, stainless steels, &amp; super alloys</li> </ul> | P        |                 |    |    |    |    |    |    |    |
|                  |  | M        |                 |    |    |    |    |    |    |    |
|                  |  | K        |                 |    |    |    |    |    |    |    |
|                  |  | N        |                 |    |    |    |    |    |    |    |
|                  |  | S        |                 |    |    |    |    |    |    |    |
|                  |  | H        |                 |    |    |    |    |    |    |    |

## Wohlhaupter Insert Grades

Uncoated Cermet | Coated Cermet

### Uncoated Cermet

| Cutting Material | Description   | Material | ISO Application |    |    |    |    |    |    |    |
|------------------|---|----------|-----------------|----|----|----|----|----|----|----|
|                  |   |          | 05              | 10 | 15 | 20 | 25 | 30 | 35 | 40 |
| WHT10<br>(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<br>(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<br>(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<br>(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<br>(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<br>(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 52 - 64 HRC</li> <li>Grain size 2 µm</li> <li>CBN content: 50%</li> </ul>          | P        |                 |    |    |    |    |    |    |    |
|                  |  | M        |                 |    |    |    |    |    |    |    |
|                  |  | K        |                 |    |    |    |    |    |    |    |
|                  |  | N        |                 |    |    |    |    |    |    |    |
|                  |  | S        |                 |    |    |    |    |    |    |    |
|                  |  | H        |                 |    |    |    |    |    |    |    |
| WBN200<br>(BN)   | <ul style="list-style-type: none"> <li>Uncoated CBN grade</li> <li>Roughing &amp; finishing highly discontinuous cuts</li> <li>Hardened steels 52 - 64 HRC</li> <li>Grain size 3 µm</li> <li>CBN content: 65%</li> </ul>                         | P        |                 |    |    |    |    |    |    |    |
|                  |  | M        |                 |    |    |    |    |    |    |    |
|                  |  | K        |                 |    |    |    |    |    |    |    |
|                  |  | N        |                 |    |    |    |    |    |    |    |
|                  |  | S        |                 |    |    |    |    |    |    |    |
|                  |  | H        |                 |    |    |    |    |    |    |    |
| WBN300<br>(BN)   | <ul style="list-style-type: none"> <li>Uncoated CBN grade</li> <li>Roughing &amp; finishing smooth cuts</li> <li>Hardened steels 52 - 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<br>(BN)   | <ul style="list-style-type: none"> <li>Uncoated CBN grade</li> <li>Roughing &amp; finishing smooth &amp; discontinuous cuts</li> <li>Pearlite grey cast iron &amp; sintered metals</li> <li>Grain size 2 µm</li> <li>CBN content: 90%</li> </ul> | P        |                 |    |    |    |    |    |    |    |
|                  |  | M        |                 |    |    |    |    |    |    |    |
|                  |  | K        |                 |    |    |    |    |    |    |    |
|                  |  | N        |                 |    |    |    |    |    |    |    |
|                  |  | S        |                 |    |    |    |    |    |    |    |
|                  |  | H        |                 |    |    |    |    |    |    |    |
| WBN448<br>(BN)   | <ul style="list-style-type: none"> <li>Uncoated CBN grade</li> <li>Roughing &amp; finishing smooth &amp; discontinuous cuts</li> <li>Pearlite grey cast iron &amp; sintered metals and ductile iron</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 |
| WBC300<br>(BC)   | <ul style="list-style-type: none"> <li>Coated CBN</li> <li>Roughing and finishing smooth cuts</li> <li>Hardened steels 52 - 64 HRC</li> <li>Grain size 1 µm</li> <li>CBN content: 50%</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<br>(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<br>(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<br>(CN)    | <ul style="list-style-type: none"> <li>Uncoated silicon-nitride ceramic</li> <li>Roughing</li> <li>Pearlite grey 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>   | ▼▼▼<br>▼    | 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>                       | ▼▼▼<br>▼    | F101, F103, F104                          |
| 112    | <ul style="list-style-type: none"> <li>Sintered chip breaker</li> <li>Finishing &amp; light roughing</li> </ul>  | ▼▼▼<br>▼    | F101, F103                                |
| 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>  | ▼▼▼<br>▼    | F37, F39, F101, F103, F104, F112, F113    |
| 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> | ▼▼▼<br>▼    | F37, F39, F101, F103                      |
| 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>                                  | ▼▼▼<br>▼    | F101, F103, F112, F113, F161              |
| 146  | <ul style="list-style-type: none"> <li>Positive geometry with stable cutting edge</li> <li>Universal usage for roughing, finishing and chamfering</li> </ul>   | ▼▼▼<br>▼    | F037, F039, F101, F103, F104, F112, F113, |



## Wohlhaupter Insert Geometries

Cermet | Carbide



Cermet | Carbide

| Geometry  | Description   | Application | Available Form  |
|---|---|-------------|---|
| 155    | <ul style="list-style-type: none"> <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                                      |
| 158    | <ul style="list-style-type: none"> <li>Stable sintered geometry for roughing &amp; finishing with &amp; without discontinuous cuts</li> </ul>   | ▼▼▼<br>▼    | F101, F103, F104, F105, F113, F114, F163                  |
| 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>                     | ▼▼▼<br>▼    | 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>   | ▼▼▼<br>▼    | 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>  | ▼▼▼<br>▼    | 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>  | ▼▼▼<br>▼    | 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   |
| 711  | <ul style="list-style-type: none"> <li>Negative geometry with 0 rake suitable for fine finishing and semi roughing</li> <li>Machined materials in groups K &amp; H</li> <li>Continuous and moderately interrupted cut</li> </ul>                | ▼▼▼<br>▼    | F101, F103, F104, F113, F163                              |
| 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>  | ▼▼▼<br>▼    | F101, F103, F104, F105, F325                              |


## 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 |

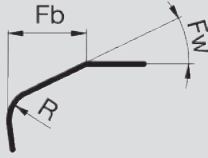







## Wohlhaupter Insert Geometries

PCD | CBN

### PCD

| Geometry  | Description  | Application | Available Form                                    |
|---|--|-------------|---|
| 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 aluminium wrought alloys</li> </ul> | ▼▼▼         | F20, F39, F101, F103, F211, F262, F264            |

### CBN

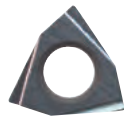
| Geometry  | Description   |  |      |     | Application | Available Form        |
|---|---|---|------|-----|-------------|-----------------------|
|   |   | R   | Fb   | Fw  |             |                       |
| 741  | <ul style="list-style-type: none"> <li>Smooth geometry with 0° rake angle for 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   | 0.2  | 20° | ▼▼▼<br>▼    | 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

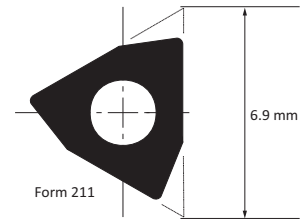
Cermet | Carbide



121 Geometry



650 Geometry



|                       |        |       |             |            |          | Cermet   |       |       |        |        | Carbide  |       |        |       |       |       |       |        |        |        |        |
|-----------------------|--------|-------|-------------|------------|----------|----------|-------|-------|--------|--------|----------|-------|--------|-------|-------|-------|-------|--------|--------|--------|--------|
|                       |        |       |             |            |          | Uncoated |       |       | Coated |        | Uncoated |       | Coated |       |       |       |       |        |        |        |        |
|                       |        |       |             |            |          | WHT10    | WHT12 | 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 |       | Description | ISO Code   | Part No. | WHT10    | WHT12 | WHT32 | WTC15  | WTC121 | WHW01    | WHW16 | WHC05  | WHC18 | WHC19 | WHC79 | WHC98 | WHC111 | WHC114 | WHC136 | WHC164 |
| 121                   | 0.10   | 0.004 | F21101GN121 | WBGX030101 | 397675   |          |       |       |        |        |          |       |        |       | ⚙     |       |       | ⚙      |        |        |        |
| 121                   | 0.20   | 0.008 | F21102GN121 | WBGX030102 | 397676   |          |       |       |        |        |          |       |        |       | ⚙     |       |       | ⚙      |        |        |        |
| 650                   | 0.10   | 0.004 | F21101GL650 | WBGX030101 | 097755   |          | ●     |       |        |        | ●        |       | ●      | ●     |       |       |       |        |        |        | ●      |
| 650                   | 0.20   | 0.008 | F21102GL650 | WBGX030102 | 097454   |          | ●     |       |        |        | ●        |       | ●      |       |       |       |       |        |        |        | ●      |

### Reference Key

| Symbol | Machining Conditions         |
|--------|------------------------------|
| ●      | Good - Main Application      |
| ⚙      | Average - Main Application   |
| ⚙      | Difficult - Main Application |

### Reference Key

| Symbol | Insert Type                      |
|--------|----------------------------------|
| ▼▼     | Finishing - Main Application     |
| ▼▼     | Finishing - Extended Application |

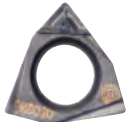
|             |                     |               |             |                |          |
|-------------|---------------------|---------------|-------------|----------------|----------|
|             |                     |               |             | Technical Data |          |
| Insert Form | Countersunk Screw   | Torque Driver | Service Key | Torque         | Key Size |
| 211         | 215377 M2 x 0.4 x 4 | 415507        | 115537      | 0.6 Nm         | T6       |

## Insert Form 211

CBN | PCD



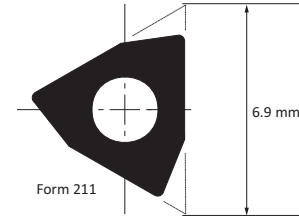
730 Geometry






735 Geometry



748 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 |       | Description | ISO Code   | Part No. |          |        | WBN150   | WBN200 | WBN300 | WBN450 |     |     | PKDD30 | PKDD50 |
|                       | mm     | in    |             |            |          |          |        |          |        |        |        |     |     |        |        |
| 730                   | 0.10   | 0.004 | F21101GN730 | WBGX030101 | 397763   |          |        |          |        |        |        |     |     | ●      |        |
| 730                   | 0.20   | 0.008 | F21102GN730 | WBGX030102 | 097557   |          |        |          |        |        |        |     |     | ●      | ●      |
| 735                   | 0.20   | 0.008 | F21102GN735 | WBGX030102 | 397237   |          |        |          |        |        |        |     |     | ●      |        |
| 748                   | 0.10   | 0.004 | F21101GN748 | WBGX030101 | 097486   |          |        | ●        |        |        | ●      |     |     |        | ●      |
| 748                   | 0.20   | 0.008 | F21102GN748 | WBGX030102 | 097552   |          |        | ●        |        |        | ●      |     |     |        |        |

|   |   |   |                |        |          |  |
|---|---|---|----------------|--------|----------|--|
|  |  |  | Technical Data |        |          |  |
| Insert Form   | Countersunk Screw   | Torque Driver   | Service Key    | Torque | Key Size |  |
| 211   | 215377 M2 x 0.4 x 4   | 415507  | 115537         | 0.6 Nm | T6       |  |

### Reference Key

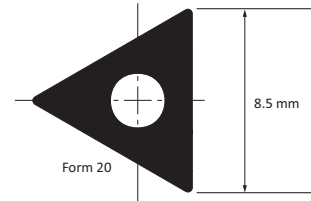
| Symbol | Machining Conditions       |
|--------|----------------------------|
| ●      | Average - Main Application |

### Reference Key

| Symbol | Insert Type                  |
|--------|------------------------------|
| ▼▼▼    | Finishing - Main Application |

# Insert Form 20

Cermet | Carbide



|                       |        |       |              |            |          | Cermet   |       |        |       |        | Carbide  |       |        |       |       |       |       |        |        |        |    |  |  |  |
|-----------------------|--------|-------|--------------|------------|----------|----------|-------|--------|-------|--------|----------|-------|--------|-------|-------|-------|-------|--------|--------|--------|----|--|--|--|
|                       |        |       |              |            |          | Uncoated |       | Coated |       |        | Uncoated |       | Coated |       |       |       |       |        |        |        |    |  |  |  |
|                       |        |       |              |            |          | WHT10    | WHT12 | WHT32  | WTC15 | WTC121 | WHW01    | WHW16 | WHC05  | WHC18 | WHC19 | WHC79 | WHC98 | WHC111 | WHC114 | WHC136 |    |  |  |  |
| Geometry              | Radius |       | Description  | ISO Code   | Part No. |          |       |        |       |        |          |       |        |       |       |       |       |        |        |        |    |  |  |  |
|                       | mm     | in    |              |            |          |          |       |        |       |        |          |       |        |       |       |       |       |        |        |        |    |  |  |  |
| Steel                 | P      |       |              |            |          | ▼▼       | ▼▼    | ▼▼     | ▼▼    | ▼▼     | ▼▼       | ▼▼    | ▼▼     | ▼▼    | ▼▼    | ▼▼    | ▼▼    | ▼▼     | ▼▼     | ▼▼     | ▼▼ |  |  |  |
| Stainless Steel       | M      |       |              |            |          | ▼▼       | ▼▼    | ▼▼     | ▼▼    | ▼▼     | ▼▼       | ▼▼    | ▼▼     | ▼▼    | ▼▼    | ▼▼    | ▼▼    | ▼▼     | ▼▼     | ▼▼     | ▼▼ |  |  |  |
| Cast Iron             | K      |       |              |            |          | ▼▼       | ▼▼    | ▼▼     | ▼▼    | ▼▼     | ▼▼       | ▼▼    | ▼▼     | ▼▼    | ▼▼    | ▼▼    | ▼▼    | ▼▼     | ▼▼     | ▼▼     | ▼▼ |  |  |  |
| Non-Ferrous Materials | N      |       |              |            |          | ▼▼       | ▼▼    | ▼▼     | ▼▼    | ▼▼     | ▼▼       | ▼▼    | ▼▼     | ▼▼    | ▼▼    | ▼▼    | ▼▼    | ▼▼     | ▼▼     | ▼▼     | ▼▼ |  |  |  |
| Titanium              | S      |       |              |            |          | ▼▼       | ▼▼    | ▼▼     | ▼▼    | ▼▼     | ▼▼       | ▼▼    | ▼▼     | ▼▼    | ▼▼    | ▼▼    | ▼▼    | ▼▼     | ▼▼     | ▼▼     | ▼▼ |  |  |  |
| Hard Materials        | H      |       |              |            |          |          |       |        |       |        |          |       |        |       |       |       |       |        |        |        |    |  |  |  |
| 121                   | 0.10   | 0.004 | F02001GN121  | TOGX080201 | 397672   |          |       |        |       |        |          |       |        |       | ●     |       |       |        | ●      |        |    |  |  |  |
| 121                   | 0.20   | 0.008 | F02002GN121  | TOGX080202 | 397673   |          |       |        |       |        |          |       |        |       | ●     |       |       |        | ●      |        |    |  |  |  |
| 121                   | 0.40   | 0.016 | F02004GN121  | TOGX080204 | 397674   |          |       |        |       |        |          |       |        |       | ●     |       |       |        | ●      |        |    |  |  |  |
| 121W                  | 0.20   | 0.008 | F02002GX121W | TOGX080202 | 397916   |          |       |        |       |        |          |       |        |       | ●     |       |       |        | ●      |        |    |  |  |  |
| 121W                  | 0.40   | 0.016 | F02004GX121W | TOGX080204 | 397917   |          |       |        |       |        |          |       |        |       | ●     |       |       |        | ●      |        |    |  |  |  |
| 128                   | 0.10   | 0.004 | F02001GN128  | TOGX080201 | 291473   |          |       |        |       |        | ●        | ●     |        |       |       |       |       |        |        |        |    |  |  |  |
| 128                   | 0.20   | 0.008 | F02002GN128  | TOGX080202 | 297541   |          |       |        |       |        | ●        | ●     | ●      |       |       |       |       |        |        |        |    |  |  |  |
| 128                   | 0.40   | 0.016 | F02004GN128  | TOGX080204 | 297542   |          |       |        |       |        | ●        | ●     | ●      |       |       |       |       |        |        |        |    |  |  |  |
| 155                   | 0.20   | 0.008 | F02002MN155  | TOMX080202 | 397688   |          |       |        | ●     |        |          |       |        |       |       |       |       |        |        |        |    |  |  |  |
| 155                   | 0.40   | 0.016 | F02004MN155  | TOMX080204 | 397689   |          |       |        | ●     |        |          |       |        |       |       |       |       |        |        |        |    |  |  |  |
| 650                   | 0.10   | 0.004 | F02001GL650  | TOGX080201 | 097153   |          | ●     |        |       | ●      | ●        | ●     |        |       |       |       |       |        |        |        | ●  |  |  |  |
| 650                   | 0.20   | 0.008 | F02002GL650  | TOGX080202 | 097546   |          | ●     |        |       | ●      | ●        | ●     |        |       |       |       |       |        |        |        | ●  |  |  |  |
| 650                   | 0.30   | 0.012 | F02003GL650  | TOGX080203 | 097154   |          |       |        |       | ●      | ●        | ●     |        |       |       |       |       |        |        |        | ●  |  |  |  |
| 650                   | 0.40   | 0.016 | F02004GL650  | TOGX080204 | 097599   |          | ●     |        |       | ●      | ●        | ●     |        |       |       |       |       |        |        |        | ●  |  |  |  |
| 650                   | 0.80   | 0.031 | F02008GL650  | TOGX080208 | 397764   |          |       |        |       | ●      |          |       |        |       |       |       |       |        |        |        | ●  |  |  |  |
| 840                   | 0.20   | 0.008 | F02002GR840  | TOGX080202 | 097701   |          | ●     |        |       |        |          |       | ●      |       |       |       |       |        |        |        |    |  |  |  |

### Reference Key

| Symbol | Machining Conditions         |
|--------|------------------------------|
| ●      | Good - Main Application      |
| ●      | Average - Main Application   |
| ⚙      | Difficult - Main Application |

### Reference Key

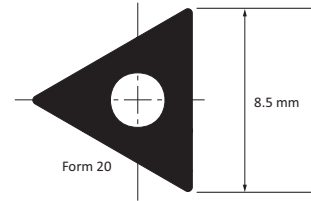
| Symbol | Insert Type                      |
|--------|----------------------------------|
| ▼▼     | Finishing - Main Application     |
| ▼▼     | Finishing - Extended Application |

|             |                     |               |             |                |          |
|-------------|---------------------|---------------|-------------|----------------|----------|
|             |                     |               |             | Technical Data |          |
| Insert Form | Countersunk Screw   | Torque Driver | Service Key | Torque         | Key Size |
| 20          | 115535 M2 x 0.4 x 5 | 415508        | 115591      | 0.9 Nm         | T7       |



### Insert Form 20

CBN | PCD







|                                |        |       |              |            |          | CBN      |       |       |        |       | PCD    |       |       |
|--------------------------------|--------|-------|--------------|------------|----------|----------|-------|-------|--------|-------|--------|-------|-------|
|                                |        |       |              |            |          | Uncoated |       |       | Coated |       |        |       |       |
|                                |        |       |              |            |          | WB150    | WB200 | WB300 | WB450  | WB448 | WBC300 | PKD30 | PKD50 |
| Geometry                       | Radius |       | Description  | ISO Code   | Part No. |          |       |       |        |       |        |       |       |
|                                | mm     | in    |              |            |          |          |       |       |        |       |        |       |       |
| <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        |        |       |              |            |          | ▼▼       | ▼▼    |       |        |       | ▼▼     |       |       |
| 720                            | 0.20   | 0.008 | F02002GN720  | TOGX080202 | 297692   |          |       |       |        |       |        | ●     |       |
| 720                            | 0.40   | 0.016 | F02004GN720  | TOGX080204 | 297845   |          |       |       |        |       |        | ●     |       |
| 730                            | 0.20   | 0.008 | F02002GN730  | TOGX080202 | 097487   |          |       |       |        |       |        | ●     | ●     |
| 730                            | 0.40   | 0.016 | F02004GN730  | TOGX080204 | 097686   |          |       |       |        |       |        | ●     | ●     |
| 730                            | 0.80   | 0.031 | F02008GN730  | TOGX080208 | 097877   |          |       |       |        |       |        | ●     |       |
| 735                            | 0.20   | 0.008 | F02002GN735  | TOGX080202 | 397133   |          |       |       |        |       |        | ●     |       |
| 735                            | 0.40   | 0.016 | F02004GN735  | TOGX080204 | 397301   |          |       |       |        |       |        | ●     |       |
| 741                            | 0.20   | 0.008 | F02002GN741  | TOGX080202 | 297260   |          | ●     |       |        |       |        |       |       |
| 741                            | 0.40   | 0.016 | F02004GN741  | TOGX080204 | 297262   |          | ●     |       |        |       |        |       |       |
| 742                            | 0.20   | 0.008 | F02002GN742  | TOGX080202 | 297264   |          |       | ●     |        |       |        |       |       |
| 742                            | 0.40   | 0.016 | F02004GN742  | TOGX080204 | 397610   |          |       | ●     |        |       |        |       |       |
| 742T                           | 0.20   | 0.008 | F02002GN742T | TOGX080202 | 397961   |          |       |       |        | ●     | ●      |       |       |
| 742T                           | 0.40   | 0.016 | F02004GN742T | TOGX080204 | 397551   |          |       |       |        | ●     | ●      |       |       |
| 745                            | 0.10   | 0.004 | F02001GN745  | TOGX080201 | 297259   |          | ●     |       |        |       |        |       |       |
| 748                            | 0.20   | 0.008 | F02002GN748  | TOGX080202 | 297780   |          |       |       | ●      |       |        |       |       |
| 748                            | 0.40   | 0.016 | F02004GN748  | TOGX080204 | 297782   |          |       |       | ●      |       |        |       |       |
| 768                            | 0.20   | 0.008 | F02002GN768  | TOGX080202 | 397146   |          |       |       | ●      |       |        |       |       |
| 768                            | 0.40   | 0.016 | F02004GN768  | TOGX080204 | 397192   |          |       |       | ●      |       |        |       |       |

Reference Key

| Symbol | Machining Conditions       |
|--------|----------------------------|
| ●      | Good - Main Application    |
| ●      | Average - Main Application |

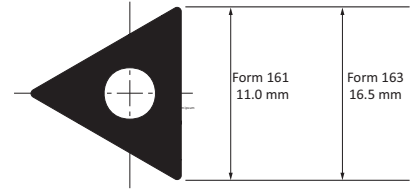
Reference Key

| Symbol | Insert Type                  |
|--------|------------------------------|
| ▼▼     | Finishing - Main Application |

|   |   |   |   |                |        |          |
|---|---|---|---|----------------|--------|----------|
|  |  |  |  | Technical Data |        |          |
| Insert Form   | Countersunk Screw   |   | Torque Driver   | Service Key    | Torque | Key Size |
| 20  | 115535  | M2 x 0.4 x 5  | 415508  | 115591         | 0.9 Nm | T7       |

## Insert Forms 161, 163

Cermet | Carbide



|                       |        |       |             |            |          | Cermet   |       |        |       |        | Carbide  |       |        |       |       |        |       |        |        |        |        |
|-----------------------|--------|-------|-------------|------------|----------|----------|-------|--------|-------|--------|----------|-------|--------|-------|-------|--------|-------|--------|--------|--------|--------|
|                       |        |       |             |            |          | Uncoated |       | Coated |       |        | Uncoated |       | Coated |       |       |        |       |        |        |        |        |
| Steel                 |        |       |             |            |          | ▼▼▼      |       | ▼▼▼    |       |        | ▼▼▼      |       | ▼▼▼    |       |       |        |       |        |        |        |        |
| Stainless Steel       |        |       |             |            |          | ▼▼▼      |       | ▼▼▼    |       |        | ▼▼▼      |       | ▼▼▼    |       |       |        |       |        |        |        |        |
| Cast Iron             |        |       |             |            |          | ▼▼▼      |       | ▼▼▼    |       |        | ▼▼▼      |       | ▼▼▼    |       |       |        |       |        |        |        |        |
| Non-Ferrous Materials |        |       |             |            |          | ▼▼▼      |       | ▼▼▼    |       |        | ▼▼▼      |       | ▼▼▼    |       |       |        |       |        |        |        |        |
| Titanium              |        |       |             |            |          | ▼▼▼      |       | ▼▼▼    |       |        | ▼▼▼      |       | ▼▼▼    |       |       |        |       |        |        |        |        |
| Hard Materials        |        |       |             |            |          | ▼▼▼      |       | ▼▼▼    |       |        | ▼▼▼      |       | ▼▼▼    |       |       |        |       |        |        |        |        |
| Geometry              | Radius |       | Description | ISO Code   | Part No. | WHT10    | WHT12 | WHT32  | WTC15 | WTC121 | WHW01    | WHW16 | WHC05  | WHC81 | WHC88 | WHC190 | WHC79 | WHC111 | WHC114 | WHC136 | WHC164 |
|                       | mm     | in    |             |            |          | WHT10    | WHT12 | WHT32  | WTC15 | WTC121 | WHW01    | WHW16 | WHC05  | WHC81 | WHC88 | WHC190 | WHC79 | WHC111 | WHC114 | WHC136 | WHC164 |
| 122                   | 0.40   | 0.016 | F16104MN122 | TCMT110204 | 097953   | ●        |       |        |       |        |          |       |        |       |       |        |       |        |        |        |        |
| 129                   | 0.20   | 0.008 | F16102GN129 | TCGT110202 | 397769   |          |       |        |       |        | ●        | ●     |        |       |       |        |       |        |        |        |        |
| 129                   | 0.40   | 0.016 | F16104GN129 | TCGT110204 | 397770   |          |       |        |       |        | ●        | ●     |        |       |       |        |       |        |        |        |        |
| 129                   | 0.40   | 0.016 | F16304GN129 | TCGT16T304 | 397771   |          |       |        |       |        | ●        | ●     |        |       |       |        |       |        |        |        |        |
| 145                   | 0.40   | 0.016 | F16104GN145 | TCGT110204 | 297993   |          |       |        |       |        |          |       |        |       |       |        | ●     |        |        |        |        |
| 146                   | 0.40   | 0.016 | F16104MN146 | TCMT110204 | 397977   |          |       |        |       |        |          |       | ●      | ●     |       |        |       |        |        |        |        |
| 146                   | 0.80   | 0.031 | F16108MN146 | TCMT110208 | 397026   |          |       |        |       |        |          |       | ●      | ●     |       |        |       |        |        |        |        |
| 146                   | 0.40   | 0.016 | F16304MN146 | TCMT16T304 | 397990   |          |       |        |       |        |          |       | ●      | ●     |       |        |       |        |        |        |        |
| 146                   | 0.80   | 0.031 | F16308MN146 | TCMT16T308 | 397974   |          |       |        |       |        |          |       | ●      | ●     |       |        |       |        |        |        |        |
| 158                   | 0.40   | 0.016 | F16304MN158 | TCMT16T304 | 297604   |          |       |        |       |        |          |       |        |       |       |        | ●     |        |        |        |        |
| 192                   | 0.40   | 0.016 | F16104MN192 | TCMT110204 | 397663   |          |       |        |       |        |          |       |        |       | ●     |        |       |        |        |        | ●      |
| 192                   | 0.40   | 0.016 | F16304MN192 | TCMT16T304 | 397654   |          |       |        |       |        |          |       |        |       | ●     |        |       |        |        |        | ●      |
| 192                   | 0.80   | 0.031 | F16308MN192 | TCMT16T308 | 397772   |          |       |        |       |        |          |       |        |       | ●     |        |       |        |        |        | ●      |
| 711                   | 0.40   | 0.016 | F16304MN711 | TCMT16T304 | 397898   |          |       |        |       |        |          |       | ●      |       |       |        |       |        |        |        |        |
| 711                   | 0.80   | 0.031 | F16304MN711 | TCMT16T308 | 397899   |          |       |        |       |        |          |       | ●      |       |       |        |       |        |        |        |        |
| 850                   | 0.20   | 0.008 | F16102GL850 | TCGT110202 | 097512   |          | ●     |        |       |        |          |       |        |       |       |        |       |        |        |        |        |

### Reference Key

| Symbol | Machining Conditions         |
|--------|------------------------------|
| ●      | Good - Main Application      |
| ◐      | Average - Main Application   |
| ⚙      | Difficult - Main Application |

### Reference Key

| Symbol | Insert Type                      |
|--------|----------------------------------|
| ▼▼▼    | Finishing - Main Application     |
| ▽▽▽    | Finishing - Extended Application |

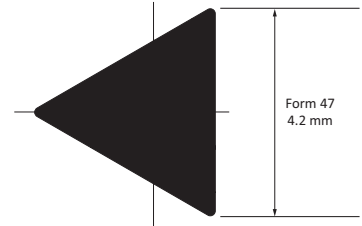
| Insert Form | Countersunk Screw |                 | Torque Driver | Service Key | Technical Data |          |
|-------------|-------------------|-----------------|---------------|-------------|----------------|----------|
|             | Part No.          | Dimensions      |               |             | Torque         | Key Size |
| 161         | 115676            | M2.5 x 0.45 x 5 | 415514        | 115590      | 1.2 Nm         | T8       |
| 163         | 115673            | M3.5 x 0.6 x 9  | 415510        | 115664      | 3.0 Nm         | T15      |

### Insert Form 47

Cermet | Carbide



650 Geometry



|                       |        |       |             |            |          | Carbide  |       |       |       |        |       |        |        |        |        |
|-----------------------|--------|-------|-------------|------------|----------|----------|-------|-------|-------|--------|-------|--------|--------|--------|--------|
|                       |        |       |             |            |          | Uncoated |       |       |       | Coated |       |        |        |        |        |
|                       |        |       |             |            |          | WHW01    | WHW16 | WHC05 | WHC18 | WHC20  | WHC79 | WHC111 | WHC114 | WHC136 | WHC164 |
| Steel                 | P      |       |             |            |          |          |       |       |       | ▼▼▼    |       |        |        |        |        |
| Stainless Steel       | M      |       |             |            |          |          |       |       |       | ▼▼▼    |       |        |        |        |        |
| Cast Iron             | K      |       |             |            |          | ▼▼▼      |       |       |       | ▼▼▼    |       |        |        |        |        |
| Non-Ferrous Materials | N      |       |             |            |          | ▼▼▼      |       |       |       |        |       |        |        |        |        |
| Titanium              | S      |       |             |            |          | ▼▼▼      |       |       |       |        |       |        |        |        |        |
| Hard Materials        | H      |       |             |            |          |          |       |       |       |        |       |        |        |        |        |
| Geometry              | Radius |       | Description | ISO Code   | Part No. |          |       |       |       |        |       |        |        |        |        |
|                       | mm     | in    |             |            |          | WHW01    | WHW16 | WHC05 | WHC18 | WHC20  | WHC79 | WHC111 | WHC114 | WHC136 | WHC164 |
| 650                   | 0.10   | 0.004 | F04701FL650 | TOFX040101 | 097832   | ●        |       |       |       | ●      |       |        |        |        |        |
| 650                   | 0.20   | 0.008 | F04702FL650 | TOFX040102 | 097833   | ●        |       |       |       | ●      |       |        |        |        |        |

Reference Key

| Symbol | Machining Conditions    |
|--------|-------------------------|
| ●      | Good - Main Application |

Reference Key

| Symbol | Insert Type                      |
|--------|----------------------------------|
| ▼▼▼    | Finishing - Main Application     |
| ▼▼     | Finishing - Extended Application |

| Insert Form | Countersunk Screw      | Clamping Jaw | Torque Driver | Service Key | Technical Data |          |
|-------------|------------------------|--------------|---------------|-------------|----------------|----------|
|             |                        |              |               |             | Torque         | Key Size |
| 47          | 315324 M1.8 x 0.35 x 4 | 315323       | -             | 115537      | 0.5 Nm         | T6       |

# Insert Forms 101, 103, 104, 105

Cermet | Carbide



|                              |        |       |             |                 |          | Cermet   |       |       |        |       |        | Carbide  |       |       |        |       |       |       |        |        |        |        |
|------------------------------|--------|-------|-------------|-----------------|----------|----------|-------|-------|--------|-------|--------|----------|-------|-------|--------|-------|-------|-------|--------|--------|--------|--------|
|                              |        |       |             |                 |          | Uncoated |       |       | Coated |       |        | Uncoated |       |       | Coated |       |       |       |        |        |        |        |
|                              |        |       |             |                 |          | WHT10    | WHT12 | WHT16 | WHT32  | WTC15 | WTC121 | WHW01    | WHW16 | WHC05 | WHC18  | WHC19 | WHC79 | WHC98 | WHC111 | WHC114 | WHC136 | WHC164 |
| <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 |       | Description | ISO Description | Part No. | WHT10    | WHT12 | WHT16 | WHT32  | WTC15 | WTC121 | WHW01    | WHW16 | WHC05 | WHC18  | WHC19 | WHC79 | WHC98 | WHC111 | WHC114 | WHC136 | WHC164 |
| 108                          | 0.20   | 0.008 | F10102MN108 | CCMT060202      | 297833   |          |       |       |        |       |        |          |       |       |        |       |       | ●     |        |        |        |        |
| 108                          | 0.40   | 0.016 | F10104MN108 | CCMT060204      | 297537   |          |       |       |        |       |        |          |       |       |        |       |       | ●     |        |        |        |        |
| 108                          | 0.40   | 0.016 | F10304MN108 | CCMT09T304      | 297891   |          |       |       |        |       |        |          |       |       |        |       |       | ●     |        |        |        |        |
| 108                          | 0.80   | 0.031 | F10308MN108 | CCMT09T308      | 397118   |          |       |       |        |       |        |          |       |       |        |       |       | ●     |        |        |        |        |
| 108                          | 0.40   | 0.016 | F10404MN108 | CCMT120404      | 297725   |          |       |       |        |       |        |          |       |       |        |       |       | ●     |        |        |        |        |
| 108                          | 0.80   | 0.031 | F10408MN108 | CCMT120408      | 297724   |          |       |       |        |       |        |          |       |       |        |       |       | ●     |        |        |        |        |
| 109                          | 0.20   | 0.008 | F10102MN109 | CCMT060202      | 397352   |          |       |       |        |       |        |          |       |       |        |       |       |       |        |        |        | ●      |
| 109                          | 0.40   | 0.016 | F10104MN109 | CCMT060204      | 397765   |          |       |       |        |       |        |          |       |       |        |       |       |       |        |        |        | ●      |
| 109                          | 0.40   | 0.016 | F10304MN109 | CCMT09T304      | 397354   |          |       |       |        |       |        |          |       |       |        |       |       |       |        |        |        | ●      |
| 109                          | 0.80   | 0.031 | F10308MN109 | CCMT09T308      | 397355   |          |       |       |        |       |        |          |       |       |        |       |       |       |        |        |        | ●      |
| 109                          | 0.40   | 0.016 | F10404MN109 | CCMT120404      | 397356   |          |       |       |        |       |        |          |       |       |        |       |       |       |        |        |        | ●      |
| 109                          | 0.80   | 0.031 | F10408MN109 | CCMT120408      | 397357   |          |       |       |        |       |        |          |       |       |        |       |       |       |        |        |        | ●      |
| 112                          | 0.20   | 0.008 | F10102GN112 | CCGT060202      | 297485   |          |       |       | ●      |       |        |          |       |       |        |       |       |       |        |        |        |        |
| 112                          | 0.40   | 0.016 | F10104MN112 | CCMT060204      | 297434   |          |       |       | ●      |       |        |          |       |       |        |       |       |       |        |        |        |        |
| 112                          | 0.20   | 0.008 | F10302GN112 | CCGT09T302      | 297534   |          |       |       | ●      |       |        |          |       |       |        |       |       |       |        |        |        |        |
| 112                          | 0.40   | 0.016 | F10304MN112 | CCMT09T304      | 297387   |          |       |       | ●      |       |        |          |       |       |        |       |       |       |        |        |        |        |
| 122                          | 0.20   | 0.008 | F10102MN122 | CCMT060202      | 097899   | ●        |       |       |        |       |        |          |       |       |        |       |       |       |        |        |        |        |
| 122                          | 0.40   | 0.016 | F10104MN122 | CCMT060204      | 097926   | ●        |       |       |        |       |        |          |       |       |        |       |       |       |        |        |        |        |
| 122                          | 0.20   | 0.008 | F10302MN122 | CCMT09T302      | 097862   | ●        |       |       |        |       |        |          |       |       |        |       |       |       |        |        |        |        |
| 122                          | 0.40   | 0.016 | F10304MN122 | CCMT09T304      | 097957   | ●        |       |       |        |       |        |          |       |       |        |       |       |       |        |        |        |        |
| 126                          | 0.80   | 0.031 | F10508MN126 | CCMT160508      | 297557   |          |       |       |        |       |        |          |       |       |        |       |       |       |        |        |        | ●      |
| 126                          | 1.20   | 0.047 | F10512MN126 | CCMT160512      | 297558   |          |       |       |        |       |        |          |       |       |        |       |       |       |        |        |        | ●      |
| 127                          | 0.20   | 0.008 | F10102GN127 | CCGT060202      | 097529   |          |       |       |        |       |        |          | ●     |       | ●      |       |       |       |        |        |        |        |
| 127                          | 0.40   | 0.016 | F10104GN127 | CCGT060204      | 097445   |          |       |       |        |       |        |          | ●     |       | ●      |       |       |       |        |        |        |        |
| 127                          | 0.20   | 0.008 | F10302GN127 | CCGT09T302      | 297550   |          |       |       |        |       |        |          | ●     |       | ●      |       |       |       |        |        |        |        |
| 127                          | 0.40   | 0.016 | F10304GN127 | CCGT09T304      | 097497   |          |       |       |        |       |        |          | ●     |       | ●      |       |       |       |        |        |        |        |
| 127                          | 0.40   | 0.016 | F10404GN127 | CCGT120404      | 097496   |          |       |       |        |       |        |          | ●     |       | ●      |       |       |       |        |        |        |        |

Reference Key

| Symbol | Machining Conditions       |
|--------|----------------------------|
| ●      | Good - Main Application    |
| ●      | Average - Main Application |

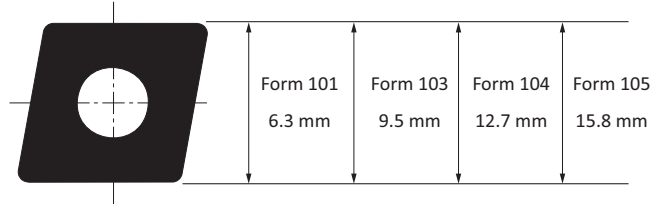
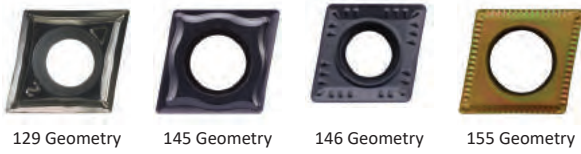
Reference Key

| Symbol | Insert Type                      |
|--------|----------------------------------|
| ▼      | Roughing - Main Application      |
| ▽      | Roughing - Extended Application  |
| ▼▼▼    | Finishing - Main Application     |
| ▽▽▽    | Finishing - Extended Application |

| Insert Form | Countersunk Screw                       |                    | Torque Driver |          | Service Key |          | Technical Data |          |
|-------------|---|--------------------|---------------|----------|-------------|----------|----------------|----------|
|             | Torque                                  | Key Size           | Torque        | Key Size | Torque      | Key Size | Torque         | Key Size |
| 101         | 115676                                  | M2.5 x 0.45 x 5    | 415514        | 115590   | 1.2 Nm      | T8       |                |          |
| 103         | 115672 (<math>\phi 37\text{ mm}</math>) | M3.5 x 0.6 x 7.5   | 415510        | 115664   | 3.0 Nm      | T15      |                |          |
| 103         | 115673 (>math>\phi 36\text{ mm}</math>) | M3.5 x 0.6 x 9     | 415510        | 115664   | 3.0 Nm      | T15      |                |          |
| 104         | 215149                                  | M4.5 x 0.75 x 11.5 | 415543        | 215150   | 5.0 Nm      | T20      |                |          |
| 105         | 215149                                  | M4.5 x 0.75 x 11.5 | 415543        | 215150   | 5.0 Nm      | T20      |                |          |

# Insert Forms 101, 103, 104

Cermet | Carbide



|                       |     |          |        |       | Cermet       |                 |          |       | Carbide  |       |        |       |       |       |       |       |       |       |       |       |        |        |        |        |
|-----------------------|-----|----------|--------|-------|--------------|-----------------|----------|-------|----------|-------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|--------|--------|--------|
|                       |     |          |        |       | Uncoated     |                 | Coated   |       | Uncoated |       | Coated |       |       |       |       |       |       |       |       |       |        |        |        |        |
| Material              | ISO | Part No. | Radius |       | Description  | ISO Description | Part No. | WHT10 | WHT32    | WTC15 | WTC121 | WHW01 | WHW16 | WHC05 | WHC18 | WHC19 | WHC79 | WHC81 | WHC88 | WHC98 | WHC111 | WHC114 | WHC136 | WHC164 |
| Steel                 | P   |          | 0.05   | 0.002 | F101005GN129 | CCGT0602005     | 397738   |       |          | ▼▼▼   |        |       | ▼     |       |       |       |       | ▼▼▼   | ▼▼▼   |       | ▼▼▼    |        |        |        |
| Stainless Steel       | M   |          | 0.10   | 0.004 | F10101GN129  | CCGT060201      | 397737   |       |          | ▼▼▼   |        |       | ▼     |       |       |       |       | ▼▼▼   | ▼▼▼   |       | ▼▼▼    |        |        |        |
| Cast Iron             | K   |          | 0.20   | 0.008 | F10102GN129  | CCGT060202      | 297545   |       |          | ▼▼▼   |        |       | ▼     | ▼     |       |       |       | ▼▼▼   | ▼▼▼   |       | ▼▼▼    |        |        |        |
| Non-Ferrous Materials | N   |          | 0.40   | 0.016 | F10104GN129  | CCGT060204      | 297546   |       |          |       |        |       | ▼     | ▼     |       |       |       |       |       |       |        |        |        |        |
| Titanium              | S   |          | 0.20   | 0.008 | F10302GN129  | CCGT09T302      | 297547   |       |          |       |        |       | ▼     | ▼     |       |       |       |       |       |       |        |        |        |        |
|                       |     |          | 0.40   | 0.016 | F10304GN129  | CCGT09T304      | 297548   |       |          |       |        |       | ●     | ●     | ●     |       |       |       |       |       |        |        |        |        |
| Hard Materials        | H   |          | 0.40   | 0.016 | F10104GN145  | CCGT060204      | 297980   |       |          |       |        |       |       |       |       |       |       |       |       |       |        | ●      |        |        |
|                       |     |          | 0.80   | 0.031 | F10108GN145  | CCGT060208      | 397742   |       |          |       |        |       |       |       |       |       |       |       |       |       |        | ●      |        |        |
|                       |     |          | 0.40   | 0.016 | F10304GN145  | CCGT09T304      | 297994   |       |          |       |        |       |       |       |       |       |       |       |       |       |        | ●      |        |        |
|                       |     |          | 0.80   | 0.031 | F10308GN145  | CCGT09T308      | 297995   |       |          |       |        |       |       |       |       |       |       |       |       |       |        | ●      |        |        |
|                       |     |          | 0.40   | 0.016 | F10104MN146  | CCMT060204      | 397953   |       |          |       |        |       |       |       |       |       |       |       | ●     | ●     |        |        |        |        |
|                       |     |          | 0.40   | 0.016 | F10304MN146  | CCMT09T304      | 397142   |       |          |       |        |       |       |       |       |       |       |       | ●     | ●     |        |        |        |        |
|                       |     |          | 0.80   | 0.031 | F10308MN146  | CCMT09T308      | 397946   |       |          |       |        |       |       |       |       |       |       |       | ●     | ●     |        |        |        |        |
|                       |     |          | 0.40   | 0.016 | F10404MN146  | CCMT120404      | 397469   |       |          |       |        |       |       |       |       |       |       |       |       | ●     | ●      |        |        |        |
|                       |     |          | 0.80   | 0.031 | F10408MN146  | CCMT120408      | 397143   |       |          |       |        |       |       |       |       |       |       |       |       | ●     | ●      |        |        |        |
|                       |     |          | 1.20   | 0.047 | F10412MN146  | CCMT120412      | 397939   |       |          |       |        |       |       |       |       |       |       |       |       | ●     | ●      |        |        |        |
|                       |     |          | 0.20   | 0.008 | F10102MN155  | CCMT060202      | 397662   |       |          | ●     |        |       |       |       |       |       |       |       |       |       |        |        |        |        |
|                       |     |          | 0.40   | 0.016 | F10104MN155  | CCMT060204      | 397739   |       |          | ●     |        |       |       |       |       |       |       |       |       |       |        |        |        |        |
|                       |     |          | 0.40   | 0.016 | F10304MN155  | CCMT09T304      | 397740   |       |          | ●     |        |       |       |       |       |       |       |       |       |       |        |        |        |        |

| Insert Form | Countersunk Screw               |                    | Torque Driver |          | Service Key |          | Technical Data |  |
|-------------|---------------------------------|--------------------|---------------|----------|-------------|----------|----------------|--|
|             | Part No.                        | Dimensions         | Part No.      | Part No. | Torque      | Key Size |                |  |
| 101         | 115676                          | M2.5 x 0.45 x 5    | 415514        | 115590   | 1.2 Nm      | T8       |                |  |
| 103         | 115672 (<math>\phi</math>37 mm) | M3.5 x 0.6 x 7.5   | 415510        | 115664   | 3.0 Nm      | T15      |                |  |
| 103         | 115673 (>math>\phi</math>36 mm) | M3.5 x 0.6 x 9     | 415510        | 115664   | 3.0 Nm      | T15      |                |  |
| 104         | 215149                          | M4.5 x 0.75 x 11.5 | 415543        | 215150   | 5.0 Nm      | T20      |                |  |
| 105         | 215149                          | M4.5 x 0.75 x 11.5 | 415543        | 215150   | 5.0 Nm      | T20      |                |  |

