

# WOHLHAUPTER

*Für Ihren Erfolg.*

## Innovative tool solutions



00015/09.2011 USA



# Expertise from the master shank to the cutting material

Technology changes, quality is constant. For more than 80 years, Wohlhaupter, as an owner-managed company, has stood for quality in the production of precision tools.

In order to achieve an effective increase in productivity for the customer, Wohlhaupter develops and produces modular tool systems and application-related solutions for flexible manufacturing concepts giving priority to the requirements of the tool planners and users. This includes simple and comprehensible handling, such as reading off dimensional corrections on a digital display, lightweight tool design and a comprehensive service package centered around the tool. Advanced technological trends are taken into account, and the products meet high technological standards. Acceptance and utilization are accommodated by the provision of efficient, modular components available at short notice.



In addition, a wide range of replaceable inserts for diverse machining operations provides the best possible flexibility and problem-solving expertise.

Wohlhaupter promotes productivity through comprehensive modularity in the tools and time-saving conversion supported by a color coding system from the master shank to the required tool material. Changing machining

tasks can be easily handled by replacing individual components or by the generous adjustment ranges.

Check our performance spectrum on the following pages and put us to the test. With tradition and innovation, Wohlhaupter is the right partner for your company.

# The digital revolution – from Ø .118" to 128.15"

**DIGITAL**

Wohlhaupter is the world's only manufacturer to offer finish machining tools with continuous digital adjustment range measurement from Ø .118" to 128.15". Our customers have appreciated the rapid, precise and convenient digital adjustment option of our DigiBore precision boring tool since 2003. Now offering an automatic balancing facility and tools in lightweight Alu-Line design from Ø 2.559",

Wohlhaupter is consistently continuing the digital precision adjustment in the Balance series. The new precision boring tool from the 538 digital series also offers these advantages of  $\mu$ -accurate digital tool adjustment from Ø 3.937" to 128.15".



## We have the weight under control **ALU LINE**

Wohlhaupter utilizes the excellent specific characteristics of aluminum in standard tools and customized solutions. With Alu-Line lightweight tools, Wohlhaupter is setting new standards in weight reduction. This allows even large tools to be integrated into the production process – with simple handling and the best possible precision.



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# MultiBore system tools: rugged – flexible – proven

**MULTI<sup>®</sup>  
BORE**

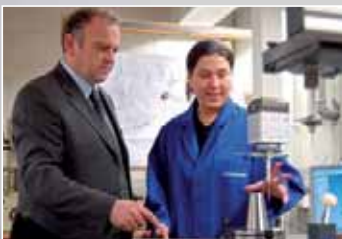


## The connection

The MVS connection has proved successful in millions of applications since its introduction in 1973:

- Easy and practical handling
- Freely accessible threaded taper pins for precise cutter positioning
- Triple point clamping ensuring high axial clamping forces on mating faces
- Accurate to less than .0001" when tool is changed
- Compatible with the MTS modular turning tool system from Wohlhaupter

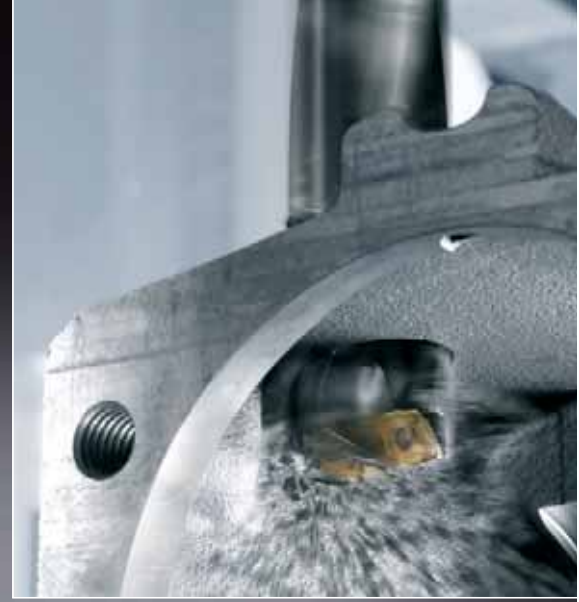
Wohlhaupter offers the widest product range for rough and finish machining of bores in the industry: **MULTI<sup>®</sup> BORE** – the globally successful modular tool system. Flexible for the most varied areas of application. Compatible with every machine spindle and accurate to the micron. The boring tools meet the strictest quality criteria; they are also suitable for high-speed machining.



