



**WINTERTHUR**  
TECHNOLOGY GROUP

# WENDT GRINDING TECHNOLOGIES FOR CUTTING INSERTS

Dr. Rolf Eckstein  
Vice President (Sales Machines)  
WENDT GmbH

Dr. Buyang Deng  
Manager - China  
WENDT GmbH

# WENDT GROUP



Founded in:	1920
Head office:	Meerbusch (Germany near Düsseldorf)
Production:	12 locations worldwide
Employees:	900
Sales volume:	80,4 Mio € (2009)

# WENDT GROUP – PRODUCTION SITES



WENDT DIACRAFT  
Wixom, MI, USA



WENDT DUNNINGTON  
Royersford, PA, USA

WENDT GMBH  
Hameln, Germany



SLIPNAXOS AB  
Västervik, Sweden



WENDT GMBH  
Niederstetten, Germany



WENDT GMBH  
Jena, Germany



WENDT GMBH,  
Meerbusch, Germany



WENDT BOART S.A.  
Nivelles, Belgium



WINTERTHUR AG  
Winterthur, Switzerland



WENDT GMBH  
Neukirch, Switzerland



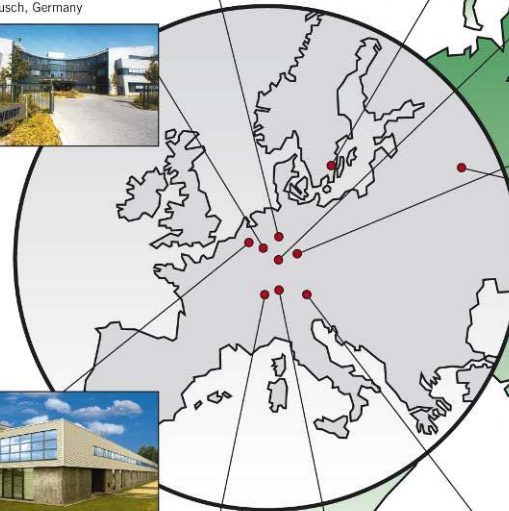
RAPPOLD WINTERTHUR GMBH  
Villach, Austria



WENDT (INDIA) LTD.  
Bangalore, India



WENDT GRINDING  
TECHNOLOGIES LTD  
Rayong, Thailand



STANKOWENDT  
Moscow, Russia



WINTERTHUR TECHNOLOGY  
(TAICANG) CO., LTD.  
Taicang, China

# WINTERTHUR TECHNOLOGY GROUP



**WENDT** Superabrasives and Grinding Machines

**Slip N Naxos** Top Quality for Steel Conditioning

**RAPPOLD** Large Diameter Cutting-Off Wheels

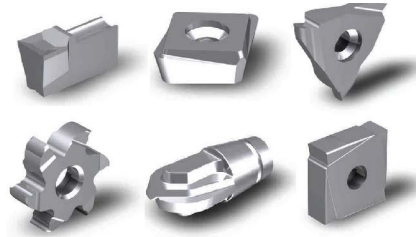
**WINTERTHUR** Precision Grinding Technology

Complete World of Grinding Technology

# TYPICAL APPLICATIONS OF WENDT MACHINES



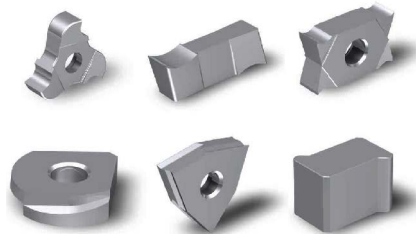
**Tungsten Carbide,  
Cermet cutting  
inserts**



**Inserts for Wood  
cutting industry**



**Ceramic Parts like  
sealings**



**CBN- and PCD-  
Tools**

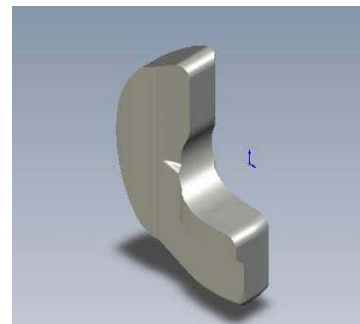
# TYPICAL APPLICATIONS OF WENDT MACHINES