### Reference Key

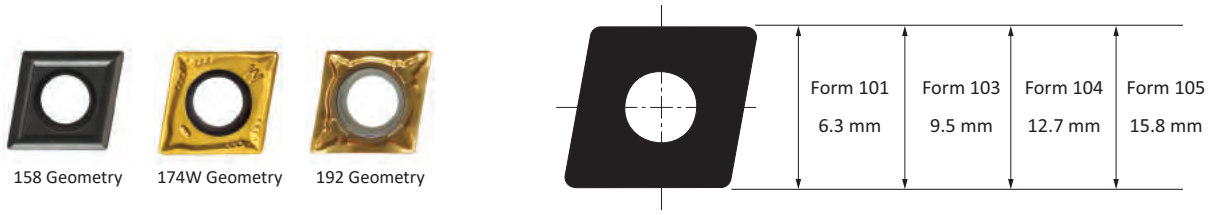
| Symbol | Machining Conditions       |
|--------|----------------------------|
| ●      | Good - Main Application    |
| ●      | Average - Main Application |

### Reference Key

| Symbol | Insert Type                      |
|--------|----------------------------------|
| ▼      | Roughing - Main Application      |
| ▽      | Roughing - Extended Application  |
| ▼▼▼    | Finishing - Main Application     |
| ▽▽▽    | Finishing - Extended Application |

# Insert Forms 101, 103, 104

Carbide



|                       |        |       |              |            |          | Carbide  |       |       |       |        |       |       |        |        |        |        |
|-----------------------|--------|-------|--------------|------------|----------|----------|-------|-------|-------|--------|-------|-------|--------|--------|--------|--------|
|                       |        |       |              |            |          | Uncoated |       |       |       | Coated |       |       |        |        |        |        |
|                       |        |       |              |            |          | 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 |       | Description  | ISO Code   | Part No. | WHW01    | WHW16 | WHC05 | WHC18 | WHC19  | WHC79 | WHC98 | WHC111 | WHC114 | WHC136 | WHC164 |
| 158                   | 0.20   | 0.008 | F10102MN158  | CCMT060202 | 297248   |          |       |       |       |        | ●     |       | ●      |        |        |        |
| 158                   | 0.40   | 0.016 | F10104MN158  | CCMT060204 | 297377   |          |       |       |       |        | ●     |       | ●      |        |        |        |
| 158                   | 0.40   | 0.016 | F10304MN158  | CCMT09T304 | 297239   |          |       |       |       |        | ●     |       | ●      |        |        |        |
| 158                   | 0.80   | 0.031 | F10308MN158  | CCMT09T308 | 297240   |          |       |       |       |        | ●     |       | ●      |        |        |        |
| 158                   | 0.40   | 0.016 | F10404MN158  | CCMT120404 | 297242   |          |       |       |       |        | ●     |       | ●      |        |        |        |
| 158                   | 0.80   | 0.031 | F10408MN158  | CCMT120408 | 297241   |          |       |       |       |        | ●     |       | ●      |        |        |        |
| 158                   | 0.80   | 0.031 | F10508MN158  | CCMT160508 | 297559   |          |       | ●     |       |        | ●     |       | ●      |        |        |        |
| 158                   | 1.20   | 0.047 | F10512MN158  | CCMT160512 | 297560   |          |       |       |       |        | ●     |       | ●      |        |        |        |
| 174W                  | 0.40   | 0.016 | F10104MN174W | CCMT060204 | 397766   |          |       |       |       | ⚙      |       |       |        |        |        | ●      |
| 174W                  | 0.40   | 0.016 | F10304MN174W | CCMT09T304 | 397767   |          |       |       |       | ⚙      |       |       |        |        |        | ●      |
| 174W                  | 0.80   | 0.031 | F10308MN174W | CCMT09T308 | 397768   |          |       |       |       | ⚙      |       |       |        |        |        | ●      |
| 192                   | 0.20   | 0.008 | F10102MN192  | CCMT060202 | 297531   |          |       |       |       | ⚙      |       |       |        |        |        | ●      |
| 192                   | 0.40   | 0.016 | F10104MN192  | CCMT060204 | 297658   |          |       |       |       | ⚙      |       |       |        |        |        | ●      |
| 192                   | 0.80   | 0.031 | F10108MN192  | CCMT060208 | 297588   |          |       |       |       | ⚙      |       |       |        |        |        | ●      |
| 192                   | 0.20   | 0.008 | F10302MN192  | CCMT09T302 | 297958   |          |       |       |       | ⚙      |       |       |        |        |        | ●      |
| 192                   | 0.40   | 0.016 | F10304MN192  | CCMT09T304 | 297653   |          |       |       |       | ⚙      |       |       |        |        |        | ●      |
| 192                   | 0.80   | 0.031 | F10308MN192  | CCMT09T308 | 397614   |          |       |       |       | ⚙      |       |       |        |        |        | ●      |
| 192                   | 0.40   | 0.016 | F10404MN192  | CCMT120404 | 397666   |          |       |       |       | ⚙      |       |       |        |        |        | ●      |
| 192                   | 0.80   | 0.031 | F10408MN192  | CCMT120408 | 297878   |          |       |       |       | ⚙      |       |       |        |        |        | ●      |
| 192                   | 1.20   | 0.047 | F10412MN192  | CCMT120412 | 397632   |          |       |       |       | ⚙      |       |       |        |        |        | ●      |

Reference Key

| Symbol | Machining Conditions         |
|--------|------------------------------|
| ●      | Good - Main Application      |
| ●      | Average - Main Application   |
| ⚙      | Difficult - Main Application |

Reference Key

| Symbol | Insert Type                      |
|--------|----------------------------------|
| ▽      | Roughing - Main Application      |
| ▽      | Roughing - Extended Application  |
| ▽▽▽    | Finishing - Main Application     |
| ▽▽▽    | Finishing - Extended Application |

| Insert Form | Countersunk Screw               |                    | Technical Data |             |        |          |
|-------------|---------------------------------|--------------------|----------------|-------------|--------|----------|
|             |                                 |                    | Torque Driver  | Service Key | Torque | Key Size |
| 101         | 115676                          | M2.5 x 0.45 x 5    | 415514         | 115590      | 1.2 Nm | T8       |
| 103         | 115672 (<math>\phi</math>37 mm) | M3.5 x 0.6 x 7.5   | 415510         | 115664      | 3.0 Nm | T15      |
| 103         | 115673 (>math>\phi</math>36 mm) | M3.5 x 0.6 x 9     | 415510         | 115664      | 3.0 Nm | T15      |
| 104         | 215149                          | M4.5 x 0.75 x 11.5 | 415543         | 215150      | 5.0 Nm | T20      |
| 105         | 215149                          | M4.5 x 0.75 x 11.5 | 415543         | 215150      | 5.0 Nm | T20      |



# Insert Forms 101, 103, 104

Cermet | Carbide



|                       |        |       |             |            |          | Cermet   |       |       |        |       |        | Carbide  |       |       |        |       |       |       |       |        |        |        |        |     |
|-----------------------|--------|-------|-------------|------------|----------|----------|-------|-------|--------|-------|--------|----------|-------|-------|--------|-------|-------|-------|-------|--------|--------|--------|--------|-----|
|                       |        |       |             |            |          | Uncoated |       |       | Coated |       |        | Uncoated |       |       | Coated |       |       |       |       |        |        |        |        |     |
| Geometry              | Radius |       | Description | ISO Code   | Part No. | WHT10    | WHT12 | WHT16 | WHT32  | WTC15 | WTC121 | WHW01    | WHW16 | WHC05 | WHC18  | WHC19 | WHC77 | WHC79 | WHC98 | WHC111 | WHC114 | WHC136 | WHC164 |     |
| Steel                 | P      |       |             |            |          |          |       |       |        |       |        | ▼▼▼      |       |       | ▼▼▼    |       |       | ▼▼▼   |       |        | ▼▼▼    | ▼▼▼    | ▼▼▼    | ▼▼▼ |
| Stainless Steel       | M      |       |             |            |          |          |       |       |        |       | ▽▽▽    |          |       | ▽▽▽   |        |       |       |       |       |        | ▽▽▽    | ▽▽▽    | ▽▽▽    | ▽▽▽ |
| Cast Iron             | K      |       |             |            |          |          |       |       |        |       | ▽      | ▽        |       | ▼▼▼   |        | ▼▼▼   |       |       |       |        | ▼▼▼    | ▼      | ▼      | ▼   |
| Non-Ferrous Materials | N      |       |             |            |          |          |       |       |        |       | ▼▼▼    |          |       |       |        |       |       |       |       |        |        |        |        |     |
| Titanium              | S      |       |             |            |          |          |       |       |        |       |        |          |       |       |        |       |       |       |       |        | ▼▼▼    | ▼▼▼    | ▼▼▼    | ▼▼▼ |
| Hard Materials        | H      |       |             |            |          |          |       |       |        |       |        |          |       |       |        |       |       | ▽▽▽   |       |        | ▼▼▼    | ▼▼▼    | ▼▼▼    | ▼▼▼ |
| 199                   | 0.20   | 0.008 | F10102MN199 | CCMT060202 | 397164   |          |       |       |        |       |        |          |       |       |        |       |       |       |       |        |        |        |        | ●   |
| 199                   | 0.40   | 0.016 | F10104MN199 | CCMT060204 | 397165   |          |       |       |        |       |        |          |       |       |        |       |       |       |       |        |        |        |        | ●   |
| 199                   | 0.20   | 0.008 | F10302MN199 | CCMT09T302 | 397702   |          |       |       |        |       |        |          |       |       |        |       |       |       |       |        |        |        |        | ●   |
| 199                   | 0.40   | 0.016 | F10304MN199 | CCMT09T304 | 397166   |          |       |       |        |       |        |          |       |       |        |       |       |       |       |        |        |        |        | ●   |
| 199                   | 0.80   | 0.031 | F10308MN199 | CCMT09T308 | 397167   |          |       |       |        |       |        |          |       |       |        |       |       |       |       |        |        |        |        | ●   |
| 199                   | 0.40   | 0.016 | F10404MN199 | CCMT120404 | 397191   |          |       |       |        |       |        |          |       |       |        |       |       |       |       |        |        |        |        | ●   |
| 199                   | 0.80   | 0.031 | F10408MN199 | CCMT120408 | 397168   |          |       |       |        |       |        |          |       |       |        |       |       |       |       |        |        |        |        | ●   |
| 200                   | 0.20   | 0.008 | F10102GN200 | CCGT060202 | 397585   |          |       |       |        |       |        |          |       |       |        |       |       |       |       |        |        |        |        | ●   |
| 200                   | 0.40   | 0.016 | F10104GN200 | CCGT060204 | 397586   |          |       |       |        |       |        |          |       |       |        |       |       |       |       |        |        |        |        | ●   |
| 200                   | 0.20   | 0.008 | F10302GN200 | CCGT09T302 | 397587   |          |       |       |        |       |        |          |       |       |        |       |       |       |       |        |        |        |        | ●   |
| 200                   | 0.40   | 0.016 | F10304GN200 | CCGT09T304 | 397588   |          |       |       |        |       |        |          |       |       |        |       |       |       |       |        |        |        |        | ●   |
| 200                   | 0.40   | 0.016 | F10404GN200 | CCGT120404 | 397589   |          |       |       |        |       |        |          |       |       |        |       |       |       |       |        |        |        |        | ●   |
| 711                   | 0.40   | 0.016 | F10104MN711 | CCMT060204 | 097637   |          |       |       |        |       |        |          |       |       |        |       |       | ●     |       |        |        |        |        |     |
| 711                   | 0.40   | 0.016 | F10304MN711 | CCMT09T304 | 097629   |          |       |       |        |       |        |          |       |       |        |       |       | ●     |       |        |        |        |        |     |
| 711                   | 0.80   | 0.031 | F10308MN711 | CCMT09T308 | 297910   |          |       |       |        |       |        |          |       |       |        |       |       | ●     |       |        |        |        |        |     |
| 711                   | 0.80   | 0.031 | F10408MN711 | CCMT120408 | 297911   |          |       |       |        |       |        |          |       |       |        |       |       | ●     |       |        |        |        |        |     |
| 860                   | 0.10   | 0.004 | F10101GL860 | CCGT060201 | 097324   |          |       |       |        |       | ●      | ●        | ●     | ●     |        |       |       |       |       |        |        |        |        | ●   |
| 860                   | 0.20   | 0.008 | F10102GL860 | CCGT060202 | 097241   |          |       |       |        |       | ●      | ●        | ●     | ●     |        |       |       |       |       |        |        |        |        | ●   |
| 860                   | 0.40   | 0.016 | F10104GL860 | CCGT060204 | 097242   |          |       |       |        |       | ●      | ●        | ●     | ●     |        |       |       |       |       |        |        |        |        | ●   |
| 860                   | 0.20   | 0.008 | F10302GL860 | CCGT09T302 | 097245   |          |       |       |        |       | ●      | ●        | ●     | ●     |        |       |       |       |       |        |        |        |        | ●   |
| 860                   | 0.40   | 0.016 | F10304GL860 | CCGT09T304 | 097244   |          |       |       |        |       | ●      | ●        | ●     | ●     |        |       |       |       |       |        |        |        |        | ●   |
| 860                   | 0.40   | 0.016 | F10404GL860 | CCGT120404 | 097738   |          |       |       |        |       | ●      | ●        | ●     | ●     |        |       |       |       |       |        |        |        |        | ●   |
| 860                   | 0.80   | 0.031 | F10408GL860 | CCGT120408 | 097247   |          |       |       |        |       | ●      | ●        | ●     | ●     |        |       |       |       |       |        |        |        |        | ●   |
| 860                   | 0.80   | 0.031 | F10508ML860 | CCMT160508 | 097249   |          |       |       |        |       | ●      | ●        | ●     | ●     |        |       |       |       |       |        |        |        |        | ●   |

| Insert Form | Countersunk Screw                             |                    | Torque Driver |          | Service Key |          | Technical Data |          |
|-------------|---|--------------------|---------------|----------|-------------|----------|----------------|----------|
|             | Part No.                                      | Description        | Part No.      | Part No. | Torque      | Key Size | Torque         | Key Size |
| 101         | 115676  | M2.5 x 0.45 x 5    | 415514        | 115590   | 1.2 Nm      | T8       |                |          |
| 103         | 115672 (<math>\leq \phi 37 \text{ mm}</math>) | M3.5 x 0.6 x 7.5   | 415510        | 115664   | 3.0 Nm      | T15      |                |          |
| 103         | 115673 (>math>\phi 36 \text{ mm}</math>)      | M3.5 x 0.6 x 9     | 415510        | 115664   | 3.0 Nm      | T15      |                |          |
| 104         | 215149  | M4.5 x 0.75 x 11.5 | 415543        | 215150   | 5.0 Nm      | T20      |                |          |
| 105         | 215149  | M4.5 x 0.75 x 11.5 | 415543        | 215150   | 5.0 Nm      | T20      |                |          |

Reference Key

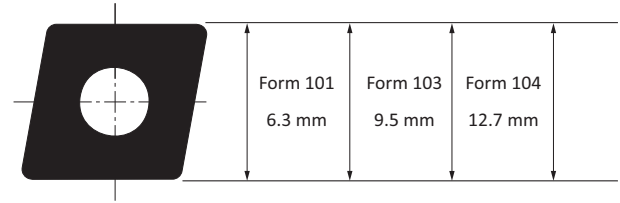
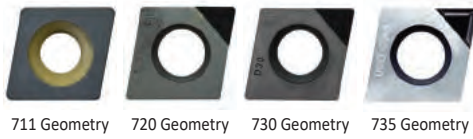
| Symbol | Machining Conditions       |
|--------|----------------------------|
| ●      | Good - Main Application    |
| ◐      | Average - Main Application |

Reference Key

| Symbol | Insert Type                      |
|--------|----------------------------------|
| ▼      | Roughing - Main Application      |
| ▽      | Roughing - Extended Application  |
| ▼▼▼    | Finishing - Main Application     |
| ▽▽▽    | Finishing - Extended Application |

# Insert Forms 101, 103, 104

Ceramic | CBN | PCD



|                       |        | Ceramic  |             | CBN        |          |        |        | PCD    |        |        |        |        |
|-----------------------|--------|----------|-------------|------------|----------|--------|--------|--------|--------|--------|--------|--------|
|                       |        | Uncoated | Coated      | Uncoated   |          | Coated |        |        |        |        |        |        |
| Steel                 | P      |          |             |            |          |        |        |        |        |        |        |        |
| Stainless Steel       | M      |          |             |            |          |        |        |        |        |        |        |        |
| Cast Iron             | K      | ▼        |             |            | ▼▼▼      |        |        |        |        |        |        |        |
| Non-Ferrous Materials | N      |          |             |            |          |        |        | ▼▼▼    | ▼▼▼    |        |        |        |
| Titanium              | S      |          |             |            |          |        |        |        |        |        |        |        |
| Hard Materials        | H      |          |             |            |          |        |        |        |        |        |        |        |
| Geometry              | Radius |          | Description | ISO Code   | Part No. | WCN06  | WBN150 | WBN200 | WBN300 | WBN450 | PKDD30 | PKDD50 |
| 711                   | 0.40   | 0.016    | F10304GN711 | CCGW09T304 | 297561   | ⚙️     |        |        |        |        |        |        |
| 711                   | 0.80   | 0.031    | F10308GN711 | CCGW09T308 | 297192   | ⚙️     |        |        |        |        |        |        |
| 711                   | 0.80   | 0.031    | F10408GN711 | CCGW120408 | 297249   | ⚙️     |        |        |        |        |        |        |
| 711                   | 1.20   | 0.047    | F10412GN711 | CCGW120412 | 297234   | ⚙️     |        |        |        |        |        |        |
| 720                   | 0.20   | 0.008    | F10102GN720 | CCGT060202 | 297501   |        |        |        |        |        | ●      |        |
| 720                   | 0.40   | 0.016    | F10104GN720 | CCGT060204 | 297502   |        |        |        |        |        | ●      |        |
| 720                   | 0.20   | 0.008    | F10302GN720 | CCGT09T302 | 297578   |        |        |        |        |        | ●      |        |
| 720                   | 0.40   | 0.016    | F10304GN720 | CCGT09T304 | 297483   |        |        |        |        |        | ●      |        |
| 730                   | 0.20   | 0.008    | F10102GN730 | CCGW060202 | 097462   |        |        |        |        |        | ●      | ●      |
| 730                   | 0.40   | 0.016    | F10104GN730 | CCGW060204 | 297164   |        |        |        |        |        | ●      | ●      |
| 730                   | 0.80   | 0.031    | F10108GN730 | CCGW060208 | 297165   |        |        |        |        |        | ●      | ●      |
| 730                   | 0.20   | 0.008    | F10302GN730 | CCGW09T302 | 397251   |        |        |        |        |        | ●      | ●      |
| 730                   | 0.40   | 0.016    | F10304GN730 | CCGW09T304 | 297533   |        |        |        |        |        | ●      | ●      |
| 730                   | 0.40   | 0.016    | F10404GN730 | CCGW120404 | 397257   |        |        |        |        |        | ●      | ●      |
| 730                   | 0.80   | 0.031    | F10408GN730 | CCGW120408 | 297871   |        |        |        |        |        | ●      | ●      |
| 735                   | 0.20   | 0.008    | F10102GN735 | CCGT060202 | 297872   |        |        |        |        |        | ●      |        |
| 735                   | 0.40   | 0.016    | F10104GN735 | CCGT060204 | 397244   |        |        |        |        |        | ●      |        |
| 735                   | 0.20   | 0.008    | F10302GN735 | CCGT09T302 | 397252   |        |        |        |        |        | ●      |        |
| 735                   | 0.40   | 0.016    | F10304GN735 | CCGT09T304 | 297870   |        |        |        |        |        | ●      |        |

Reference Key

| Symbol | Machining Conditions         |
|--------|------------------------------|
| ●      | Good - Main Application      |
| ●      | Average - Main Application   |
| ⚙️     | Difficult - Main Application |

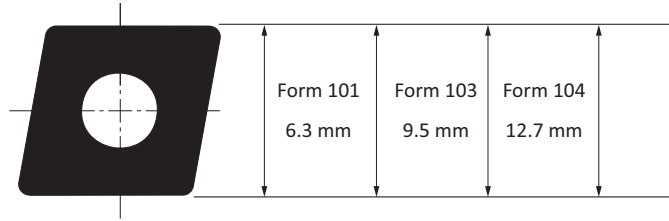
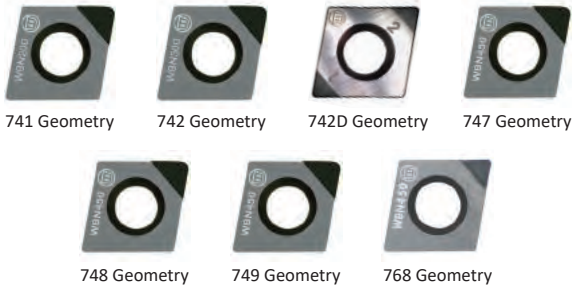
Reference Key

| Symbol | Insert Type                      |
|--------|----------------------------------|
| ▼      | Roughing - Main Application      |
| ▽      | Roughing - Extended Application  |
| ▼▼▼    | Finishing - Main Application     |
| ▽▽▽    | Finishing - Extended Application |

| Insert Form | Countersunk Screw                                   |                    | Torque Driver |          | Service Key |          | Technical Data |  |
|-------------|---|--------------------|---------------|----------|-------------|----------|----------------|--|
|             | Part No.  | Dimensions         | Part No.      | Part No. | Torque      | Key Size |                |  |
| 101         | 115676  | M2.5 x 0.45 x 5    | 415514        | 115590   | 1.2 Nm      | T8       |                |  |
| 103         | 115672 (<math>\le \varnothing 37 \text{ mm}</math>) | M3.5 x 0.6 x 7.5   | 415510        | 115664   | 3.0 Nm      | T15      |                |  |
| 103         | 115673 (>math>\varnothing 36 \text{ mm}</math>)     | M3.5 x 0.6 x 9     | 415510        | 115664   | 3.0 Nm      | T15      |                |  |
| 104         | 215149  | M4.5 x 0.75 x 11.5 | 415543        | 215150   | 5.0 Nm      | T20      |                |  |

## Insert Forms 101, 103, 104

CBN



|                              |          |       |              |            |               | CBN      |          |          |          |          |          |   |
|------------------------------|----------|-------|--------------|------------|---------------|----------|----------|----------|----------|----------|----------|---|
|                              |          |       |              |            |               | Uncoated |          |          |          |          | Coated   |   |
|                              |          |       |              |            |               | WB150    | WB200    | WB300    | WB450    | WB448    | WB300    |   |
| Geometry                     | Radius   |       | Description  | ISO Code   | Part No.      |          |          |          |          |          |          |   |
|                              | mm       | in    |              |            |               |          |          |          |          |          |          |   |
| <b>Steel</b>                 | <b>P</b> |       |              |            |               |          |          |          |          |          |          |   |
| <b>Stainless Steel</b>       | <b>M</b> |       |              |            |               |          |          |          |          |          |          |   |
| <b>Cast Iron</b>             | <b>K</b> |       |              |            |               | ▽▽▽<br>▽ |          | ▽▽▽<br>▽ | ▽▽▽<br>▽ | ▽▽▽<br>▽ |          |   |
| <b>Non-Ferrous Materials</b> | <b>N</b> |       |              |            |               |          |          |          |          |          |          |   |
| <b>Titanium</b>              | <b>S</b> |       |              |            |               |          |          |          |          |          |          |   |
| <b>Hard Materials</b>        | <b>H</b> |       |              |            |               | ▽▽▽<br>▽ | ▽▽▽<br>▽ | ▽▽▽<br>▽ |          |          | ▽▽▽<br>▽ |   |
| <b>741</b>                   | 0.20     | 0.008 | F10102GN741  | CCGW060202 | <b>297290</b> |          | ●        |          |          |          |          |   |
| <b>741</b>                   | 0.40     | 0.016 | F10104GN741  | CCGW060204 | <b>297291</b> |          | ●        |          |          |          |          |   |
| <b>741</b>                   | 0.40     | 0.016 | F10304GN741  | CCGW09T304 | <b>297303</b> |          | ●        |          |          |          |          |   |
| <b>742</b>                   | 0.20     | 0.008 | F10102GN742  | CCGW060202 | <b>297293</b> |          |          | ●        |          |          |          |   |
| <b>742</b>                   | 0.40     | 0.016 | F10104GN742  | CCGW060204 | <b>297294</b> |          |          | ●        |          |          |          |   |
| <b>742</b>                   | 0.40     | 0.016 | F10304GN742  | CCGW09T304 | <b>297306</b> |          |          | ●        |          |          |          |   |
| <b>742D</b>                  | 0.20     | 0.008 | F10102GN742D | CCGW060202 | <b>397949</b> |          |          |          |          | ●        |          | ● |
| <b>742D</b>                  | 0.40     | 0.016 | F10104GN742D | CCGW060204 | <b>397999</b> |          |          |          |          | ●        |          | ● |
| <b>742D</b>                  | 0.40     | 0.016 | F10304GN742D | CCGW090204 | <b>397931</b> |          |          |          |          | ●        |          | ● |
| <b>742D</b>                  | 0.80     | 0.031 | F10308GN742D | CCGW090208 | <b>397958</b> |          |          |          |          | ●        |          | ● |
| <b>747</b>                   | 0.40     | 0.016 | F10404GN747  | CCGW120404 | <b>397260</b> | ●        |          |          | ●        |          |          |   |
| <b>748</b>                   | 0.20     | 0.008 | F10102GN748  | CCGW060202 | <b>297787</b> |          |          |          | ●        |          |          |   |
| <b>748</b>                   | 0.40     | 0.016 | F10104GN748  | CCGW060204 | <b>297788</b> |          |          |          | ●        |          |          |   |
| <b>748</b>                   | 0.20     | 0.008 | F10302GN748  | CCGW09T302 | <b>297790</b> |          |          |          | ●        |          |          |   |
| <b>748</b>                   | 0.40     | 0.016 | F10304GN748  | CCGW09T304 | <b>297419</b> |          |          |          | ●        |          |          |   |
| <b>749</b>                   | 0.80     | 0.031 | F10408GN749  | CCGW120408 | <b>397261</b> | ●        |          |          | ●        |          |          |   |
| <b>768</b>                   | 0.20     | 0.008 | F10102GN768  | CCGT060202 | <b>297486</b> |          |          |          | ●        |          |          |   |
| <b>768</b>                   | 0.40     | 0.016 | F10104GN768  | CCGT060204 | <b>297659</b> |          |          |          | ●        |          |          |   |
| <b>768</b>                   | 0.20     | 0.008 | F10302GN768  | CCGT09T302 | <b>397439</b> |          |          |          | ●        |          |          |   |
| <b>768</b>                   | 0.40     | 0.016 | F10304GN768  | CCGT09T304 | <b>297660</b> |          |          |          | ●        |          |          |   |

| Insert Form | Countersunk Screw   |                    | Torque Driver |               | Service Key |          | Technical Data |  |
|-------------|---|--------------------|---------------|---------------|-------------|----------|----------------|--|
|             | Part No.  | Dimensions         | Part No.      | Part No.      | Torque      | Key Size |                |  |
| 101         | <b>115676</b>   | M2.5 x 0.4 x 5     | <b>415514</b> | <b>115590</b> | 1.2 Nm      | T8       |                |  |
| 103         | <b>115672</b> (<math>\leq \varnothing 37 \text{ mm}</math>) | M3.5 x 0.6 x 7.5   | <b>415510</b> | <b>115664</b> | 3.0 Nm      | T15      |                |  |
| 103         | <b>115673</b> (>math>\varnothing 36 \text{ mm}</math>)      | M3.5 x 0.6 x 9     | <b>415510</b> | <b>115664</b> | 3.0 Nm      | T15      |                |  |
| 104         | <b>215149</b>   | M4.5 x 0.75 x 11.5 | <b>415543</b> | <b>215150</b> | 5.0 Nm      | T20      |                |  |

### Reference Key

| Symbol | Machining Conditions       |
|--------|----------------------------|
| ●      | Good - Main Application    |
| ●      | Average - Main Application |

### Reference Key

| Symbol | Insert Type                      |
|--------|----------------------------------|
| ▽      | Roughing - Main Application      |
| ▽      | Roughing - Extended Application  |
| ▽▽▽    | Finishing - Main Application     |
| ▽▽▽    | Finishing - Extended Application |

### Insert Form 39

Cermet | Carbide



|                       |        |       |             |            |          | Cermet   |       |       |        |       |        | Carbide  |       |       |        |       |       |        |        |        |        |        |  |  |  |
|-----------------------|--------|-------|-------------|------------|----------|----------|-------|-------|--------|-------|--------|----------|-------|-------|--------|-------|-------|--------|--------|--------|--------|--------|--|--|--|
|                       |        |       |             |            |          | Uncoated |       |       | Coated |       |        | Uncoated |       |       | Coated |       |       |        |        |        |        |        |  |  |  |
|                       |        |       |             |            |          | WHT10    | WHT12 | WHT16 | WHT32  | WTC15 | WTC121 | WHW01    | WHW16 | WHC05 | WHC81  | WHC88 | WHC98 | WHC111 | WHC114 | WHC136 | WHC164 | WHC190 |  |  |  |
| Geometry              | Radius |       | Description | ISO Code   | Part No. |          |       |       |        |       |        |          |       |       |        |       |       |        |        |        |        |        |  |  |  |
|                       | mm     | in    |             |            |          |          |       |       |        |       |        |          |       |       |        |       |       |        |        |        |        |        |  |  |  |
| Steel                 | P      |       |             |            |          |          |       |       |        |       |        |          |       |       |        |       |       |        |        |        |        |        |  |  |  |
| Stainless Steel       | M      |       |             |            |          |          |       |       |        |       |        |          |       |       |        |       |       |        |        |        |        |        |  |  |  |
| Cast Iron             | K      |       |             |            |          |          |       |       |        |       |        |          |       |       |        |       |       |        |        |        |        |        |  |  |  |
| Non-Ferrous Materials | N      |       |             |            |          |          |       |       |        |       |        |          |       |       |        |       |       |        |        |        |        |        |  |  |  |
| Titanium              | S      |       |             |            |          |          |       |       |        |       |        |          |       |       |        |       |       |        |        |        |        |        |  |  |  |
| Hard Materials        | H      |       |             |            |          |          |       |       |        |       |        |          |       |       |        |       |       |        |        |        |        |        |  |  |  |
| 121                   | 0.20   | 0.008 | F03902MN121 | DCMT11T302 | 397787   |          |       |       |        |       |        |          |       |       |        |       |       |        |        |        |        |        |  |  |  |
| 121                   | 0.40   | 0.016 | F03904MN121 | DCMT11T304 | 397788   |          |       |       |        |       |        |          |       |       |        |       |       |        |        |        |        |        |  |  |  |
| 127                   | 0.20   | 0.008 | F03702GN127 | DCGT070202 | 397234   |          |       |       |        |       |        |          |       |       |        |       |       |        |        |        |        |        |  |  |  |
| 127                   | 0.40   | 0.016 | F03704GN127 | DCGT070204 | 097787   |          |       |       |        |       |        |          |       |       |        |       |       |        |        |        |        |        |  |  |  |
| 127                   | 0.20   | 0.008 | F03902GN127 | DCGT11T302 | 397235   |          |       |       |        |       |        |          |       |       |        |       |       |        |        |        |        |        |  |  |  |
| 127                   | 0.40   | 0.016 | F03904GN127 | DCGT11T304 | 097559   |          |       |       |        |       |        |          |       |       |        |       |       |        |        |        |        |        |  |  |  |
| 129                   | 0.20   | 0.008 | F03702GN129 | DCGT070202 | 397708   |          |       |       |        |       |        |          |       |       |        |       |       |        |        |        |        |        |  |  |  |
| 129                   | 0.20   | 0.008 | F03902GN129 | DCGT11T302 | 397816   |          |       |       |        |       |        |          |       |       |        |       |       |        |        |        |        |        |  |  |  |
| 129                   | 0.40   | 0.016 | F03904GN129 | DCGT11T304 | 397817   |          |       |       |        |       |        |          |       |       |        |       |       |        |        |        |        |        |  |  |  |
| 146                   | 0.40   | 0.016 | F03704MN146 | DCMT070204 | 397968   |          |       |       |        |       |        |          |       |       |        |       |       |        |        |        |        |        |  |  |  |
| 146                   | 0.80   | 0.031 | F03708MN146 | DCMT070208 | 397047   |          |       |       |        |       |        |          |       |       |        |       |       |        |        |        |        |        |  |  |  |
| 146                   | 0.40   | 0.016 | F03904MN146 | DCMT11T304 | 397591   |          |       |       |        |       |        |          |       |       |        |       |       |        |        |        |        |        |  |  |  |
| 146                   | 0.80   | 0.031 | F03908MN146 | DCMT11T308 | 397598   |          |       |       |        |       |        |          |       |       |        |       |       |        |        |        |        |        |  |  |  |
| 155                   | 0.20   | 0.008 | F03902MN155 | DCMT11T302 | 397809   |          |       |       |        |       |        |          |       |       |        |       |       |        |        |        |        |        |  |  |  |
| 155                   | 0.40   | 0.016 | F03904MN155 | DCMT11T304 | 397810   |          |       |       |        |       |        |          |       |       |        |       |       |        |        |        |        |        |  |  |  |
| 192                   | 0.20   | 0.008 | F03902MN192 | DCMT11T302 | 397783   |          |       |       |        |       |        |          |       |       |        |       |       |        |        |        |        |        |  |  |  |
| 192                   | 0.40   | 0.016 | F03904MN192 | DCMT11T304 | 297721   |          |       |       |        |       |        |          |       |       |        |       |       |        |        |        |        |        |  |  |  |
| 192                   | 0.80   | 0.031 | F03908MN192 | DCMT11T308 | 397784   |          |       |       |        |       |        |          |       |       |        |       |       |        |        |        |        |        |  |  |  |
| 200                   | 0.20   | 0.008 | F03902GN200 | DCGT11T302 | 397785   |          |       |       |        |       |        |          |       |       |        |       |       |        |        |        |        |        |  |  |  |
| 200                   | 0.40   | 0.016 | F03904GN200 | DCGT11T304 | 397786   |          |       |       |        |       |        |          |       |       |        |       |       |        |        |        |        |        |  |  |  |

Reference Key

| Symbol | Machining Conditions         |
|--------|------------------------------|
| ●      | Good - Main Application      |
| ◐      | Average - Main Application   |
| ⚙      | Difficult - Main Application |

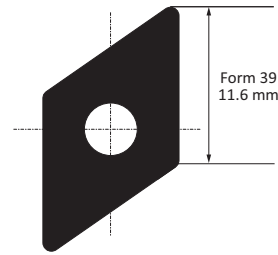
Reference Key

| Symbol | Insert Type                      |
|--------|----------------------------------|
| ▼      | Roughing - Main Application      |
| ▽      | Roughing - Extended Application  |
| ▼▼▼    | Finishing - Main Application     |
| ▽▽▽    | Finishing - Extended Application |

|             |                       |               |             |                |          |
|-------------|-----------------------|---------------|-------------|----------------|----------|
|             |                       |               |             | Technical Data |          |
| Insert Form | Countersunk Screw     | Torque Driver | Service Key | Torque         | Key Size |
| 39          | 115673 M3.5 x 0.6 x 9 | 414510        | 115664      | 3.0 Nm         | T15      |

# Insert Form 39

CBN | PCD







|                       |        |       |             |            |          | CBN      |        |        |        |        | PCD |  |        |        |
|-----------------------|--------|-------|-------------|------------|----------|----------|--------|--------|--------|--------|-----|--|--------|--------|
|                       |        |       |             |            |          | Uncoated |        |        | Coated |        |     |  |        |        |
| Steel                 |        |       |             |            |          | P        |        |        |        |        |     |  |        |        |
| Stainless Steel       |        |       |             |            |          | M        |        |        |        |        |     |  |        |        |
| Cast Iron             |        |       |             |            |          | K        |        |        | K      |        |     |  |        |        |
| Non-Ferrous Materials |        |       |             |            |          | N        |        |        |        |        | N   |  |        |        |
| Titanium              |        |       |             |            |          | S        |        |        |        |        |     |  |        |        |
| Hard Materials        |        |       |             |            |          | H        |        |        |        |        |     |  |        |        |
| Geometry              | Radius |       | Description | ISO Code   | Part No. | WBN150   | WBN200 | WBN300 | WBN450 | WBN200 |     |  | PKDD30 | PKDD50 |
|                       | mm     | in    |             |            |          |          |        |        |        |        |     |  |        |        |
| 730                   | 0.20   | 0.008 | F03902GN730 | DCGW11T302 | 397269   |          |        |        |        |        |     |  | ●      |        |
| 730                   | 0.40   | 0.016 | F03904GN730 | DCGW11T304 | 397270   |          |        |        |        |        |     |  | ●      |        |
| 735                   | 0.20   | 0.008 | F03902GN735 | DCGT11T302 | 397271   |          |        |        |        |        |     |  | ●      |        |
| 735                   | 0.40   | 0.016 | F03904GN735 | DCGT11T304 | 397272   |          |        |        |        |        |     |  | ●      |        |
| 747                   | 0.20   | 0.008 | F03902GN747 | DCGW11T302 | 397273   | ●        |        |        | ●      |        |     |  |        |        |
| 747                   | 0.40   | 0.016 | F03904GN747 | DCGW11T304 | 397274   | ●        |        |        | ●      |        |     |  |        |        |

### Reference Key

| Symbol | Machining Conditions         |
|--------|------------------------------|
| ●      | Average - Main Application   |
| ⊕      | Difficult - Main Application |

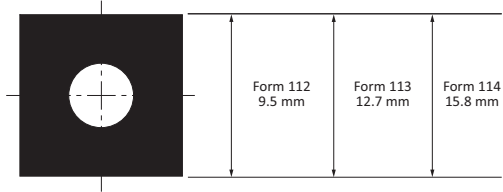
### Reference Key

| Symbol | Insert Type                      |
|--------|----------------------------------|
| ▼      | Roughing - Main Application      |
| ▽      | Roughing - Extended Application  |
| ▼▼     | Finishing - Main Application     |
| ▽▽     | Finishing - Extended Application |

|   |   |   |   |                |        |          |
|---|---|---|---|----------------|--------|----------|
|  |  |  |  | Technical Data |        |          |
| Insert Form   | Countersunk Screw   |   | Torque Driver   | Service Key    | Torque | Key Size |
| 39  | 115673  | M3.5 x 0.6 x 9  | 414510  | 115664         | 3.0 Nm | T15      |

## Insert Forms 112, 113, 114

Carbide



|                         |        |       |             |            |          | Carbide  |       |        |       |       |       |       |       |       |        |        |        |        |        |    |    |    |    |
|-------------------------|--------|-------|-------------|------------|----------|----------|-------|--------|-------|-------|-------|-------|-------|-------|--------|--------|--------|--------|--------|----|----|----|----|
|                         |        |       |             |            |          | Uncoated |       | Coated |       |       |       |       |       |       |        |        |        |        |        |    |    |    |    |
| Steel P                 |        |       |             |            |          |          |       |        | ▽▽    | ▽▽    | ▽▽    | ▽▽    | ▽▽    | ▽▽    | ▽▽     | ▽▽     | ▽▽     | ▽▽     | ▽▽     | ▽▽ | ▽▽ | ▽▽ |    |
| Stainless Steel M       |        |       |             |            |          |          |       |        | ▽     |       | ▽     |       | ▽     |       | ▽      |        | ▽      |        | ▽      |    | ▽  |    |    |
| Cast Iron K             |        |       |             |            |          |          | ▽▽    |        | ▽▽    | ▽▽    | ▽▽    | ▽▽    |       | ▽▽    | ▽▽     | ▽▽     |        | ▽▽     | ▽▽     | ▽▽ |    | ▽▽ | ▽▽ |
| Non-Ferrous Materials N |        |       |             |            |          |          | ▽▽    |        |       |       |       |       |       |       |        |        |        |        |        |    |    |    |    |
| Titanium S              |        |       |             |            |          |          | ▽▽    |        | ▽▽    |       |       |       |       | ▽▽    |        | ▽▽     | ▽▽     |        | ▽▽     |    | ▽▽ |    |    |
| Hard Materials H        |        |       |             |            |          |          |       |        |       | ▽▽    |       | ▽▽    |       |       |        |        | ▽▽     |        |        |    | ▽▽ |    |    |
| Geometry                | Radius |       | Description | ISO Code   | Part No. | WHW01    | WHW16 | WHC05  | WHC30 | WHC77 | WHC79 | WHC81 | WHC88 | WHC98 | WHC111 | WHC114 | WHC136 | WHC164 | WHC190 |    |    |    |    |
|                         | mm     | in    |             |            |          |          |       |        |       |       |       |       |       |       |        |        |        |        |        |    |    |    |    |
| 108                     | 0.40   | 0.016 | F11204MN108 | SCMT09T304 | 297535   |          |       |        |       |       |       |       |       | ●     |        |        |        |        |        |    |    |    |    |
| 108                     | 0.80   | 0.031 | F11308MN108 | SCMT120408 | 397110   |          |       |        |       |       |       |       |       | ●     |        |        |        |        |        |    |    |    |    |
| 127                     | 0.40   | 0.016 | F11204GN127 | SCGT09T304 | 097539   |          | ●     |        |       |       |       |       |       |       |        |        |        |        |        |    |    |    |    |
| 127                     | 0.40   | 0.016 | F11304GN127 | SCGT120404 | 397590   |          | ●     |        |       |       |       |       |       |       |        |        |        |        |        |    |    |    |    |
| 127                     | 0.80   | 0.031 | F11308GN127 | SCGT120408 | 097566   |          | ●     |        |       |       |       |       |       |       |        |        |        |        |        |    |    |    |    |
| 145                     | 0.80   | 0.031 | F11208GN145 | SCGT09T308 | 297996   |          |       |        |       |       |       |       |       |       | ●      |        |        |        |        |    |    |    |    |
| 145                     | 0.80   | 0.031 | F11308GN145 | SCGT120408 | 297997   |          |       |        |       |       |       |       |       |       | ●      |        |        |        |        |    |    |    |    |
| 146                     | 0.40   | 0.016 | F11204MN146 | SCMT09T304 | 397940   |          |       |        |       |       |       | ●     | ⚙     |       |        |        |        |        |        |    |    |    |    |
| 146                     | 0.80   | 0.031 | F11208MN146 | SCMT09T308 | 397992   |          |       |        |       |       |       | ●     | ⚙     |       |        |        |        |        |        |    |    |    |    |
| 146                     | 0.40   | 0.016 | F11304MN146 | SCMT12T304 | 397049   |          |       |        |       |       |       | ●     | ⚙     |       |        |        |        |        |        |    |    |    |    |
| 146                     | 0.80   | 0.031 | F11308MN146 | SCMT12T308 | 397969   |          |       |        |       |       |       | ●     | ⚙     |       |        |        |        |        |        |    |    |    |    |
| 158                     | 0.80   | 0.031 | F11308MN158 | SCMT120408 | 297497   |          |       |        |       | ●     |       |       |       |       |        |        |        |        |        |    |    |    |    |
| 158                     | 1.20   | 0.047 | F11412MN158 | SCMT150512 | 097252   |          |       |        | ⚙     |       |       |       |       |       |        |        |        |        |        |    |    |    |    |
| 192                     | 0.40   | 0.016 | F11204MN192 | SCMT09T304 | 397741   |          |       |        |       |       |       |       |       |       |        |        |        |        | ●      | ⚙  |    |    |    |
| 192                     | 0.80   | 0.031 | F11208MN192 | SCMT09T308 | 397640   |          |       |        |       |       |       |       |       |       |        |        |        |        | ●      | ⚙  |    |    |    |
| 192                     | 0.80   | 0.031 | F11308MN192 | SCMT120408 | 397709   |          |       |        |       |       |       |       |       |       |        |        |        |        | ●      | ⚙  |    |    |    |
| 192                     | 1.20   | 0.047 | F11312MN192 | SCMT120412 | 397710   |          |       |        |       |       |       |       |       |       |        |        |        |        |        | ⚙  |    |    |    |
| 199                     | 0.40   | 0.016 | F11204MN199 | SCMT09T304 | 397703   |          |       |        |       |       |       |       |       |       |        |        |        |        | ●      |    |    |    |    |
| 199                     | 0.80   | 0.031 | F11208MN199 | SCMT09T308 | 397704   |          |       |        |       |       |       |       |       |       |        |        |        |        | ●      |    |    |    |    |
| 199                     | 0.80   | 0.031 | F11308MN199 | SCMT120408 | 397705   |          |       |        |       |       |       |       |       |       |        |        |        |        | ●      |    |    |    |    |
| 711                     | 0.80   | 0.031 | F11308MN711 | SCMT120408 | 297212   |          |       |        |       | ●     |       |       |       |       |        |        |        |        |        |    |    |    |    |