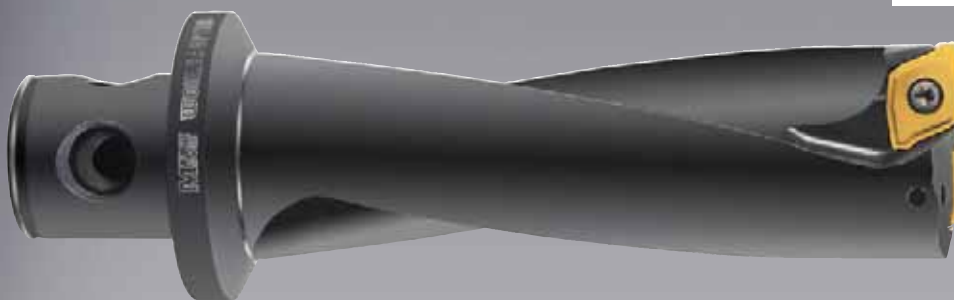
Production on modern turning/milling centers with permanent quality control according to DIN EN ISO 9001: 2000



# For the full benefit: Top Cut Plus insert drills Ø .748" – 2.126"



**MULTI<sup>®</sup>  
BORE**



#### Top Cut Plus:

With this insert drill series, Wohlhaupter offers a state-of-the-art modular solution that can perform at its best only with plane-parallel contact of the MVS connection.

#### Drill characteristics:

- Boring diameter .748" – 2.126"
- 3xD
- Maximum rigidity through 3-point clamping effect and plane-parallel contact of the MVS connection
- Can also be used on machines with low power consumption
- Reduced machining time through maximum cutting speed and feed.

#### Replaceable insert characteristics:

- Replaceable inserts XOMT in:
  - 3 geometries
  - 4 carbide grades to cover all applications
  - 2 x 2 = 4 effective cutting edges for high cost efficiency
  - Perfect separation of inner and outer cutting edges for full use of all four cutting edges
  - Four cutting edges can be used in any sequence

Other lengths and diameters on request.



Rapid assistance from our Service Hotline: a machining specialist will advise you

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# Rough machining making the chips fly

## Ø .768" – 128.15"



### Characteristics:

- Boring range Ø .768" – 128.15"
- Serrated tool body with ground serrated body
- A wide variety of different insert holders for rough machining, chamfering, axial grooving and reverse machining guarantees a wide diversity of applications
- Insert holders for level or height-staggered machining
- Use of manufacturer-independent ISO replaceable inserts is possible
- Boring range 7.874" – 128.15" with slides in aluminum lightweight design



Rough machining, chamfering, reverse machining, circular milling, axial grooving – **MULTI BORE** serrated bodies, combined with various insert holders, provide the greatest variability in machining. Wohlhaupter offers the widest range for premachining bores.



Basic version



EV version, individually adjustable



ZV version, centrally adjustable



Fast in-house repair service – production gap bridging using rental tools

## VARIO LINE

The versatile Vario-Line can be ideally adapted to the machining processes in the Basic, Individual Adjustment and Central Adjustment versions.

# Perfect precision

## Ø .146" – 1.189"

# MULTI<sup>®</sup> BORE



Test machining in customized applications  
at the Wohlhaupter Technology Center

With its **MULTI<sup>®</sup> BORE** boring tools for finish machining and decades of success world-wide, Wohlhaupter offers the widest production range for internal machining of bores in the familiar quality. Great flexibility in application, selection of cutting materials as well as simple handling guarantee optimum tool solutions for the greatest machining diversity. Wohlhaupter – for maximum precision.



## 249

The precision boring tools belonging to the 249 series are designed for machining precision bores. Their compactness means they can be used where there are long overhangs. Where they fit onto the machine, the tools are equipped with a fine thread for securing to cylindrical support shanks. Simple location into a collet chuck is thus guaranteed. The use of intermediate elements means that these tools are compatible with the corresponding **MULTI<sup>®</sup> BORE** modules.

### Characteristics of the 249 series:

- Boring range Ø .146" – 1.189"
- Compact design
- Feed-in accuracy with scaling .0004" in dia.
- Max. speed 15,000 rpm
- Continuously variable length adjustment up to 10xD
- Holding fixture in cylindrical shanks
- Can be adapted to the **MULTI<sup>®</sup> BORE** system
- Internal coolant feed up to the cutting edge

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# Customized product differentiation



The right finish-machining tool for every requirement – with three complete product lines, Wohlhaupter can provide the customized tool solution in the field of modular precision boring tools:

**320**



The practical, inexpensive finish machining tool 320 with accurate adjustment via vernier and in the proven Wohlhaupter quality.