**Precision Steel Parts**



**Piezo Stacks**

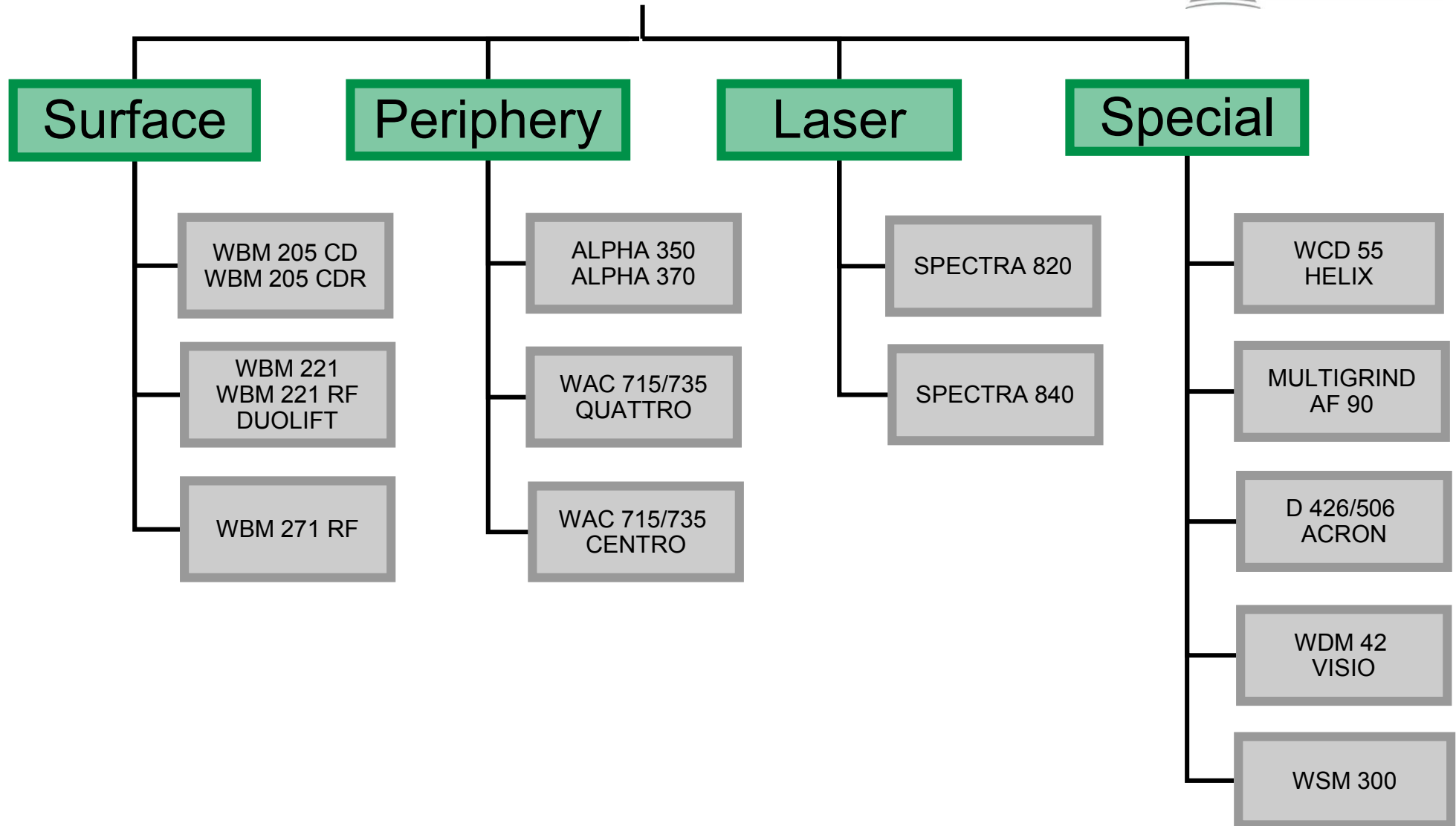


**Diesel injection  
Parts**

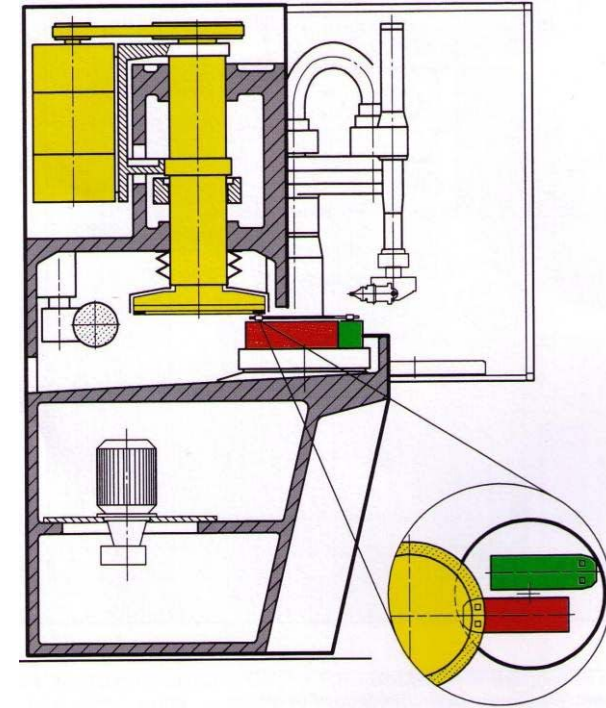


**Sapphire Glasses**

# WENDT Machines



# SURFACE GRINDING MACHINE WBM 205 CD