### Reference Key

| Symbol | Machining Conditions         |
|--------|------------------------------|
| ●      | Good - Main Application      |
| ●      | Average - Main Application   |
| ⚙      | Difficult - Main Application |

### Reference Key

| Symbol | Insert Type                      |
|--------|----------------------------------|
| ▽      | Roughing - Main Application      |
| ▽      | Roughing - Extended Application  |
| ▽▽     | Finishing - Extended Application |

| Insert Form | Countersunk Screw                       |                    | Torque Driver |          | Service Key |          | Technical Data |          |
|-------------|---|--------------------|---------------|----------|-------------|----------|----------------|----------|
|             | Torque                                  | Key Size           | Torque        | Key Size | Torque      | Key Size | Torque         | Key Size |
| 112         | 115672 (<math>\phi 37\text{ mm}</math>) | M3.5 x 0.6 x 7.5   | 415510        | 115664   | 3.0 Nm      | T15      |                |          |
| 112         | 115673 (>math>\phi 36\text{ mm}</math>) | M3.5 x 0.6 x 9     | 415510        | 115664   | 3.0 Nm      | T15      |                |          |
| 113         | 215149                                  | M4.5 x 0.75 x 11.5 | 415543        | 215150   | 5.0 Nm      | T20      |                |          |
| 114         | 215149                                  | M4.5 x 0.75 x 11.5 | 415543        | 215150   | 5.0 Nm      | T20      |                |          |



## Insert Forms 04, 05

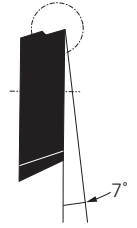
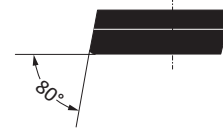
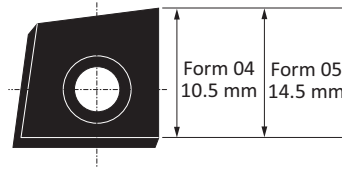
Carbide



880 Geometry



811 Geometry



|                       |        |       |             |          |          | Carbide  |       |       |        |       |       |        |        |        |        |        |
|-----------------------|--------|-------|-------------|----------|----------|----------|-------|-------|--------|-------|-------|--------|--------|--------|--------|--------|
|                       |        |       |             |          |          | Uncoated |       |       | Coated |       |       |        |        |        |        |        |
| Steel                 |        | P     |             |          |          |          |       |       |        |       |       |        |        | ▼      | ▼      | ▼      |
| Stainless Steel       |        | M     |             |          |          |          |       |       |        |       |       |        |        | ▽      | ▽      | ▽      |
| Cast Iron             |        | K     |             |          |          |          |       |       |        |       |       |        |        | ▼      | ▼      | ▼      |
| Non-Ferrous Materials |        | N     |             |          |          |          |       |       |        |       |       |        |        |        |        | ▽      |
| Titanium              |        | S     |             |          |          |          |       |       |        |       |       |        |        |        |        | ▽      |
| Hard Materials        |        | H     |             |          |          |          |       |       |        |       |       |        |        |        |        |        |
| Geometry              | Radius |       | Description | ISO Code | Part No. | WHW16    | WHC05 | WHC18 | WHC19  | WHC79 | WHC98 | WHC111 | WHC114 | WHC170 | WHC168 | WHC198 |
|                       | mm     | in    |             |          |          |          |       |       |        |       |       |        |        |        |        |        |
| 880                   | 0.40   | 0.016 | F00404ML880 | -        | 397595   |          |       |       |        |       |       |        |        |        |        | ●      |
| 880                   | 0.40   | 0.016 | F00504ML880 | -        | 397593   |          |       |       |        |       |       |        |        |        |        | ●      |
| 880                   | 0.80   | 0.031 | F00508ML880 | -        | 397594   |          |       |       |        |       |       |        |        | ⚡      | ⚡      | ●      |
| 811                   | 0.80   | 0.031 | F00508ML811 | -        | 397844   |          |       |       |        |       |       |        |        | ⚡      | ⚡      | ●      |

Reference Key

| Symbol | Machining Conditions         |
|--------|------------------------------|
| ●      | Average - Main Application   |
| ⚡      | Difficult - Main Application |

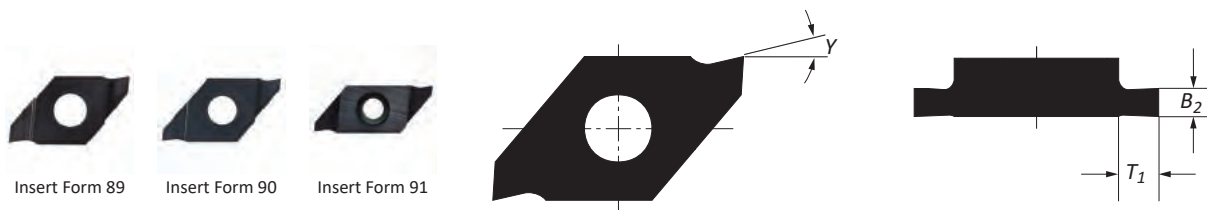
Reference Key

| Symbol | Insert Type                     |
|--------|---------------------------------|
| ▼      | Roughing - Main Application     |
| ▽      | Roughing - Extended Application |

| Insert Form | Countersunk Screw |                | Torque Driver | Service Key | Technical Data |          |
|-------------|-------------------|----------------|---------------|-------------|----------------|----------|
|             |                   |                |               |             | Torque         | Key Size |
| 04          | 415977            | M4 x 0.7 x 7.9 | 415510        | 115664      | 3.0 Nm         | T15      |
| 05          | 415949            | M4 x 0.7 x 11  | 415543        | 215150      | 5.0 Nm         | T20      |

## 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           | B <sub>2</sub> | Y   | T <sub>1</sub> | Ring Width | Part No. | WHW01    | WHW16 | WHW20 | WHC05  | WHC18 | WHC19 | WHC79 | WHC98 | WHC111 | WHC114 | WHC136 | WHC164 |    |  |
| 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 | Machining Conditions       |
|--------|----------------------------|
| ●      | Average - Main Application |

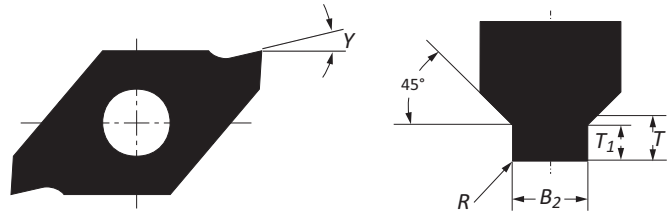
Reference Key

| Symbol | Insert Type                      |
|--------|----------------------------------|
| ▽▽     | Universal - Main Application     |
| ▽      | Universal - Extended Application |

| Insert Form | Countersunk Screw |                 | Torque Driver | Service Key | Technical Data |          |
|-------------|-------------------|-----------------|---------------|-------------|----------------|----------|
|             |                   |                 |               |             | Torque         | Key Size |
| 89          | 115676            | M2.5 x 0.45 x 5 | 415514        | 115590      | 1.2 Nm         | T8       |
| 90          | 115531            | M3 x 0.5 x 7.5  | 415514        | 115590      | 1.2 Nm         | T8       |
| 91          | 115802            | M3 x 0.5 x 12   | 415514        | 115590      | 1.2 Nm         | T8       |

## Radial Grooving Insert Forms 89, 90, 91

Carbide



|                       |                 |       |     |      |       |      |            |          | Carbide  |       |       |        |       |       |       |       |        |        |        |        |
|-----------------------|-----------------|-------|-----|------|-------|------|------------|----------|----------|-------|-------|--------|-------|-------|-------|-------|--------|--------|--------|--------|
|                       |                 |       |     |      |       |      |            |          | Uncoated |       |       | Coated |       |       |       |       |        |        |        |        |
| Steel                 |                 |       |     |      |       |      |            |          | P        |       |       | M      |       |       |       |       |        |        |        |        |
| Stainless Steel       |                 |       |     |      |       |      |            |          | M        |       |       | K      |       |       |       |       |        |        |        |        |
| Cast Iron             |                 |       |     |      |       |      |            |          | K        |       |       | N      |       |       |       |       |        |        |        |        |
| Non-Ferrous Materials |                 |       |     |      |       |      |            |          | N        |       |       | S      |       |       |       |       |        |        |        |        |
| Titanium              |                 |       |     |      |       |      |            |          | S        |       |       | H      |       |       |       |       |        |        |        |        |
| Hard Materials        |                 |       |     |      |       |      |            |          | H        |       |       |        |       |       |       |       |        |        |        |        |
| Insert Form           | Boring $\phi$   | $B_2$ | $Y$ | $R$  | $T_1$ | $T$  | Ring Width | Part No. | WHW01    | WHW16 | WHW20 | WHC05  | WHC18 | WHC19 | WHC79 | WHC98 | WHC111 | WHC114 | WHC136 | WHC164 |
| 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   |          |       |       |        |       |       |       |       |        |        | ●      |        |

III

### Reference Key

| Symbol | Machining Conditions       |
|--------|----------------------------|
| ●      | Average - Main Application |

### Reference Key

| Symbol | Insert Type                      |
|--------|----------------------------------|
| ▼▼     | Universal - Main Application     |
| ▽▽     | Universal - Extended Application |

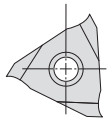
| Insert Form | Countersunk Screw |                 | Torque Driver |          | Service Key |          | Technical Data |  |
|-------------|-------------------|-----------------|---------------|----------|-------------|----------|----------------|--|
|             | Part No.          | Size            | Part No.      | Part No. | Torque      | Key Size |                |  |
| 89          | 115676            | M2.5 x 0.45 x 5 | 415514        | 115590   | 1.2 Nm      | T8       |                |  |
| 90          | 115531            | M3 x 0.5 x 7.5  | 415514        | 115590   | 1.2 Nm      | T8       |                |  |
| 91          | 115802            | M3 x 0.5 x 12   | 415514        | 115590   | 1.2 Nm      | T8       |                |  |

# Axial Grooving Insert Blanks Form 304

Carbide



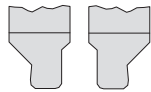
|                                 |                |          | Carbide  |       |       |        |       |       |       |       |        |        |        |        |
|---------------------------------|----------------|----------|----------|-------|-------|--------|-------|-------|-------|-------|--------|--------|--------|--------|
|                                 |                |          | Uncoated |       |       | Coated |       |       |       |       |        |        |        |        |
| Material                        | Code           |          | WHW01    | WHW16 | WHW20 | WHC05  | WHC18 | WHC19 | WHC79 | WHC98 | WHC111 | WHC114 | WHC136 | WHC164 |
| Steel                           | P              |          |          |       |       |        |       |       |       |       |        |        |        |        |
| Stainless Steel                 | M              |          |          |       |       |        |       |       |       |       |        |        |        |        |
| Cast Iron Non-Ferrous Materials | K              |          |          |       | ▽▽    |        |       |       |       |       |        |        |        |        |
| Non-Ferrous Materials           | N              |          |          |       | ▼▼    |        |       |       |       |       |        |        |        |        |
| Titanium                        | S              |          |          |       | ▽▽    |        |       |       |       |       |        |        |        |        |
| Hard Materials                  | H              |          |          |       |       |        |       |       |       |       |        |        |        |        |
| Geometry                        | S <sub>1</sub> | Part No. | WHW01    | WHW16 | WHW20 | WHC05  | WHC18 | WHC19 | WHC79 | WHC98 | WHC111 | WHC114 | WHC136 | WHC164 |
|                                 | 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   |          |       | ●     |        |       |       |       |       |        |        |        |        |



Other insert types available upon request.



Two-Sided Cutting Form



Single-Sided Cutting Form (Right / Left)



Two-Sided Angle Cutting



With Corner Radius



Full Radius

Reference Key

| Symbol | Machining Conditions       |
|--------|----------------------------|
| ●      | Average - Main Application |

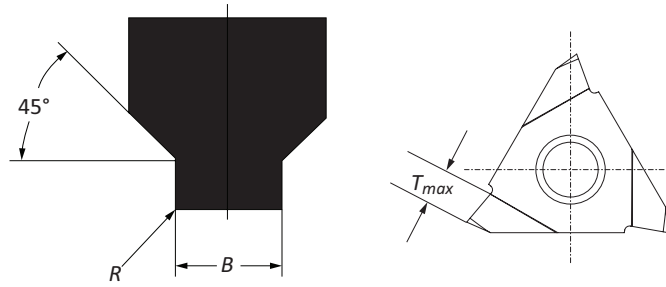
Reference Key


| Symbol | Insert Type                      |
|--------|----------------------------------|
| ▼▼     | Universal - Main Application     |
| ▽▽     | Universal - Extended Application |

|             |                        |               |             |                |          |
|-------------|------------------------|---------------|-------------|----------------|----------|
|             |                        |               |             | Technical Data |          |
| Insert Form | Countersunk Screw      | Torque Driver | Service Key | Torque         | Key Size |
| 304         | 215392 M5 x 0.8 x 12.9 | 415543        | 215150      | 5.0 Nm         | T20      |

# Axial Grooving O-Rings for Single Cutter Tools Insert Form 304

Carbide



|   |              |                      |          |       |       |          |               | Carbide  |       |       |       |        |       |       |       |        |        |        |        |   |   |  |    |    |
|---|--------------|----------------------|----------|-------|-------|----------|---------------|----------|-------|-------|-------|--------|-------|-------|-------|--------|--------|--------|--------|---|---|--|----|----|
|   |              |                      |          |       |       |          |               | Uncoated |       |       |       | Coated |       |       |       |        |        |        |        |   |   |  |    |    |
| 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    | WHW16 | WHW20 | WHC05 | WHC18  | WHC19 | WHC79 | WHC98 | WHC111 | WHC114 | WHC136 | WHC164 |   |   |  |    |    |
|  | 20 - 54      | 1.00                 | 1.50     | 1.50  | 1.65  | 0.20     | <b>297969</b> |          |       |       |       |        |       |       |       |        |        |        |        | ● |   |  |    |    |
|   | 20 - 54      | 1.50                 | 2.20     | 2.20  | 2.35  | 0.30     | <b>297970</b> |          |       |       |       |        |       |       |       |        |        |        |        | ● |   |  |    |    |
|   | 20 - 54      | 2.00                 | 2.90     | 2.90  | 3.15  | 0.40     | <b>297971</b> |          |       |       |       |        |       |       |       |        |        |        |        | ● |   |  |    |    |
|   | 20 - 54      | 2.50                 | 3.50     | 3.50  | 3.85  | 0.50     | <b>297972</b> |          |       |       |       |        |       |       |       |        |        |        |        | ● |   |  |    |    |
|   | 20 - 54      | 3.00                 | 4.10     | 4.10  | 4.45  | 0.60     | <b>297973</b> |          |       |       |       |        |       |       |       |        |        |        |        | ● |   |  |    |    |
|   | 20 - 54      | 4.00                 | 5.40     | 5.40  | 4.95  | 0.80     | <b>297974</b> |          |       |       |       |        |       |       |       |        |        |        |        |   | ● |  |    |    |
|   | 20 - 54      | 5.00                 | 6.80     | 6.80  | 4.95  | 0.80     | <b>297975</b> |          |       |       |       |        |       |       |       |        |        |        |        |   | ● |  |    |    |

Reference Key

| Symbol | Machining Conditions       |
|--------|----------------------------|
| ●      | Average - Main Application |

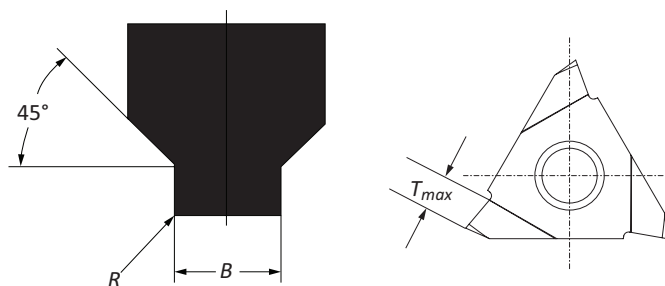
Reference Key

| Symbol | Insert Type                      |
|--------|----------------------------------|
| ▼▼     | Universal - Main Application     |
| ▽▽     | Universal - Extended Application |

| Insert Form | Countersunk Screw |                 | Torque Driver | Service Key   | Technical Data |          |
|-------------|-------------------|-----------------|---------------|---------------|----------------|----------|
| 304         | <b>215392</b>     | M5 x 0.8 x 12.9 | <b>415543</b> | <b>215150</b> | Torque         | Key Size |
|             |                   |                 |               |               | 5.0 Nm         | T20      |

## Axial Grooving O-Rings for Twin Cutter Tools Insert Form 304

Carbide



|                                 |                 | Carbide              |          |                  |                  |          |          |       |        |        |        |        |        |       |       |        |        |        |        |
|---------------------------------|-----------------|----------------------|----------|------------------|------------------|----------|----------|-------|--------|--------|--------|--------|--------|-------|-------|--------|--------|--------|--------|
|                                 |                 | Uncoated             |          |                  |                  |          |          |       | Coated |        |        |        |        |       |       |        |        |        |        |
| Material                        | Grade           | WHW01                | 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 <sub>max</sub> | T <sub>max</sub> | R ± 0.05 | Part No. | WHW01 | WHW16  | WHW20  | WHC05  | WHC18  | WHC19  | WHC79 | WHC98 | WHC111 | WHC114 | WHC136 | WHC164 |
|                                 | 53.00 - 1000.00 | 1.00 - 1.50          | 1.50     | 2.50             | 1.65             | 0.20     | 297976   |       |        |        |        |        |        |       |       |        |        |        |        |
|                                 | 53.00 - 1000.00 | 1.50 - 2.40          | 2.20     | 3.70             | 2.35             | 0.30     | 297977   |       |        |        |        |        |        |       |       |        |        |        | ●      |
|                                 | 53.00 - 1000.00 | 2.40 - 4.00          | 3.40     | 5.70             | 3.65             | 0.50     | 297978   |       |        |        |        |        |        |       |       |        |        |        | ●      |
|                                 | 53.00 - 1000.00 | 4.00 - 5.50          | 5.40     | 9.10             | 4.95             | 0.80     | 297979   |       |        |        |        |        |        |       |       |        |        |        | ●      |

### Reference Key

| Symbol | Machining Conditions       |
|--------|----------------------------|
| ●      | Average - Main Application |

### Reference Key

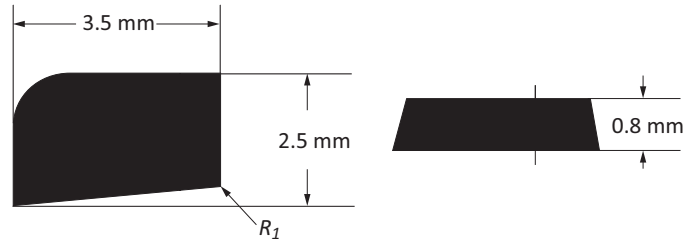
| Symbol | Insert Type                      |
|--------|----------------------------------|
| ▼▼     | Universal - Main Application     |
| ▽▽     | Universal - Extended Application |




| Insert Form | Countersunk Screw      | Torque Driver | Service Key | Technical Data |          |
|-------------|------------------------|---------------|-------------|----------------|----------|
| 304         | 215392 M5 x 0.8 x 12.9 | 415543        | 215150      | Torque         | Key Size |
|             |                        |               |             | 5.0 Nm         | T20      |



## Insert Form 325

Carbide



|   |                                |                    |                 | Carbide  |       |   |        |       |       |       |       |        |        |   |        |
|---|--------------------------------|--------------------|-----------------|----------|-------|---|--------|-------|-------|-------|-------|--------|--------|---|--------|
|   |                                |                    |                 | Uncoated |       |   | Coated |       |       |       |       |        |        |   |        |
| Material  | Grade                          | Radius $R_1$       | Part No.        | WHW01    | 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                              |                    |                 |          |       |   |        |       |       |       |       |        |        |   |        |
| <b>Geometry</b>   | <b>Radius <math>R_1</math></b> | <b>Description</b> | <b>Part No.</b> |          |       |   |        |       |       |       |       |        |        |   |        |
|  | 860                            | 0.10               | F32501CN860     |          |       |  |        |       |       |       |       |        |        |  |        |

### Reference Key

| Symbol  | Machining Conditions       |
|---|----------------------------|
|  | Average - Main Application |

### Reference Key

| Symbol | Insert Type                      |
|--------|----------------------------------|
| ▼▼▼    | Finishing - Main Application     |
| ▽▽▽    | Finishing - Extended Application |

| Insert Form | Countersunk Screw      | Clamping Jaw | Torque Driver | Service Key | Technical Data |          |
|-------------|------------------------|--------------|---------------|-------------|----------------|----------|
|             |                        |              |               |             | Torque         | Key Size |
| 325         | 315321 M1.6 x 0.35 x 3 | 315320       | -             | 315322      | 0.3 Nm         | 0.5x3    |

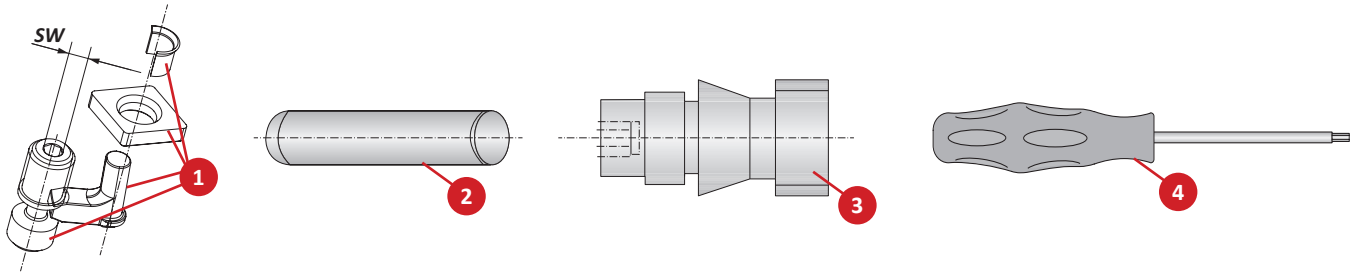
## Insert Accessories

### Countersunk Screws | Torque Drivers

| Insert Form | Countersunk Screw   |                    | Clamping Jaw  | Torque Driver |               | Technical Data |          |
|-------------|---|--------------------|---------------|---------------|---------------|----------------|----------|
|             |   |                    |               |               |               | Torque         | Key Size |
| 04          | <b>415977</b>   | M4 x 0.7 x 7.9     | –             | <b>415510</b> | <b>115664</b> | 3.0 Nm         | T15      |
| 05          | <b>415949</b>   | M4 x 0.7 x 11      | –             | <b>415543</b> | <b>215150</b> | 5.0 Nm         | T20      |
| 20          | <b>115535</b>   | M2 x 0.4 x 5       | –             | <b>415508</b> | <b>115591</b> | 0.9 Nm         | T7       |
| 39          | <b>115673</b>   | M3.5 x 0.6 x 9     | –             | <b>414510</b> | <b>115664</b> | 3.0 Nm         | T15      |
| 47          | <b>315324</b>   | M1.8 x 0.35 x 4    | <b>315323</b> | –             | <b>115537</b> | 0.5 Nm         | T6       |
| 89          | <b>115676</b>   | M2.5 x 0.45 x 5    | –             | <b>415514</b> | <b>115590</b> | 1.2 Nm         | T8       |
| 90          | <b>115531</b>   | M3 x 0.5 x 7.5     | –             | <b>415514</b> | <b>115590</b> | 1.2 Nm         | T8       |
| 91          | <b>115802</b>   | M3 x 0.5 x 12      | –             | <b>415514</b> | <b>115590</b> | 1.2 Nm         | T8       |
| 101         | <b>115676</b>   | M2.5 x 0.45 x 5    | –             | <b>415514</b> | <b>115590</b> | 1.2 Nm         | T8       |
| 103         | <b>115672 (&lt;math&gt;\lt; \varnothing 37 \text{ mm}&lt;/math&gt;)</b> | M3.5 x 0.6 x 7.5   | –             | <b>415510</b> | <b>115664</b> | 3.0 Nm         | T15      |
| 103         | <b>115673 (&gt;math&gt;\gt; \varnothing 36 \text{ mm}&lt;/math&gt;)</b> | M3.5 x 0.6 x 9     | –             | <b>415510</b> | <b>115664</b> | 3.0 Nm         | T15      |
| 104         | <b>215149</b>   | M4.5 x 0.75 x 11.5 | –             | <b>415543</b> | <b>215150</b> | 5.0 Nm         | T20      |
| 105         | <b>215149</b>   | M4.5 x 0.75 x 11.5 | –             | <b>415543</b> | <b>215150</b> | 5.0 Nm         | T20      |
| 111         | <b>115531</b>   | M3 x 0.5 x 7.5     | –             | <b>415514</b> | <b>115590</b> | 1.2 Nm         | T8       |
| 112         | <b>115672 (&lt;math&gt;\lt; \varnothing 37 \text{ mm}&lt;/math&gt;)</b> | M3.5 x 0.6 x 7.5   | –             | <b>415510</b> | <b>115664</b> | 3.0 Nm         | T15      |
| 112         | <b>115673 (&gt;math&gt;\gt; \varnothing 36 \text{ mm}&lt;/math&gt;)</b> | M3.5 x 0.6 x 9     | –             | <b>415510</b> | <b>115664</b> | 3.0 Nm         | T15      |
| 113         | <b>215149</b>   | M4.5 x 0.75 x 11.5 | –             | <b>415543</b> | <b>215150</b> | 5.0 Nm         | T20      |
| 114         | <b>215149</b>   | M4.5 x 0.75 x 11.5 | –             | <b>415543</b> | <b>215150</b> | 5.0 Nm         | T20      |
| 161         | <b>115676</b>   | M2.5 x 0.45 x 5    | –             | <b>415514</b> | <b>115590</b> | 1.2 Nm         | T8       |
| 163         | <b>115673</b>   | M3.5 x 0.6 x 9     | –             | <b>415510</b> | <b>115664</b> | 3.0 Nm         | T15      |
| 211         | <b>215377</b>   | M2 x 0.4 x 4       | –             | <b>415507</b> | <b>115537</b> | 0.6 Nm         | T6       |
| 262         | <b>215987</b>   | M2.5 x 0.45 x 6    | –             | <b>415514</b> | <b>115590</b> | 1.2 Nm         | T8       |
| 264         | <b>115673</b>   | M3.5 x 0.6 x 9     | –             | <b>415510</b> | <b>115664</b> | 3.0 Nm         | T15      |
| 304         | <b>215392</b>   | M5 x 0.8 x 12.9    | –             | <b>415543</b> | <b>215150</b> | 5.0 Nm         | T20      |
| 325         | <b>315321</b>   | M1.6 x 0.35 x 3    | <b>315320</b> | –             | <b>315322</b> | 0.3 Nm         | 0.5x3    |
| 394         | <b>215915</b>   | M2.5 x 0.45 x 7    | –             | <b>415514</b> | <b>115590</b> | 1.1 Nm         | T8       |
| 395         | <b>215985</b>   | M3 x 0.5 x 7.5     | –             | <b>415514</b> | <b>115590</b> | 1.2 Nm         | T8       |
| 396         | <b>415320</b>   | M3.5 x 0.6 x 11    | –             | <b>415510</b> | <b>115664</b> | 3.0 Nm         | T15      |
| 397         | <b>215149</b>   | M4.5 x 0.75 x 11.5 | –             | <b>415543</b> | <b>215150</b> | 5.0 Nm         | T20      |

## Insert Accessories

Countersunk Screws | Torque Drivers



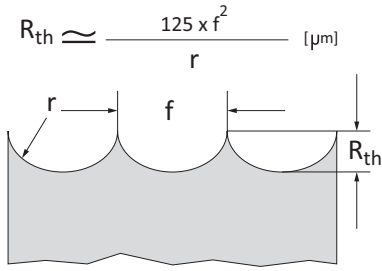

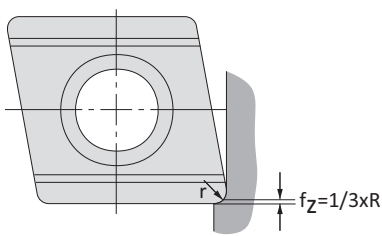
| Insert Form | 1. Clamping Set |          | 2. Mounting Arbor for Sleeve | 3. Clamping Bolt |          | 4. Service Key   |            |
|-------------|-----------------|----------|------------------------------|------------------|----------|------------------|------------|
|             | Part No.        | Key Size | Part No.                     | Part No.         | Key Size | Part No.         | Key Size   |
| 75          | 315004          | s3       | 415642                       | -                | -        | 415578           | s3         |
| 123         | 315003          | s3       | 415642                       | 115775           | s2.5     | 415578<br>115575 | s3<br>s2.5 |
| 124         | 315054          | s3       | 415644                       | 115776           | s3       | 415578<br>115630 | s3<br>s3   |

## Technical Information

### Surface Finish | General Formulas

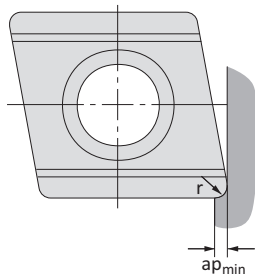
The corner radius of replaceable inserts is very important in finish machining. Large corner radii 0.8 mm (0.031") or higher allow for high feed rates with good surface quality.

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> |



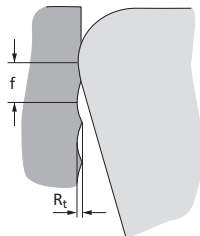
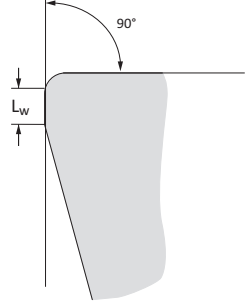
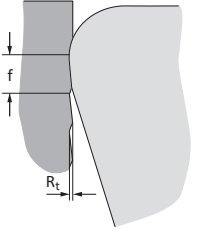
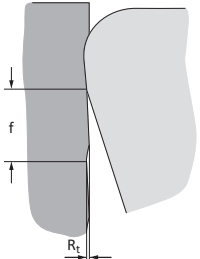
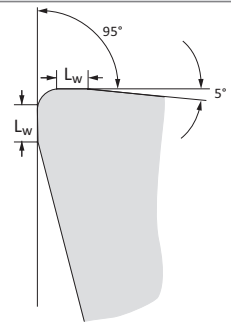
Minimum depth of cut ( $a_p$ ) should at least match the corner radius. This minimizes the radial forces.



| 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   |  | Wiper Geometry for 90° Approach Angle   |  |
|---|--|---|--|
| <p>Insert with conventional corner radius with feed (f)</p>  |  | <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<br/>L<sub>w</sub> = length of the wiper secondary cutting edge</p>  |  |
| <p>Insert with wiper geometry radius with same feed (f)</p>  |  | <h3>Wiper Geometry for 95° Approach Angle</h3>  |  |
| <p>Insert with wiper geometry with increased feed (f)</p>   |  | <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)<br/>L<sub>w</sub> = length of the secondary wiper cutting edge</p>    |  |

## Recommended Cutting Data | Metric (mm)

| ISO | Material  | (BHN)<br>Hardness | Grade   | *Speed<br>M / Min | Recommended Feed (mm / tooth)<br>Nose Radii |             |             |             |
|-----|---|-------------------|---------|-------------------|---|-------------|-------------|-------------|
|     |   |                   |         |                   | 0.1 mm                                      | 0.2 mm      | 0.4 mm      | 0.8 mm      |
| P   | Free-Machining Steel<br>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<br>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<br>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<br>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<br>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<br>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<br>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 |
|     | High-Temp Alloy<br>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 |
| S   | 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<br>S82  | 185 - 350         | Carbide | 40 - 90           | 0.02 - 0.05                                 | 0.05 - 0.08 | 0.08 - 0.13 | 0.10 - 0.15 |
|     | Stainless Steel 400 Series<br>416, 420, etc.                    | 185 - 350         | Carbide | 90 - 160          | 0.02 - 0.05                                 | 0.05 - 0.10 | 0.08 - 0.10 | 0.10 - 0.15 |
| M   | Stainless Steel 300 Series<br>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. *email: [engineering.eu@alliedmachine.com](mailto:engineering.eu@alliedmachine.com)*

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

- Do not exceed recommended 10xD length-to-diameter ratio or exceed 4 total components (including shank)
- When using Alu-Line components, do not exceed recommended 5xD length-to-diameter ratio
- When using tool steel components, do not exceed recommended 6xD length-to-diameter ratio
- When using heavy metal components, do not exceed recommended 8xD length-to-diameter ratio
- When using a carbide shank, do not exceed recommended 9xD length-to-diameter ratio
- When using a NOVI<sup>TECH</sup> module, do not exceed recommended 10xD length-to-diameter ratio

Factory technical assistance is available for your specific applications through our Application Engineering department. *email: [engineering.eu@alliedmachine.com](mailto:engineering.eu@alliedmachine.com)*



## Recommended Cutting Data | Metric (mm)

| ISO    | Material                                | (BHN)<br>Hardness | Grade     | *Speed<br>M / Min | Recommended Feed (mm / tooth)<br>Nose Radii |             |             |             |
|--------|---|-------------------|-----------|-------------------|---|-------------|-------------|-------------|
|        |   |                   |           |                   | 0.1 mm                                      | 0.2 mm      | 0.4 mm      | 0.8 mm      |
| H      | Wear Plate<br>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 Aluminium                          | 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 Aluminium                       | 30 - 180          | Carbide   | 205 - 600         | 0.02 - 0.05                                 | 0.05 - 0.13 | 0.10 - 0.15 | 0.15 - 0.23 |
|        |   |                   |           |                   |   |             |             |             |
|        | Aluminium Bronze                        | 100 - 250         | Carbide   | 145 - 280         | 0.02 - 0.05                                 | 0.05 - 0.10 | 0.10 - 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. *email: [engineering.eu@alliedmachine.com](mailto:engineering.eu@alliedmachine.com)*

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

- Do not exceed recommended 10xD length-to-diameter ratio or exceed 4 total components (including shank)
- When using Alu-Line components, do not exceed recommended 5xD length-to-diameter ratio
- When using tool steel components, do not exceed recommended 6xD length-to-diameter ratio
- When using heavy metal components, do not exceed recommended 8xD length-to-diameter ratio
- When using a carbide shank, do not exceed recommended 9xD length-to-diameter ratio
- When using a NOVI<sup>TECH</sup> module, do not exceed recommended 10xD length-to-diameter ratio

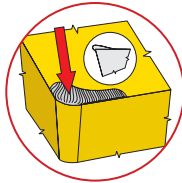
Factory technical assistance is available for your specific applications through our Application Engineering department. *email: [engineering.eu@alliedmachine.com](mailto:engineering.eu@alliedmachine.com)*

## Boring Insert Wear Patterns

### Built-up Edge

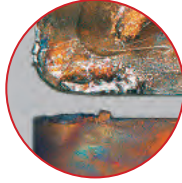
#### Potential Problem

- Machined material adheres to the cutting edge of insert
- When it breaks, the edge becomes brittle and cracks
- This can negatively affect machined surface



#### Possible Solution

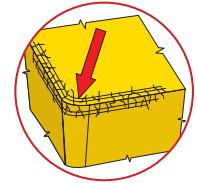
- Increase temperature by increasing speed or feed
- Use an insert with higher lubricity coating
- Choose a freer cutting insert geometry



### Comb Cracks

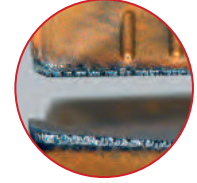
#### Potential Problem

- Caused by high stress on the cutting edge during interrupted cuts



#### Possible Solution

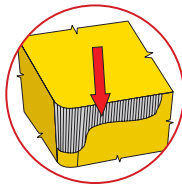
- Switch off coolant or increase coolant flow to obtain an even temperature level
- Reduce cutting speed
- Use tougher insert grade



### Flank Wear

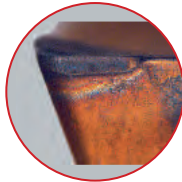
#### Potential Problem

- Caused by friction between the insert and machined material
- It cannot be fully eliminated, but it can be reduced



#### Possible Solution

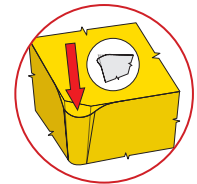
- Use a more wear-resistant grade
- Reduce cutting speed
- Use coolant or increase coolant flow to the cutting edge



### Plastic Deformation

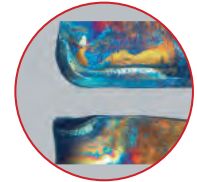
#### Potential Problem

- Caused by high thermal stress on the cutting edge from excessive feed rate and cutting speed



#### Possible Solution

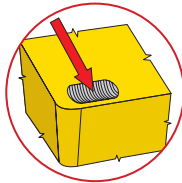
- Use a more wear-resistant grade
- Reduce cutting speed
- Reduce feed rate
- Use coolant or increase coolant flow to the cutting edge



### Cratering

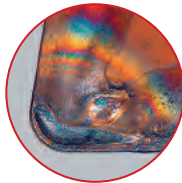
#### Potential Problem

- Appears when the geometry is too neutral or material is too hard for the substrate



#### Possible Solution

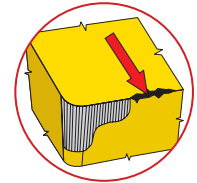
- Use a more wear-resistant grade
- Reduce cutting speed or feed
- Use coolant or increase coolant flow to the cutting edge



### Chipping of Cutting Edge (Out of Cut)

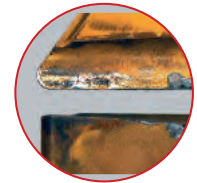
#### Potential Problem

- Caused by poor chip control
- Can damage the portion of the cutting edge that might not be engaged in the cut



#### Possible Solution

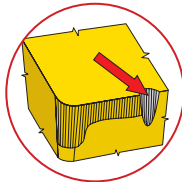
- Change feed rate to gain chip control
- Select a tool with a different approach angle
- Use an insert with a different geometry
- Use a tougher grade of carbide



### Notch Wear

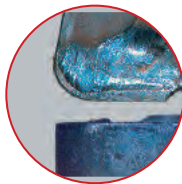
#### Potential Problem

- Occurs when cutting edge of insert comes in contact with surface of machined material
- Caused by hardening of surface layer of material and burrs
- Often appears on stainless austenitic steels and other high-temperature alloy steels



#### Possible Solution

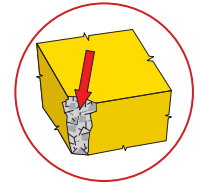
- Use a more wear-resistant grade ( $Al_2O_3$ )
- Select a tool with a smaller approach angle
- Vary the radial depth of cut
- Use coolant or increase coolant flow to the cutting edge



### Insert Fracture

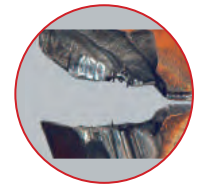
#### Potential Problem

- Caused by workpiece material, grade, condition, the rigidity of the machine-tool workpiece, extent of wear, and cutting conditions



#### Possible Solution

- Use a tougher grade of carbide
- Reduce the feed and depth of cut
- Use an insert with a stronger chip breaker
- Use an insert with a bigger corner radius







SECTION

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# B10-I

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Modular Tool Holders

# Wohlhaupter® Modular Tool Holders

Adapter Sleeves | Drill Chucks | Collet Chucks | Milling Arbors | Holding Arbors | Hydraulic Clamping Chucks  
Tapping Chucks | Boring Bar Blanks



## Clamping Tools with MVS Connection

Wohlhaupter offers a complete range of tool holders that incorporates the MVS connection. Our clamping tools allow for smaller MVS tools to connect and provide a quick and inexpensive alternative to special tooling. Many of the clamping tools also feature coolant-through capabilities.

Your safety and the safety of others is very important. This catalogue 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 catalogue, 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 catalogue. 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

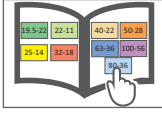


Renewable  
Energy



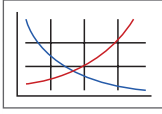
### Reference Icons

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



#### MVS Connection Colour Guide

Detailed instructions and information regarding the MVS connection(s)



#### Recommended Cutting Data

Speed and feed recommendations for optimum and safe boring



#### Through Coolant Option

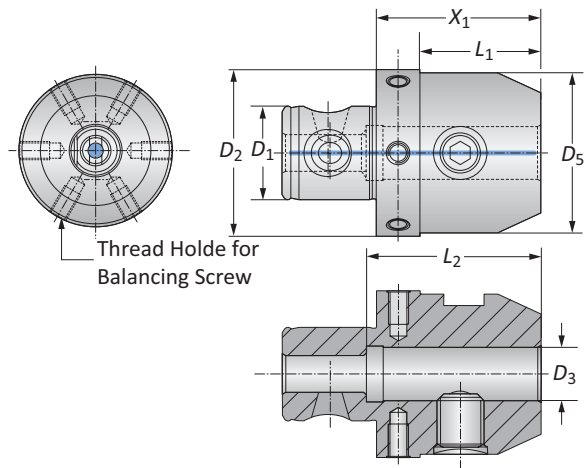
Indicates that the product is through coolant

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## Adapter Side Lock for Cylindrical Shanks DIN 1835B

Clamping Diameter Range: 6.00 mm - 40.00 mm



| MVS Connection | Clamping Range | Adapter Sleeve |       |       |       | Weight    | Balancing Screw | Part No. |
|----------------|----------------|----------------|-------|-------|-------|-----------|-----------------|----------|
|                |                | $D_2   D_1$    | $D_3$ | $X_1$ | $L_1$ |           |                 |          |
| 32 - 18        | 6.00           | 36.00          | 23.00 | 40.00 | 25.00 | 0.20 (kg) | M5 x .8 x 6     | 228022   |
| 32 - 18        | 8.00           | 36.00          | 23.00 | 40.00 | 28.00 | 0.20 (kg) | M5 x .8 x 6     | 228023   |
| 32 - 18        | 10.00          | 48.00          | –     | 44.00 | 35.00 | 0.30 (kg) | M5 x .8 x 6     | 228024   |
| 40 - 22        | 12.00          | 52.00          | –     | 49.00 | 42.00 | 0.50 (kg) | M5 x .8 x 8     | 228025   |
| 40 - 22        | 14.00          | 54.00          | –     | 49.00 | 44.00 | 0.60 (kg) | M5 x .8 x 8     | 228026   |
| 50 - 28        | 6.00           | 36.00          | 23.00 | 40.00 | 25.00 | 0.40 (kg) | M6 x 1 x 10     | 162015   |
| 50 - 28        | 8.00           | 36.00          | 23.00 | 40.00 | 28.00 | 0.40 (kg) | M6 x 1 x 10     | 162016   |
| 50 - 28        | 10.00          | 44.00          | 31.00 | 44.00 | 35.00 | 0.50 (kg) | M6 x 1 x 10     | 162017   |
| 50 - 28        | 12.00          | 44.00          | 31.00 | 49.00 | 42.00 | 0.50 (kg) | M6 x 1 x 10     | 162018   |
| 50 - 28        | 16.00          | 49.00          | 36.00 | 52.00 | 48.00 | 1.00 (kg) | M6 x 1 x 10     | 162019   |
| 50 - 28        | 18.00          | 49.00          | 36.00 | 52.00 | 48.00 | 1.00 (kg) | M6 x 1 x 10     | 228014   |
| 50 - 28        | 20.00          | 60.00          | –     | 54.00 | 52.00 | 1.20 (kg) | M6 x 1 x 10     | 162020   |
| 63 - 36        | 20.00          | 49.00          | 36.00 | 54.00 | 52.00 | 1.10 (kg) | M6 x 1 x 10     | 161024   |
| 63 - 36        | 25.00          | 75.00          | –     | 59.00 | 63.00 | 1.90 (kg) | M6 x 1 x 15     | 161026   |
| 63 - 36        | 32.00          | 75.00          | –     | 63.00 | 72.00 | 2.20 (kg) | M6 x 1 x 15     | 161027   |
| 80 - 36        | 40.00          | 85.00          | –     | 73.00 | 80.00 | 2.50 (kg) | M6 x 1 x 15     | 161028   |

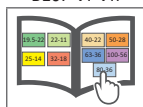
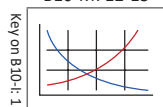
**NOTE:** Balanced 10 gmm/kg

**NOTE:** When using a ball pressure screw instead of a thread pin, it's similar to DIN 1835E, without axial adjustment.

See ball pressure screws on page B10-I: 9.