*Balance*



The self-balancing Balance series 365 for the demanding user, with the familiar precision adjustment via vernier.

*Balance*  
**DIGITAL**



The premium precision boring tool 565 Balance digital with user-friendly adjustment via digital display.



Proficient advice from Wohlhaupter field engineers

Whether the focus is on price or high-end quality: Wohlhaupter covers all requirements and segments in finish machining with these product lines. Wohlhaupter finish machining tools from these series are manufactured in Alu-Line lightweight design in the larger boring diameter ranges.

# Precision has a name

## Ø .787" – 8.071"



# MULTI<sup>®</sup> BORE



## 320

The inexpensive standard series 320 precision boring tools from Wohlhaupter, are not equipped with the automatic balancing facility. Simply by turning the insert holders through 180° from the Ø 1.417" boring range, these tools can then also be used for reverse machining.

### Characteristics of the 320 series:

- Boring range Ø .787" – 8.071"
- Ø 3.937" – 8.071" in Alu-Line
- Feed-in accuracy .0004 mm in diameter
- Max. speed 8,000 rpm
- Internal coolant feed up to the cutting edge

### New:

- A special coating provides ideal protection against corrosion and wear for the steel tools up to Ø 4.055"
- From Ø 3.937" mm, the precision boring tools from the 320 series are manufactured in lightweight aluminum design. They are coated with a hard and wear-resistant surface

# ALU LINE



Modern production facility with state-of-the-art machining centers. Our tools are manufactured with the familiar Wohlhaupter precision here.

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# Keeping a balance

## Ø .787" – 8.071"

*Balance*

### Characteristics of the 365 Balance series:

- Boring range Ø .787" – 8.071"
- Automatic balancing over the entire boring range
- Feed-in accuracy .0001" in diameter
- Max. speed 30,000 rpm
- Weight reduction by up to 58% with Alu-Line
- Precision balancing as standard ≤ 10 gmm
- MQL-compatible
- Reverse machining upwards from boring range 1.496"
- Reduction in process times by up to 50%
- Increase in tool life by up to 100%
- A special coating provides ideal protection against corrosion and wear for all types
- Maximum precision with large overhangs



## 365

The high-end tools for quantity production – large adjustment range, always balanced.

As early as 1993, Wohlhaupter launched the Balance series on the market as the first tool for finish machining with automatic balancing. The logical further development of these tools guarantees maximum boring quality at high cutting speeds with the latest technology from as small as Ø .787" upwards. The tools larger than Ø 2.559" are manufactured in aluminum lightweight design – Wohlhaupter is also a pioneer in this technology and helps to minimize production costs.

## ALU LINE



Wohlhaupter precision tools undergo standard balancing. They are precision balanced at the customer's request.

# The logical further development

## Ø 1.968" – 8.071"

# Balance

## DIGITAL



### 565

With the digitization of the "Balance" precision boring tools, user friendliness has also become a useful feature in this series. The opto-electronic adjustment range measurement – which has proven its worth in the DigiBore precision boring tool – makes  $\mu$ -accurate adjustment extraordinarily simple.

## ALU LINE

Wohlhaupter also provides the Balance digital series in the Alu-Line version from Ø 2.559". This produces the following advantages: protection of the machine spindle and improved service lives of the cutting materials, as well as an ideal surface and roundness in the bore.

### Characteristics of Alu-Line tools:

- Weight reduction of up to 50% protects the machine spindle
- Hard and wear-resistant surface achieved by special coating
- For use with cutting speeds up to 9,900 SFM
- No galling



### Additional characteristics of the 565 Balance digital series:

- Easy handling
- Lower reject rate thanks to simple tool adjustment using the digital display
- Greater productivity and quality provided by  $\mu$ -accurate dimension corrections with +/- display directly in the machine
- Simple read-off of the LCD panel
- Protected against water and dust according to IP65
- Cutting speeds up to 6,600 SFM
- Reverse machining as of Ø 1.968"



Production optimization by several days of Wohlhaupter workshops – free of charge with practical session at the training center in Frickenhausen

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# μ-accuracy – the standard for decades

## Ø .118" – 4.016"

### Characteristics of 263 019:

- Boring range Ø .118" – 4.016"
- Outside turning from Ø .157" – 2.598"
- Balancing for improved boring quality
- Extensive range of accessories – also available as complete sets
- Feed-in accuracy with scaling .0001" in diameter
- Suitable for speeds up to 12,000 rpm
- Internal coolant feed



## 263 019

Compact in design and universal in application, it remains the best seller. The extensive range of accessories provides the user with a broad spectrum of applications. This tool is also ideal for special machining. Even outside turning is made possible through the use of specially developed outside turning insert holders. Practical tool sets in a handy case facilitate the transition to universal boring operations. An expansion by the purchase of additional accessories is thus possible at any time.