**High Productivity:** by loading and unloading simultaneous to the grinding process.

**High Rigidity:** short cycle times, closest tolerances.

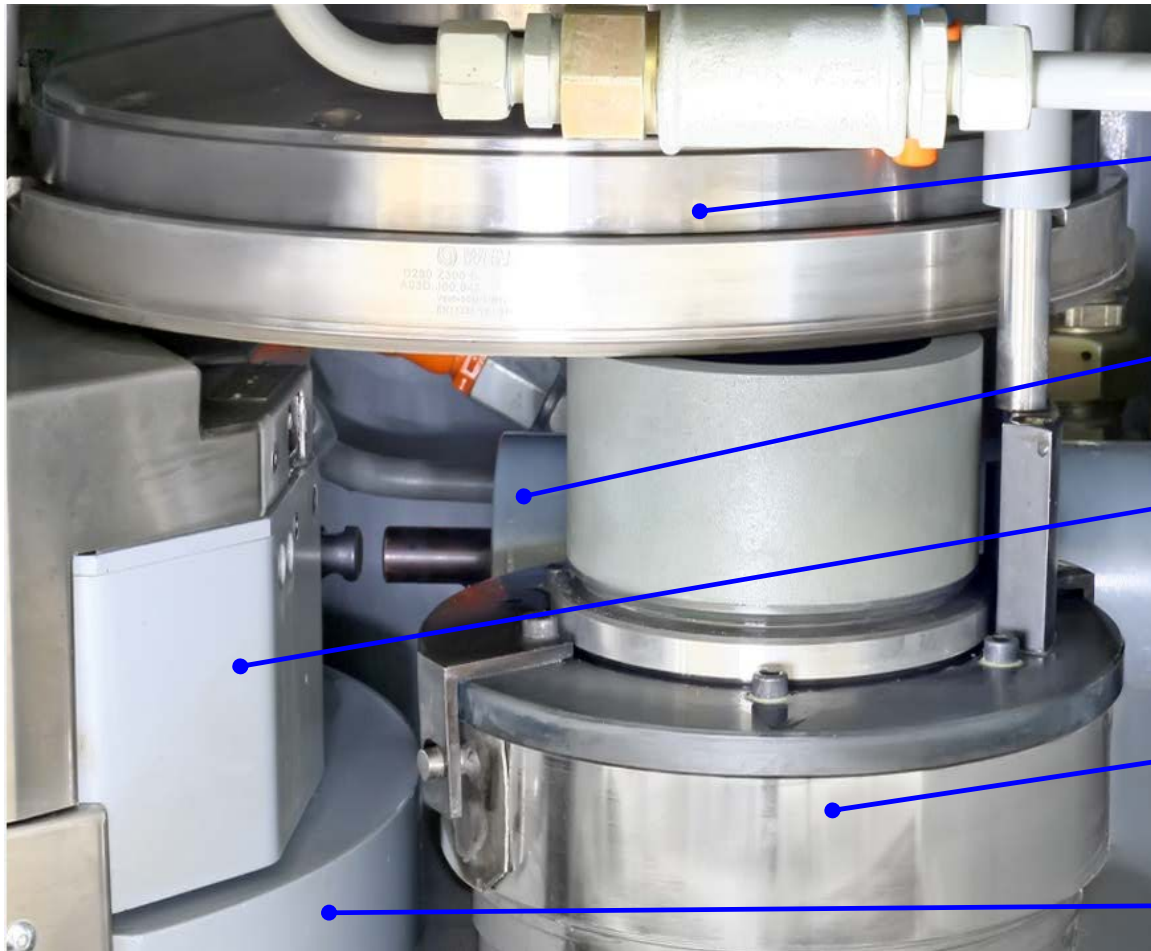
**Hydrostatic Bearings:** high precision, good damping.