B10-M: 12-13

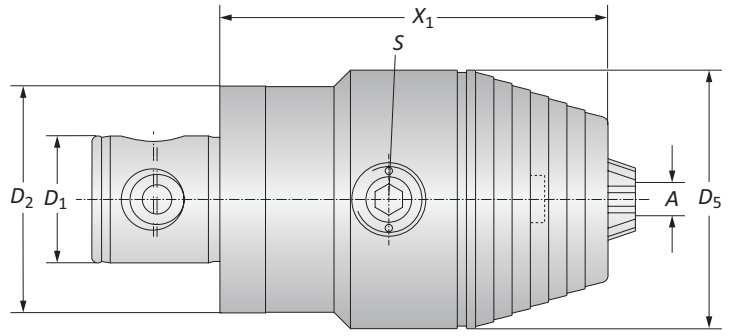
B10: VI-VII



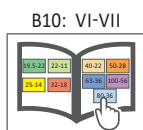
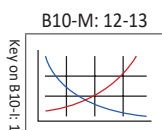
Ⓜ = Metric (mm)

## Drill Chucks for Clockwise & Counterclockwise Rotation

Clamping Diameter Range: 0.50 mm - 16.00 mm



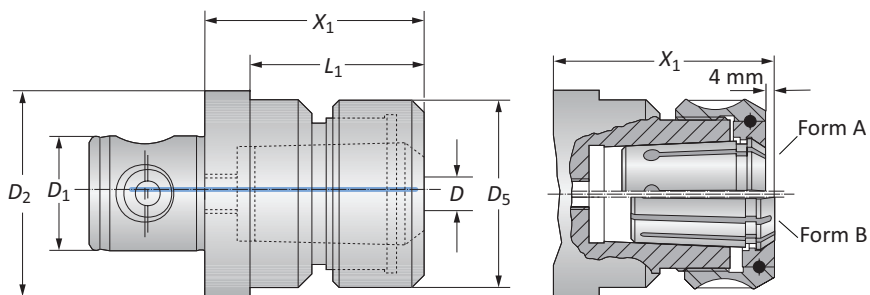
| MVS Connection | Clamping Range | Drill Chuck   |       |       | Weight | Part No.  |        |
|----------------|----------------|---------------|-------|-------|--------|-----------|--------|
|                |                | $D_2$   $D_1$ | $A$   | $X_1$ |        |           | $D_5$  |
| Ⓜ              | 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 |



Ⓜ = Metric (mm)

## Collet Chucks ISO 10898 (DIN 6388) | ISO 15488 (DIN 6499)

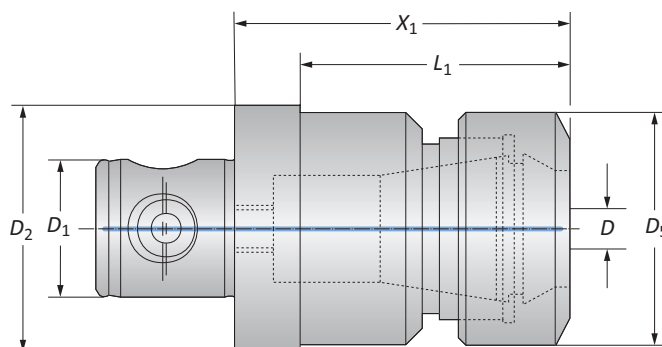
Clamping Diameter Range: 2.00 mm - 32.00 mm



### Collet Chucks ISO 10897 (DIN 6388) | Diameter Range: 2.00 mm - 32.00 mm

| MVS Connection | Clamping Range | Nominal Size | Collet Chuck  |       |         | Weight    | Part No. |
|----------------|----------------|--------------|---------------|-------|---------|-----------|----------|
|                |                |              | $D_2$   $D_1$ | $D$   | $X_1^*$ |           |          |
| 40 - 22        | 2.00 - 16.00   | 16           | 64.00         | -     | 43.00   | 0.50 (kg) | 209082   |
| 50 - 28        | 2.00 - 16.00   | 16           | 63.00         | 50.00 | 43.00   | 0.90 (kg) | 162011   |
| 50 - 28        | 2.00 - 25.00   | 25           | 74.00         | -     | 60.00   | 1.00 (kg) | 209083   |
| 63 - 36        | 2.00 - 25.00   | 25           | 74.00         | -     | 60.00   | 1.40 (kg) | 161016   |
| 63 - 36        | 4.00 - 32.00   | 32           | 89.00         | -     | 72.00   | 1.80 (kg) | 161098   |

\* $X_1$  Clamping nut with ball-bearing



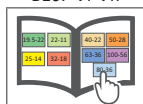
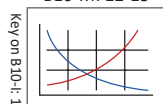
### Collet Chucks ISO 15488 (DIN 6499) | Diameter Range: 1.00 mm - 26.00 mm

| MVS Connection | Clamping Range | Nominal Size | Collet Chuck  |       |         | Weight    | Part No. |
|----------------|----------------|--------------|---------------|-------|---------|-----------|----------|
|                |                |              | $D_2$   $D_1$ | $D$   | $X_1^*$ |           |          |
| 32 - 18        | 1.00 - 10.00   | ER 16        | 54.00         | 4100  | 28.00   | 0.20 (kg) | 228020   |
| 40 - 22        | 2.00 - 16.00   | ER 25        | 75.00         | -     | 42.00   | 0.60 (kg) | 228021   |
| 50 - 28        | 2.00 - 16.00   | ER 25        | 75.00         | 62.00 | 42.00   | 0.80 (kg) | 228003   |
| 50 - 28        | 2.00 - 20.00   | ER 32        | 76.00         | -     | 50.00   | 0.80 (kg) | 228004   |
| 63 - 36        | 2.00 - 20.00   | ER 32        | 76.00         | 63.00 | 50.00   | 1.20 (kg) | 228007   |
| 63 - 36        | 4.00 - 26.00   | ER 40        | 88.00         | -     | 63.00   | 1.20 (kg) | 228006   |

\* $X_1$  Clamping nut with sliding ring

B10-M: 12-13

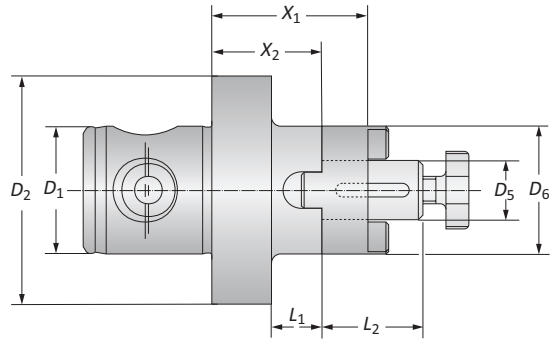
B10: VI-VII



Ⓜ = Metric (mm)

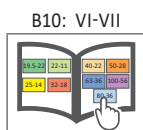
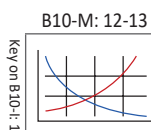
## Milling Machine Arbors

For Milling Cutters with Longitudinal or Transverse Drive | Shell Mill Adapter Range: 13.00 mm - 40.00 mm



| MVS Connection | Adapter Range | Milling Arbor |       |       |       |       |        | Weight    | Part No. |
|----------------|---------------|---------------|-------|-------|-------|-------|--------|-----------|----------|
|                |               | $D_2$   $D_1$ | $D_5$ | $X_1$ | $X_2$ | $L_1$ | $L_2$  |           |          |
| m              | 50 - 28       | 13.00         | 34.00 | 24.00 | 11.00 | 22.00 | 28.00  | 0.40 (kg) | 162002   |
|                | 50 - 28       | 16.00         | 40.00 | 30.00 | 17.00 | 27.00 | 32.00  | 0.50 (kg) | 162003   |
|                | 50 - 28       | 22.00         | 40.00 | 28.00 | 15.00 | 31.00 | 40.00  | 0.60 (kg) | 162004   |
|                | 63 - 36       | 16.00         | 40.00 | 30.00 | 17.00 | 27.00 | 32.00  | 0.80 (kg) | 161002   |
|                | 63 - 36       | 22.00         | 40.00 | 28.00 | 15.00 | 31.00 | 40.00  | 0.90 (kg) | 161003   |
|                | 63 - 36       | 27.00         | 40.00 | 28.00 | 15.00 | 33.00 | 48.00  | 1.10 (kg) | 161004   |
|                | 63 - 36       | 32.00         | 40.00 | 26.00 | 13.00 | 38.00 | 58.00  | 1.30 (kg) | 161005   |
|                | 80 - 36       | 40.00         | 53.00 | 39.00 | -     | 41.00 | 70.00* | 2.60 (kg) | 161006   |

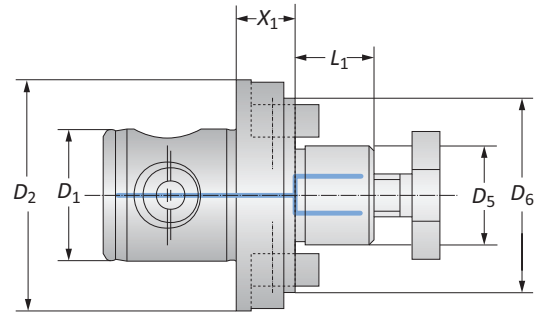
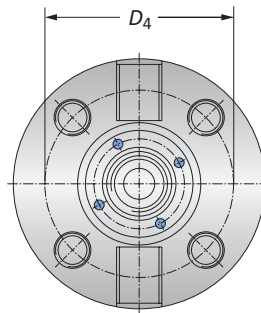
\* $\varnothing$  70.00 mm with clutch drive ring



m = Metric (mm)

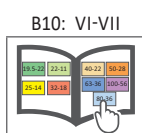
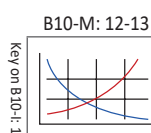
## Holding Arbors for Milling Cutters

Central Coolant Feed | Shell Mill Adapter Range: 16.00 mm - 40.00 mm



| MVS Connection   | Adapter Range | Holding Arbor |       |       |       | Weight    | Part No.      |
|------------------|---------------|---------------|-------|-------|-------|-----------|---------------|
|                  |               | $D_2$   $D_1$ | $D_5$ | $X_1$ | $L_1$ |           |               |
| 50 - 28          | 16.00         | 16.00         | 17.00 | –     | 40.00 | 0.40 (kg) | <b>162032</b> |
| 50 - 28          | 22.00         | 16.00         | 19.00 | –     | 50.00 | 0.50 (kg) | <b>162033</b> |
| <b>m</b> 63 - 36 | 27.00         | 16.00         | 21.00 | –     | 60.00 | 0.80 (kg) | <b>161082</b> |
| 80 - 36          | 32.00         | 16.00         | 24.00 | –     | 78.00 | 1.10 (kg) | <b>209080</b> |
| 80 - 36          | 40.00         | 19.00         | 27.00 | 66.70 | 89.00 | 1.50 (kg) | <b>209081</b> |

**NOTE:** See page B10-G: 15 for holding arbor with MVS 100 - 56 connection

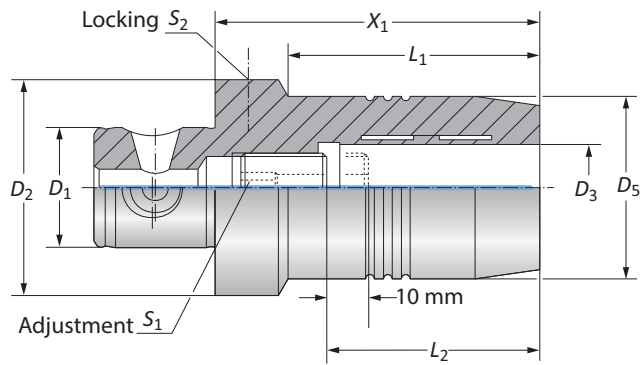


**m** = Metric (mm)





## Clamping Chucks | Tapping Chucks

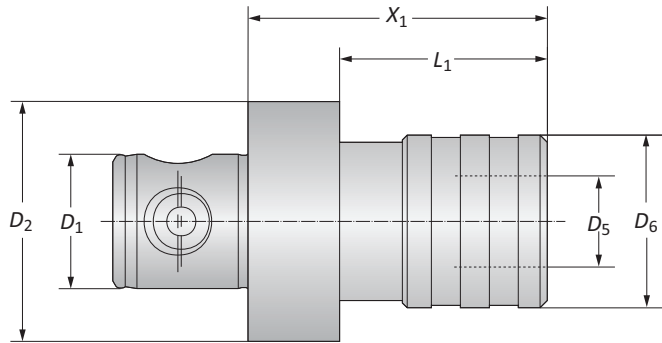
Clamping Range: 20.00 mm








### Though Coolant Hydraulic Clamping Chucks

| MVS Connection  | Clamping Range | Clamping Chucks |       |       |       |       |       |       | Weight | Part No.  |        |
|---|----------------|-----------------|-------|-------|-------|-------|-------|-------|--------|-----------|--------|
|   |                | $D_2$   $D_1$   | $D_3$ | $X_1$ | $D_5$ | $L_1$ | $L_2$ | $S_1$ |        |           | $S_2$  |
|  50 - 28 | 20.00          | 50 - 28         | 20.00 | 75.00 | 42.00 | 58.00 | 51.00 | s6    | s5     | 0.80 (kg) | 209044 |
|  63 - 36 | 20.00          | 63 - 36         | 20.00 | 75.00 | 42.00 | 53.00 | 51.00 | s5    | s5     | 1.10 (kg) | 209045 |

Note: Balanced corresponds to a specific residual imbalance of  $\leq 10$  gmm/kg.

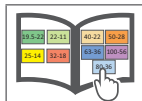
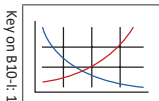


### Tapping Chucks (Non-Coolant)

| MVS Connection  | Quick Change Adapters |              | Tapping Chucks |       |       |       | Length Compensation |         | Weight    | Part No. |
|---|-----------------------|--------------|----------------|-------|-------|-------|---------------------|---------|-----------|----------|
|   | For Taps              | Nominal Size | $X_1$          | $L_1$ | $D_5$ | $D_6$ | Pressure            | Tension |           |          |
|  50 - 28 | M 3 - M 12            | 1            | 62.00          | 49.00 | 19.00 | 41.50 | 7.50                | 7.50    | 0.70 (kg) | 209098   |
|  50 - 28 | M 6 - M 20            | 2            | 94.00          | -     | 31.00 | 60.30 | 10.00               | 10.00   | 1.10 (kg) | 209099   |
|  63 - 36 | M 3 - M 12            | 1            | 56.00          | 43.00 | 19.00 | 41.50 | 7.50                | 7.50    | 0.80 (kg) | 231005   |
|  63 - 36 | M 6 - M 20            | 2            | 80.00          | 67.00 | 31.00 | 60.30 | 10.00               | 10.00   | 1.30 (kg) | 231006   |
|  63 - 36 | M 14 - M 33           | 3            | 152.00         | -     | 48.00 | 86.00 | 17.50               | 17.50   | 4.10 (kg) | 231007   |

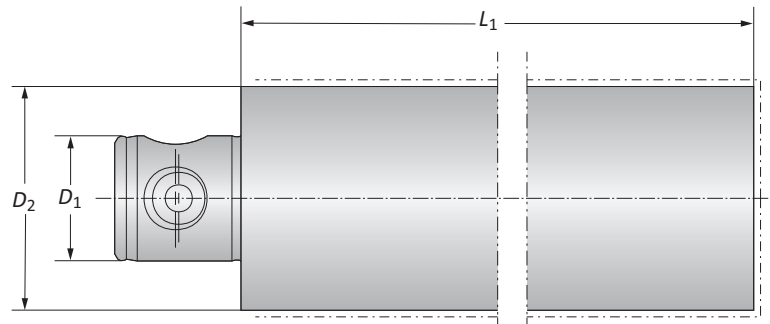
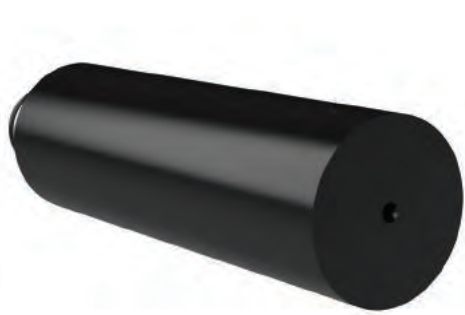
B10-M: 12-13

B10: VI-VII



 = Metric (mm)

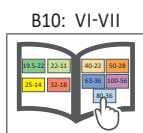
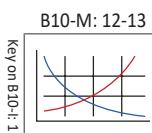
## Boring Bar Blanks



**NOTE:** The blanks are unhardened and unground in areas marked

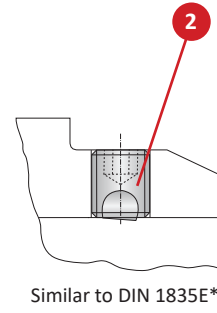
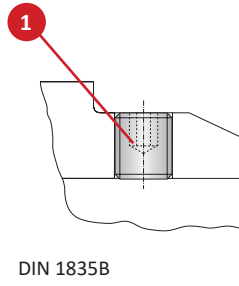
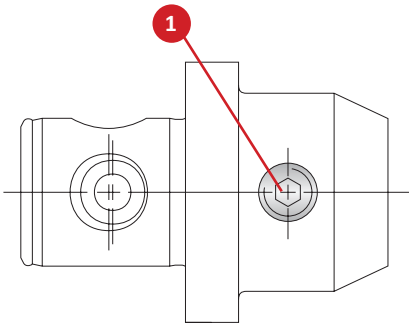
| MVS Connection | Boring Bar Blanks |           |               |
|----------------|-------------------|-----------|---------------|
| $D_2   D_1$    | $L_1$             | Weight    | Part No.      |
| 50 - 28        | 160.00            | 2.60 (kg) | <b>166103</b> |
| 63 - 36        | 160.00            | 4.20 (kg) | <b>166104</b> |
| 80 - 36        | 160.00            | 6.60 (kg) | <b>166105</b> |

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



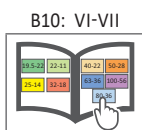
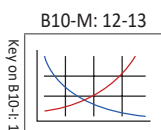
**m** = Metric (mm)

## Accessories for Adapter Sleeves



| Clamping Diameter | 1 Thread Pin |             | 2 Ball Pressure Screw |             |              |
|-------------------|--------------|-------------|-----------------------|-------------|--------------|
|                   | Part No.     | Service Key | Part No.              | Service Key | Thread       |
| 6.00              | 115680       | s3 / B      | 315788                | s3 / B      | M6 x 1       |
| 8.00              | 115681       | s4 / B      | 315789                | s4 / B      | M8 x 1.25    |
| 10.00             | 115682       | s5 / B      | 515535                | s5 / B      | M10 x 1.5    |
| 12.00             | 115683       | s6 / B      | 315790                | s6 / B      | M12 x 1.75   |
| 14.00             | 115683       | s6 / B      | 315790                | s6 / B      | M12 x 1.75   |
| 16.00             | 115684       | s6 / B      | 515675                | s6 / B      | M14 x 2      |
| 18.00             | 115684       | s6 / B      | 515675                | s6 / B      | M14 x 2      |
| 20.00             | 115685       | s8 / B      | 515676                | s8 / B      | M16 x 2      |
| 25.00             | 115686       | s10 / B     | 515677                | s10 / B     | M18 x 2 (2x) |
| 32.00             | 115687       | s10 / B     | 515678                | s10 / B     | M20 x 2 (2x) |
| 40.00             | 115687       | s10 / B     | 515678                | s10 / B     | M20 x 2 (2x) |

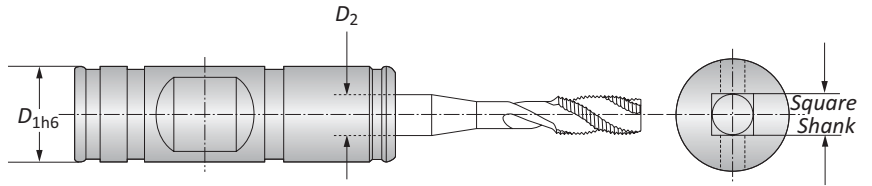
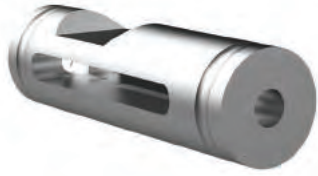
\*Without axial adjustment.



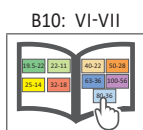
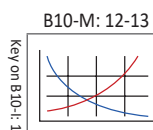
 = Metric (mm)

## Accessories for Adapter Sleeves

Adapter Sleeve for Tap Shanks Suitable for Reduction Sleeves with Shanks to DIN 1835-B

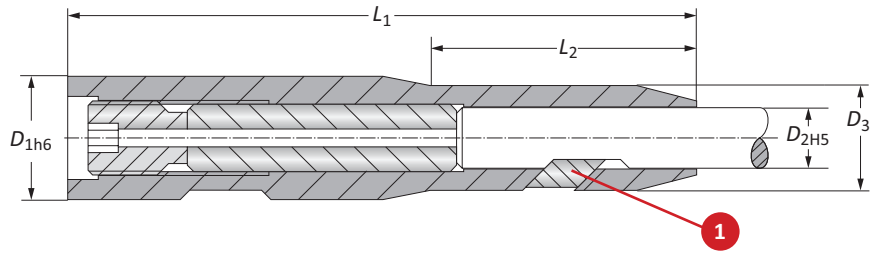


| Adapter Sleeves    |                      |          |
|--------------------|----------------------|----------|
| $D_{1h6}$          | $D_2$ x Square Shank | Part No. |
| 8.00               | 2.10 x 2.50          | 271190   |
| 8.00               | 2.10 x 2.80          | 271191   |
| 10.00              | 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   |
| <sup>m</sup> 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              | 20.00 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   |



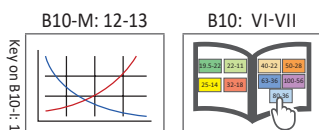
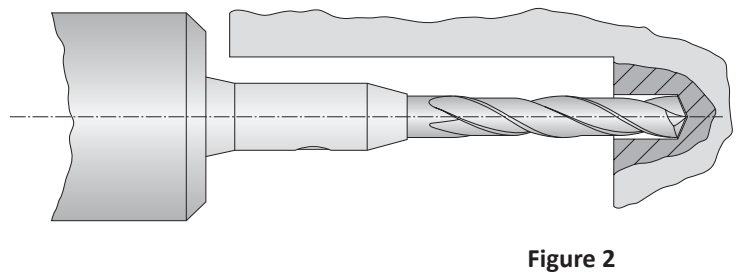
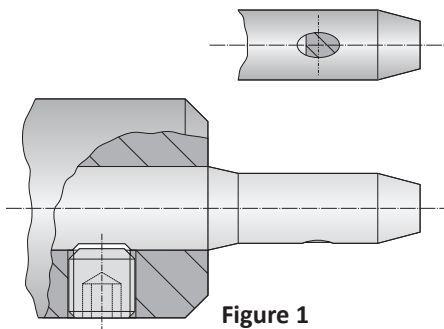
## Accessories for Adapter Sleeves

Adapter Sleeve for Tap Shanks Suitable for Reduction Sleeves with Shanks to DIN 1835-B



| Micro Clamping Chucks |           |       |        |       | 1 Clamping Wedge |          |
|-----------------------|-----------|-------|--------|-------|------------------|----------|
| $D_{1h6}$             | $D_{2H5}$ | $D_3$ | $L_1$  | $L_2$ | Part No.         | Part No. |
| 16.00                 | 6.00      | 12.00 | 100.00 | 40.00 | 219170           | 219070   |
| 16.00                 | 8.00      | 14.00 | 100.00 | 45.00 | 219171           | 219071   |
| 20.00                 | 10.00     | 17.00 | 100.00 | 43.00 | 219172           | 219072   |
| 25.00                 | 12.00     | 20.00 | 110.00 | 39.00 | 219173           | 219073   |
| 25.00                 | 14.00     | 22.00 | 110.00 | 46.00 | 219174           | 219074   |
| 32.00                 | 16.00     | 25.00 | 125.00 | 45.00 | 219174           | 219075   |
| 32.00                 | 18.00     | 27.00 | 130.00 | 54.00 | 219174           | 219076   |
| 32.00                 | 20.00     | 30.00 | 130.00 | 62.00 | 219175           | 219077   |

**NOTE:** Clamping chucks are used in reduction sleeves for clamping tools with cylindrical shanks to DIN 1835-B (Fig. 1). The chucks' design allows the use of standard tools versus ordering special tools (Fig. 2).



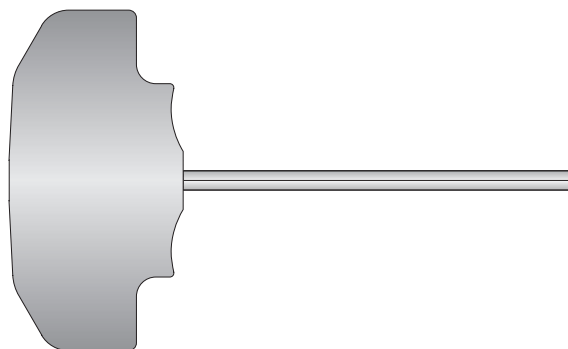
**m** = Metric (mm)

## Accessories for Drill Chucks

Service Keys | Gaskets | Assembly Tool

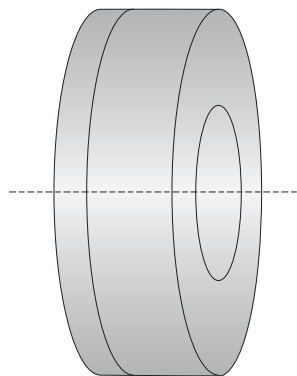
### Service Keys for Drill Chucks

| Service Key |      | Tightening Torque Nm | Part No.      |
|-------------|------|----------------------|---------------|
| Service Key | Type |                      |               |
| 2.50        | B    | 15                   | <b>415577</b> |
| 6.00        | B    | 15                   | <b>115578</b> |



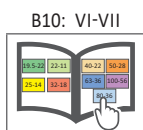
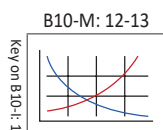
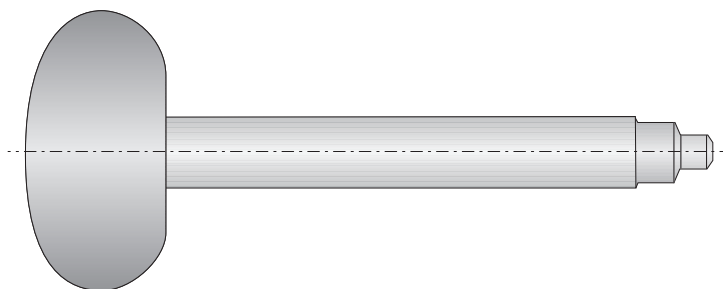
### Gaskets for Drill Chucks

|          | Gasket          |                   | Part No.      |
|----------|-----------------|-------------------|---------------|
|          | Gasket Diameter | Clamping Diameter |               |
|          | 3.00 - 6.00     | 0.50 - 13.00      | <b>387113</b> |
|          | 6.00 - 13.00    | 0.50 - 13.00      | <b>387114</b> |
| <b>m</b> | 3.00 - 6.00     | 2.50 - 16.00      | <b>387115</b> |
|          | 6.00 - 16.00    | 2.50 - 16.00      | <b>387116</b> |



### Assembly Tool for Gasket

| Part No.      |
|---------------|
| <b>387112</b> |

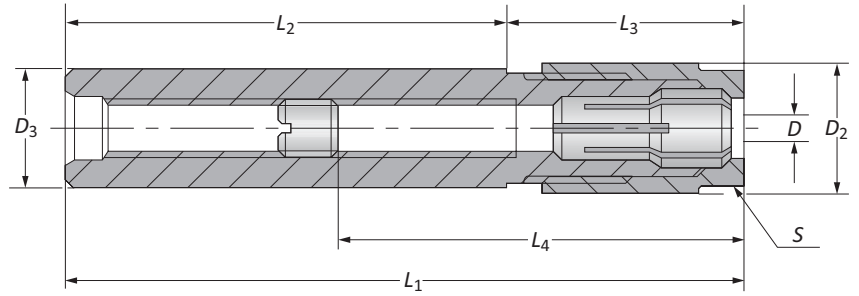


**m** = Metric (mm)



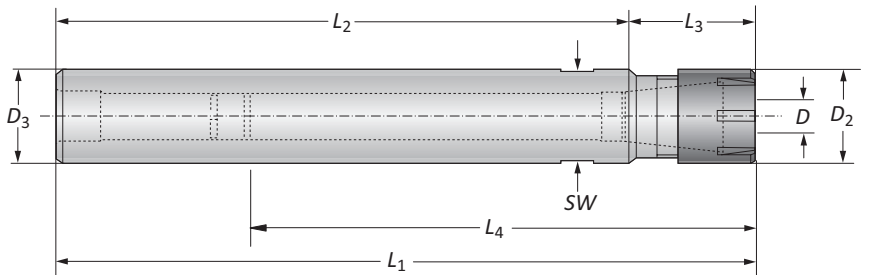
## Collet Chucks for Erickson System | Cylindrical Collet Chucks for ISO 15488 (DIN 6499) Collets

Diameter Range: 1.00 mm - 10.00 mm



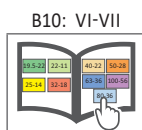
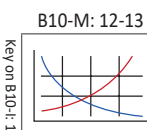
### Collet Chucks for Erickson System

| Nominal Size | Clamping Range | Collet Chuck |       |       |        |        |           |           |        | Service Key | Weight    | Part No. |
|--------------|----------------|--------------|-------|-------|--------|--------|-----------|-----------|--------|-------------|-----------|----------|
|              |                | $D_2$        | $D_3$ | $L_1$ | $L_2$  | $L_3$  | $L_4$ Min | $L_4$ Max | $S$    |             |           |          |
| 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

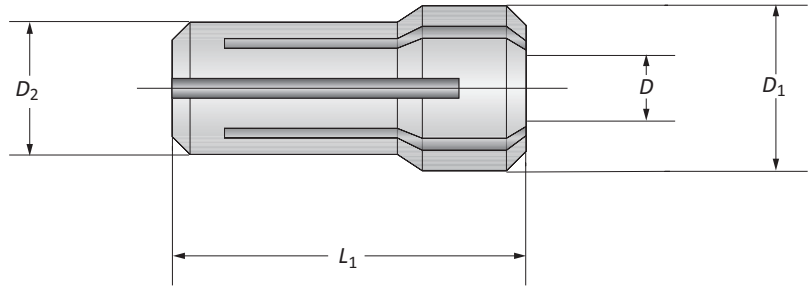
| Nominal Size | Collet Chuck |              |       |       |        |        |           |           |        | Hex Size | Part No. |
|--------------|--------------|--------------|-------|-------|--------|--------|-----------|-----------|--------|----------|----------|
|              | $D$          | $D_2$        | $D_3$ | $L_1$ | $L_2$  | $L_3$  | $L_4$ Min | $L_4$ Max | $SW$   |          |          |
| 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   |



m = Metric (mm)

## Accessories for Collet Chucks

Diameter Range: 0.50 mm - 10.00 mm

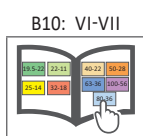
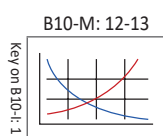


### Collet Sets for Erickson System

| Metric | Nominal Size | Standard-No. | Set   |       |       |              | Part No.      |
|--------|--------------|--------------|-------|-------|-------|--------------|---------------|
|        |              |              | $D_1$ | $D_2$ | $L_1$ | $D$          |               |
|        | 6            | 416 E        | 9.50  | 7.62  | 25.50 | 0.50 - 6.00  | <b>071016</b> |
|        | 10           | 417 E        | 13.50 | 11.43 | 30.40 | 0.50 - 10.00 | <b>071017</b> |

### Collets for Erickson System

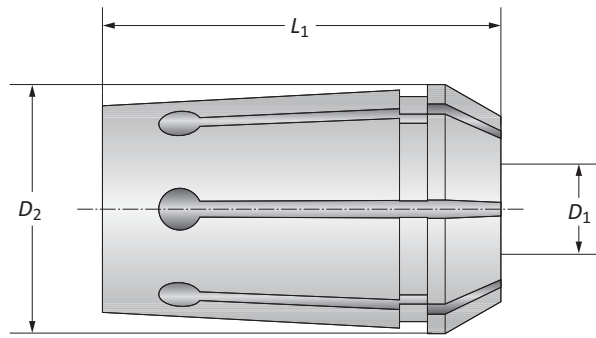
| Metric | Collet       | Diameter Range | Part No.      |
|--------|--------------|----------------|---------------|
|        | Nominal Size | $D$            |               |
| m      | 6            | 0.50 - 1.00    | <b>071355</b> |
|        | 6            | 1.00 - 1.50    | <b>071356</b> |
|        | 6            | 1.50 - 2.00    | <b>071357</b> |
|        | 6            | 2.00 - 2.50    | <b>071358</b> |
|        | 6            | 2.50 - 3.00    | <b>071359</b> |
|        | 6            | 3.00 - 3.50    | <b>071360</b> |
|        | 6            | 3.50 - 4.00    | <b>071361</b> |
|        | 6            | 4.00 - 4.50    | <b>071362</b> |
|        | 6            | 4.50 - 5.00    | <b>071363</b> |
|        | 6            | 5.00 - 5.50    | <b>071364</b> |
|        | 6            | 5.50 - 6.00    | <b>071365</b> |
|        | 10           | 0.50 - 1.00    | <b>071368</b> |
|        | 10           | 1.00 - 1.50    | <b>071369</b> |
|        | 10           | 1.50 - 2.00    | <b>071370</b> |
|        | 10           | 2.00 - 2.50    | <b>071371</b> |
|        | 10           | 2.50 - 3.00    | <b>071372</b> |
|        | 10           | 3.00 - 3.50    | <b>071373</b> |
|        | 10           | 3.50 - 4.00    | <b>071374</b> |
|        | 10           | 4.00 - 4.50    | <b>071375</b> |
|        | 10           | 4.50 - 5.00    | <b>071376</b> |
| 10     | 5.00 - 5.50  | <b>071377</b>  |               |
| 10     | 5.50 - 6.00  | <b>071378</b>  |               |
| 10     | 6.00 - 6.50  | <b>071379</b>  |               |
| 10     | 6.50 - 7.00  | <b>071380</b>  |               |
| 10     | 7.00 - 7.50  | <b>071381</b>  |               |
| 10     | 7.50 - 8.00  | <b>071382</b>  |               |
| 10     | 8.00 - 8.50  | <b>071383</b>  |               |
| 10     | 8.50 - 9.00  | <b>071384</b>  |               |
| 10     | 9.00 - 9.50  | <b>071385</b>  |               |
| 10     | 9.50 - 10.00 | <b>071681</b>  |               |



**m** = Metric (mm)

## Accessories for Collet Chucks

ISO 10897-A (DIN 6388-A)

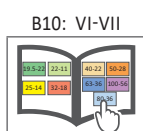
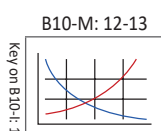


### Collet Sets

|   | Nominal Size | Standard-No. | Set   |       |              | Part No. |
|---|--------------|--------------|-------|-------|--------------|----------|
|   |              |              | $D_2$ | $L_1$ | $D_1$        |          |
| m | A 16         | 410 E        | 22.65 | 40.00 | 2.00 - 16.00 | 071003   |
|   | A 25         | 444 E        | 32.90 | 52.00 | 2.00 - 25.00 | 071004   |
|   | A 32         | 450 E        | 41.30 | 60.00 | 4.00 - 32.00 | 071019   |

### Collets

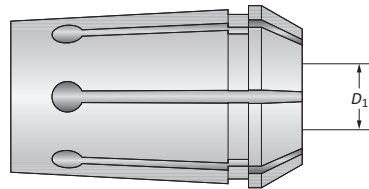
|      | Nominal Size | Diameter |          |
|------|--------------|----------|----------|
|      |              | $D_1$    | Part No. |
| m    | A 16         | 2.00     | 071140   |
|      | A 16         | 2.50     | 071141   |
|      | A 16         | 3.00     | 071142   |
|      | A 16         | 3.50     | 071143   |
|      | A 16         | 4.00     | 071144   |
|      | A 16         | 4.50     | 071145   |
|      | A 16         | 5.00     | 071146   |
|      | A 16         | 5.50     | 071147   |
|      | A 16         | 6.00     | 071148   |
|      | A 16         | 6.50     | 071149   |
|      | A 16         | 7.00     | 071150   |
|      | A 16         | 7.50     | 071151   |
|      | A 16         | 8.00     | 071152   |
|      | A 16         | 8.50     | 071153   |
|      | A 16         | 9.00     | 071154   |
|      | A 16         | 9.50     | 071155   |
|      | A 16         | 10.00    | 071156   |
|      | A 16         | 10.50    | 071157   |
|      | A 16         | 11.00    | 071158   |
|      | A 16         | 11.50    | 071159   |
| A 16 | 12.00        | 071160   |          |
| A 16 | 12.50        | 071161   |          |
| A 16 | 13.00        | 071162   |          |
| A 16 | 13.50        | 071163   |          |
| A 16 | 14.00        | 071164   |          |
| A 16 | 14.50        | 071165   |          |
| A 16 | 15.00        | 071166   |          |
| A 16 | 15.50        | 071167   |          |
| A 16 | 16.00        | 071168   |          |



m = Metric (mm)

## Accessories for Collet Chucks

ISO 10897-A (DIN 6388-A)

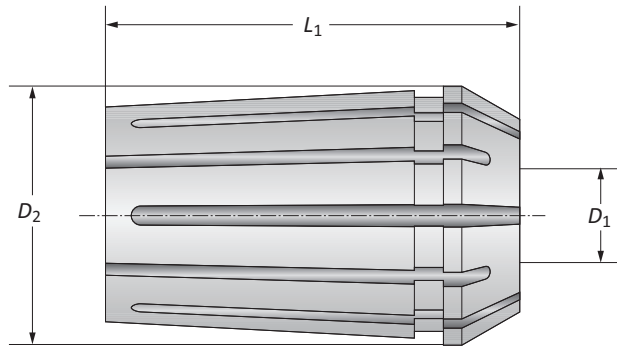


### Collets

|     | 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   |
| III | A 32         | 6.00     | 071420   |
|     | A 32         | 7.00     | 071613   |
|     | A 32         | 8.00     | 071421   |
|     | A 32         | 9.00     | 071614   |
|     | A 32         | 10.00    | 071422   |
|     | A 32         | 11.00    | 071666   |
|     | A 32         | 12.00    | 071423   |
|     | A 32         | 13.00    | 071667   |
|     | A 32         | 14.00    | 071668   |
|     | A 32         | 15.00    | 071669   |
|     | A 32         | 16.00    | 071424   |
|     | A 32         | 17.00    | 071670   |
|     | A 32         | 18.00    | 071665   |
|     | A 32         | 19.00    | 071671   |
|     | A 32         | 20.00    | 071416   |
|     | A 32         | 21.00    | 071672   |
|     | A 32         | 22.00    | 071673   |
|     | A 32         | 23.00    | 071674   |
|     | A 32         | 24.00    | 071675   |
|     | A 32         | 25.00    | 071417   |
|     | A 32         | 26.00    | 071676   |
|     | A 32         | 27.00    | 071677   |
|     | A 32         | 28.00    | 071678   |
|     | A 32         | 29.00    | 071679   |
|     | A 32         | 30.00    | 071633   |
|     | A 32         | 31.00    | 071680   |
|     | A 32         | 32.00    | 071418   |

## Accessories for Collet Chucks

ISO 10897-B (DIN 6388-B)

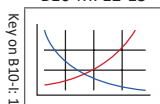


### Collet Sets

|   | Nominal Size | Standard-No. | Set   |       |              | Part No. |
|---|--------------|--------------|-------|-------|--------------|----------|
|   |              |              | $D_2$ | $L_1$ | $D_1$        |          |
| m | B 16         | 415 E        | 22.65 | 40.00 | 1.50 - 16.00 | 071005   |
|   | B 25         | 462 E        | 32.90 | 52.00 | 3.50 - 25.00 | 071006   |
|   | B 32         | 467 E        | 41.30 | 60.00 | 5.50 - 32.00 | 071022   |

### Collets

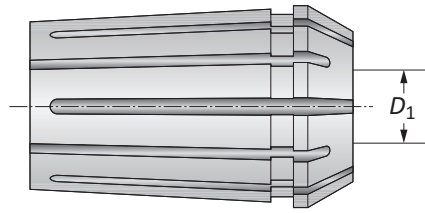
|      | Nominal Size  | Diameter      | Part No. |
|------|---------------|---------------|----------|
|      |               | $D_1$         |          |
| m    | B 16          | 1.50 - 2.00   | 071625   |
|      | B 16          | 2.00 - 2.50   | 071626   |
|      | B 16          | 2.50 - 3.00   | 071621   |
|      | B 16          | 3.00 - 3.50   | 071622   |
|      | B 16          | 3.50 - 4.00   | 071193   |
|      | B 16          | 4.00 - 4.50   | 071194   |
|      | B 16          | 4.50 - 5.00   | 071195   |
|      | B 16          | 5.00 - 5.50   | 071196   |
|      | B 16          | 5.50 - 6.00   | 071197   |
|      | B 16          | 6.00 - 6.50   | 071198   |
|      | B 16          | 6.50 - 7.00   | 071199   |
|      | B 16          | 7.00 - 7.50   | 071200   |
|      | B 16          | 7.50 - 8.00   | 071201   |
|      | B 16          | 8.00 - 8.50   | 071202   |
|      | B 16          | 8.50 - 9.00   | 071203   |
|      | B 16          | 9.00 - 9.50   | 071204   |
|      | B 16          | 9.50 - 10.00  | 071205   |
|      | B 16          | 10.00 - 10.50 | 071206   |
|      | B 16          | 10.50 - 11.00 | 071207   |
|      | B 16          | 11.00 - 11.50 | 071208   |
| B 16 | 11.50 - 12.00 | 071209        |          |
| B 16 | 12.00 - 12.50 | 071210        |          |
| B 16 | 12.50 - 13.00 | 071211        |          |
| B 16 | 13.00 - 13.50 | 071212        |          |
| B 16 | 13.50 - 14.00 | 071213        |          |
| B 16 | 14.00 - 14.50 | 071214        |          |
| B 16 | 14.50 - 15.00 | 071215        |          |
| B 16 | 15.00 - 15.50 | 071216        |          |
| B 16 | 15.50 - 16.00 | 071217        |          |



m = Metric (mm)

## Accessories for Collet Chucks

ISO 10897-B (DIN 6388-B)



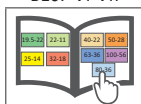
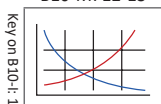
### Collets

| Nominal Size | Diameter<br>$D_1$ | 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 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   |

mm

B10-M: 12-13

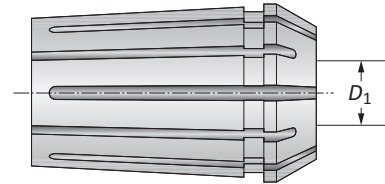
B10: VI-VII



mm = Metric (mm)

## Accessories for Collet Chucks

ISO 10897-B (DIN 6388-B)