As a tool set in a practical plastic case



Wohlhaupter on-the-spot production check by our application technicians with an analysis of results

# Success is a matter of the correct adjustment

## Ø .118" – 8.189"



# DIGI BORE

Finish machining of Ø .118" – 8.189" with one tool, simple handling using the digital display, precision accuracy with opto-electronic traverse measurement to the cutting edge. Alongside these technical highlights and a wide range of accessories, DigiBore also includes axial grooving and outside turning. Fast and  $\mu$ -accurate dimensional corrections in the machine increase productivity. The fit is achieved with a single correction and downtime considerably reduced. DigiBore: unbeatable precision.



Tool sets as complete solutions

### Characteristics of DigiBore:

- Boring range Ø .118" – 8.189"
- Axial grooving Ø .236" – 5.354"
- Outside turning Ø .079" – 4.488"
- Max. speed 16,000 rpm
- Feed-in accuracy .0001" in diameter
- Opto-electronic traverse measurement
- Automatic balancing
- MQL-compatible
- System-independent with MVS connection or HSK interface
- Universally applicable with extensive accessories
- Simple handling
- $\mu$ -accurate dimensional corrections with digital display – increase your productivity and quality
- Reduction in scrap rate



Wohhaupter quality certificate with every tool supplied

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# Doing the work of two Ø .965" – 128.15"

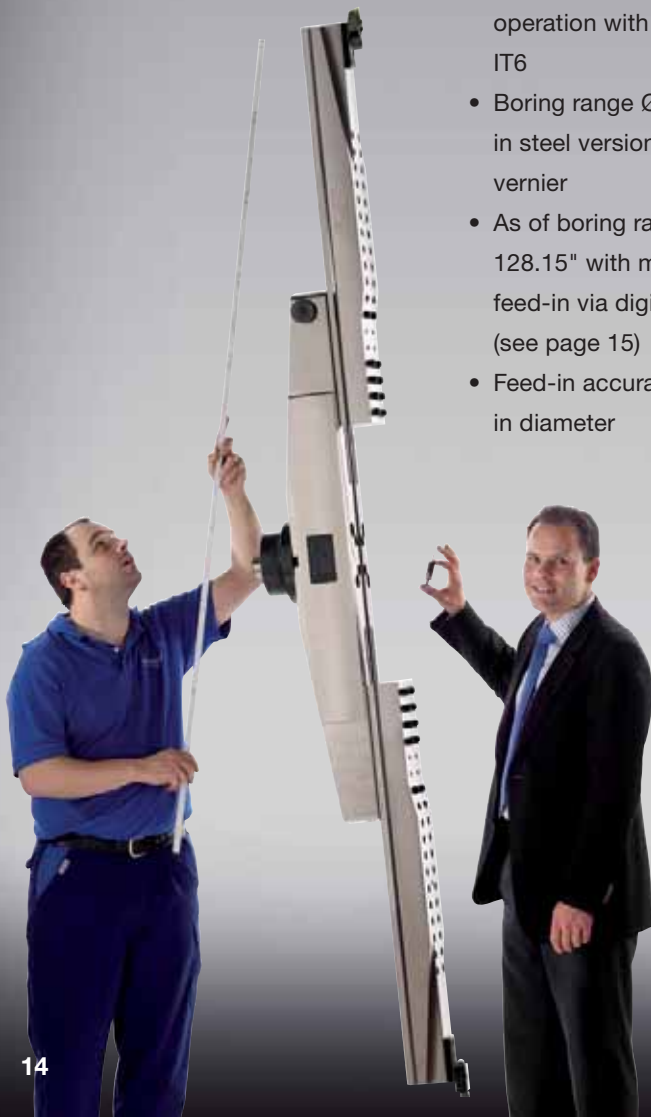
## COMBI LINE

Rough and finish machining in one operation – with a feed-in accuracy of .0001" in diameter – level or height-staggered machining – from Ø .965 – 128.15". Wohlhaupter Combi-Line: doubled productivity, coupled with the flexibility of the **MULTI BORE** range – the production manager's dream.