**Oscillation of inserts:** keeps grinding wheel even, reduced pressure and temperature

**Good Temperature Stability:** by integrated hydraulic systems



# WORKING AREA WITH **ROTODRESS**



Grinding Spindle

Oscillation Drive

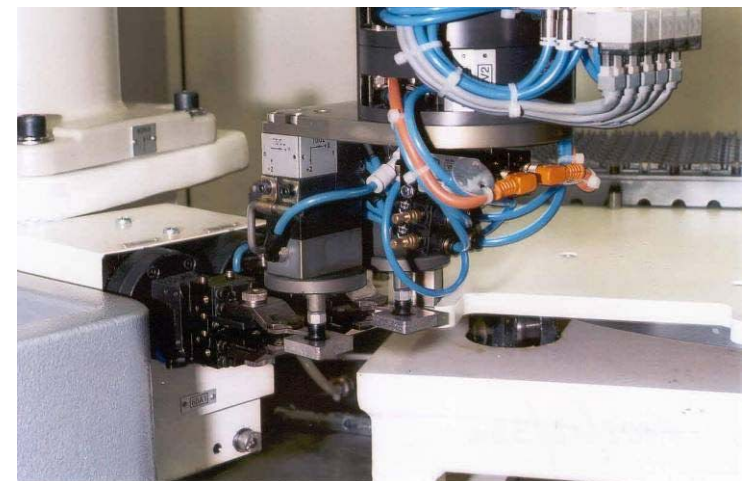
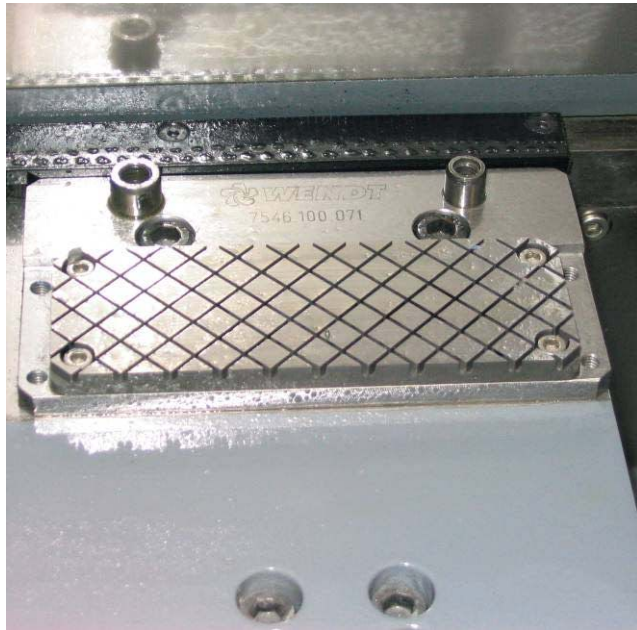
Oscillation Slide

**ROTODRESS-**  
Dressing System

Rotary Table

**ROTODRESS** permits in-process dressing also of finest-grained grinding wheels. Advantages are reduced grinding forces, improved edge qualities and shorter cycle times.