### Collets

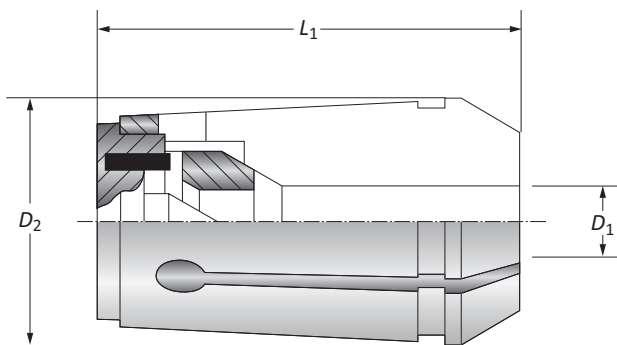
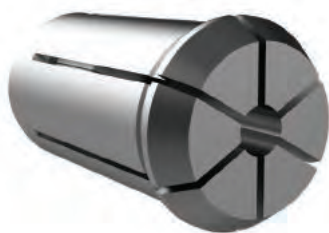
| Nominal Size | Diameter      | Part No. |
|--------------|---------------|----------|
|              | $D_1$         |          |
| B 32         | 5.50 - 6.00   | 071686   |
| B 32         | 6.00 - 6.50   | 071687   |
| B 32         | 6.50 - 7.00   | 071688   |
| B 32         | 7.00 - 7.50   | 071689   |
| 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 32         | 18.50 - 19.00 | 071560   |
| B 32         | 19.00 - 19.50 | 071561   |
| B 32         | 19.50 - 20.00 | 071562   |
| B 32         | 20.00 - 20.50 | 071563   |
| B 32         | 20.50 - 21.00 | 071564   |
| B 32         | 21.00 - 21.50 | 071565   |
| B 32         | 21.50 - 22.00 | 071566   |
| B 32         | 22.00 - 22.50 | 071567   |
| B 32         | 22.50 - 23.00 | 071568   |
| B 32         | 23.00 - 23.50 | 071569   |
| B 32         | 23.50 - 24.00 | 071570   |
| B 32         | 24.00 - 24.50 | 071571   |
| B 32         | 24.50 - 25.00 | 071572   |
| B 32         | 25.00 - 25.50 | 071573   |
| B 32         | 25.50 - 26.00 | 071574   |
| B 32         | 26.00 - 26.50 | 071575   |
| B 32         | 26.50 - 27.00 | 071576   |
| B 32         | 27.00 - 27.50 | 071577   |
| B 32         | 27.50 - 28.00 | 071578   |
| B 32         | 28.00 - 28.50 | 071579   |
| B 32         | 28.50 - 29.00 | 071580   |
| B 32         | 29.00 - 29.50 | 071581   |
| B 32         | 29.50 - 30.00 | 071582   |
| B 32         | 30.00 - 30.50 | 071583   |
| B 32         | 30.50 - 31.00 | 071584   |
| B 32         | 31.00 - 31.50 | 071585   |
| B 32         | 31.50 - 32.00 | 071586   |

m



## Accessories for Collet Chucks

ISO 10897-A (DIN 6388-A)



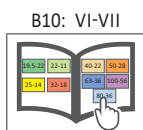
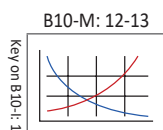
### Collet Sets for Clarkson System

|   | Nominal Size | Standard-No. | Diameter     |       | Part No. |
|---|--------------|--------------|--------------|-------|----------|
|   |              |              | $D_1$        | $D_2$ |          |
| m | A 16         | 421 E        | 6.00 - 12.00 | 22.65 | 071013   |
|   | A 25         | 459 E        | 6.00 - 25.00 | 32.90 | 071014   |
|   | A 32         | 460 E        | 6.00 - 32.00 | 41.30 | 071020   |

**NOTE:** Recommended to use clamping nuts with ball-bearings to lock collets

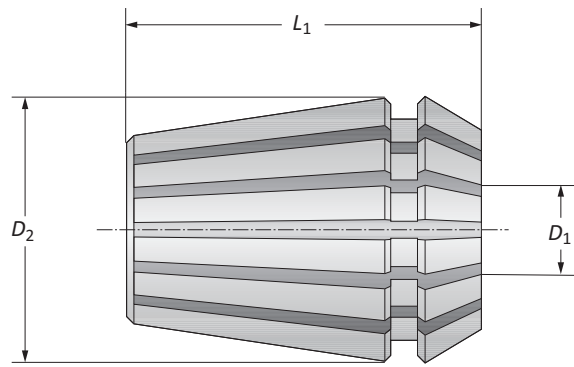
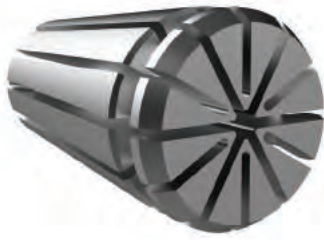
### Collets for Clarkson System

|   | Nominal Size | Diameter |          |
|---|--------------|----------|----------|
|   |              | $D_1$    | Part No. |
| m | A 16         | 6.00     | 071304   |
|   | A 16         | 8.00     | 071305   |
|   | A 16         | 10.00    | 071306   |
|   | A 16         | 12.00    | 071307   |
|   | A 25         | 6.00     | 071308   |
|   | A 25         | 8.00     | 071309   |
|   | A 25         | 10.00    | 071310   |
|   | A 25         | 12.00    | 071311   |
|   | A 25         | 16.00    | 071312   |
|   | A 25         | 20.00    | 071313   |
|   | A 25         | 25.00    | 071684   |
|   | A 32         | 6.00     | 071427   |
|   | A 32         | 8.00     | 071428   |
|   | A 32         | 10.00    | 071429   |
|   | A 32         | 12.00    | 071430   |
|   | A 32         | 16.00    | 071431   |
|   | A 32         | 20.00    | 071432   |
|   | A 32         | 25.00    | 071433   |
|   | A 32         | 32.00    | 071685   |



## Accessories for Collet Chucks

ISO 15488-B (DIN 6499-B)

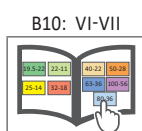
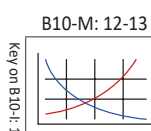


### Collet Sets

|   | Nominal Size | Standard-No. | Diameter     |       | Collet Set |               | Part No. |
|---|--------------|--------------|--------------|-------|------------|---------------|----------|
|   |              |              | $D_1$        | $D_2$ | $L_1$      |               |          |
| m | ER 8         | 4004 E       | 1.00 - 5.00  | 8.50  | 13.50      | <b>071034</b> |          |
|   | ER 11        | 4008 E       | 1.00 - 7.00  | 11.00 | 18.00      | <b>071028</b> |          |
|   | ER 16        | 426 E        | 0.50 - 10.00 | 16.00 | 27.50      | <b>071029</b> |          |
|   | ER 25        | 430 E        | 1.50 - 16.00 | 25.00 | 34.00      | <b>071031</b> |          |
|   | ER 32        | 470 E        | 2.00 - 20.00 | 32.00 | 40.00      | <b>071032</b> |          |
|   | ER 40        | 472 E        | 3.00 - 26.00 | 40.00 | 46.00      | <b>071033</b> |          |

### Collets

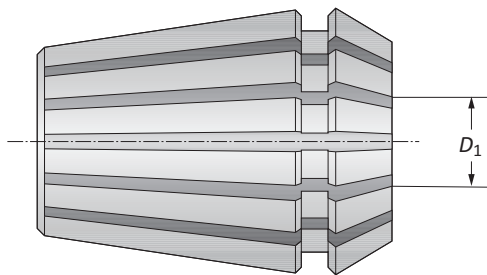
|       | Nominal Size | Diameter      |               | Part No. |
|-------|--------------|---------------|---------------|----------|
|       |              | $D_1$         |               |          |
| m     | ER 8         | 1.00          | <b>071986</b> |          |
|       | ER 8         | 1.50          | <b>071987</b> |          |
|       | ER 8         | 2.00          | <b>071988</b> |          |
|       | ER 8         | 2.50          | <b>071989</b> |          |
|       | ER 8         | 2.60 - 3.00   | <b>071990</b> |          |
|       | ER 8         | 3.10 - 3.50   | <b>071991</b> |          |
|       | ER 8         | 3.60 - 4.00   | <b>071992</b> |          |
|       | ER 8         | 4.10 - 4.50   | <b>071993</b> |          |
|       | ER 8         | 4.60 - 5.00   | <b>071994</b> |          |
|       | ER 11        | 1.00          | <b>071700</b> |          |
|       | ER 11        | 1.50          | <b>071701</b> |          |
|       | ER 11        | 2.00          | <b>071702</b> |          |
|       | ER 11        | 2.50          | <b>071703</b> |          |
|       | ER 11        | 2.60 - 3.00   | <b>071704</b> |          |
|       | ER 11        | 3.10 - 3.50   | <b>071705</b> |          |
|       | ER 11        | 3.60 - 4.00   | <b>071706</b> |          |
|       | ER 11        | 4.10 - 4.50   | <b>071707</b> |          |
|       | ER 11        | 4.60 - 5.00   | <b>071708</b> |          |
|       | ER 11        | 5.10 - 5.50   | <b>071709</b> |          |
|       | ER 11        | 5.60 - 6.00   | <b>071710</b> |          |
| ER 11 | 6.10 - 6.50  | <b>071711</b> |               |          |
| ER 11 | 6.60 - 7.00  | <b>071712</b> |               |          |



m = Metric (mm)

## Accessories for Collet Chucks

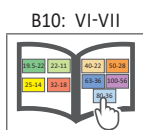
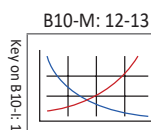
ISO 15488-B (DIN 6499-B)



### Collets

|          | Nominal Size | Diameter     | Part No. |
|----------|--------------|--------------|----------|
|          |              | $D_1$        |          |
|          | ER 16        | 0.50 - 1.00  | 071713   |
|          | ER 16        | 1.00 - 1.50  | 071714*  |
|          | ER 16        | 1.00 - 2.00  | 071715   |
|          | ER 16        | 2.00 - 2.50  | 071716*  |
|          | ER 16        | 2.50 - 3.00  | 071717   |
|          | ER 16        | 3.00 - 3.50  | 071718*  |
|          | ER 16        | 3.50 - 4.00  | 071719   |
|          | ER 16        | 4.00 - 4.50  | 271132*  |
| <b>m</b> | ER 16        | 4.00 - 5.00  | 071720   |
|          | ER 16        | 5.00 - 5.50  | 271133*  |
|          | ER 16        | 5.50 - 6.00  | 071721   |
|          | ER 16        | 6.00 - 6.50  | 271134*  |
|          | ER 16        | 6.00 - 7.00  | 071722   |
|          | ER 16        | 7.00 - 7.50  | 271135*  |
|          | ER 16        | 7.5 - 8.00   | 071723   |
|          | ER 16        | 8.00 - 8.50  | 271136*  |
|          | ER 16        | 8.50 - 9.00  | 071724   |
|          | ER 16        | 9.00 - 9.50  | 271137*  |
|          | ER 16        | 9.00 - 10.00 | 071725   |

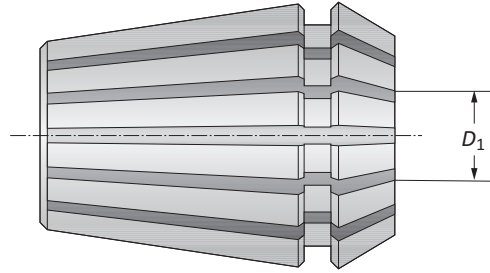
\* Items not contained in set.
























**m** = Metric (mm)

## Accessories for Collet Chucks

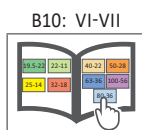
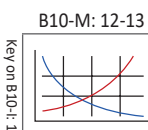
ISO 15488-B (DIN 6499-B)



### Collets

| Nominal Size  | Diameter      |  | Part No. |
|---|---------------|--|----------|
|   | $D_1$         |  |          |
| 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   |
|  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   |

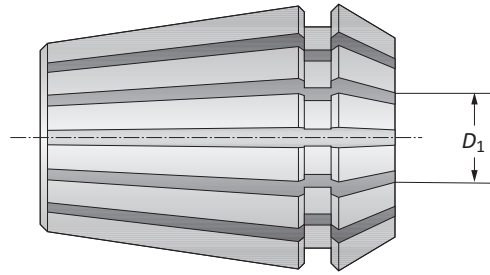
\* Items not contained in set.



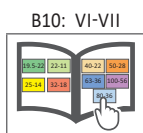
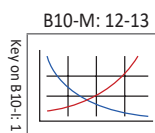
 = Metric (mm)

## Accessories for Collet Chucks

ISO 15488-B (DIN 6499-B)

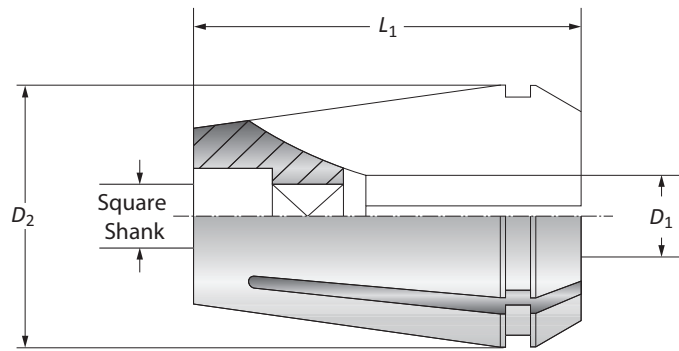


|          | Nominal Size | Diameter      | Part No.      |
|----------|--------------|---------------|---------------|
|          |              | $D_1$         |               |
|          | ER 40        | 3.00 - 4.00   | <b>071779</b> |
|          | ER 40        | 4.00 - 5.00   | <b>071780</b> |
|          | ER 40        | 5.00 - 6.00   | <b>071781</b> |
|          | ER 40        | 6.00 - 7.00   | <b>071782</b> |
|          | ER 40        | 7.00 - 8.00   | <b>071783</b> |
|          | ER 40        | 8.00 - 9.00   | <b>071784</b> |
|          | ER 40        | 9.00 - 10.00  | <b>071785</b> |
|          | ER 40        | 10.00 - 11.00 | <b>071786</b> |
|          | ER 40        | 11.00 - 12.00 | <b>071787</b> |
|          | ER 40        | 12.00 - 13.00 | <b>071788</b> |
| <b>m</b> | ER 40        | 13.00 - 14.00 | <b>071789</b> |
|          | ER 40        | 14.00 - 15.00 | <b>071790</b> |
|          | ER 40        | 15.00 - 16.00 | <b>071791</b> |
|          | ER 40        | 16.00 - 17.00 | <b>071792</b> |
|          | ER 40        | 17.00 - 18.00 | <b>071793</b> |
|          | ER 40        | 18.00 - 19.00 | <b>071794</b> |
|          | ER 40        | 19.00 - 20.00 | <b>071795</b> |
|          | ER 40        | 20.00 - 21.00 | <b>071796</b> |
|          | ER 40        | 21.00 - 22.00 | <b>071797</b> |
|          | ER 40        | 22.00 - 23.00 | <b>071798</b> |
|          | ER 40        | 23.00 - 24.00 | <b>071799</b> |
|          | ER 40        | 24.00 - 25.00 | <b>071800</b> |
|          | ER 40        | 25.00 - 26.00 | <b>071801</b> |



## Collet Sets for Taps DIN 371/374/376

ISO 15488-B (DIN 6499-B)



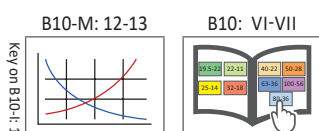
### Collet Sets

|   | Nominal Size | Standard-No. | Clamping Range<br>$D_1$ | Collet Set |       | Part No. |
|---|--------------|--------------|-------------------------|------------|-------|----------|
|   |              |              |                         | $D_2$      | $L_1$ |          |
| m | ER 16        | 426 EGB      | 4.50 - 7.00             | 16.00      | 27.50 | 071045   |
|   | ER 25        | 430 EGB      | 4.50 - 12.00            | 25.00      | 34.00 | 071047   |
|   | ER 32        | 470 EGB      | 4.50 - 16.00            | 32.00      | 40.00 | 071048   |
|   | ER 40        | 472 EGB      | 7.00 - 20.00            | 40.00      | 46.00 | 071049   |

**NOTE:** To lock these collets, we recommend using the clamping nuts with sliding ring for higher clamping forces.

### Taps

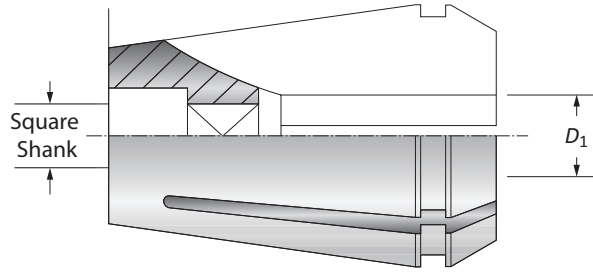
|   | Shank |              | Tap       |              |         |
|---|-------|--------------|-----------|--------------|---------|
|   | $D_1$ | Square Shank | DIN 371   | DIN 374      | DIN 376 |
| m | 4.50  | 3.40         | M 4       | M 6 x...     | M 6     |
|   | 5.50  | 4.30         | -         | M 7 x...     | M 7     |
|   | 6.00  | 4.90         | M 4,5/5/6 | M 8 x...     | M 8     |
|   | 7.00  | 5.50         | M 7       | M 9/10 x...  | M 9/10  |
|   | 8.00  | 6.20         | M 8       | M 6 x...     | M 11    |
|   | 9.00  | 7.00         | M 9       | M 6 x...     | M 12    |
|   | 10.00 | 8.00         | M 10      | -            | -       |
|   | 11.00 | 9.00         | -         | M 14 x...    | M 14    |
|   | 12.00 | 9.00         | M 12      | M 16 x...    | M 16    |
|   | 14.00 | 11.00        | -         | M 18 x...    | M 18    |
|   | 16.00 | 12.00        | -         | M 20 x...    | M 20    |
|   | 18.00 | 14.00        | -         | M 22/24 x... | M 22/24 |
|   | 20.00 | 16.00        | -         | M 27 x...    | M 27    |



m = Metric (mm)

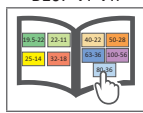
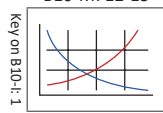
## Accessories for Collet Sets for Taps DIN 371/374/376

ISO 15488-B (DIN 6499-B)



| Nominal Size | Suitable Taps |              | Part No. |
|--------------|---------------|--------------|----------|
|              | $D_1$         | Square Shank |          |
| ER 16        | 4.50          | 3.40         | 071901   |
| ER 16        | 5.50          | 4.30         | 071902   |
| ER 16        | 6.00          | 4.90         | 071903   |
| ER 16        | 7.00          | 5.50         | 071904   |
| ER 25        | 4.50          | 3.40         | 071912   |
| ER 25        | 5.50          | 4.30         | 071913   |
| ER 25        | 6.00          | 4.90         | 071914   |
| ER 25        | 7.00          | 5.50         | 071915   |
| ER 25        | 8.00          | 6.20         | 071916   |
| ER 25        | 9.00          | 7.00         | 071917   |
| ER 25        | 10.00         | 8.00         | 071918   |
| ER 25        | 11.00         | 9.00         | 071919   |
| ER 25        | 12.00         | 9.00         | 071920   |
| ER 32        | 4.50          | 3.40         | 071921   |
| ER 32        | 5.50          | 4.30         | 071922   |
| ER 32        | 6.00          | 4.90         | 071923   |
| ER 32        | 7.00          | 5.50         | 071924   |
| ER 32        | 8.00          | 6.20         | 071925   |
| ER 32        | 9.00          | 7.00         | 071926   |
| ER 32        | 10.00         | 8.00         | 071927   |
| ER 32        | 11.00         | 9.00         | 071928   |
| ER 32        | 12.00         | 9.00         | 071929   |
| ER 32        | 14.00         | 11.00        | 071930   |
| ER 32        | 16.00         | 12.00        | 071931   |
| ER 40        | 7.00          | 5.50         | 071932   |
| ER 40        | 8.00          | 6.20         | 071933   |
| ER 40        | 9.00          | 7.00         | 071934   |
| ER 40        | 10.00         | 8.00         | 071935   |
| ER 40        | 11.00         | 9.00         | 071936   |
| ER 40        | 12.00         | 9.00         | 071937   |
| ER 40        | 14.00         | 11.00        | 071938   |
| ER 40        | 16.00         | 12.00        | 071939   |
| ER 40        | 18.00         | 14.50        | 071940   |
| ER 40        | 20.00         | 16.00        | 071941   |

Ⓜ

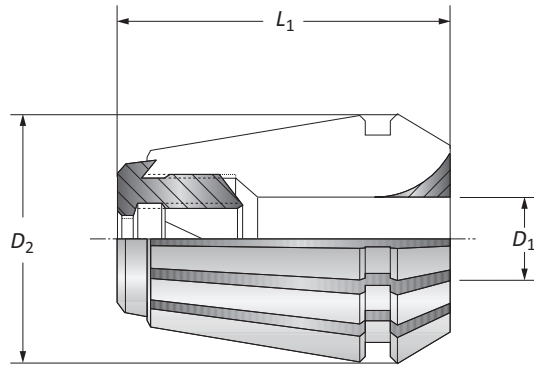


Ⓜ = Metric (mm)



## Accessories for Collet Chucks: ISO 15488-B (DIN 6499-B)

### Collets



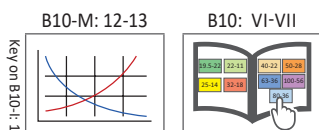
#### Collets for Mill Cutters with Pull Thread System

|   | Nominal Size | Standard-No. | Clamping Range<br>$D_2$ | Collet |              | Part No. |
|---|--------------|--------------|-------------------------|--------|--------------|----------|
|   |              |              |                         | $L_1$  | $D_1$        |          |
| m | ER 32        | 470 ECL      | 32.00                   | 46.00  | 6.00 - 16.00 | 071052   |
|   | ER 40        | 472 ECL      | 40.00                   | 52.00  | 6.00 - 25.00 | 071053   |

### Collets

|   | Collet       |       | Part No. |
|---|--------------|-------|----------|
|   | Nominal Size | $D_1$ |          |
| m | ER 32        | 6.00  | 071826   |
|   | ER 32        | 8.00  | 071827   |
|   | ER 32        | 10.00 | 071828   |
|   | ER 32        | 12.00 | 071829   |
|   | ER 32        | 16.00 | 071830   |
|   | ER 40        | 6.00  | 071831   |
|   | ER 40        | 8.00  | 071832   |
|   | ER 40        | 10.00 | 071833   |
|   | ER 40        | 12.00 | 071834   |
|   | ER 40        | 16.00 | 071835   |
|   | ER 40        | 20.00 | 071836   |
|   | ER 40        | 25.00 | 071837   |

**NOTE:** To lock these collets, we recommend using the clamping nuts with sliding ring for higher clamping forces.



m = Metric (mm)

## Collet Kit Set Accessories for Collet Chucks



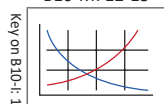
### Collet Kits: ISO 15488 (DIN 6499)

|   | Nominal Size | Kit    |        |        |       | Collet Space | Kit Part No. |
|---|--------------|--------|--------|--------|-------|--------------|--------------|
|   |              | Width  | Depth  | Height |       |              |              |
| Ⓜ | 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       |              |

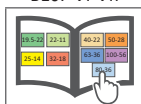
### Collet Kits: ISO 10897 (DIN 6388)

|   | Nominal Size | Kit    |        |        |       | Collet Space | Kit Part No. |
|---|--------------|--------|--------|--------|-------|--------------|--------------|
|   |              | Width  | Depth  | Height |       |              |              |
| Ⓜ | 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       |              |

B10-M: 12-13



B10: VI-VII

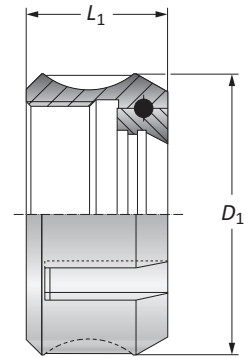


## Accessories for Collet Chucks: ISO 10897 (DIN 6388)

### Clamping Nuts

#### Clamping Nuts: DIN 6388 / ISO 10897 - 1:10

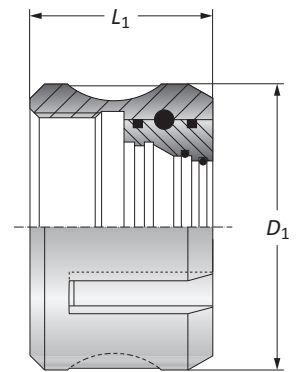
|   | Nominal Size | Clamping Nut |       |                |        | Part No.      |
|---|--------------|--------------|-------|----------------|--------|---------------|
|   |              | $D_1$        | $L_1$ | Clamping Range | Torque |               |
| m | 16           | 43.00        | 24.00 | 2.00 - 16.00   | 100 Nm | <b>068048</b> |
|   | 25           | 60.00        | 30.00 | 2.00 - 25.00   | 180 Nm | <b>068052</b> |
|   | 32           | 72.00        | 33.50 | 4.00 - 32.00   | 220 Nm | <b>161099</b> |



#### Clamping Nuts for Sealing Discs: DIN 6388 / ISO 10897 - 1:10

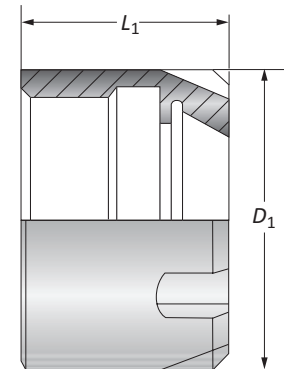
|   | Nominal Size | Clamping Nut |       |                |        | Part No.      |
|---|--------------|--------------|-------|----------------|--------|---------------|
|   |              | $D_1$        | $L_1$ | Clamping Range | Torque |               |
| m | 16           | 43.00        | 31.50 | 2.00 - 16.00   | 100 Nm | <b>275001</b> |
|   | 25           | 60.00        | 38.00 | 2.00 - 25.00   | 180 Nm | <b>275003</b> |
|   | 32           | 72.00        | 42.00 | 4.00 - 32.00   | 220 Nm | <b>276001</b> |

NOTE: with ball-bearing, for use with sealing discs



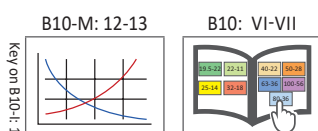
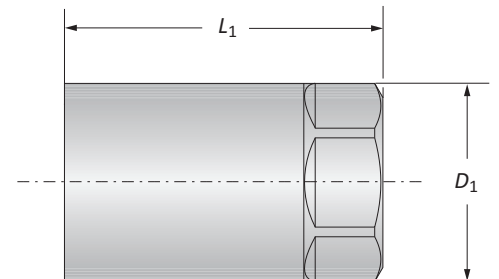
#### Mini Clamping Nuts

|   | Nominal Size | Clamping Nut |       |                |        | Part No.      |
|---|--------------|--------------|-------|----------------|--------|---------------|
|   |              | $D_1$        | $L_1$ | Clamping Range | Torque |               |
| m | ER 08        | 12.00        | 10.80 | 1.00 - 4.00    | 8 Nm   | <b>415357</b> |
|   | ER 11        | 16.00        | 12.00 | 1.00 - 7.00    | 16 Nm  | <b>415358</b> |
|   | ER 16        | 22.00        | 18.00 | 1.00 - 10.00   | 25 Nm  | <b>415359</b> |



#### Clamping Nuts for Erickson Collet Chuck System

|   | Nominal Size | Clamping Nut |       |                | Part No.      |
|---|--------------|--------------|-------|----------------|---------------|
|   |              | $D_1$        | $L_1$ | Clamping Range |               |
| m | 6            | 14.00        | 28.00 | 1.00 - 6.50    | <b>162095</b> |
|   | 10           | 21.00        | 36.00 | 1.00 - 10.00   | <b>162093</b> |



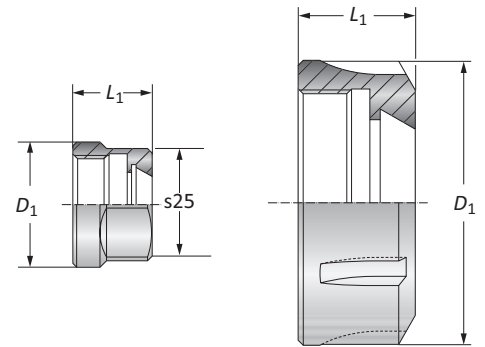
m = Metric (mm)

## Accessories for Collet Chucks: ISO 15488 (DIN 6499)

### Clamping Nuts

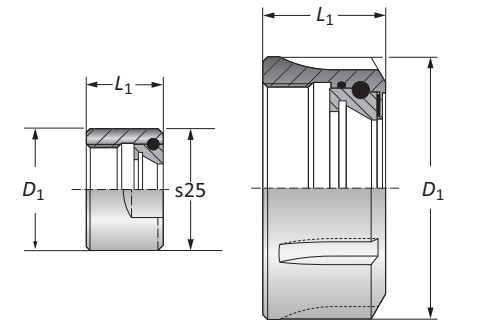
#### One Piece Clamping Nuts: DIN 6499 / ISO 15488 - 8°

|   | Nominal Size | Clamping Nut |       |                |        | Part No.      |
|---|--------------|--------------|-------|----------------|--------|---------------|
|   |              | $D_1$        | $L_1$ | Clamping Range | Torque |               |
| m | ER 16        | 28.00        | 17.50 | 1.00 - 10.00   | 60 Nm  | <b>215922</b> |
|   | ER 25        | 42.00        | 20.00 | 2.00 - 16.00   | 100 Nm | <b>215924</b> |
|   | ER 32        | 50.00        | 22.50 | 2.00 - 20.00   | 140 Nm | <b>215925</b> |
|   | ER 40        | 63.00        | 25.50 | 4.00 - 26.00   | 180 Nm | <b>215926</b> |



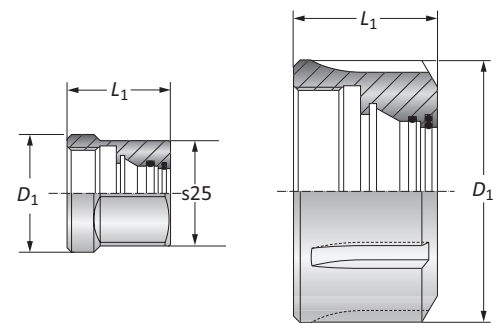
#### Clamping Nuts with Sliding Ring: DIN 6499 / ISO 15488 - 8°

|   | Nominal Size | Clamping Nut |       |                |        | Part No.      |
|---|--------------|--------------|-------|----------------|--------|---------------|
|   |              | $D_1$        | $L_1$ | Clamping Range | Torque |               |
| m | ER 16        | 28.00        | 20.30 | 1.00 - 10.00   | 60 Nm  | <b>315015</b> |
|   | ER 25        | 42.00        | 22.40 | 2.00 - 16.00   | 100 Nm | <b>315016</b> |
|   | ER 32        | 50.00        | 25.00 | 2.00 - 20.00   | 140 Nm | <b>315017</b> |
|   | ER 40        | 63.00        | 28.30 | 4.00 - 26.00   | 180 Nm | <b>315018</b> |



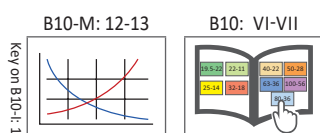
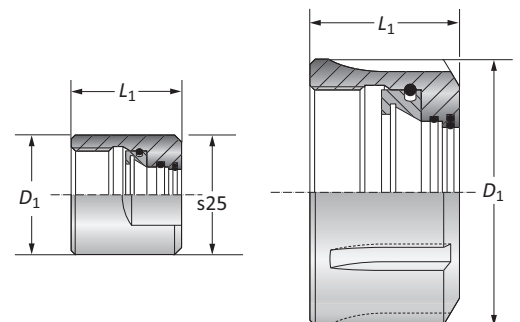
#### One Piece Clamping Nuts for use with Sealing Disks: DIN 6499 / ISO 15488 - 8°

|   | Nominal Size | Clamping Nut |       |                |        | Part No.      |
|---|--------------|--------------|-------|----------------|--------|---------------|
|   |              | $D_1$        | $L_1$ | Clamping Range | Torque |               |
| m | ER 16        | 28.00        | 25.00 | 1.00 - 10.00   | 60 Nm  | <b>277001</b> |
|   | ER 25        | 42.00        | 27.50 | 2.00 - 16.00   | 100 Nm | <b>277005</b> |
|   | ER 32        | 50.00        | 30.50 | 2.00 - 20.00   | 140 Nm | <b>277007</b> |
|   | ER 40        | 63.00        | 34.00 | 4.00 - 26.00   | 180 Nm | <b>278001</b> |



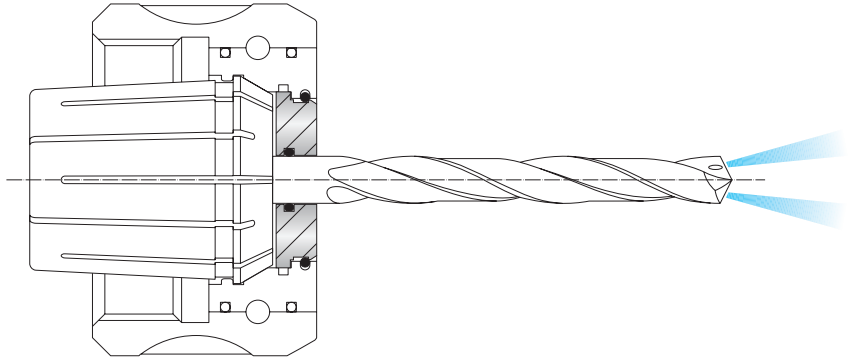
#### Clamping Nuts with Sliding Ring for use with Sealing Disks: DIN 6499 / ISO 15488 - 8°

|   | Nominal Size | Clamping Nuts: ISO 15488 (DIN 6499) |       |                |        | Part No.      |
|---|--------------|-------------------------------------|-------|----------------|--------|---------------|
|   |              | $D_1$                               | $L_1$ | Clamping Range | Torque |               |
| m | ER 16        | 28.00                               | 25.00 | 1.00 - 10.00   | 60 Nm  | <b>277002</b> |
|   | ER 25        | 42.00                               | 28.50 | 2.00 - 16.00   | 100 Nm | <b>277006</b> |
|   | ER 32        | 50.00                               | 31.50 | 2.00 - 20.00   | 140 Nm | <b>277008</b> |
|   | ER 40        | 63.00                               | 35.00 | 4.00 - 26.00   | 180 Nm | <b>278002</b> |



m = Metric (mm)

## Sealing Disks for Collet Chucks: ISO 10897 (DIN 6388)

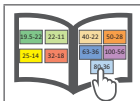
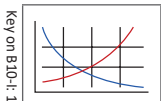


| Nominal Size | Sealing Disk  |               | Sealing Disk  |               | Sealing Disk  |               | Sealing Disk  |               |
|--------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
|              | 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> |
| <b>m</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>276058</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> | –             | –             |

**m**

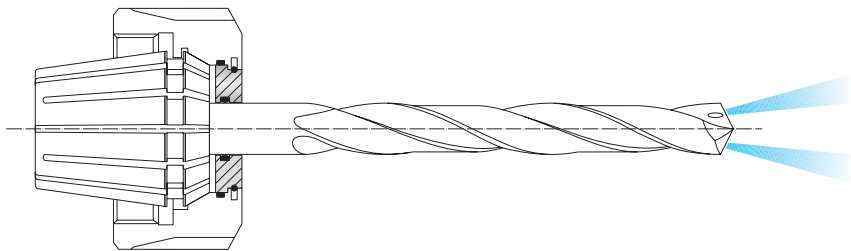
B10-M: 12-13

B10: VI-VII



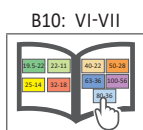
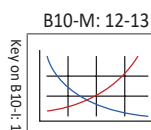
**m** = Metric (mm)

## Sealing Disks Collet Chucks: ISO 15488 (DIN 6499)



| 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> | –             | –             |

m



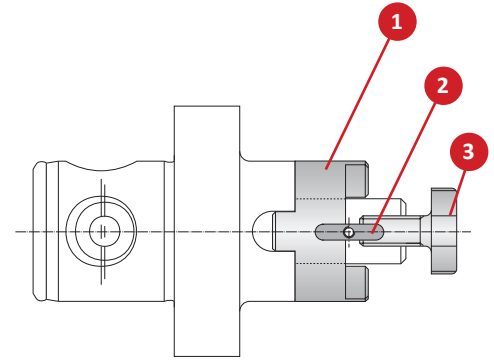
m = Metric (mm)

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

## Accessories for Milling Machine Arbors

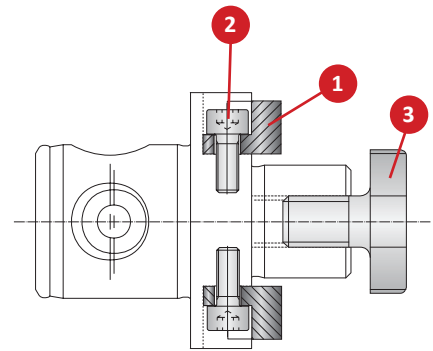
### Accessories for Milling Machine Arbors

| 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            |



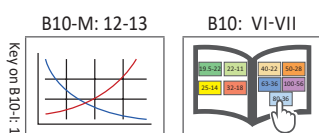
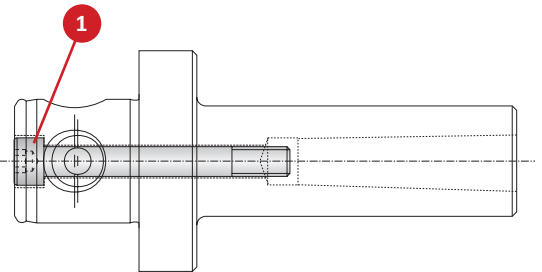
### Accessories for Milling Machine Arbors

| Shell-Mill Adapter | Part No.    |             |                   |
|--------------------|-------------|-------------|-------------------|
|                    | 1 Drive Key | 2 Cap Screw | 3 Retaining Screw |
| 16                 | 215701      | 115566      | 115697            |
| 22                 | 215702      | 108109      | 115345            |
| 27                 | 215703      | 109109      | 115346            |
| 32                 | 215704      | 115147      | 115347            |
| 40                 | 215705      | 116152      | 115348            |
| 60                 | 115643      | 115237      | -                 |



### Accessories for Holding Arbors

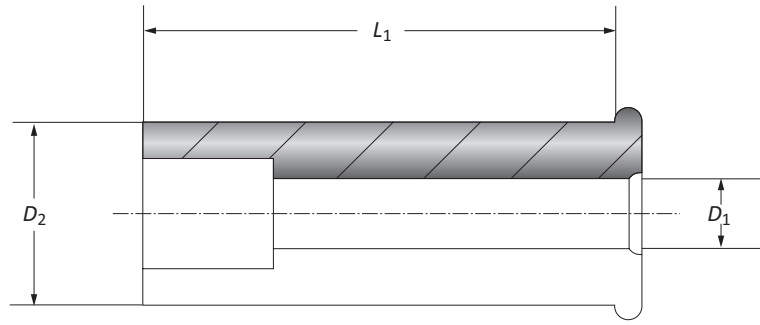
| Adapter Sleeves | Part No.    |             |
|-----------------|-------------|-------------|
|                 | 1 Cap Screw | Service Key |
| 209022          | 115929      | s5          |
| 209023          | 115930      | s7          |
| 209024          | 115932      | s8          |
| 209025          | 115933      | s5          |
| 209026          | 115169      | s8          |
| 209027          | 115934      | s10         |
| 209028          | 115936      | s12         |



**m** = Metric (mm)

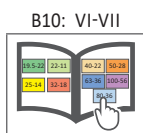
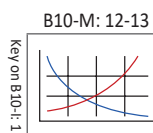


## Reducing Sleeves for Hydraulic Clamping Chucks



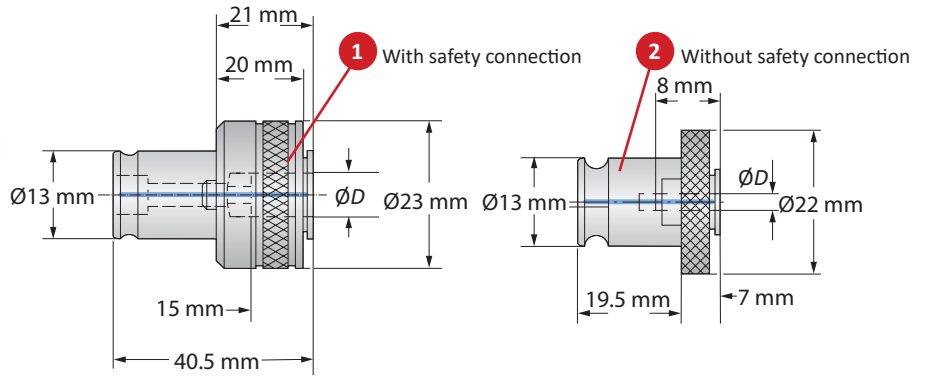
|   | Nominal Size | Reducing Sleeve |       | Part No. |
|---|--------------|-----------------|-------|----------|
|   | $D_2$        | $D_1$           | $L_1$ |          |
| m | 20.00        | 3.00            | 50.50 | 271045   |
|   | 20.00        | 4.00            | 50.50 | 271046   |
|   | 20.00        | 5.00            | 50.50 | 271047   |
|   | 20.00        | 6.00            | 50.50 | 271070   |
|   | 20.00        | 7.00            | 50.50 | 271049   |
|   | 20.00        | 8.00            | 50.50 | 271004   |
|   | 20.00        | 9.00            | 50.50 | 271050   |
|   | 20.00        | 10.00           | 50.50 | 271005   |
|   | 20.00        | 11.00           | 50.50 | 271051   |
|   | 20.00        | 12.00           | 50.50 | 271073   |
|   | 20.00        | 13.00           | 50.50 | 271052   |
|   | 20.00        | 14.00           | 50.50 | 271074   |
|   | 20.00        | 15.00           | 50.50 | 271018   |
|   | 20.00        | 16.00           | 50.50 | 271008   |

**NOTE:** For cylindrical shanks with shank tolerance h6 for clamping diameter 3 mm and 8 mm and with shank tolerance h7 for clamping diameter 10 mm - 32 mm.  
**NOTE:** Reduction sleeve with adjustable stop.