### Characteristics:

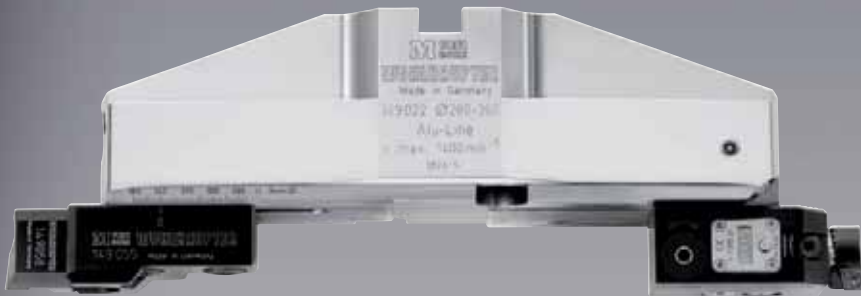
- Two tools in one
- Rough and finish machining in one operation with system of fits up to IT6
- Boring range Ø .965" to 7.913" in steel version with feed-in via vernier
- As of boring range Ø 3.937" – 128.15" with modular slide range, feed-in via digital display (see page 15)
- Feed-in accuracy .0001" in diameter
- Max. speed 13,500 rpm (2,000 rpm with aluminum slide)
- Special machining by individual insert holders
- Greater bore concentricity
- Elimination of a magazine location
- Increase in productivity by up to 60%
- Reduction of machining times and downtimes
- Lower investment costs



# Flexibility also with large dimensions

## Ø 3.937" – 128.15"

**ALU LINE**



Internal machining from Ø 3.937" – 128.15" – the range of slides from Wohlhaupter permits boring in larger sizes, with all advantages: high quality of the bore in the shortest machining time. Whether for rough machining or finish machining or combined rough/finished machining Combi-Line – the modular design permits a diversity of applications and thus maximum flexibility.

### Characteristics:

- Diverse machining options due to modular design
- High cutting speeds
- Short machining times
- D60 shank for large machining
- D40 shank for machining from Ø 7.874" – 33.071" on lower-power machines
- Convenient tool handling from assembly to tool presetting
- Weight savings up to 58%
- All advantages of the Alu-Line lightweight design
- Simple handling
- Larger range of applications
- Ideal bore quality
- Long tool life

**DIGITAL**



### Characteristics of the 338 series:

- Feed-in accuracy with scaling .0004" in dia.
- Max. speed 2,500 rpm
- Reverse machining possible
- Aluminum lightweight design
- Internal coolant supply
- Also for Combi-Line machining

### Additional characteristics of the 538 series:

- Feed-in accuracy with digital display .0001" in dia.
- Simple read-off of the LCD display



Wohlhaupter provides for a newly qualified generation through training in its own apprentice workshop

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# MTS: Modular turning Tool System – flexible and variable

## Characteristics:

- High flexibility through modular design
- Components from the MultiBore tool range can be used
- Various ISO insert holders allow any cutting material to be used
- Economical exchange of insert holders in the event of wear or the use of new geometries
- Can be used on HSK and ISO 26623-1 polygon shaft spindles
- User-friendly tool mounting using color coding system
- Convenient conversion of the turning tools to meet new machining requirements



**Modular turning Tool System** **MTS**

The Wohlhaupter modular tools for turning/milling centers are impressive in their high precision and great flexibility. A wide selection of master shanks allows the use of HSK and ISO 26623-1 polygon shaft spindles. Combined with the MultiBore system, any length and diameter of MTS tools can be individually adapted. A large number of insert holders can be adapted to the tool holders via the serrated body, so that different cutting materials and geometries can be used to the optimum extent. To round off the range of solutions for the multitasking machines, Wohlhaupter offers an extensive range of clamping tools.



HSK has been supplemented by ISO standard HSK-T 12164-3/4, hollow taper shank for use when turning. HSK benefits such as maximum accuracy, simple manufacture and high level of rigidity are retained. Added to these benefits is its precise radial positioning accuracy, which is so important when turning. All Wohlhaupter MTS tool holders already meet this ISO standard.

# Where experience and service are required



## Customized solutions

Whether in rough or finish machining, in complex machining, work pieces requiring unusual machining, special materials or particularly long overhangs – the decades of Wohlhaupter experience in internal machining of bores also flows into the provision of special tool solutions. The most exacting requirements for precision, innovative tool technology and great flexibility through the use of optimum tool materials are the basis for your success.