# STATIONARY WORK PIECE SUPPORT



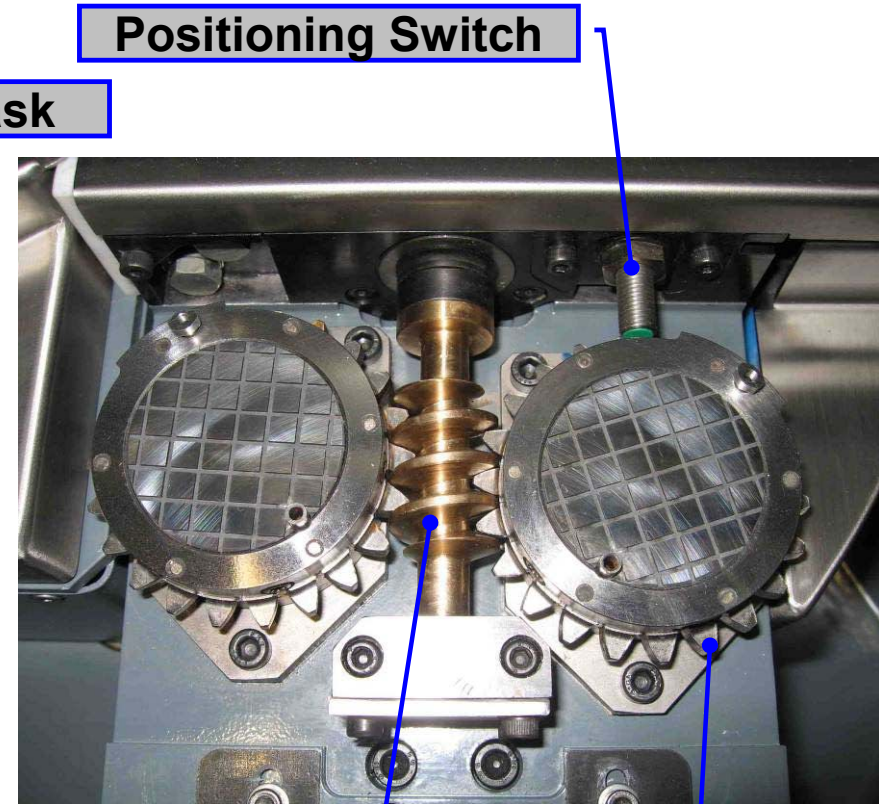
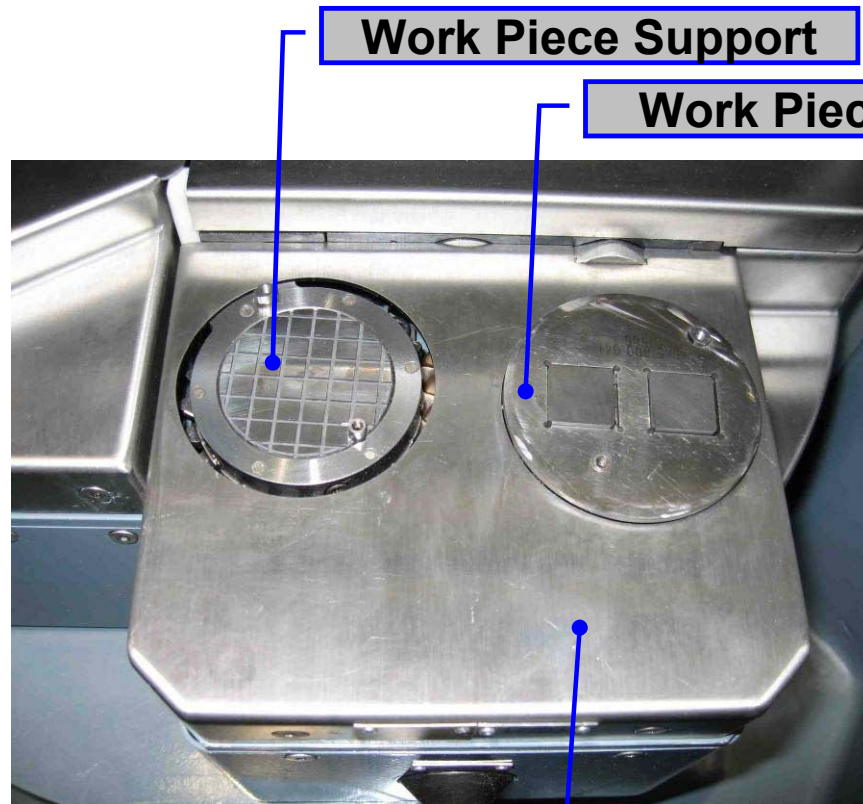
**Adaptable, quickly varying accessories concept**