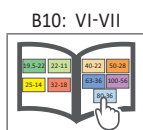
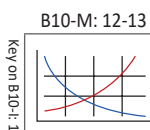
m = Metric (mm)

## Quick Change Adapters

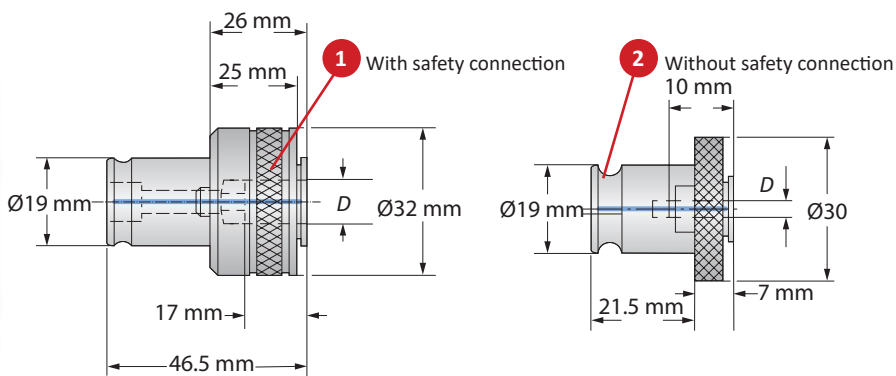


| Shank Dimensions |                  | Quick Change Adapter |         |         |         |         |          |          |                | Part No. |        |
|------------------|------------------|----------------------|---------|---------|---------|---------|----------|----------|----------------|----------|--------|
| Nominal Size     | D x Square Shank | DIN 352              | DIN 353 | DIN 371 | DIN 374 | DIN 376 | DIN 2182 | DIN 2183 | Torque Setting | 1        | 2      |
| 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 |

**NOTE:** Quick change adapters are typically set to the torque value shown in the table.

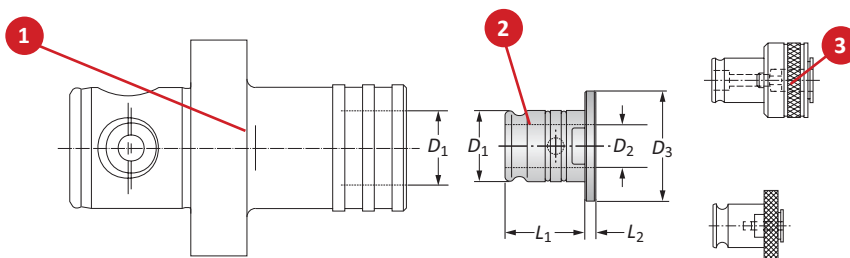


## Quick Change Adapters



### Quick Change Adapters

| Shank Dimensions |                  | Quick Change Adapter |         |         |         |         |          |          |                | Part No. |        |
|------------------|------------------|----------------------|---------|---------|---------|---------|----------|----------|----------------|----------|--------|
| Nominal Size     | D x Square Shank | DIN 352              | DIN 353 | DIN 371 | DIN 374 | DIN 376 | DIN 2182 | DIN 2183 | Torque Setting | 1        | 2      |
| 1                | 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 |

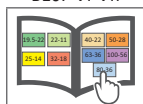
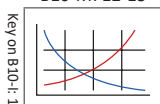


### Reducers for Quick Change Adapters

| 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> |           |          |
| 1               | 19.00          | 0                      | 13.00          | 19.00          | 13.00          | 30.00          | 21.50          | 4.00           | 0.12 (kg) | 161038   |
| 2               | 31.00          | 1                      | 19.00          | 31.00          | 19.00          | 48.00          | 35.00          | 5.00           | 0.48 (kg) | 162094   |

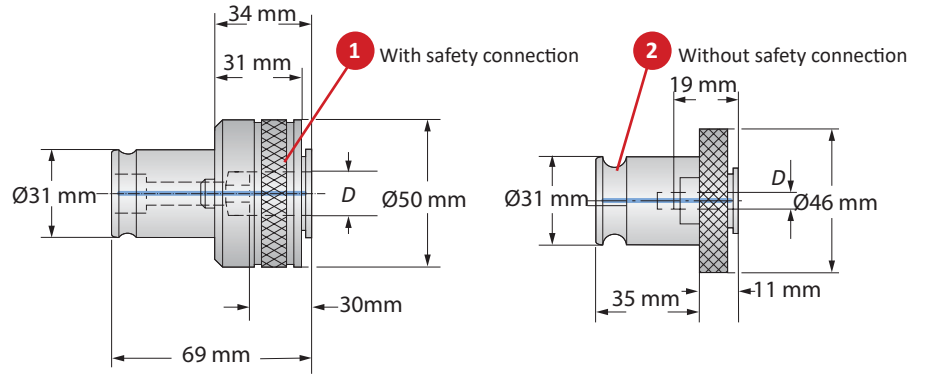
B10-M: 12-13

B10: VI-VII



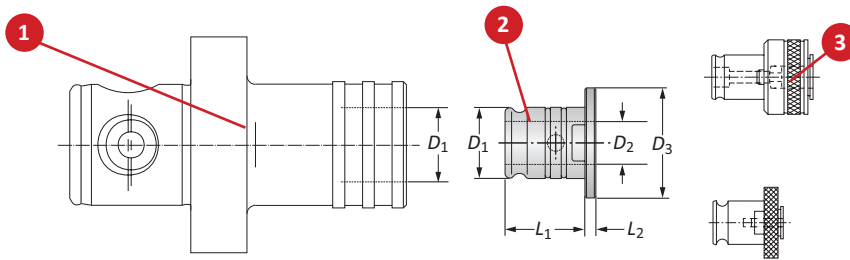
Ⓜ = Metric (mm)

## 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      |        |
| m                | 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 |
|                  | 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     | -        | 1 1/16"        | 85 - 90   | 233026 | K16420 |
|                  | 2                | 12.00 x 16.00        | M 20    | G 1/2"  | -       | M 20    | M 20     | -        | 1 3/16"        | 110 - 115 | 233027 | K15286 |
|                  | 2                | 14.50 x 18.00        | M 24    | -       | -       | M 24    | M 24     | -        | 1 5/16"        | 110 - 115 | 233028 | K18457 |



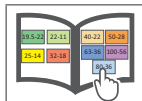
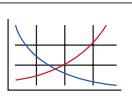
### Reducers for Quick Change Adapters

| 1 Tapping Chuck |                | 2 Quick Change Adapter |                | 3 Reducer      |                |                |                |                | Weight | Part No.  |        |
|-----------------|----------------|------------------------|----------------|----------------|----------------|----------------|----------------|----------------|--------|-----------|--------|
| Nominal Size    | D <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> |        |           |        |
| 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 |

B10-M: 12-13

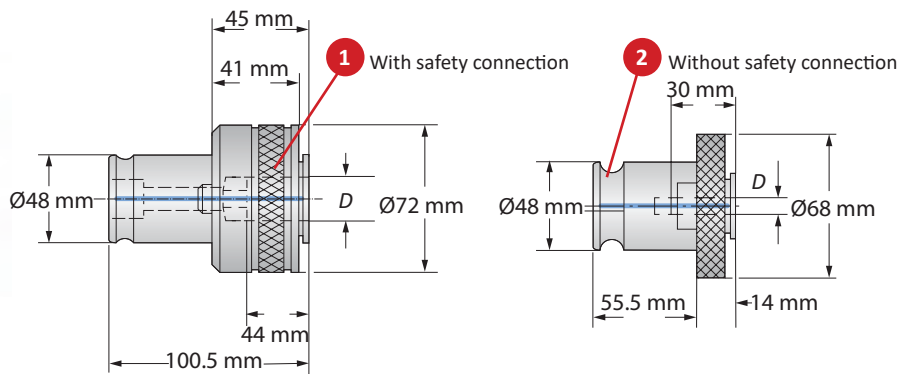
B10: VI-VII

Key on B10-I-1

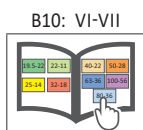
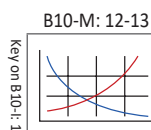


m = Metric (mm)

## Quick Change Adapters



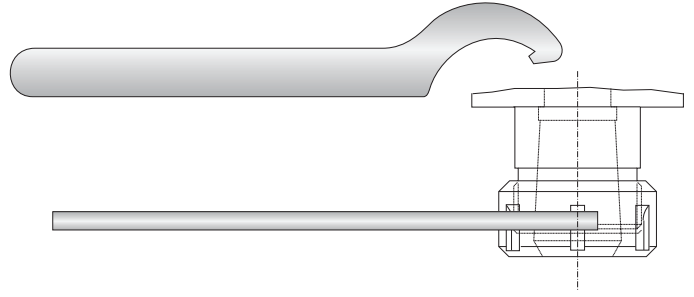
| Shank Dimensions |                  | Quick Change Adapters |          |         |         |         |          |          |                | Part No. |        |
|------------------|------------------|-----------------------|----------|---------|---------|---------|----------|----------|----------------|----------|--------|
| Nominal Size     | D x Square Shank | DIN 352               | DIN 353  | DIN 371 | DIN 374 | DIN 376 | DIN 2182 | DIN 2183 | Torque Setting | 1        | 2      |
| 3                | 9.00 x 11.00     | M 14                  | G 1/4"   | -       | M 14    | M 14    | -        | 9/16"    | 50 - 53        | 233040   | K22434 |
| 3                | 9.00 x 12.00     | M 16                  | G 3/8"   | -       | M 16    | M 16    | -        | 5/8"     | 55 - 58        | 233041   | K22435 |
| 3                | 11.00 x 14.00    | M 18                  | -        | -       | M 18    | M 18    | -        | 11/16"   | 85 - 90        | 233042   | K22436 |
| 3                | 12.00 x 16.00    | M 20                  | G 1/2"   | -       | M 20    | M 20    | -        | 13/16"   | 100 - 106      | 233043   | K22437 |
| <b>m</b>         | 14.50 x 18.00    | M 24                  | -        | -       | M 24    | M 24    | -        | 15/16"   | 140 - 150      | 233044   | K16421 |
| 3                | 16.50 x 20.00    | M 27                  | G 3/4"   | -       | M 27    | M 27    | -        | 1"       | 150 - 160      | 233045   | K16422 |
| 3                | 18.00 x 22.00    | M 30                  | G 7/8"   | -       | 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 |



## 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   |



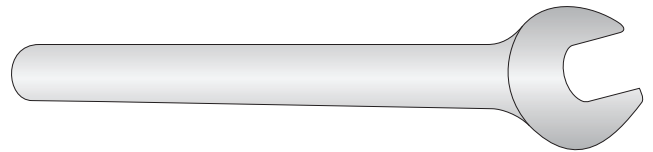
### Service Keys for ISO 15488 (DIN 6499) Collet Chuck Systems

| 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   |



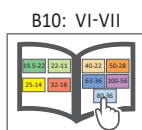
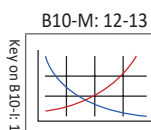
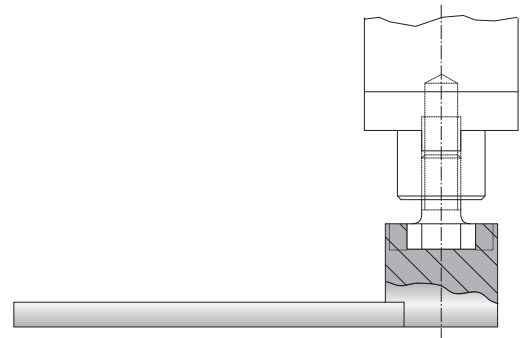
### Service Keys for Erickson Collet Chuck Systems

| Service Key |      |          |
|-------------|------|----------|
| Service Key | Type | Part No. |
| 13          | P    | 315689   |
| 19          | P    | 315691   |



### Service Keys for Milling Machine and Holding Arbors

| Service Keys |          |
|--------------|----------|
| Service Key  | Part No. |
| 13           | 115785   |
| 16           | 115699   |
| 22           | 115660   |
| 27           | 115661   |
| 32           | 115662   |
| 40           | 115663   |
| 60           | 315637   |







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 5-S 6

▶ Diameter Range: 0.00 mm - 620.00 mm



## Operation Facing and Boring

In 1936, the first model of the Wohlhaupter Universal Facing and Boring head was developed to launch the start of Wohlhaupter boring products. It became a staple to the boring industry.

Universal Facing and Boring heads are used on universal milling and boring machines, boring mills, and jig boring machines for machining stationary workpieces in individual and batch productions.

## Applicable Industries



Aerospace



Agriculture



Automotive



Firearms



General  
Machining



Oil & Gas



Renewable  
Energy

Your safety and the safety of others is very important. This catalogue 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 catalogue, 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 catalogue. 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.

# Universal Versatile Boring Heads Table of Contents

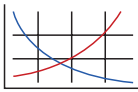
## Reference Icons

The following icons will appear throughout the catalogue 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

UPA Product Overview . . . . . 2 - 3

## UPA 3 Boring System

UPA 3 Boring Head and Accessories . . . . . 4 - 5

UPA 3 Shanks . . . . . 6 - 7

## UPA 4 and 5s6 Boring System

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UPA 5-S 6 Boring Heads and Accessories . . . . . 10 - 11

UPA 4 and 5-S 6 Shanks . . . . . 12

Technical Information and Chip Production Values . . . . . 13

UPA Boring System Diagram . . . . . 14 - 15

| Series    | Diameter Range |
|-----------|----------------|
|           | Metric (mm)    |
| UPA 3     | 0.00 - 260.00  |
| UPA 4     | 0.00 - 400.00  |
| UPA 5-S 6 | 0.00 - 620.00  |

# UPA Product Overview



## UPA Boring Head FACING AND BORING

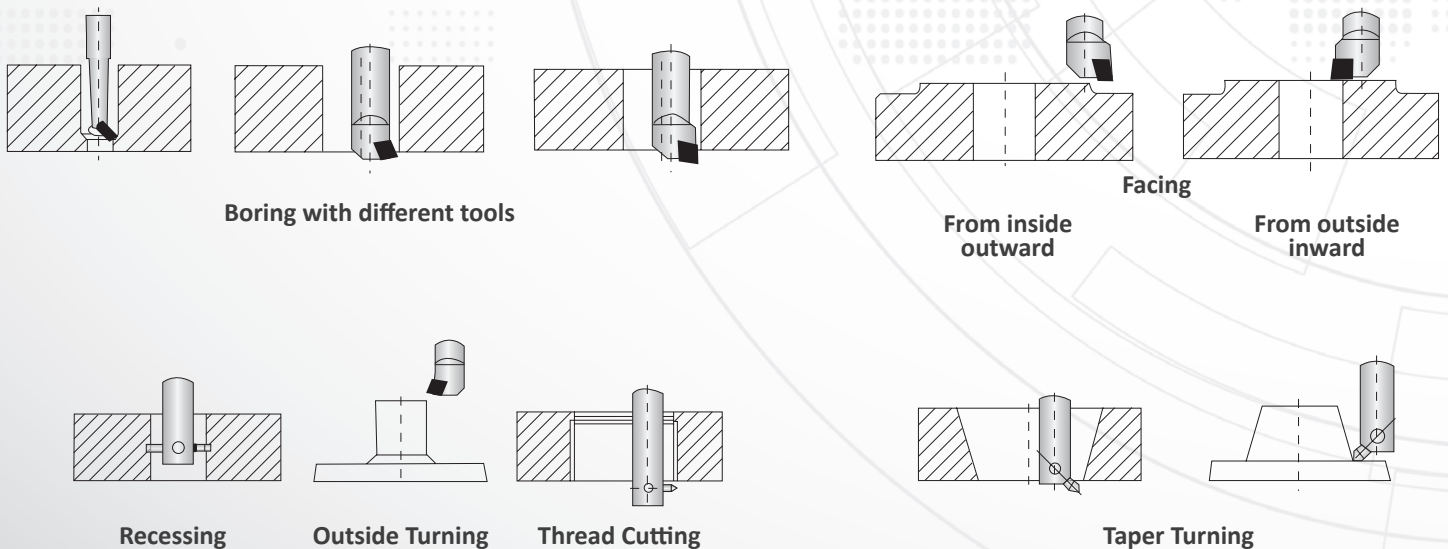
### Universal Facing and Boring Heads

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: 0.00 mm - 620.00 mm
- Slide adjustment up to 112.00 mm
- Can be used in a variety of operations

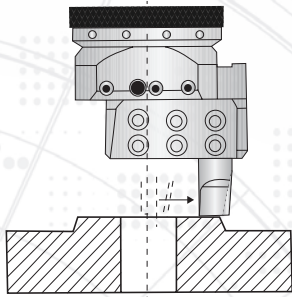
## UNIVERSAL FACING AND BORING Applications



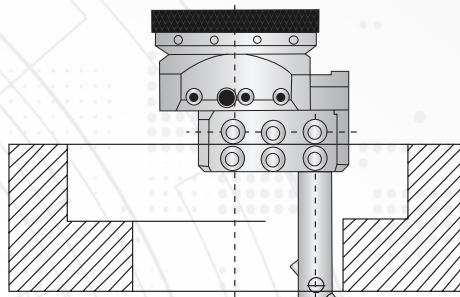


# UNIVERSAL

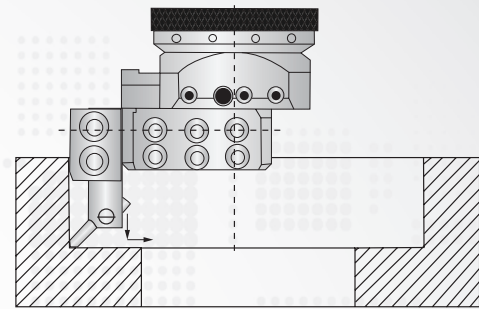
## FACING & BORING Application Examples



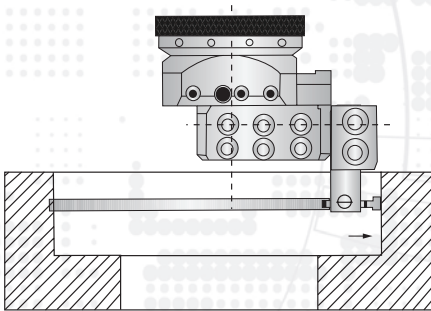
Facing with boring bar directly in slide



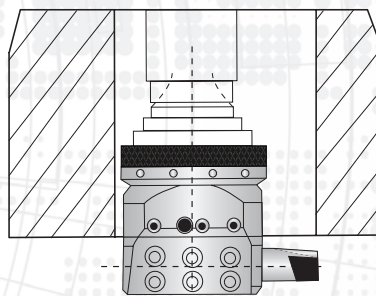
Boring with long boring bar



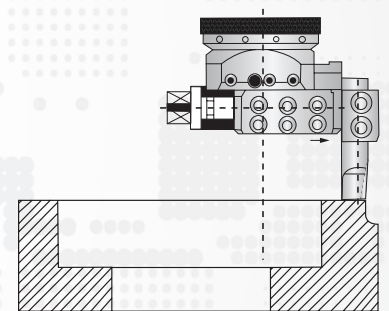
Boring and facing with short boring bar holder and a boring bar



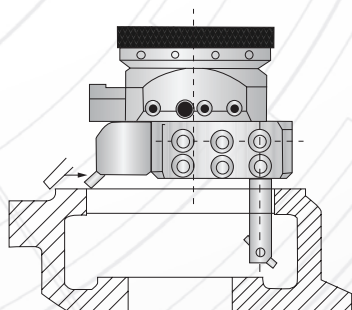
Recessing with short boring bar holder and a boring bar



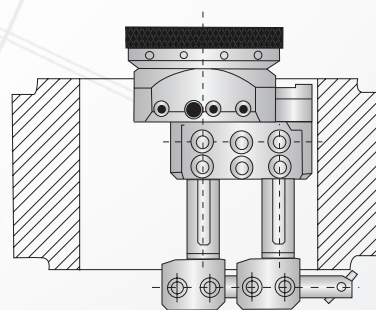
Deep hole boring with boring bar directly in slide



Large diameter facing with a long boring bar holder



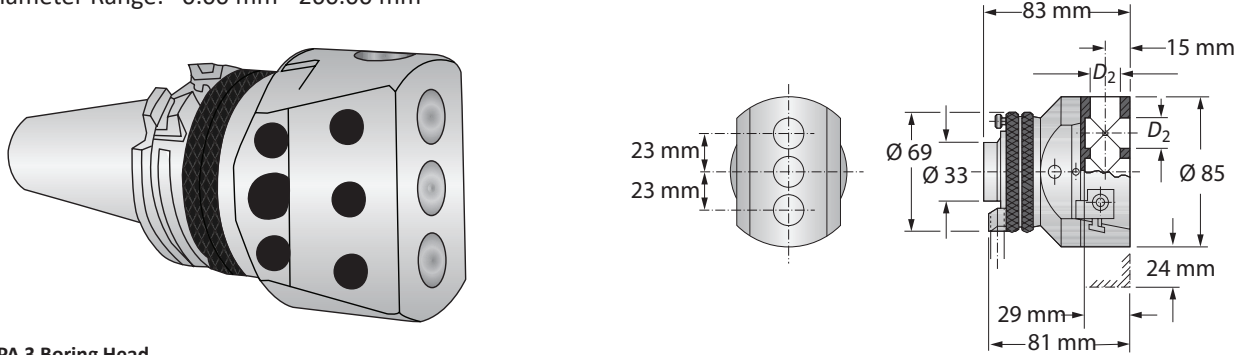
Facing in two areas with one boring bar and a boring bar holder



Facing the reverse side by using boring bar holders contained in attachment

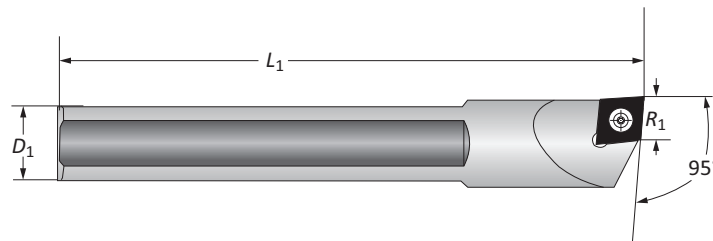
### UPA 3 Boring Head and Accessories

Diameter Range: 0.00 mm - 260.00 mm



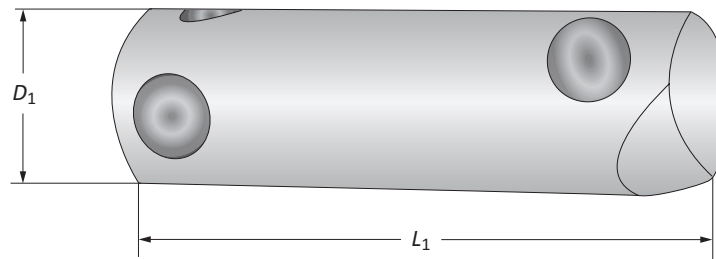
UPA 3 Boring Head

| Boring Head   |       |           |          |
|---------------|-------|-----------|----------|
| Boring Range  | $D_2$ | Weight    | Part No. |
| 0.00 - 260.00 | 18.00 | 2.10 (kg) | 005020   |



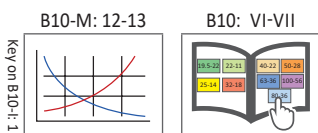
UPA 3 Boring Bars

| Boring Bar |       |       |           | Cutting Direction | Insert Form | Part No. |
|------------|-------|-------|-----------|-------------------|-------------|----------|
| $D_1$      | $L_1$ | $R_1$ | Weight    |                   |             |          |
| 18.00      | 80.00 | 13.50 | 0.10 (kg) | R                 | 103         | 081087   |
| 18.00      | 80.00 | 13.50 | 0.10 (kg) | L                 | 103         | 218088   |



UPA 3 Boring Bars

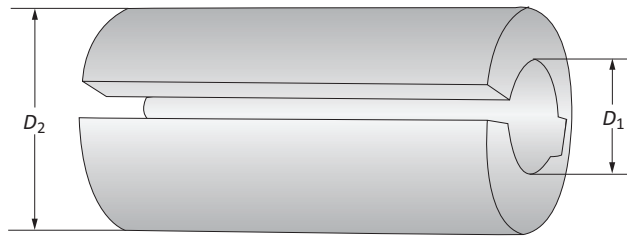
| Boring Bar |        | Boring Depth | Designation | Part No. |
|------------|--------|--------------|-------------|----------|
| $D_1$      | $L_1$  |              |             |          |
| 18.00      | 60.00  | 30.00        | B 306       | 073003   |
| 18.00      | 90.00  | 60.00        | B 309       | 073004   |
| 18.00      | 120.00 | 90.00        | B 312       | 073005   |



m = Metric (mm)

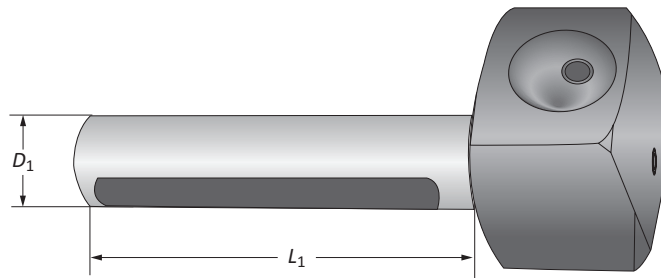
## UPA 3 Accessories

Reducing Sleeves | Boring Bar Holders



### UPA 3 Reducing Sleeves

| Reducing Sleeve |       | Weight    | Part No. |
|-----------------|-------|-----------|----------|
| $D_2$           | $D_1$ |           |          |
| 18.00           | 8.00  | 0.10 (kg) | 071103   |
| 18.00           | 10.00 | 0.10 (kg) | 071104   |
| 18.00           | 12.00 | 0.10 (kg) | 071105   |
| 18.00           | 14.00 | 0.10 (kg) | 071106   |

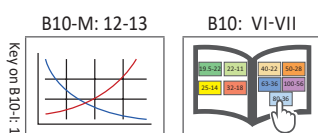
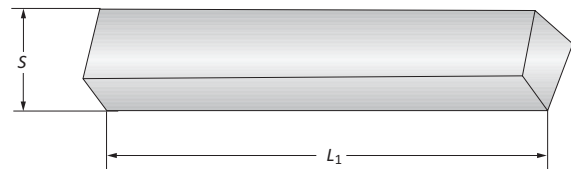


### UPA 3 Boring Bar Holders

| Boring Bar Holder |        | Working Diameter Range | Designation | Part No. |
|-------------------|--------|------------------------|-------------|----------|
| $D_1$             | $L_1$  |                        |             |          |
| 18.00             | 82.00  | 85.00 - 190.00         | BH 308      | 075001   |
| 18.00             | 120.00 | 160.00 - 260.00        | BH 312      | 075002   |

### UPA 3 Square Turning Bit

| Square Turning Bit |       | Weight | Part No. |
|--------------------|-------|--------|----------|
| $S$                | $L_1$ |        |          |
| 6.00               | 40.00 | 11 (g) | 089001   |

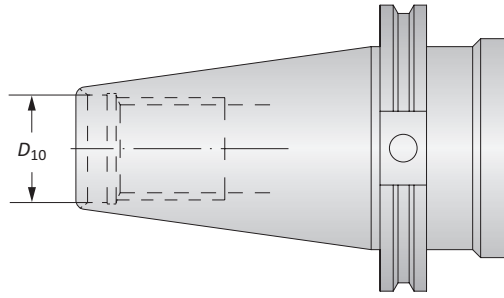


 = Metric (mm)



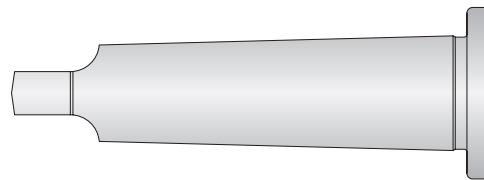
## UPA 3 Master Shanks

CAT 40/50 | Morse Taper



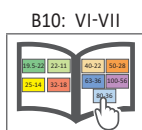
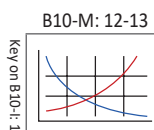
### CAT 40/50 Shanks

|   |  | Shank  |          |           |               |
|---|--|--------|----------|-----------|---------------|
|   |  | Style  | $D_{10}$ | Weight    | Part No.      |
| m |  | CAT 40 | M16 x 2  | 1.06 (kg) | 130001T016960 |
|   |  | CAT 50 | M24 x 3  | 3.20 (kg) | 130001T016962 |



### Morse Taper Shanks

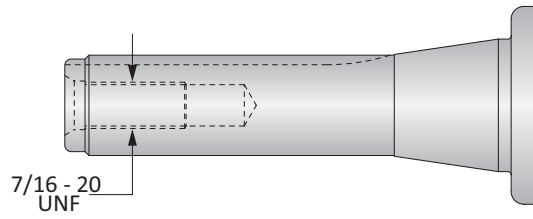
|   |  | Shank |           |               |
|---|--|-------|-----------|---------------|
|   |  | Style | Weight    | Part No.      |
| m |  | MT 3  | 0.30 (kg) | 130001T004509 |
|   |  | MT 4  | 0.55 (kg) | 130001T003590 |
|   |  | MT 5  | 1.35 (kg) | 130001T003920 |




m = Metric (mm)

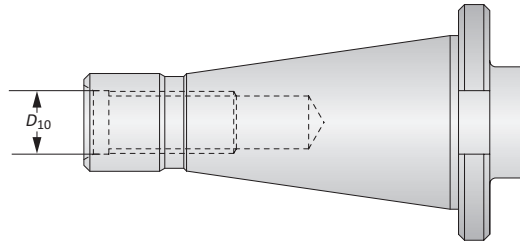
## UPA 3 Master Shanks

R-8 | NMTB 40/50




### R-8 Shanks


| Shank   |           | Part No.      |
|---|-----------|---------------|
| Weight  |           |               |
|  | 0.48 (kg) | 130001T007166 |

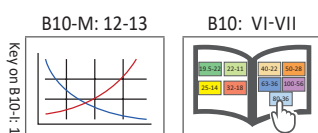


### NMTB 40/50 Shanks

| Shank   |          | Weight    | Part No.      |
|---|----------|-----------|---------------|
| Style   | $D_{10}$ |           |               |
|  | NMTB40   | 0.90 (kg) | 130001T004498 |
|   | NMTB50   | 2.63 (kg) | 130001T004480 |

### Differential Screw

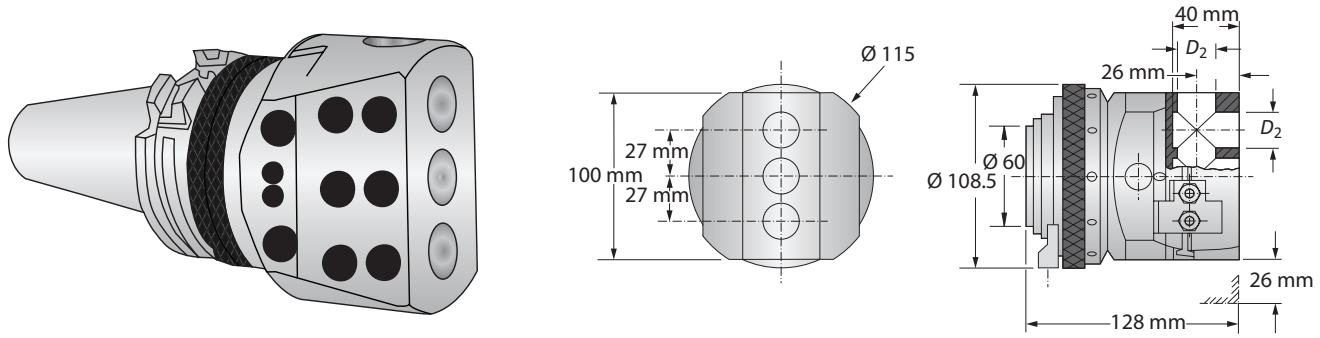
| Thread  | Weight    | Part No. |
|---|-----------|----------|
|  M16 x 2 | 0.03 (kg) | KW9208   |



 = Metric (mm)

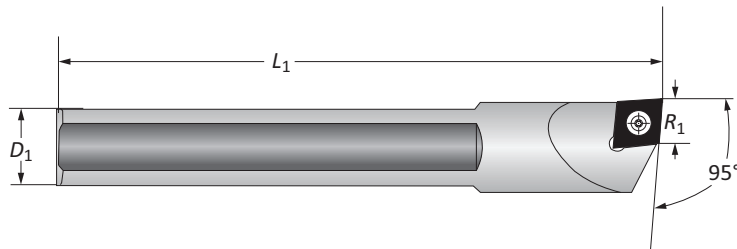
## UPA 4 Boring Heads and Accessories

Diameter Range: 0.000" - 15.748" (0.00 mm - 400.00 mm)



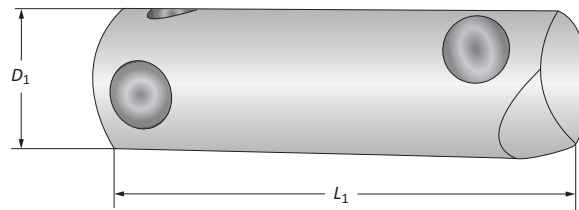
### UPA 4 Boring Heads

|          |               | Boring Head |           |          |
|----------|---------------|-------------|-----------|----------|
|          | Boring Range  | $D_2$       | Weight    | Part No. |
| <b>m</b> | 0.00 - 400.00 | 22.00       | 6.50 (kg) | 007020   |



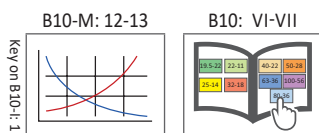
### UPA 4 Boring Bars

|          |       | Boring Bar |       |           |                   |             |          |
|----------|-------|------------|-------|-----------|-------------------|-------------|----------|
|          | $D_1$ | $L_1$      | $R_1$ | Weight    | Cutting Direction | Insert Form | Part No. |
| <b>m</b> | 22.00 | 100.00     | 13.50 | 0.10 (kg) | R                 | 103         | 081092   |
|          | 22.00 | 100.00     | 13.50 | 0.10 (kg) | L                 | 103         | 218089   |



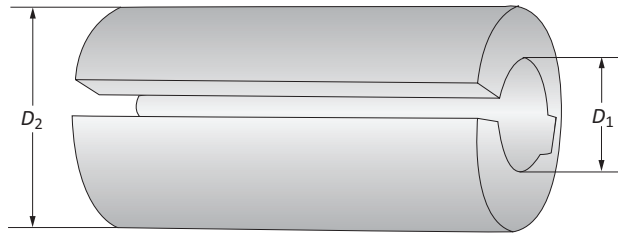
### UPA 4 Boring Bars

|          |       | Boring Bar |              |             |          |
|----------|-------|------------|--------------|-------------|----------|
|          | $D_1$ | $L_1$      | Boring Depth | Designation | Part No. |
| <b>m</b> | 22.00 | 85.00      | 45.00        | B 408       | 073006   |
|          | 22.00 | 125.00     | 85.00        | B 412       | 073007   |
|          | 22.00 | 165.00     | 125.00       | B 416       | 073008   |



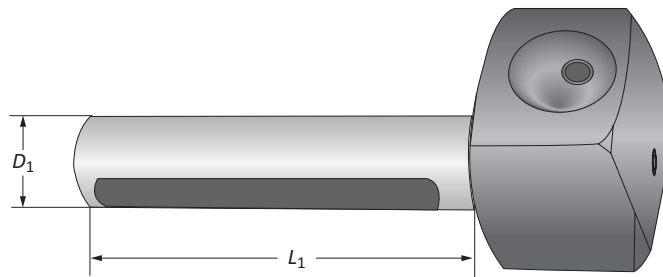
## UPA 4 Accessories

Reducing Sleeves | Boring Bar Holders



### UPA 4 Reducing Sleeves

| Reducing Sleeve |       |           |               |
|-----------------|-------|-----------|---------------|
| $D_2$           | $D_1$ | Weight    | Part No.      |
| 22.00           | 8.00  | 0.10 (kg) | <b>071107</b> |
| 22.00           | 10.00 | 0.10 (kg) | <b>071108</b> |
| 22.00           | 12.00 | 0.10 (kg) | <b>071109</b> |
| 22.00           | 14.00 | 0.08 (kg) | <b>071110</b> |
| 22.00           | 18.00 | 0.08 (kg) | <b>071111</b> |

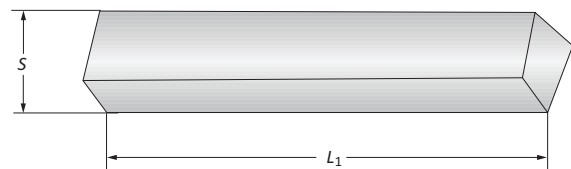


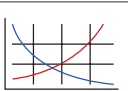

### UPA 4 Boring Bar Holders

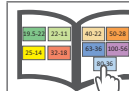
| Boring Bar Holder |        |             |                        |               |
|-------------------|--------|-------------|------------------------|---------------|
| $D_1$             | $L_1$  | Designation | Working Diameter Range | Part No.      |
| 22.00             | 98.00  | BH 410      | 115.00 - 240.00        | <b>075003</b> |
| 22.00             | 180.00 | BH 418      | 220.00 - 400.00        | <b>075004</b> |

### UPA 4 Square Turning Bit

| Square Turning Bit |       |        |               |
|--------------------|-------|--------|---------------|
| $S$                | $L_1$ | Weight | Part No.      |
| 6.00               | 40.00 | 11 (g) | <b>089001</b> |



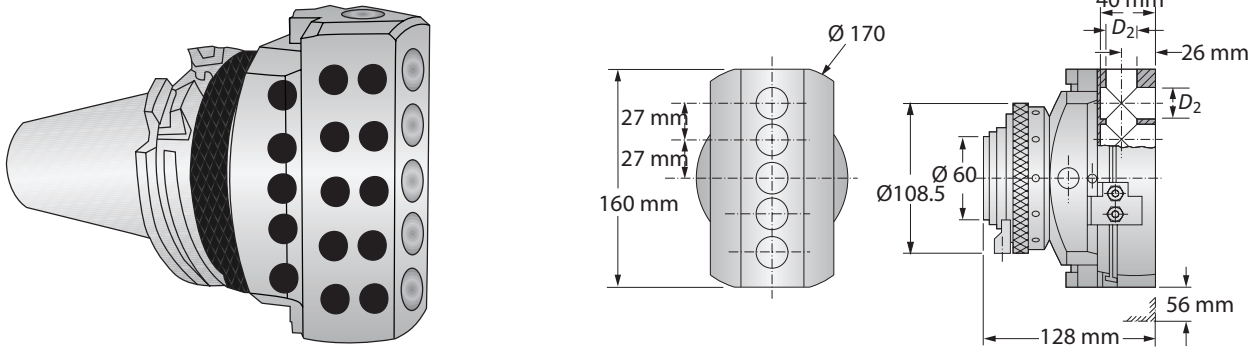
B10-M: 12-13  

B10: VI-VII 

 = Metric (mm)

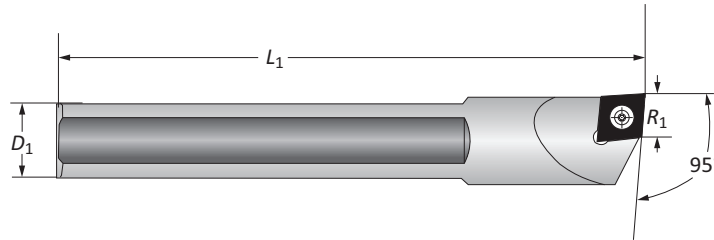
## UPA 5-S 6 Boring Heads and Accessories

Diameter Range: 0.00 mm - 620.00 mm



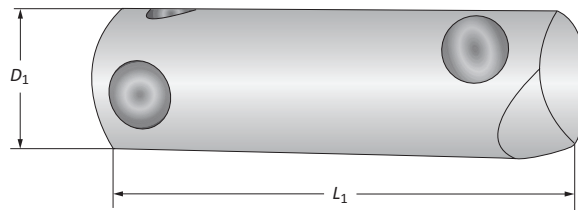
UPA 5-S 6 Boring Heads

|               |       | Boring Head |          |  |
|---------------|-------|-------------|----------|--|
| Boring Range  | $D_2$ | Weight      | Part No. |  |
| 0.00 - 620.00 | 22.00 | 7.90 (kg)   | 013020   |  |



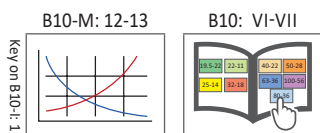
UPA 5-S 6 Boring Bars

|       |        | Boring Bar |           |                   |             |          |  |
|-------|--------|------------|-----------|-------------------|-------------|----------|--|
| $D_1$ | $L_1$  | $R_1$      | Weight    | Cutting Direction | Insert Form | Part No. |  |
| 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

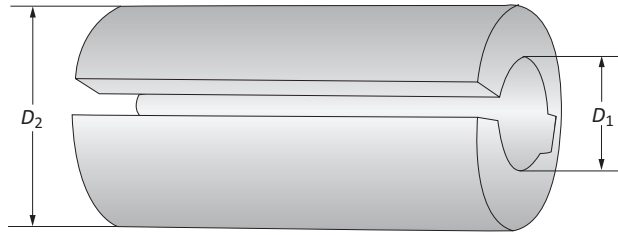
|       |        | Boring Bar   |             |          |  |
|-------|--------|--------------|-------------|----------|--|
| $D_1$ | $L_1$  | Boring Depth | Designation | Part No. |  |
| 22.00 | 85.00  | 45.00        | B 408       | 073006   |  |
| 22.00 | 125.00 | 85.00        | B 412       | 073007   |  |
| 22.00 | 165.00 | 125.00       | B 416       | 073008   |  |



= Metric (mm)

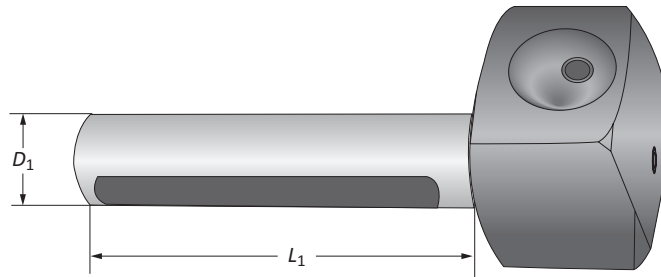
## UPA 5-S 6 Accessories

Reducing Sleeves | Boring Bar Holders



### UPA 5-S 6 Reducing Sleeves

| Reducing Sleeve |       |           |               |
|-----------------|-------|-----------|---------------|
| $D_2$           | $D_1$ | Weight    | Part No.      |
| 22.00           | 8.00  | 0.10 (kg) | <b>071107</b> |
| 22.00           | 10.00 | 0.10 (kg) | <b>071108</b> |
| 22.00           | 12.00 | 0.10 (kg) | <b>071109</b> |
| 22.00           | 14.00 | 0.08 (kg) | <b>071110</b> |
| 22.00           | 18.00 | 0.08 (kg) | <b>071111</b> |

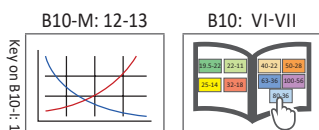
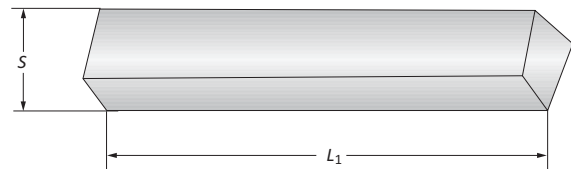


### UPA 5-S 6 Boring Bar Holders

| Boring Bar Holder |        |             |                        |               |
|-------------------|--------|-------------|------------------------|---------------|
| $D_1$             | $L_1$  | Designation | Working Diameter Range | Part No.      |
| 22.00             | 228.00 | BH 513      | 120.00 - 400.00        | <b>075003</b> |
| 22.00             | 230.00 | BH 523      | 270.00 - 620.00        | <b>075004</b> |

### UPA 5-S 6 Square Turning Bit

| Square Turning Bit |       |        |               |
|--------------------|-------|--------|---------------|
| $S$                | $L_1$ | Weight | Part No.      |
| 6.00               | 40.00 | 11 (g) | <b>089001</b> |



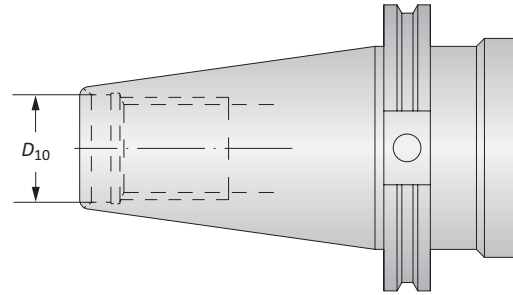
**m** = Metric (mm)

## UPA 4 and 5-S 6 Master Shanks

CAT 40/50 | Morse Taper | NMTB 40/50

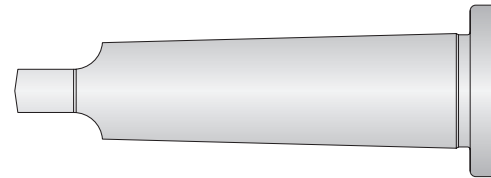
### CAT 40/50 Shanks

| Shank           |          |           |               |  |
|-----------------|----------|-----------|---------------|--|
| Style           | $D_{10}$ | Weight    | Part No.      |  |
| <b>m</b> CAT 40 | M16 x 2  | 1.45 (kg) | 130005T016960 |  |
| CAT 50          | M24 x 3  | 3.20 (kg) | 130005T016962 |  |



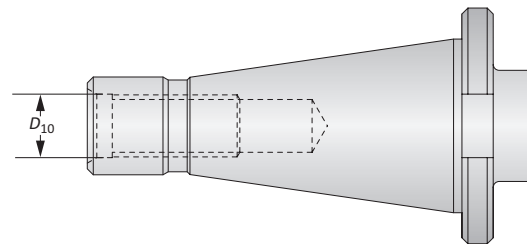
### Morse Taper Shanks

| Shank         |           |               |  |
|---------------|-----------|---------------|--|
| Style         | Weight    | Part No.      |  |
| <b>m</b> MT 4 | 0.86 (kg) | 130005T003590 |  |
| MT 5          | 1.65 (kg) | 130005T003920 |  |



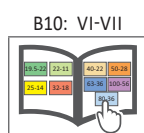
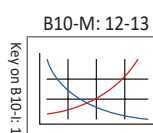
### NMTB 40/50 Shanks

| Shank           |                    |           |               |
|-----------------|--------------------|-----------|---------------|
| Style           | $D_{10}$           | Weight    | Part No.      |
| <b>m</b> NMTB40 | $\frac{5}{8}$ - 11 | 1.30 (kg) | 130005T004498 |
| NMTB50          | 1 - 8              | 2.90 (kg) | 130005T004480 |



### Differential Screw

| Thread             | Weight    | Part No. |
|--------------------|-----------|----------|
| <b>m</b> M20 x 2.5 | 0.07 (kg) | KW9209   |