## Characteristics:

- Expert advice from the initial contact to commissioning by experienced application technicians
- Optimum tool design resulting from the many years of experience of the designers
- Modular design – in combination with standard tools – reduces your tooling costs
- Optimized use of replaceable inserts reduces subsequent costs in relation to cutting materials
- Standard balancing at the factory for optimum machining

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# Latest technology also in the Wohlhaupter head

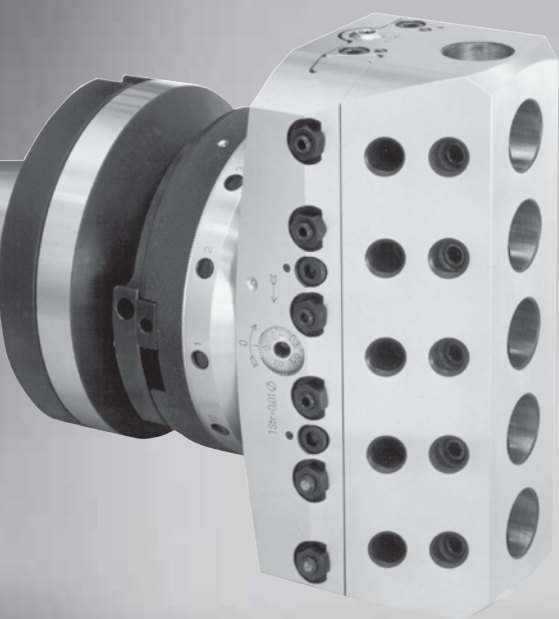
## Characteristics:

- Improvement in surface quality
- Reduction in machining times by up to 80%
- Machining safeguarded by electronic tool monitoring
- Simple to operate
- Problem-free integration into the machine control system
- Designed for all machining centers
- Comprehensive service package
- Single or double grooving in one machining operation
- Guarantees an economical process in mass production



## EK

Pure innovation for internal and external grooving in high-volume production: the trailblazing grooving head from Wohlhaupter combines linear single-cutting feed with multi-cutting circular milling.



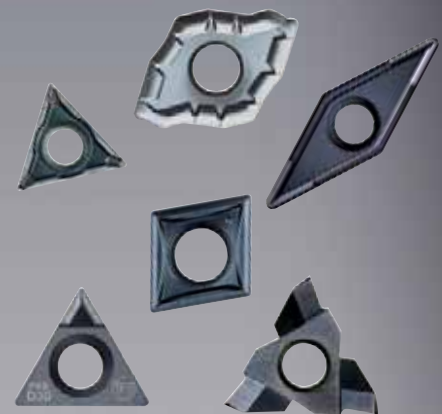
## UPA

The legendary Wohlhaupter head – top technology for over 70 years in facing, boring and taper turning as well as in thread cutting for single-item and high-volume production. The universal facing and boring head in the sizes UPA 3, UPA 4 and UPA 5-S6 remains in demand for machining.



Information exchange with the user at regional technology seminars

# From the master shank to the cutting material



The extensive range in HSK or angle taper version includes all standard clamping elements. As the first users of HSK, we have used this connection for years: Maximum tool change and repeat accuracy and maximum static and dynamic rigidity allow the use of the latest machining centers. Angle taper: For use on all standard NC machines, designed according to the standards DIN 69871 -A/ -AD/B and DIN 2080, as well as MAS-BT and CAT.

Wohlhaupter offers an unique variety of specified and ISO replaceable inserts specially designed for all conventional spindle milling operations. The range of replaceable inserts is continuously being supplemented with new shapes and current cutting materials. Whether coated or uncoated carbide metal, whether cermets, ceramics or also the ultra-hard tool materials CBN or PKD, the highly successful Wohlhaupter range of replaceable inserts will provide appropriately high-performance machining of your material.

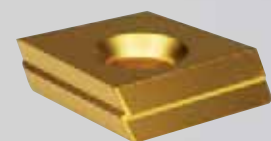
**Wohlhaupter Geometrien**  
Wohlhaupter Geometrien  
Geometrien Wohlhaupter

**Wendeschneidplatten**  
Replaceable inserts  
Plaquettes de coupe

**Beschichtete Hartmetalle**  
Coated carbides  
Carbures revêtus

**Auswahl Wendeschneidplatten**  
Selection of replaceable inserts  
Sélection des plaquettes de coupe

Selection of the replaceable insert made easy: The new catalog of replaceable inserts 90200 from Wohlhaupter includes a detailed description of the shapes and cutting materials, as well as comprehensive recommendations for feeds and speeds.



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