**Manual or robot based work piece supply**

**Handling from flat or vertical palettes**

**Grippers for hole centering, magnet or vacuum are available**

# ROTODRIVE SYSTEM

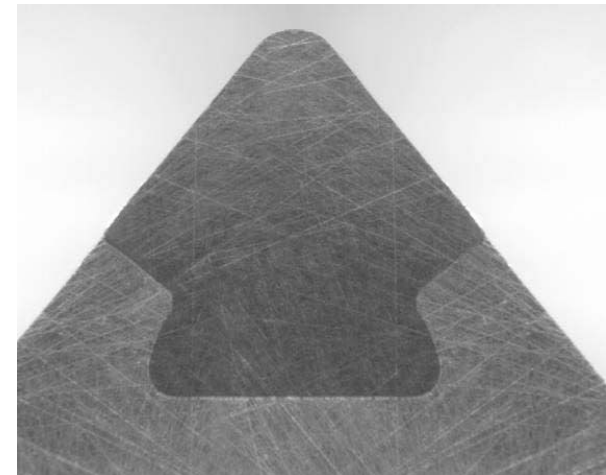


# BENEFITS AND EXAMPLES FOR **ROTODRIVE**



## Benefits

- Irregular grinding lines (cross grinding)
- Highest surface quality (Ra 0.04 – 0.12  $\mu\text{m}$ )
- Excellent evenness and plan parallelism (1 - max. 2  $\mu\text{m}$ )



## Examples

- Cutting tools inserts made of CBN, ceramics or hard metal
- Precise steel parts
- Slide faces
- Sealing elements