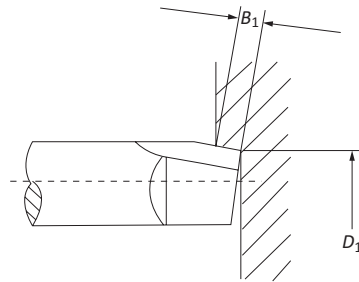




## Technical Information | Chip Production Values

### Technical Data

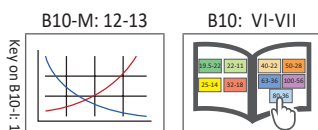
| Type  | UPA 3         | UPA 4  | UPA 5-S 6  |
|---|---------------|--|--|
| Working accuracy                            | ±0.005        | ±0.005   | ±0.005   |
| Diameter range                              | 25.00         | 35.00  | 45.00  |
| MT shank                                    | 3.00          | 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, 0.08, 0.10, 0.12, 0.14, 0.16, 0.18, 0.20, 0.22, 0.24 | 0.02, 0.04, 0.06, 0.08, 0.10, 0.12, 0.14, 0.16, 0.18, 0.20, 0.22, 0.24 |
| Fine adjustment of one division             | 0.01          | 0.01   | 0.01   |
| Fine adjustment of one revolution           | 1.00          | 0.40   | 0.40   |
| Rapid return per revolution                 | 1.00          | -  | -  |
| Rapid return setting per revolution         | -             | 6.00   | 6.00   |
| Largest diameter of slide                   | 85.00         | 115.00   | 170.00   |
| Height of boring head without shank         | 81.00         | 128.00   | 128.00   |
| Tool locations in slide                     | 18.00         | 22.00  | 22.00  |
| Max permissible revolutions                 | 1000          | 600  | 600  |
| End cut off accuracy                        | ±0.05         | ±0.05  | ±0.05  |



### Chip Production Values

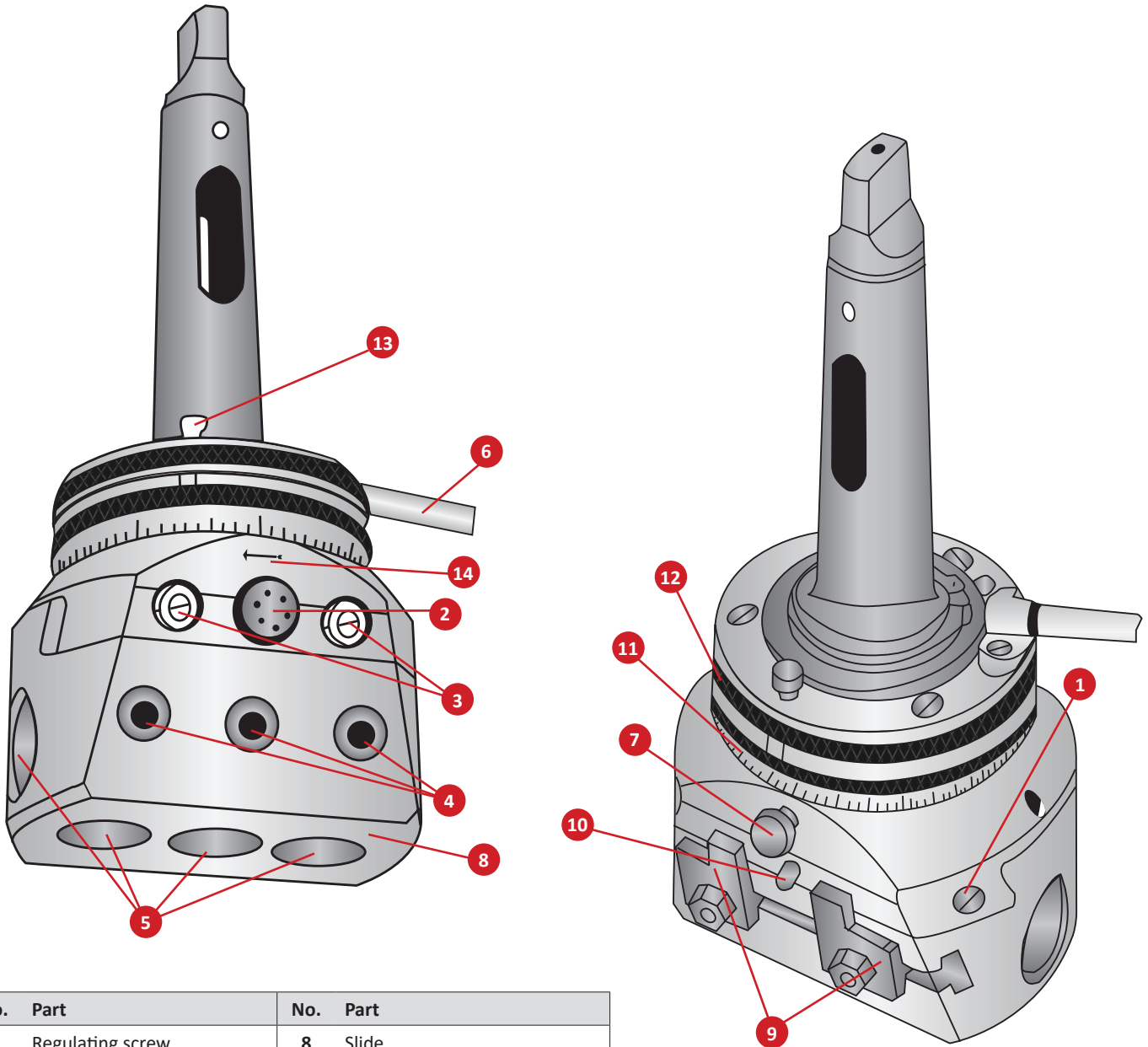
| Chip Cutting Guide                            | Type    | UPA 3  | UPA 4            | UPA 5-S 6        |
|---|---------|--------|------------------|------------------|
| Max load                                      | kW      | 2.50   | 7.00             | 9.50             |
| With slide feed                               | 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           |
| Maximum width of chip                         | $B_1$   | 4.00   | 7.00, 6.00, 4.00 | 8.00, 7.00, 5.00 |
| Maximum working $\varnothing$                 | $D_1$   | 260.00 | 400.00           | 500.00 / 620.00  |
| Max width of clip without reinforcement rings | $B_1$   | 2.00   | 2.20, 2.00, 1.50 | 2.50, 2.00, 1.50 |
| Max width of clip with reinforcement rings*   | $B_1$   | -      | 4.50, 4.00, 3.00 | 5.00, 4.00, 3.00 |

\*By using the reinforcement rings contained in the normal attachment, chip cutting capacity is increased by 100%

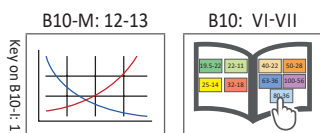


$\text{m}$  = Metric (mm)

UPA 3 Boring Head Diagram

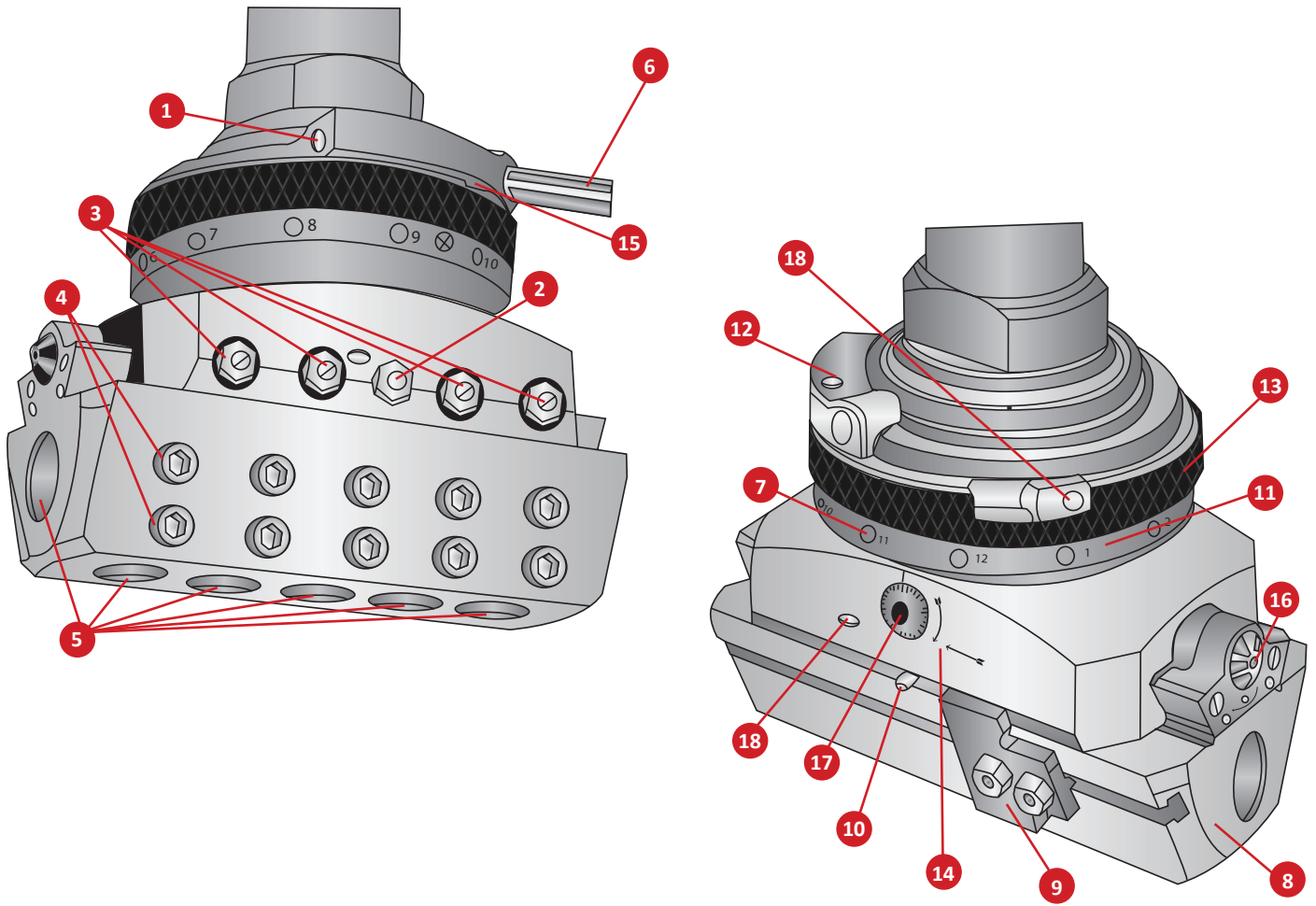


| No. | Part             | No. | Part                       |
|-----|------------------|-----|----------------------------|
| 1   | Regulating screw | 8   | Slide                      |
| 2   | Locking screw    | 9   | Stop                       |
| 3   | Setting screws   | 10  | Fixed pin                  |
| 4   | Fastening screw  | 11  | Scale ring                 |
| 5   | Tool post holes  | 12  | Holding ring               |
| 6   | Holding rod      | 13  | Button for return movement |
| 7   | Feed button      | 14  | Arrow                      |

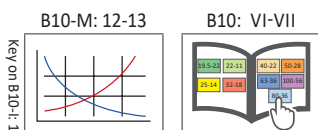


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UPA 4 / 5-S 6 Boring Heads Diagram



| No. | Part                      | No. | Part               |
|-----|---------------------------|-----|--------------------|
| 1   | Regulating screw          | 10  | Fixed pin          |
| 2   | Locking screw             | 11  | Scale ring         |
| 3   | Setting screws            | 12  | Retaining ring     |
| 4   | Fastening screws          | 13  | Feed ring          |
| 5   | Tool post holes           | 14  | Arrow              |
| 6   | Holding rod               | 15  | Recess             |
| 7   | Feed buttons              | 16  | Quick setting dial |
| 8   | Slide with rotation bores | 17  | Fine setting dial  |
| 9   | Stop                      | 18  | Release ring       |



 = Metric (mm)



SECTION

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# B10-K

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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 you save time and money.

If you have a particularly unique or difficult application, contact our Application Engineering team.

email: [engineering.eu@alliedmachine.com](mailto:engineering.eu@alliedmachine.com)

Your safety and the safety of others is very important. This catalogue 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 catalogue, 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 catalogue. 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

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| Anti-Vibration   Multistep Boring Tool . . . . .    | 4 |
| OD Turning Tool   Padded Line Boring Tool . . . . . | 5 |
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## ES-Bore Fine Boring Lay Down Cartridge

### DIGITAL ES-BORE WITH ADAPTER PLATE



**NOTE:** ES-Bore digital fine boring cartridges must be used with the new 3E<sup>TECH+</sup> and adapter plate. The ES-Bore cannot be used with 3E<sup>TECH</sup>.

**NOTE:** 3E<sup>TECH+</sup> adjustment accuracy of 0.001 mm on diameter

### ANALOG ES-BORE



### LAY DOWN CARTRIDGES

## ES-BORE

- ▶ Mounts to custom designed boring tools
- ▶ Available with digital 3E<sup>TECH+</sup> or analog adjustment
- ▶ Accurate adjustments with easy-to-use settings
- ▶ Versatility in many different application types over 1.102" (28.00 mm)



GROOVING TOOLS

**EK GROOVER**

- ▶ Create complex grooves faster and deeper than ever before
- ▶ Eliminate chatter in hard-to-reach internal forms
- ▶ The electronically-controlled insert release can be adapted to most machine tools
- ▶ Single or double grooving in one operation

ROUGH BORING TOOLS

**LAY DOWN CARTRIDGE**

- ▶ Increase the productivity of your roughing tool while protecting your investment
- ▶ If the tool is ever damaged, simply replace a cartridge and resume making chips



*SPECIAL BORING TOOLS*  
**ANTI-VIBRATION**

- ▶ Vibration dampening rings
- ▶ Optimized tool weight
- ▶ Used to reduce harmonic vibration in deeper boring applications



*SPECIAL BORING TOOLS*  
**MULTISTEP BORING TOOL**

- ▶ Fine adjustment tool for reverse machining
- ▶ Combined with multidiameter fine adjustable cartridges for finish machining



*SPECIAL BORING TOOLS*

**OD TURNING TOOLS**

- ▶ Multistep OD turning
- ▶ Drastically reduce cycle time
- ▶ Improve surface finish and feature concentricity

*SPECIAL BORING TOOLS*

**PADDED TOOLING**

- ▶ Aids in stable part processing
- ▶ Expands length to diameter capabilities
- ▶ Improves surface finish
- ▶ Pads are replaceable to extend tool life



NOTE: 3E<sup>TECH+</sup> adjustment accuracy of 0.001 mm on diameter



NOTE: 3E<sup>TECH+</sup> adjustment accuracy of 0.001 mm on diameter

### 3E<sup>TECH+</sup> BORING TOOL

## MULTISTEP 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
- ▶ Easy diameter adjustment at the machine spindle

DigiBore Special Boring Tools



**NOTE:** Metric item pictured  
**NOTE:** Digital adjustment accuracy of 0.002 mm on diameter



**NOTE:** Metric item pictured  
**NOTE:** Digital adjustment accuracy of 0.002 mm on diameter

FINISH BORING TOOLS

**DIGIBORE WITH 249 (248)**

- ▶ Standard DigiBore head, standard 249 (248) head, and special slide for precise two-step bore
- ▶ MVS connection

FINISH BORING TOOLS

**DIGIBORE SPECIAL**

- ▶ Standard DigiBore boring head with OD turn and OD chamfer insert holder
- ▶ MVS connection

## Combi-Line Special Boring Tool

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*ROUGH, FINISH, and CHAMFER BORING TOOLS*

### **COMBI-LINE**

---

- ▶ Standard Combi-Line tooling with added chamfer cartridge
- ▶ MVS connection



Online Tools

ToolMD® | Wohlhaupter® Boring Insert Selector

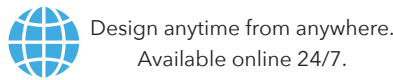


Design Your Own Solutions

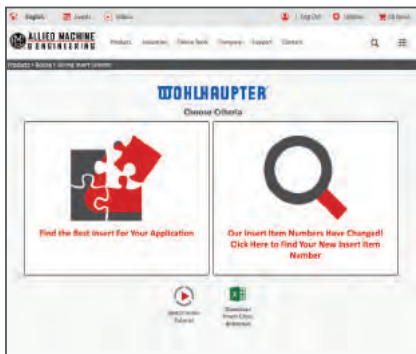
ToolMD is a configurator for Wohlhaupter modular tooling systems that allows customers to virtually build their own solution. This online-based simulator puts the entire Wohlhaupter product line at your fingertips. It provides a digital bank of every individual part that Wohlhaupter manufactures in either inch or metric.

Once you select a component, you will be guided by a series of user-friendly prompts to select the next components until you have built your tooling system. Throughout the process, you can monitor the size of your custom tool and ensure what you're building matches your real-life specifications. Once a complete system is virtually assembled, the program will render the tool in either a 2D or 3D drawing to view on your device.

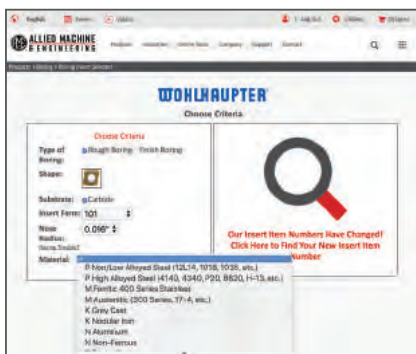
Designing your tools with ToolMD saves you time and allows you to instantly obtain the right tool for the job.



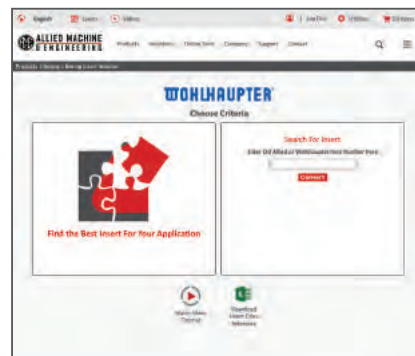
WOHLHAUPTER® | Boring Insert Selector  
www.alliedmachine.com/bis



- 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

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



SECTION

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# B10-L

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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 catalogue 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 catalogue, 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 catalogue. 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

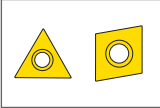


Renewable  
Energy

# Lay Down Cartridges Table of Contents

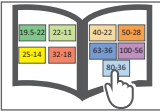
## Reference Icons

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



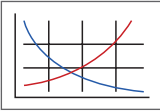
### Inserts

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

## ES-Bore Lay Down Cartridges

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| Analogue Insert Forms 101 and 20. . . . .                    | 3 |
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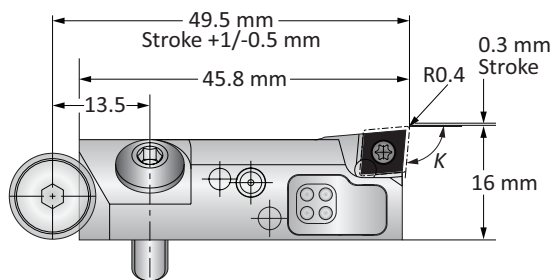
## Compact Lay Down Cartridges

|   |    |
|---|----|
| Insert Forms 101, 103, 104 and 105. . . . . | 6  |
| Insert Form 112. . . . .                    | 7  |
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| Mounting Dimensions. . . . .                | 9  |
| Accessories. . . . .                        | 10 |



## ES-Bore Digital 3E<sup>TECH+</sup> Fine Boring Cartridges | Insert Forms 101 and 20

Diameter Range: ≥1.102" (28.00 mm)



| Holder Type | K   | ISO         | Minimum Boring Diameter | Cutting Direction | Insert Form | Weight    | Part No.      |
|-------------|-----|-------------|-------------------------|-------------------|-------------|-----------|---------------|
|             | 90° | CC.. 0602.. | 28.00                   | Right             | 101         | 0.06 (kg) | <b>345032</b> |
|             | 90° | CC.. 0602.. | 28.00                   | Left              | 101         | 0.06 (kg) | <b>345033</b> |
|             | 90° | TOGX 0802.. | 28.00                   | Right             | 20          | 0.06 (kg) | <b>345042</b> |
|             | 90° | TOGX 0802.. | 28.00                   | Left              | 20          | 0.06 (kg) | <b>345043</b> |
|             | 95° | CC.. 0602.. | 28.00                   | Right             | 101         | 0.06 (kg) | <b>345030</b> |
|             | 95° | CC.. 0602.. | 28.00                   | Left              | 101         | 0.06 (kg) | <b>345031</b> |
|             | 95° | TOGX 0802.. | 28.00                   | Right             | 20          | 0.06 (kg) | <b>345040</b> |
|             | 95° | TOGX 0802.. | 28.00                   | Left              | 20          | 0.06 (kg) | <b>345041</b> |

**NOTE:** ES-Bore digital fine boring cartridges must be used with the new 3E<sup>TECH+</sup> and adapter plate. The ES-Bore cannot be used with 3E<sup>TECH</sup>.  
**NOTE:** 3E<sup>TECH+</sup> module, adapter, and charging unit sold separately.

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

| Part No.      | Charging Unit* |
|---------------|----------------|
| <b>536015</b> | <b>536016</b>  |

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



**NOTE:** 3E<sup>TECH+</sup> adjustment accuracy of 0.001 mm on diameter

### Adapter Plate for 3E<sup>TECH+</sup>

| Cutting Direction | Part No.      |
|-------------------|---------------|
| Right             | <b>536017</b> |
| Left              | <b>536018</b> |

**NOTE:** Adapter sold separately.



B10-M: 12-13 B10-H B10: VI-VII

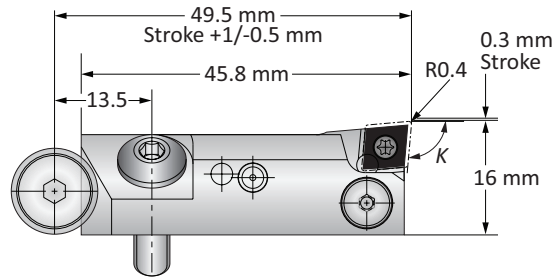
Key on B10-L: 1

**m** = Metric (mm)  
 Inserts sold separately



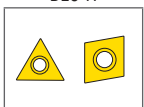
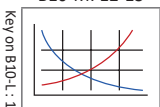
## ES-Bore Analogue Fine Boring Cartridges | Insert Forms 101 and 20

Diameter Range:  $\geq 1.102''$  (28.00 mm)



| Holder Type | K   | ISO         | Minimum Boring Diameter | Cutting Direction | Insert Form | Weight    | Part No.      |
|-------------|-----|-------------|-------------------------|-------------------|-------------|-----------|---------------|
|             | 90° | CC.. 0602.. | 28.00                   | Right             | 101         | 0.06 (kg) | <b>345036</b> |
|             | 90° | CC.. 0602.. | 28.00                   | Left              | 101         | 0.06 (kg) | <b>345037</b> |
|             | 90° | TOGX 0802.. | 28.00                   | Right             | 20          | 0.06 (kg) | <b>345046</b> |
|             | 90° | TOGX 0802.. | 28.00                   | Left              | 20          | 0.06 (kg) | <b>345047</b> |
|             | 95° | CC.. 0602.. | 28.00                   | Right             | 101         | 0.06 (kg) | <b>345034</b> |
|             | 95° | CC.. 0602.. | 28.00                   | Left              | 101         | 0.06 (kg) | <b>345035</b> |
|             | 95° | TOGX 0802.. | 28.00                   | Right             | 20          | 0.06 (kg) | <b>345044</b> |
|             | 95° | TOGX 0802.. | 28.00                   | Left              | 20          | 0.06 (kg) | <b>345045</b> |

Ⓜ

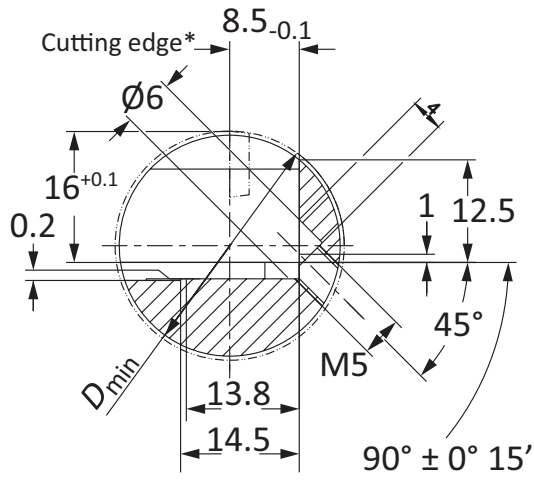


Key on B10-L: 1

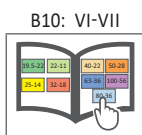
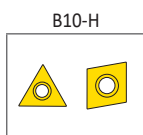
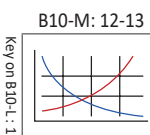
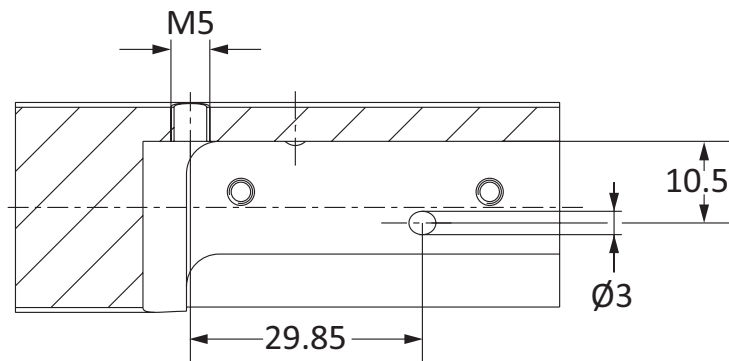
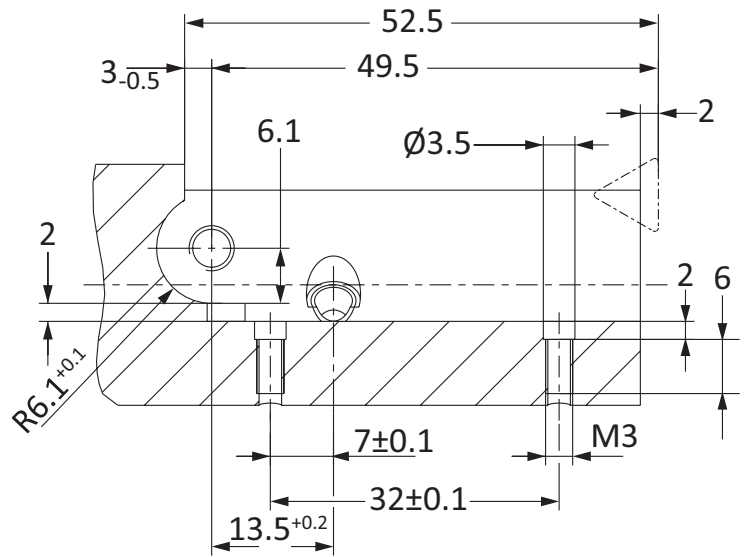
Ⓜ = Metric (mm)  
Inserts sold separately



## ES-Bore Mounting Dimensions

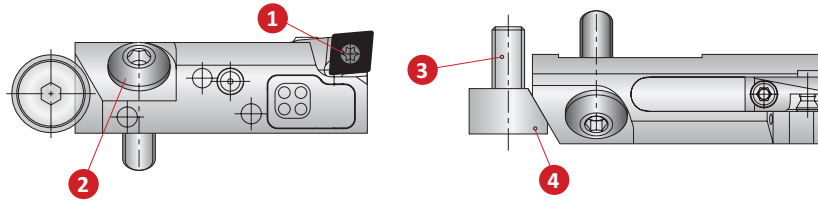


\*For  $D \leq 32$  mm cutting edge 1 mm before center



## ES-Bore Accessories

Screws | Service Keys | 3E<sup>TECH+</sup> Accessories



|             | 1<br>Insert Screw |                | 2<br>Mounting Screw | 3<br>Height Adjusting Screw | 4<br>Height Adjusting Wedge |
|-------------|-------------------|----------------|---------------------|-----------------------------|-----------------------------|
|             | Insert Form 101   | Insert Form 20 |                     |                             |                             |
| Screw       | 115676 (T8)       | 115535 (T7)    | 515632 (s3)         | 115466 (s3)                 | 415721                      |
| Service Key | 115590            | 115591         | 051110              | 051110                      | -                           |

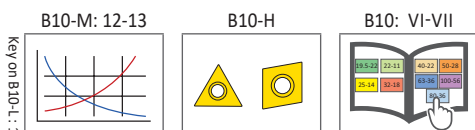
### 3E<sup>TECH+</sup> Accessories


|                    |
|--------------------|
| 1<br>Charging Unit |
| Part No.<br>536016 |

**NOTE:** Charging unit sold separately from 3E<sup>TECH+</sup>



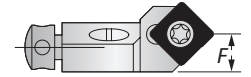
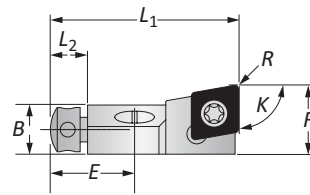
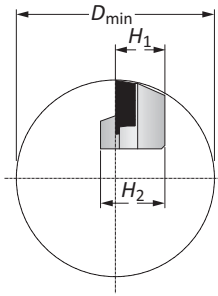
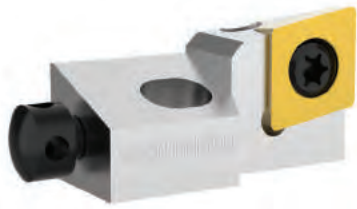
**NOTE:** 3E<sup>TECH+</sup> adjustment accuracy of 0.001 mm on diameter



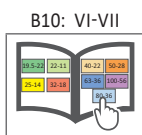
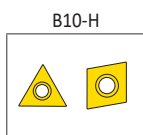
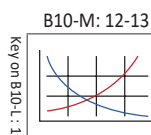
 = Metric (mm)  
Inserts sold separately

## Compact Lay Down Cartridges | Insert Forms 101, 103, 104 & 105

Diameter Range:  $\geq 25.00$  mm



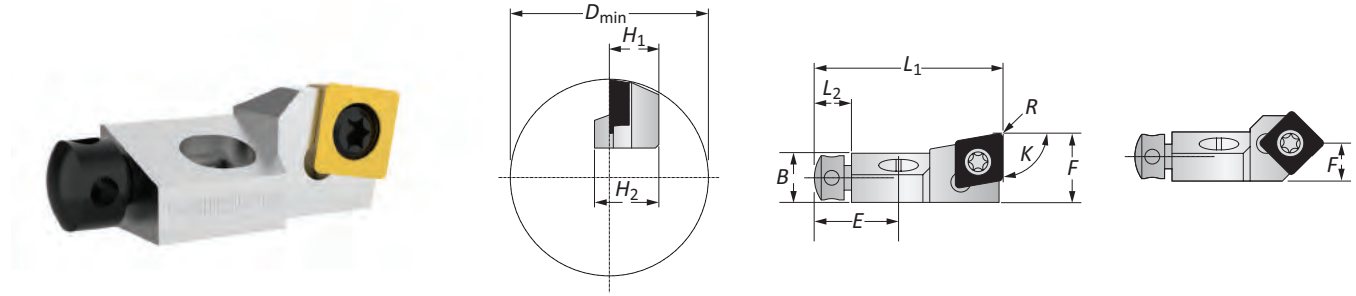
| Holder Type | K   | ISO        | D <sub>min</sub><br>Boring<br>Range | Designation  | Insert Holder  |                |       |                |                |       |             |       | Insert<br>Form | Part<br>No. |
|-------------|-----|------------|-------------------------------------|--------------|----------------|----------------|-------|----------------|----------------|-------|-------------|-------|----------------|-------------|
|             |     |            |                                     |              | L <sub>1</sub> | L <sub>2</sub> | B     | H <sub>1</sub> | H <sub>2</sub> | F     | R<br>Radius | E     |                |             |
|             | 90° | CC..0602.. | 25.00                               | SCFCR08CK-06 | 28.00          | 6.00           | 6.50  | 8.00           | 10.00          | 10.00 | 0.40        | 13.00 | 101            | 345001      |
|             | 90° | CC..09T3.. | 40.00                               | SCFCR10CK-09 | 38.00          | 7.50           | 10.00 | 10.00          | 13.00          | 14.00 | 0.80        | 17.00 | 103            | 345002      |
|             | 90° | CC..1204.. | 50.00                               | SCFCR12CK-12 | 45.00          | 8.00           | 14.00 | 12.00          | 16.00          | 20.00 | 0.80        | 20.00 | 104            | 345003      |
|             | 90° | CC..1605.. | 55.00                               | SCFCR14CK-16 | 54.00          | 8.00           | 16.00 | 14.00          | 18.00          | 23.00 | 0.80        | 23.50 | 105            | 345004      |
|             | 80° | CC..0602.. | 25.00                               | SCOCR08CK-06 | 28.00          | 6.00           | 6.50  | 8.00           | 10.00          | 9.00  | 0.40        | 13.00 | 101            | 345014      |
|             | 80° | CC..09T3.. | 40.00                               | SCOCR10CK-09 | 38.00          | 7.50           | 10.00 | 10.00          | 13.00          | 12.50 | 0.80        | 17.00 | 103            | 345009      |
|             | 75° | CC..0602.. | 25.00                               | SCR08CK-06   | 28.00          | 6.00           | 6.50  | 8.00           | 10.00          | 8.50  | 0.40        | 13.00 | 101            | 345013      |
|             | 75° | CC..09T3.. | 40.00                               | SCR10CK-09   | 38.00          | 7.50           | 10.00 | 10.00          | 13.00          | 11.70 | 0.80        | 17.00 | 103            | 345008      |
|             | 70° | CC..0602.. | 25.00                               | SCPCR08CK-06 | 28.00          | 6.00           | 6.50  | 8.00           | 10.00          | 8.00  | 0.40        | 13.00 | 101            | 345012      |
|             | 70° | CC..09T3.. | 40.00                               | SCPCR10CK-09 | 38.00          | 7.50           | 10.00 | 10.00          | 13.00          | 11.00 | 0.80        | 17.00 | 103            | 345007      |
|             | 60° | CC..0602.. | 25.00                               | SCTCR08CK-06 | 28.00          | 6.00           | 6.50  | 8.00           | 10.00          | 7.00  | 0.40        | 13.00 | 101            | 345011      |
|             | 60° | CC..09T3.. | 40.00                               | SCTCR10CK-09 | 38.00          | 7.50           | 10.00 | 10.00          | 13.00          | 9.70  | 0.80        | 17.00 | 103            | 345006      |
|             | 45° | CC..0602.. | 25.00                               | SCSCR08CK-06 | 24.00          | 6.00           | 6.50  | 8.00           | 10.00          | 10.00 | 0.40        | 13.00 | 101            | 345010      |
|             | 45° | CC..09T3.. | 40.00                               | SCSCR10CK-09 | 32.00          | 7.50           | 10.00 | 10.00          | 13.00          | 14.50 | 0.80        | 17.00 | 103            | 345005      |








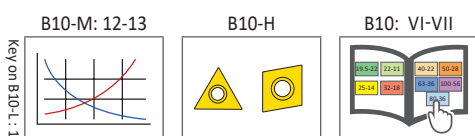
**m** = Metric (mm)  
Inserts sold separately


## Compact Lay Down Cartridges | Insert Form 112

Diameter Range:  $\geq 40.00$  mm



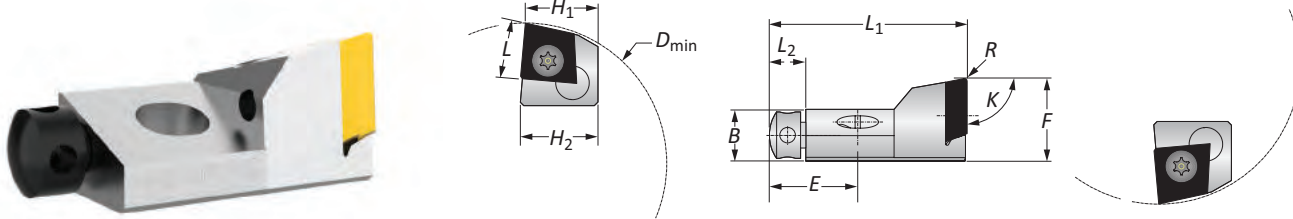
| Holder Type   | K   | ISO        | D <sub>min</sub><br>Boring<br>Range | Designation  | Insert Holder  |                |       |                |                |       |             |       | Insert<br>Form | Part<br>No.   |
|---|-----|------------|-------------------------------------|--------------|----------------|----------------|-------|----------------|----------------|-------|-------------|-------|----------------|---------------|
|   |     |            |                                     |              | L <sub>1</sub> | L <sub>2</sub> | B     | H <sub>1</sub> | H <sub>2</sub> | F     | R<br>Radius | E     |                |               |
|  | 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> |



 = Metric (mm)  
Inserts sold separately

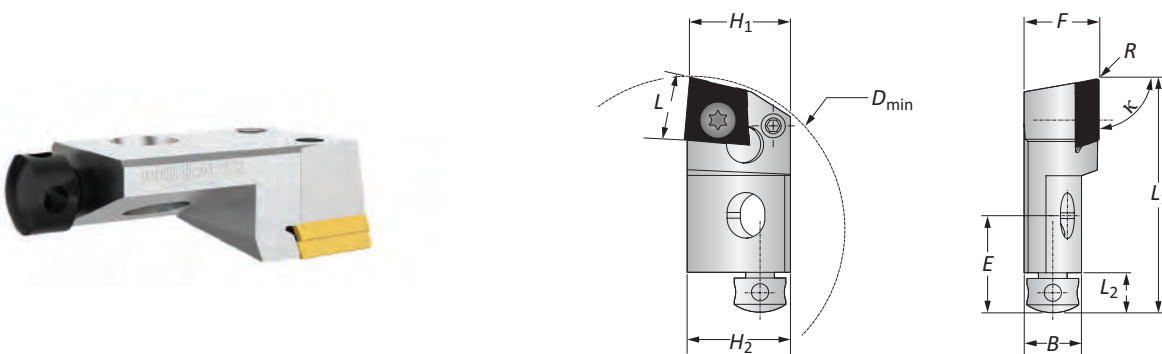
## Tangential Compact Lay Down Cartridges | Insert Forms 04 & 05

Diameter Range:  $\geq 2.125''$  (54.00 mm)



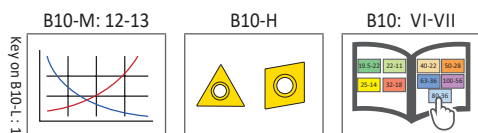
### Insert Form 04, 05 Insert Holders

| Holder Type | K   | D <sub>min</sub><br>Boring<br>Range | Insert Holder  |                |       |                |                |       |             |       | Holder Cutting<br>Form | L     | Insert<br>Form | Part<br>No. |
|-------------|-----|-------------------------------------|----------------|----------------|-------|----------------|----------------|-------|-------------|-------|------------------------|-------|----------------|-------------|
|             |     |                                     | L <sub>1</sub> | L <sub>2</sub> | B     | H <sub>1</sub> | H <sub>2</sub> | F     | R<br>Radius | E     |                        |       |                |             |
|             | 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      |



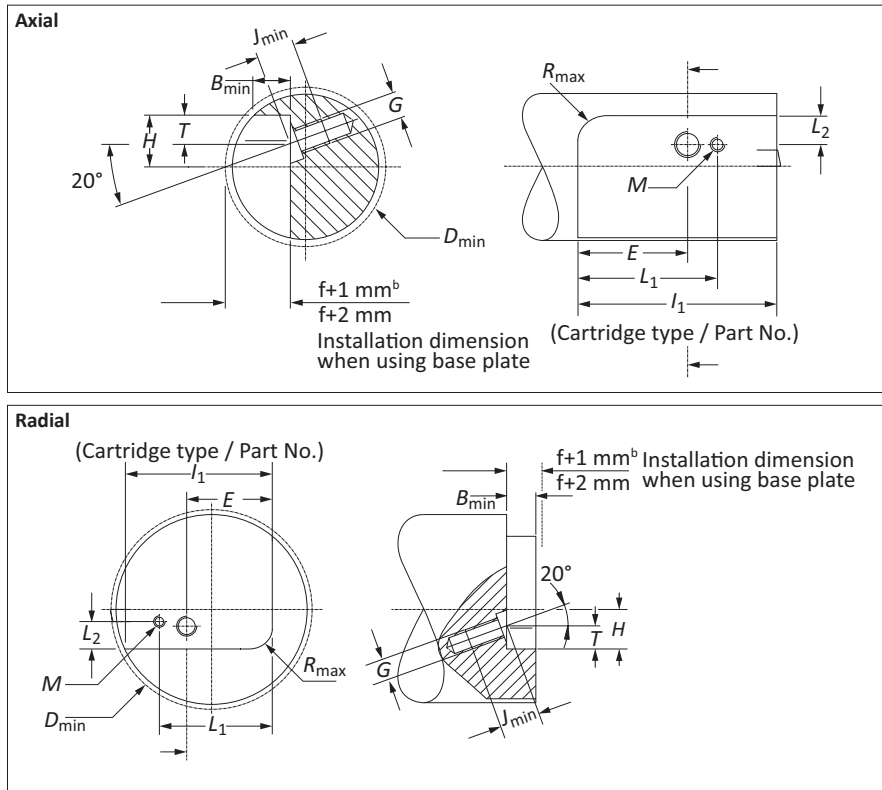
### Insert Form 04, 05 Radial Cutting Insert Holders

| Holder Type | K   | D <sub>min</sub><br>Boring<br>Range | Insert Holder  |                |       |                |                |       |             |       | Holder Cutting<br>Form | L     | Insert<br>Form | Part<br>No. |
|-------------|-----|-------------------------------------|----------------|----------------|-------|----------------|----------------|-------|-------------|-------|------------------------|-------|----------------|-------------|
|             |     |                                     | L <sub>1</sub> | L <sub>2</sub> | B     | H <sub>1</sub> | H <sub>2</sub> | F     | R<br>Radius | E     |                        |       |                |             |
|             | 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      |





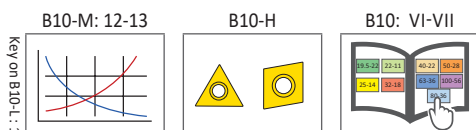
## Compact Lay Down Cartridge Mounting Dimensions



|   | Installation Dimensions |       |           |           | Mounting Thread and Base Plate |       |      |       |     |     |           | Cartridge Type            |
|---|-------------------------|-------|-----------|-----------|--------------------------------|-------|------|-------|-----|-----|-----------|---------------------------|
|   | $D_{min}$               | $H$   | $R_{max}$ | $B_{min}$ | $E$                            | $L_1$ | $T$  | $L_2$ | $G$ | $M$ | $J_{min}$ |                           |
| m | 25.00                   | 8.00  | 2.00      | 6.50      | 13.00                          | 18.50 | 4.50 | 4.20  | M4  | M2  | 8.00      | XXXXX 08CK <sup>1,2</sup> |
|   | 40.00                   | 10.00 | 2.50      | 10.00     | 17.00                          | 24.50 | 5.00 | 4.70  | M6  | M3  | 11.00     | XXXXX 10CK                |
|   | 50.00                   | 12.00 | 5.50      | 14.00     | 20.00                          | 28.00 | 6.00 | 5.70  | M6  | M3  | 12.00     | XXXXX 12CK                |
|   | 55.00                   | 14.00 | 5.50      | 16.00     | 23.50                          | 33.00 | 6.00 | 7.20  | M8  | M3  | 13.00     | XXXXX 14CK                |
|   | 70.00                   | 20.00 | 6.50      | 14.00     | 20.00                          | 27.50 | 6.00 | 11.20 | M8  | M3  | 15.00     | 345020                    |
|   | 70.00                   | 22.00 | 6.50      | 14.00     | 20.00                          | 28.00 | 6.00 | 11.20 | M8  | M3  | 15.00     | 345021*                   |
|   | 70.00                   | 20.00 | 6.50      | 14.00     | 20.00                          | 27.50 | 6.00 | 11.20 | M8  | M3  | 15.00     | 345022                    |
|   | 54.00                   | 15.00 | 3.00      | 10.00     | 17.00                          | 23.50 | 5.00 | 9.70  | M6  | M3  | 11.00     | 345023                    |
|   | 54.00                   | 18.00 | 3.00      | 10.00     | 17.00                          | 24.00 | 5.00 | 9.20  | M6  | M3  | 11.00     | 345024*                   |
|   | 54.00                   | 15.00 | 3.00      | 10.00     | 17.00                          | 23.50 | 5.00 | 9.70  | M6  | M3  | 11.00     | 345025                    |