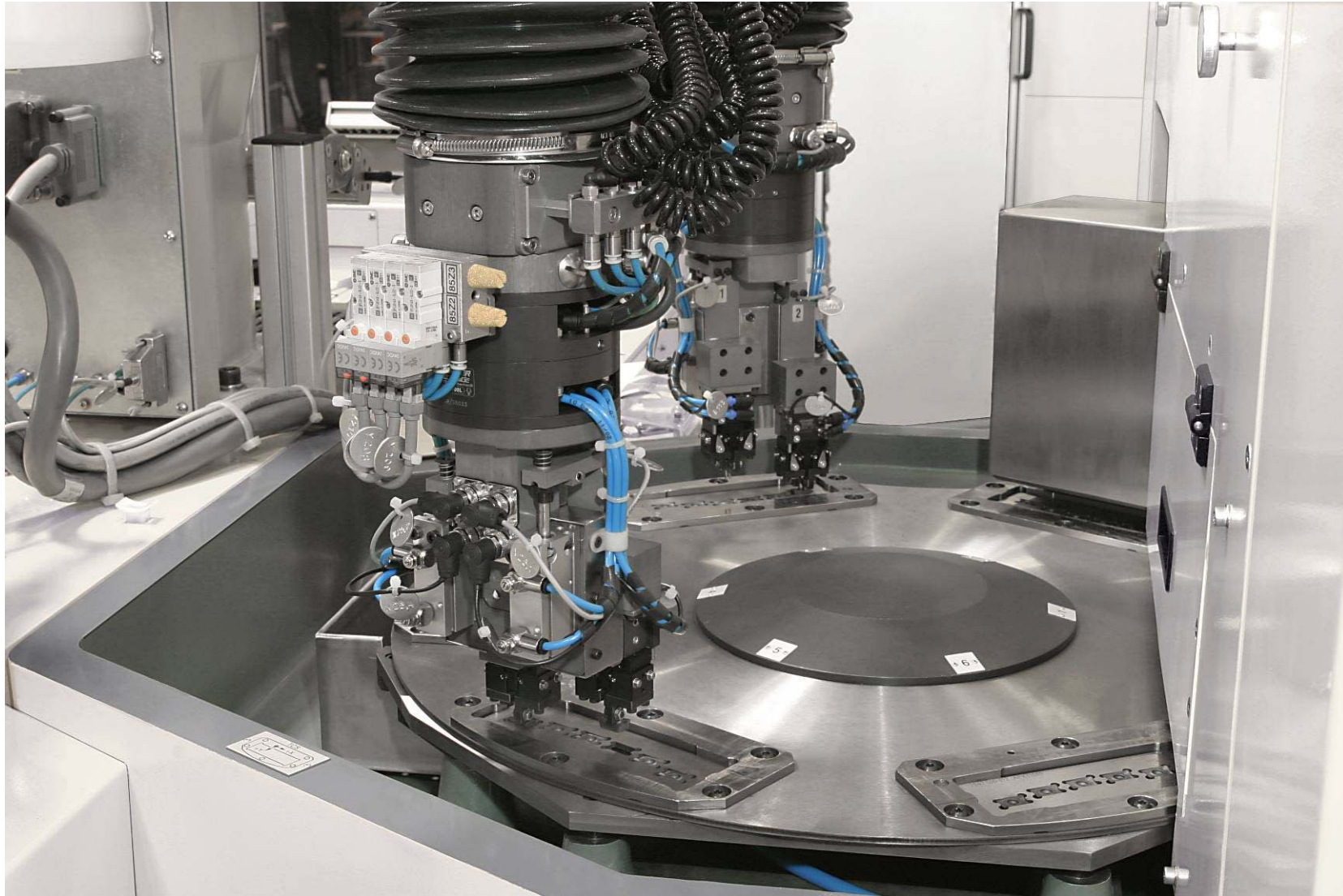


# SURFACE GRINDING MACHINE WBM 271 RF

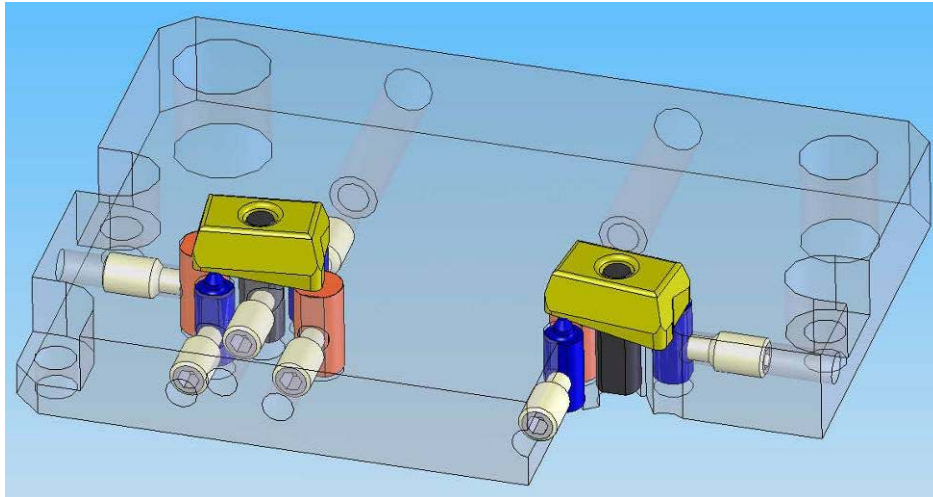


- Surface grinding of inserts with complicated chip geometries
- Productivity up to 1.200 inserts/h
- For middle and big batch sizes
- 2 Scara Robots (Adept)
- 2 pallet storages