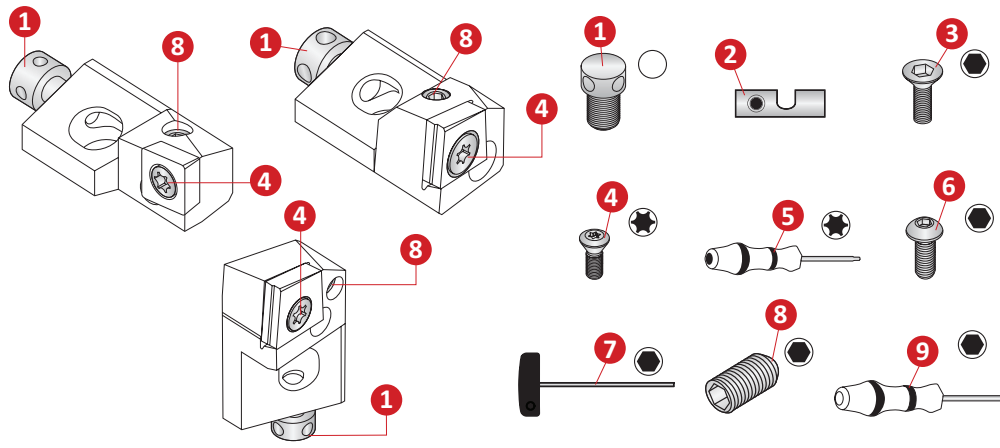
\*Radial

1. From  $D_{min}$  25 mm - 32 mm, the short clamp holder is 0.5 mm from the middle.
2. Installation with base plate.

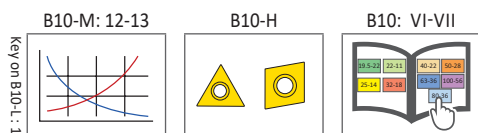


m = Metric (mm)  
Inserts sold separately

### Compact Lay Down Cartridges Accessories



| Insert Holder Part No. | 1<br>Axial Barrel Screw | 2<br>Shim | 3<br>Insert Screw | 4<br>Insert Screw | 5<br>Torx Driver | 6<br>Holder Fixing Screw | 7<br>Hex Driver | 8<br>Radial Set Screw | 9<br>Hex Driver |
|------------------------|-------------------------|-----------|-------------------|-------------------|------------------|--------------------------|-----------------|-----------------------|-----------------|
| 345001                 | 215742                  | 345201    | 215461            | 115676            | 115590           | 215343                   | 415577          | 114224                | 215472          |
| 345002                 | 415299                  | 345202    | 116433            | 115673            | 115664           | 215634                   | 415164          | 070161                | 215473          |
| 345003                 | 215250                  | 345203    | 116433            | 415298            | 215150           | 215431                   | 415164          | 215467                | 115575          |
| 345004                 | 215265                  | 345204    | 116433            | 215149            | 215150           | 315476                   | 415165          | 215467                | 115575          |
| 345005                 | 415299                  | 345216    | 116433            | 115673            | 115664           | 215634                   | 415164          | 070161                | 215473          |
| 345006                 | 415299                  | 345218    | 116433            | 115673            | 115664           | 215634                   | 415164          | 070161                | 215473          |
| 345007                 | 415299                  | 345208    | 116433            | 115673            | 115664           | 215634                   | 415164          | 070161                | 215473          |
| 345008                 | 415299                  | 345208    | 116433            | 115673            | 115664           | 215634                   | 415164          | 070161                | 215473          |
| 345009                 | 415299                  | 345202    | 116433            | 115673            | 115664           | 215634                   | 415164          | 070161                | 215473          |
| 345010                 | 215742                  | 345211    | 215461            | 115676            | 115590           | 215343                   | 415577          | 114224                | 215472          |
| 345011                 | 215742                  | 345211    | 215461            | 115676            | 115590           | 215343                   | 415577          | 114224                | 215472          |
| 345012                 | 215742                  | 345213    | 215461            | 115676            | 115590           | 215343                   | 415577          | 114224                | 215472          |
| 345013                 | 215742                  | 345213    | 215461            | 115676            | 115590           | 215343                   | 415577          | 114224                | 215472          |
| 345014                 | 215742                  | 345201    | 215461            | 115676            | 115590           | 215343                   | 415577          | 114224                | 215472          |
| 345015                 | 415299                  | 345215    | 116433            | 115673            | 115664           | 215634                   | 415164          | 070161                | 215473          |
| 345016                 | 415299                  | 345216    | 116433            | 115673            | 115664           | 215634                   | 415164          | 070161                | 215473          |
| 345017                 | 415299                  | 345218    | 116433            | 115673            | 115664           | 215634                   | 415164          | 070161                | 215473          |
| 345018                 | 415299                  | 345218    | 116433            | 115673            | 115664           | 215634                   | 415164          | 070161                | 215473          |
| 345019                 | 415299                  | 345208    | 116433            | 115673            | 115664           | 215634                   | 415164          | 070161                | 215473          |
| 345020                 | 215250                  | 345220    | 116433            | 415949            | 215150           | 315476                   | 415165          | 215467                | 115575          |
| 345021                 | 215250                  | 345221    | 116433            | 415949            | 215150           | 315476                   | 415165          | 215104                | 115575          |
| 345022                 | 215250                  | 345222    | 116433            | 415949            | 215150           | 315476                   | 415165          | 215467                | 115575          |
| 345023                 | 415299                  | 345223    | 116433            | 415977            | 115664           | 215634                   | 415164          | 415280                | 215473          |
| 345024                 | 415299                  | 345224    | 116433            | 415977            | 115664           | 215634                   | 415164          | 070161                | 215473          |
| 345025                 | 415299                  | 345225    | 116433            | 415977            | 115664           | 215634                   | 415164          | 415280                | 215473          |



m = Metric (mm)  
Inserts sold separately







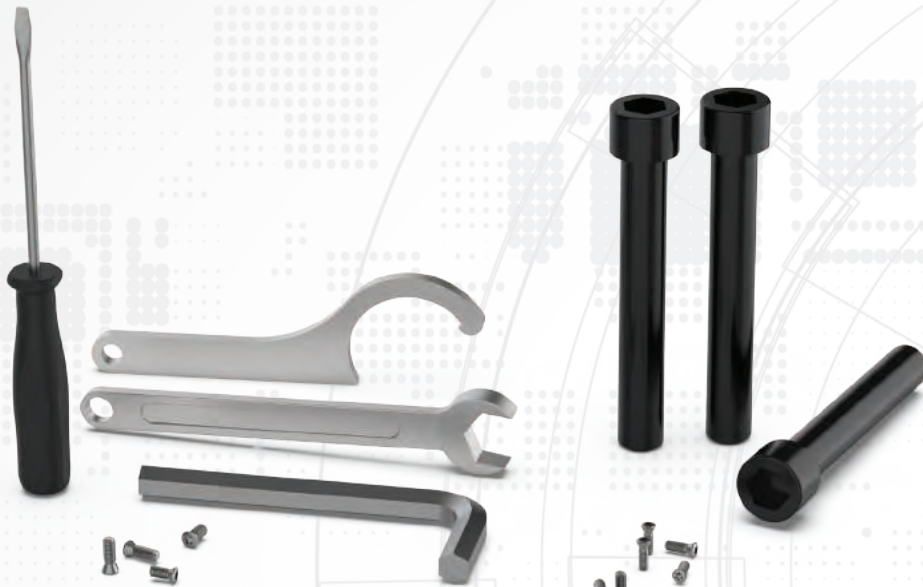
SECTION

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# B10-M

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Accessories / Technical Information



Your safety and the safety of others is very important. This catalogue 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 catalogue, 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 catalogue. 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



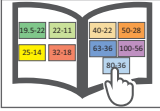
Oil & Gas



Renewable  
Energy

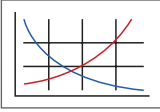
**Reference Icons**

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



**MVS Connection Color Guide**

Detailed instructions and information regarding the MVS connection(s)



**Recommended Cutting Data**

Speed and feed recommendations for optimum and safe boring

# Accessories and Technical Information Table of Contents

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**Technical Information**

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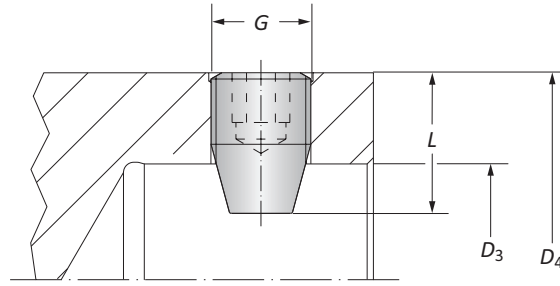
Calculating Tool Assembly Weight . . . . . 11

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## Accessories

### Threaded Taper Pins for MVS Connections

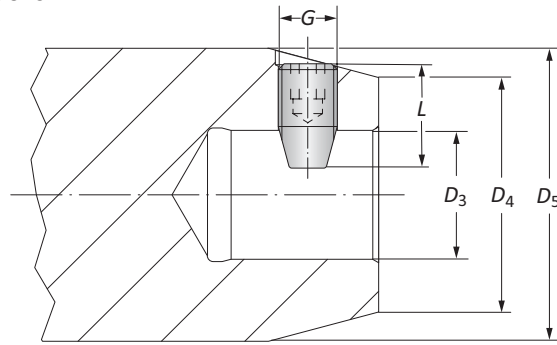


|   | Connection  | Taper Pin |       | Service Key | Steel    | Titanium |
|---|-------------|-----------|-------|-------------|----------|----------|
|   | $D_4   D_3$ | $G$       | $L$   |             | Part No. | Part No. |
| E | 19.5 - 11   | M5 x 0.5  | 6.50  | s2.5 / A    | 115949   | -        |
|   | 22 - 11     | M5 x 0.5  | 8.30  | s2.5 / A    | 215375   | -        |
| m | 25 - 14     | M8 x 1.0  | 8.30  | s4 / B      | 132174   | -        |
|   | 32 - 18     | M8 x 1.0  | 10.40 | s4 / B      | 132142   | -        |
|   | 40 - 22     | M10 x 1.0 | 14.50 | s5 / B      | 133113   | -        |
|   | 50 - 28     | M12 x 1.0 | 16.70 | s6 / B      | 132145   | 415334   |
|   | 63 - 36     | M16 x 1.5 | 19.80 | s8 / B      | 132146   | 415336   |
|   | 80 - 36     | M16 x 1.5 | 28.80 | s8 / B      | 132191   | 415335   |
|   | 100 - 56    | M24 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



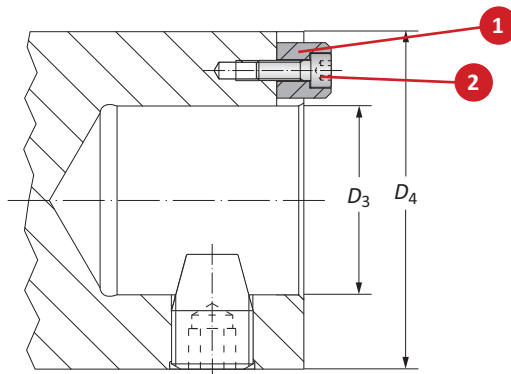
| Connection | Taper Pin   |           |       | Service Key | Steel    | Titanium |          |
|------------|-------------|-----------|-------|-------------|----------|----------|----------|
|            | $D_4   D_3$ | $G$       | $L$   |             | $D_5$    | Part No. | Part No. |
| II         | 22 - 11     | M5 x 0.5  | 8.30  | 32.00       | s2.5 / A | 215375   | -        |
|            | 22 - 11     | M5 x 0.5  | 16.00 | 40.00       | s2.5 / A | 215376   | -        |
|            | 22 - 11     | M5 x 0.5  | 16.00 | 50.00       | s2.5 / A | 215376   | -        |
|            | 22 - 11     | M5 x 0.5  | 16.00 | 63.00       | s2.5 / A | 215376   | -        |
|            | 25 - 14     | M8 x 1.0  | 10.40 | 32.00       | s4 / B   | 132142   | -        |
|            | 25 - 14     | M8 x 1.0  | 10.40 | 36.00       | s4 / B   | 132142   | -        |
|            | 32 - 18     | M8 x 1.0  | 10.40 | 35.00       | s4 / B   | 132142   | -        |
|            | 32 - 18     | M8 x 1.0  | 14.50 | 37.00       | s4 / B   | 132143   | -        |
|            | 32 - 18     | M8 x 1.0  | 14.50 | 40.00       | s4 / B   | 132143   | -        |
|            | 32 - 18     | M8 x 1.0  | 14.50 | 46.00       | s4 / B   | 132143   | -        |
|            | 40 - 22     | M10 x 1.0 | 14.50 | 40.00       | s5 / B   | 133113   | -        |
|            | 40 - 22     | M10 x 1.0 | 17.80 | 47.00       | s5 / B   | 132144   | -        |
|            | 40 - 22     | M10 x 1.0 | 17.80 | 50.00       | s5 / B   | 132144   | -        |
|            | 50 - 28     | M12 x 1.0 | 16.70 | 63.00       | s6 / B   | 132145   | 415334   |
|            | 63 - 36     | M16 x 1.5 | 19.80 | 80.00       | s8 / B   | 132146   | 415336   |

**NOTE:** Steel or titanium taper pins are used in balancing the Alu-Line tooling.



## Accessories

### Clamping Pieces for MVS Connection 100 - 56 | D 60 / D 40 Connections



#### Clamping Pieces for MVS 100 - 56

| Connection | 1 Torque    |       |          | 2 Cap Screw |             |          |
|------------|-------------|-------|----------|-------------|-------------|----------|
|            | Service Key | D x L | Part No. | Service Key | D x L       | Part No. |
| 100 - 56   | -           | -     | 115641   | S5 / B      | M6 x 1 x 16 | 115147   |

#### Clamping Pieces for D 60 / D 40

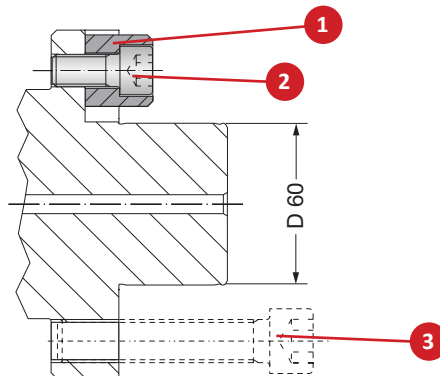
| Connection | 1 Torque         |
|------------|------------------|
|            | Part No.         |
| D 60       | 115643 (125 mm)  |
| D 60       | KW31562 (110 mm) |
| D 40       | 117143           |

#### Clamping Pieces for D 60 / D 40

| Connection | 2 Cap Screw |                 |          |
|------------|-------------|-----------------|----------|
|            | Service Key | D x L           | Part No. |
| D 60       | s10 / B     | M12 x 1.75 x 25 | 115237   |
| D 40       | s5 / B      | M6 x 1 x 16     | 115147   |

#### Clamping Pieces for D 60 / D 40

| Connection | 3 Cap Screw |                 |                       |
|------------|-------------|-----------------|-----------------------|
|            | Service Key | D x L           | Part No.              |
| D 60       | s14 / C     | M16 x 2 x 80    | 115170 <sup>(1)</sup> |
| D 60       | s14 / C     | M16 x 2 x 55    | 215189 <sup>(2)</sup> |
| D 40       | s10 / B     | M12 x 1.75 x 75 | 315186 <sup>(3)</sup> |
| D 40       | s10 / B     | M12 x 1.75 x 50 | 077104 <sup>(2)</sup> |



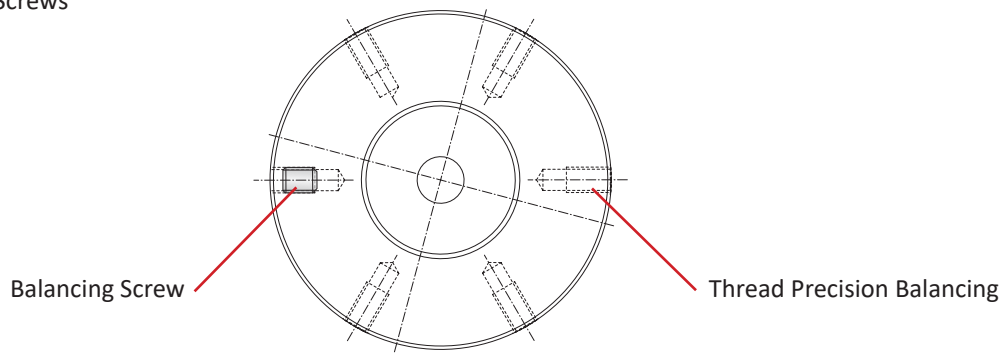
<sup>(1)</sup> To mount boring tools above  $\varnothing 200.00$  mm, see section B10-F

<sup>(2)</sup> Cap screws used for mounting cutter heads to DIN 1830

<sup>(3)</sup>  $\varnothing 200.00$  mm - 520.00 mm

**Accessories**

Heavy Metal Balancing Screws



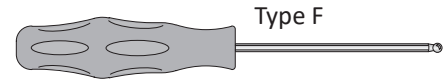
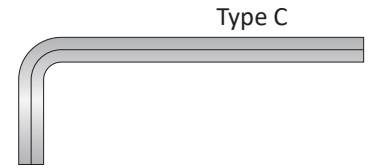
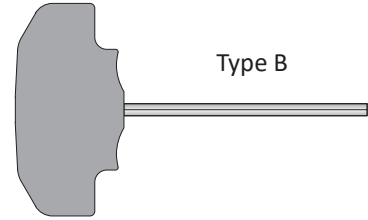
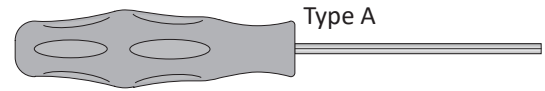
| Balancing Screw |               |          |
|-----------------|---------------|----------|
| Nominal Size    | Service Key   | Part No. |
| M5 x 0.8 x 6    | 0.8 x 4 / K   | 415573   |
| M6 x 1 x 6      | 0.8 x 4 / K   | 415284   |
| M6 x 1 x 8      | 0.8 x 4 / K   | 415341   |
| M6 x 1 x 10     | 0.8 x 4 / K   | 415283   |
| M8 x 1.25 x 8   | 1.2 x 6.5 / K | 415285   |
| M8 x 1.25 x 10  | 1.2 x 6.5 / K | 415286   |
| M8 x 1.25 x 12  | 1.2 x 6.5 / K | 415287   |

## Accessories

Torque Drivers | Wrenches

### Service Keys for Insert Holders and Fixing Screws (Type A, B, C, F)

| Service Key | Part No. |
|-------------|----------|
| s1.5 / A    | 215472   |
| s2 / A      | 215473   |
| s2 / B      | 415761   |
| s2.5 / A    | 115575   |
| s2.5 / B    | 415577   |
| s3 / A      | 115630   |
| s3 / B      | 415578   |
| s4 / B      | 115576   |
| s4 / F      | 315265   |
| s4 / B      | 415164   |
| s5 / B      | 115577   |
| s5 / B      | 415165   |
| s6 / B      | 115578   |
| s8 / B      | 115579   |
| s8 / C      | 415611   |
| s10 / B     | 115580   |
| s12 / B     | 215638   |
| s14 / C     | 215639   |

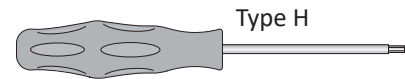


### Fixed Torque Driver (Type B, H)

| Service Key | Part No. |
|-------------|----------|
| T6 / H      | 115537   |
| T7 / H      | 115591   |
| T8 / H      | 115590   |
| T15 / H     | 115664   |
| T20 / H     | 215150   |
| T25 / B     | 415121   |

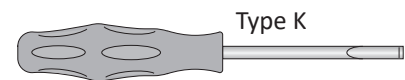
### Torque Driver (Type H)

| Service Key | Part No. |
|-------------|----------|
| T6 / H      | 415507   |
| T7 / H      | 415508   |
| T8 / H      | 415514   |
| T15 / H     | 415510   |
| T20 / H     | 415543   |



### Torque Driver (Type K)

| Service Key   | Part No. |
|---------------|----------|
| 0.5 x 3 / K   | 315322   |
| 0.8 x 4 / K   | 415579   |
| 1.2 x 6.5 / K | 415580   |



### Wrench (Type P)

| Service Key | Part No. |
|-------------|----------|
| 13 / P      | 315689   |
| 15 / P      | 315690   |
| 19 / P      | 315691   |



**Accessories**

Torque Driver Set | 25 Piece Wrench Set



NOTE: Torque driver set pictured

Torque Driver Set: Torx® Bits, Hexagon Bits, Flat Blade Bits

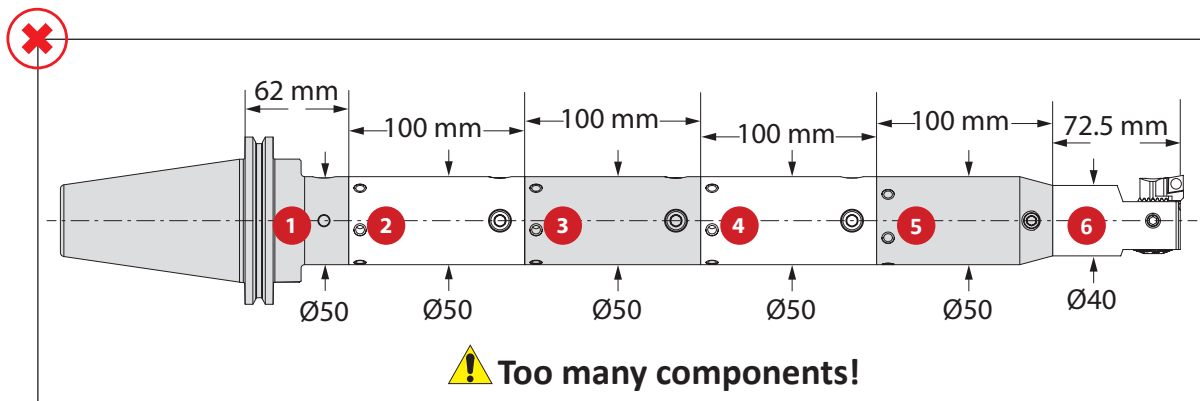
| Type           | Pieces | Size           | Set Part No. |
|----------------|--------|----------------|--------------|
| Flat Blade Bit | 1      | 0.3 - 1.2 (Nm) | 103086       |
| Flat Blade Bit | 1      | 1.2 - 3.0 (Nm) |              |
| Flat Blade Bit | 1      | 4.0 - 8.0 (Nm) |              |
| Torque Driver  | 3      | T6             |              |
| Torque Driver  | 3      | T7             |              |
| Torque Driver  | 3      | T8             |              |
| Torque Driver  | 1      | T16            |              |
| Torque Driver  | 1      | T20            |              |
| Torque Driver  | 1      | T25            |              |
| Hexagon Bit    | 3      | s2             |              |
| Hexagon Bit    | 3      | s2.5           |              |
| Hexagon Bit    | 2      | s3             |              |
| Hexagon Bit    | 2      | s4             |              |
| Hexagon Bit    | 1      | s5             |              |
| Flat Blade Bit | 1      | 0.5 x 3.0      |              |

25 Piece Wrench Set

| Type | Size                                | Set Part No. |
|------|-------------------------------------|--------------|
| A    | s1.5 / s2 / s2.5 / s3 / s4          | 103025       |
| B    | s4 / s5 / s6 / s8 / s10 / s12 / s14 |              |
| C    | s7                                  |              |
| F    | s4                                  |              |
| H    | T6 / T7 / T8 / T15 / T20 / T25      |              |
| K    | 0.5 x 3                             |              |
| P    | s13 / s15 / s19                     |              |

## Guidelines for not Exceeding Recommended Length-to-diameter Ratio

To calculate, see graphics below:



**NOTE:** Length-to-diameter ratio is calculated using body diameters not cutting diameter.

**NOTE:** Do not exceed recommended 10xD length-to-diameter ratio or exceed four total components (including shank)

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

- 1.  $1.2 = 62/50$
- 2.  $2.0 = 100/50$
- 3.  $2.0 = 100/50$
- 4.  $2.0 = 100/50$
- 5.  $2.0 = 100/50$
- 6.  $1.8 = 72.5/40$

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

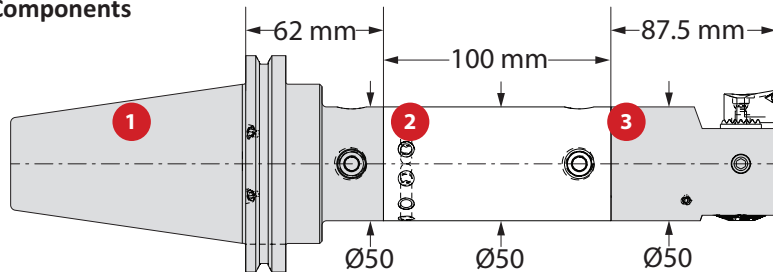
- 1.2
- 2.0
- 2.0
- 2.0
- 2.0
- 2.0
- + 1.8
- 11.0 = L : D ratio**



**! Too long with too many components!**



### Alu-Line Components



**NOTE:** Length-to-diameter ratio is calculated using body diameters not cutting diameter.

**NOTE:** Do not exceed recommended 5xD length-to-diameter ratio when using Alu-Line (Aluminium) components or exceed four total components (including shank).

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

- 1.  $1.2 = 62/50$
- 2.  $2.0 = 100/50$
- 3.  $1.8 = 87.5/50$

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

- 1.2
- 2.0
- + 1.8
- 5.0 = L : D ratio**



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

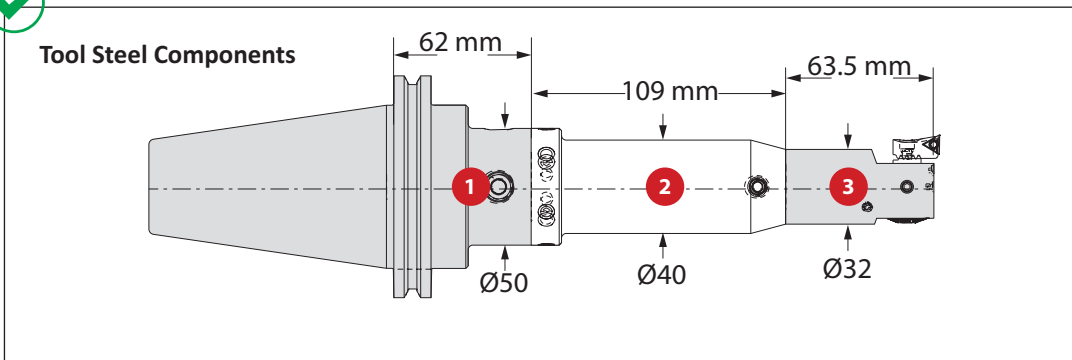
- Do not exceed recommended 10xD length-to-diameter ratio or exceed four total components (including shank)
- When using Alu-Line components, do not exceed recommended 5xD length-to-diameter ratio
- When using tool steel components, do not exceed recommended 6xD length-to-diameter ratio
- When using heavy metal components, do not exceed recommended 8xD length-to-diameter ratio
- When using a carbide shank, do not exceed recommended 9xD length-to-diameter ratio
- When using a NOVI<sup>TECH</sup> module, do not exceed recommended 10xD length-to-diameter ratio

Factory technical assistance is available for your specific applications through our Application Engineering department. email: [engineering.eu@alliedmachine.com](mailto:engineering.eu@alliedmachine.com)



## Guidelines for not Exceeding Recommended Length-to-diameter Ratio

To calculate, see graphics below:



**NOTE:** Length-to-diameter ratio is calculated using body diameters not cutting diameter.

**NOTE:** When using steel components, do not exceed recommended 6xD length-to-diameter ratio or exceed four total components (including shank).

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

1  $1.2 = 62/50$

2  $2.7 = 109/40$

3  $2.0 = 63.5/32$

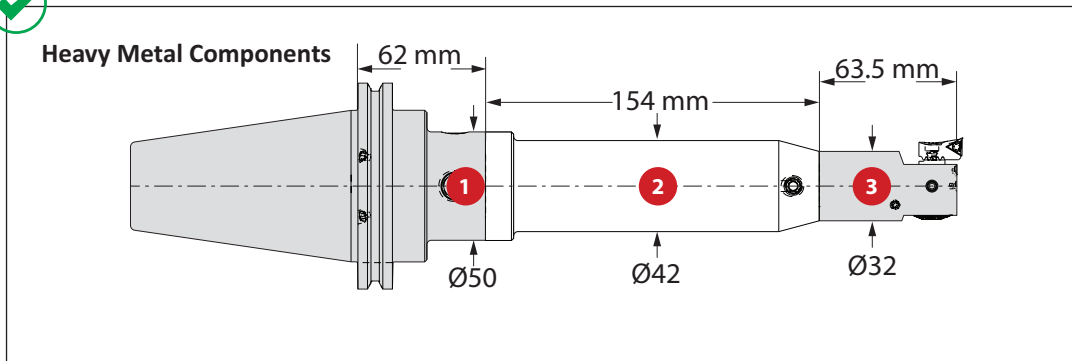
### Step 2: Add each L : D average

1.2

2.7

+ 2.0

5.9 = L : D ratio



**NOTE:** Length-to-diameter ratio is calculated using body diameters not cutting diameter.

**NOTE:** When using heavy metal components, do not exceed recommended 8xD length-to-diameter ratio or exceed four total components (including shank).

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

1  $1.2 = 62/50$

2  $3.6 = 154/42$

3  $2.0 = 63.5/32$

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

1.2

3.6

+ 2.0

6.8 = L : D ratio



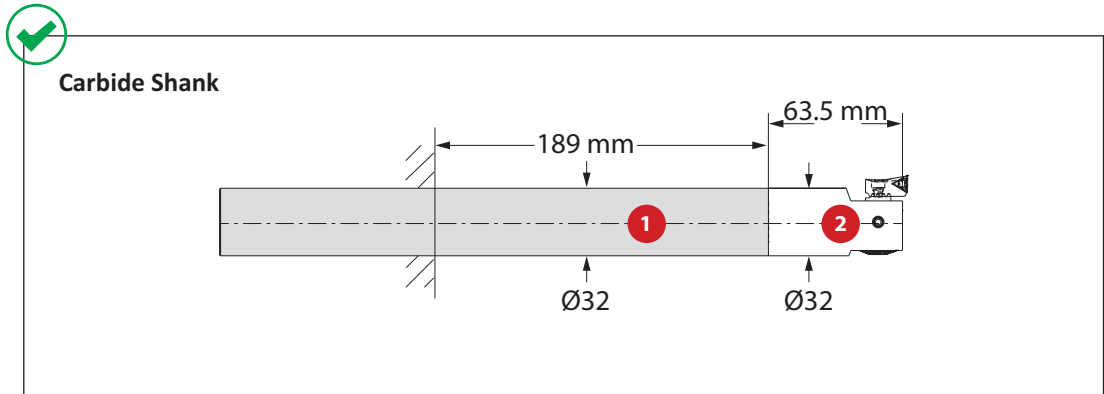
**1 WARNING** Tool failure can cause serious injury. To prevent:

- Do not exceed recommended 10xD length-to-diameter ratio or exceed four total components (including shank)
- When using Alu-Line components, do not exceed recommended 5xD length-to-diameter ratio
- When using tool steel components, do not exceed recommended 6xD length-to-diameter ratio
- When using heavy metal components, do not exceed recommended 8xD length-to-diameter ratio
- When using a carbide shank, do not exceed recommended 9xD length-to-diameter ratio
- When using a NOVI<sup>TECH</sup> module, do not exceed recommended 10xD length-to-diameter ratio

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## Guidelines for not Exceeding Recommended Length-to-diameter Ratio

To calculate, see graphics below:



**NOTE:** Length-to-diameter ratio is calculated using body diameters not cutting diameter.

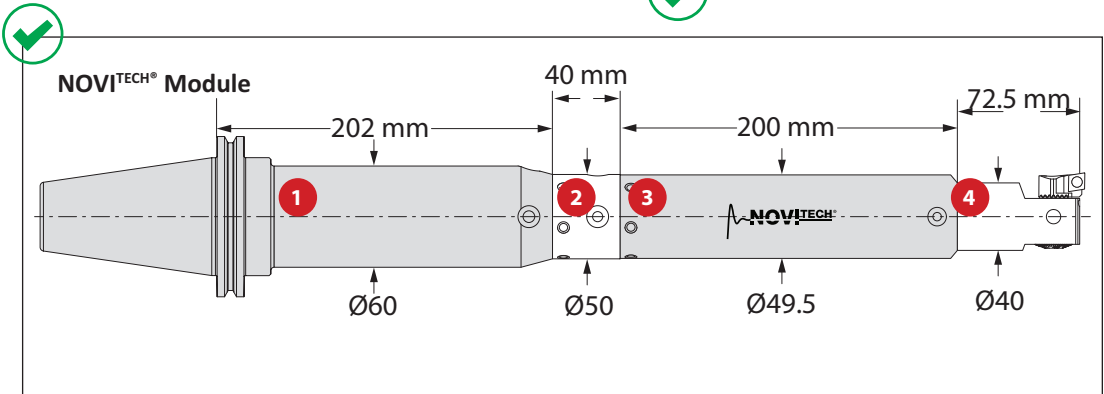
**NOTE:** When using carbide shank components, do not exceed recommended 9xD length-to-diameter ratio or exceed 4 total components.

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

- 1 8.1 = 189/32
- 2 2.0 = 63.5/32

**Step 2: Add each L : D average**

$$\begin{array}{r}
 5.9 \\
 + 2.0 \\
 \hline
 7.9 = L : D \text{ ratio}
 \end{array}$$



**NOTE:** Length-to-diameter ratio is calculated using body diameters not cutting diameter.

**NOTE:** Do not exceed recommended 10xD length-to-diameter ratio when using NOVI<sup>TECH</sup> intermediate modules or exceed four total components (including shank)

**NOTE:** The NOVI<sup>TECH</sup> intermediate module should always be assembled as close as possible to the cutting edge (i.e. the next component behind the boring head)

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

- 1 3.3 = 202/60
- 2 0.8 = 40/50
- 3 4.0 = 200/49.5
- 4 1.8 = 72.5/40

**Step 2: Add each L : D average**

$$\begin{array}{r}
 3.3 \\
 0.8 \\
 4.0 \\
 + 1.8 \\
 \hline
 9.9 = L : D \text{ ratio}
 \end{array}$$

| Component            | Length-to-diameter Ratio |
|----------------------|--------------------------|
| Alu-Line             | 5xD                      |
| Tool Steel           | 6xD                      |
| Heavy Metal          | 8xD                      |
| Carbide              | 9xD                      |
| NOVI <sup>TECH</sup> | 10xD                     |

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

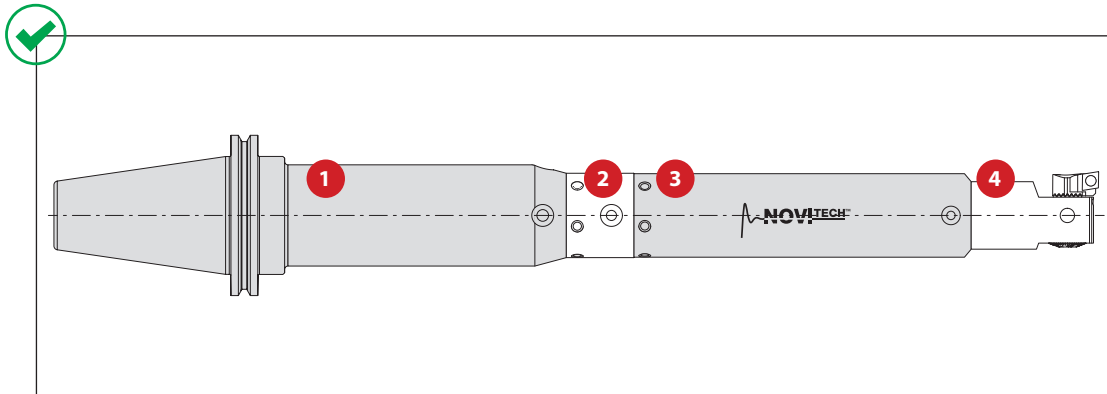
- Do not exceed recommended 10xD length-to-diameter ratio or exceed four total components (including shank)
- When using Alu-Line components, do not exceed recommended 5xD length-to-diameter ratio
- When using tool steel components, do not exceed recommended 6xD length-to-diameter ratio
- When using heavy metal components, do not exceed recommended 8xD length-to-diameter ratio
- When using a carbide shank, do not exceed recommended 9xD length-to-diameter ratio
- When using a NOVI<sup>TECH</sup> module, do not exceed recommended 10xD length-to-diameter ratio

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## Calculating Tool Assembly Weight

To calculate, see graphics below:



**Step 1:** Find weight for each component circled in the example table below

**Example:**

| MVS Connection | Boring Range  | 4 Boring Head |       |       |       | Weight    | Part No. |
|----------------|---------------|---------------|-------|-------|-------|-----------|----------|
| $D_1$ & $D_2$  | A             | $X_1$         | $X_2$ | $L_2$ | $D_5$ |           |          |
| 40 - 22        | 53.01 - 65.98 | 75.00         | 39.00 | 72.50 | -     | 0.70 (kg) | 320004   |

**Step 2:** Calculate total assembly weight

$$\begin{array}{r}
 1 \text{ } 6.6 \text{ kg} \\
 2 \text{ } 0.6 \text{ kg} \\
 3 \text{ } 3.5 \text{ kg} \\
 + 4 \text{ } 0.7 \text{ kg} \\
 \hline
 11.4 \text{ kg}
 \end{array}$$

**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. *email: [engineering.eu@alliedmachine.com](mailto:engineering.eu@alliedmachine.com)*

## Recommended Cutting Data | Metric (mm)

| ISO | Material  | (BHN)<br>Hardness | Grade   | *Speed<br>M / Min | Recommended Feed (mm / tooth)<br>Nose Radii |             |             |             |
|-----|---|-------------------|---------|-------------------|---|-------------|-------------|-------------|
|     |   |                   |         |                   | 0.1 mm                                      | 0.2 mm      | 0.4 mm      | 0.9 mm      |
| P   | Free-Machining Steel<br>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<br>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<br>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<br>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<br>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<br>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<br>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<br>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<br>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<br>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<br>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. *email: [engineering.eu@alliedmachine.com](mailto:engineering.eu@alliedmachine.com)*

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

- Do not exceed recommended 10xD length-to-diameter ratio or exceed four total components (including shank)
- When using Alu-Line components, do not exceed recommended 5xD length-to-diameter ratio
- When using tool steel components, do not exceed recommended 6xD length-to-diameter ratio
- When using heavy metal components, do not exceed recommended 8xD length-to-diameter ratio
- When using a carbide shank, do not exceed recommended 9xD length-to-diameter ratio
- When using a NOVI<sup>TECH</sup> module, do not exceed recommended 10xD length-to-diameter ratio

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## Recommended Cutting Data | Metric (mm)

| ISO    | Material                                | (BHN)<br>Hardness | Grade     | *Speed<br>M / Min | Recommended Feed (mm / tooth)<br>Nose Radii |             |             |             |
|--------|---|-------------------|-----------|-------------------|---|-------------|-------------|-------------|
|        |   |                   |           |                   | 0.1 mm                                      | 0.2 mm      | 0.4 mm      | 0.9 mm      |
| H      | Wear Plate<br>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 Aluminium                          | 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 Aluminium                       | 30 - 180          | Carbide   | 205 - 600         | 0.02 - 0.05                                 | 0.05 - 0.13 | 0.10 - 0.15 | 0.15 - 0.23 |
|        |   |                   |           |                   |   |             |             |             |
|        | Aluminium Bronze                        | 100 - 250         | Carbide   | 145 - 280         | 0.02 - 0.05                                 | 0.05 - 0.10 | 0.10 - 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. *email: [engineering.eu@alliedmachine.com](mailto:engineering.eu@alliedmachine.com)*

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

- Do not exceed recommended 10xD length-to-diameter ratio or exceed four total components (including shank)
- When using Alu-Line components, do not exceed recommended 5xD length-to-diameter ratio
- When using tool steel components, do not exceed recommended 6xD length-to-diameter ratio
- When using heavy metal components, do not exceed recommended 8xD length-to-diameter ratio
- When using a carbide shank, do not exceed recommended 9xD length-to-diameter ratio
- When using a NOVI<sup>TECH</sup> module, do not exceed recommended 10xD length-to-diameter ratio

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Visit our digital platform.

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- Explore various locations and zones to see real people in real positions
- See our training and engineering departments
- Get a glimpse of our state-of-the-art logistical and machining equipment
- Virtually meet our customer service and marketing teams
- Access digital resources like literature, videos, and online tools and training

D



E

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

F



Increase the production and success of your applications today.

G

- 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

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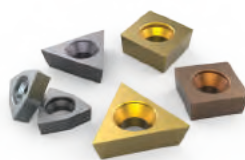
[toolmd.com](http://toolmd.com)

J

## **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



L

M

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

# 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



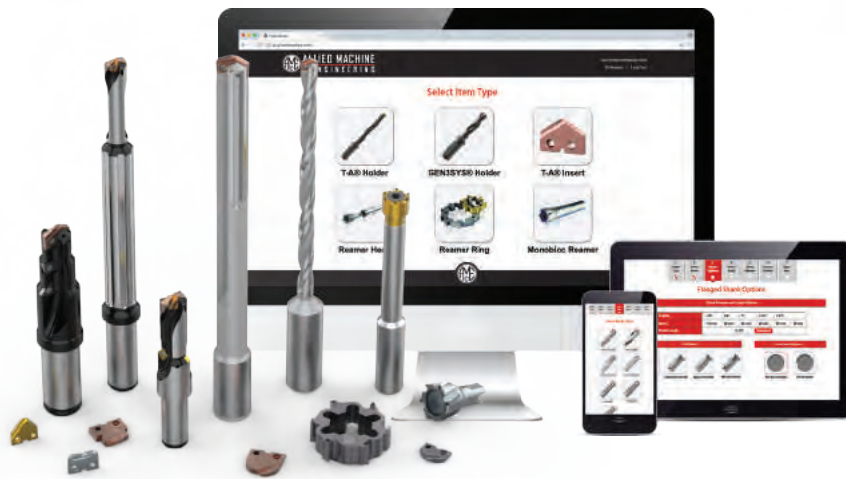
Insta-Code also has a **Cycle Time Calculator**

[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

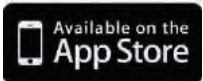


[iq.alliedmachine.com](http://iq.alliedmachine.com)

## Solution Hub App

All Allied all the time.

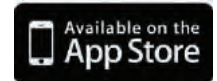
- Quickly look up product information
- Links to our free online tools
- Locate distributors
- Stay up to date on news and events



## 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



## Customer Support

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### 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.




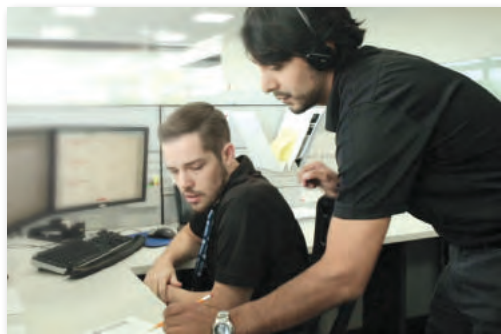
**1**

#### Internal 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.

 +44 (0)1384 400900 opt. 3


 [sales.eu@alliedmachine.com](mailto:sales.eu@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 Application Engineers (AEs) are experienced in working with difficult materials in many different environments. Give us a call and put our knowledge to the test.

 +44 (0)1384 400900 opt. 4


 [engineering.eu@alliedmachine.com](mailto:engineering.eu@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.

Visit [www.alliedmachine.com/field-lookup](http://www.alliedmachine.com/field-lookup) to find your Regional Sales Manager.

 +44 (0)1384 400900 opt. 4

 [engineering.eu@alliedmachine.com](mailto:engineering.eu@alliedmachine.com)





**Online Training**

Get *all* the tooling training of our 2-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 two 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

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





# 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: _____<br>(4150 / A36 / Cast Iron / etc.) |
| Pre-existing Diameter: _____ in/mm | Depth of Cut: _____ in/mm | Hardness: _____<br>(BHN / Rc)                      |
| Required Finish: _____ RMS         | State: _____              | (Casting / Hot rolled / Forging)                   |

### Machine Information

|  |  |                              |
|--|--|------------------------------|
| Machine Type: _____<br>(Lathe / Screw machine / Machine center / etc.) | Builder: _____<br>(Haas, Mori Seiki, etc.) | Model #: _____               |
| Shank Required: _____<br>(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: _____<br>(Through tool / Flood)                      | Coolant Pressure: _____ PSI / bar |
| Coolant Type: _____<br>(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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