# SIMULTANEOUS LOAD AND UNLOAD



# WORKPIECE RELATED TOOLING

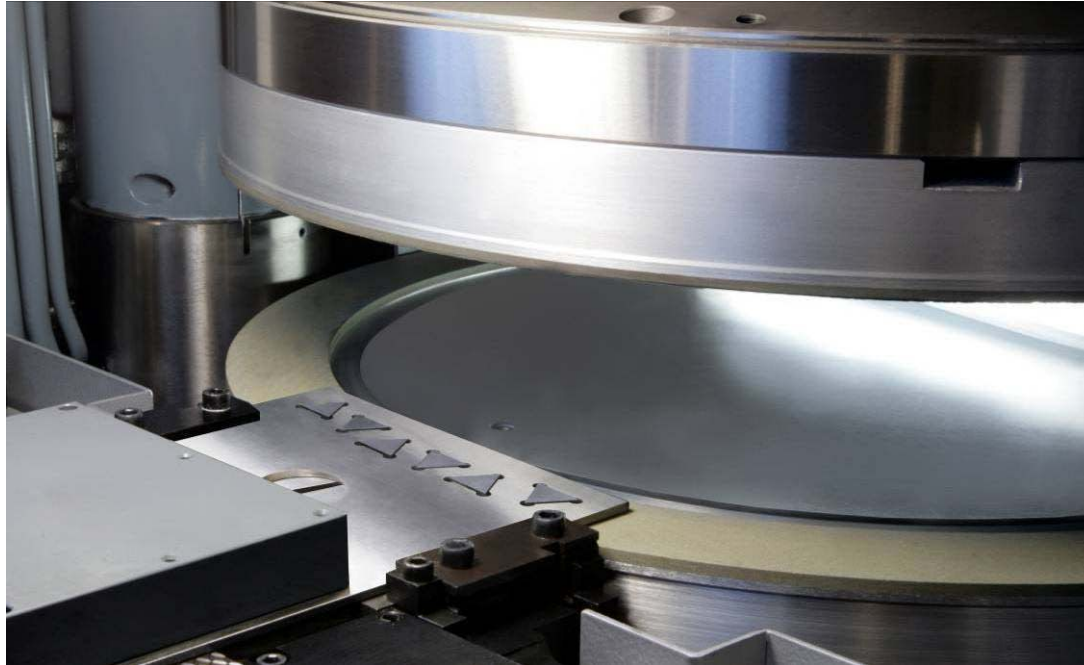


# DOUBLE SPINDLE GRINDER WBM 221





# PLUNGE-CUT GRINDING PROCESS



- High productivity by time-parallel load and unload to the grinding process
- Plunge-cut grinding allows pre- and finish in grinding one working operation
- Shortest setup times by simple work piece related accessories
- Automatic dressing of grinding wheels on the machine
- Oscillating work piece movement to achieve a constant grinding wheel level

# WBM 221 DUOLIFT



- Compact construction, one Scara-Robot for load and unload
- Separation of raw and finished inserts palettes
- 32 trays to store different types of palettes, individually take-off

# WBM 221 DUOLIFT



- 4-gripper solution for quick loading and unloading
- Load from sinter pallets, unload in other pallet types
- Productivity up to 1.000 inserts/h

# VISION SYSTEM VG+

## High-resolution applications

- camera at the robot arm
- pixel size less than 0.1 mm
- sub pixel resolution 40  $\mu\text{m}$

## "Wide area" applications

- stationary camera
- viewing of the whole palette

## Infrared lighting and daylight filter

- setup and detection independent of daylight influences
- maximum reliability



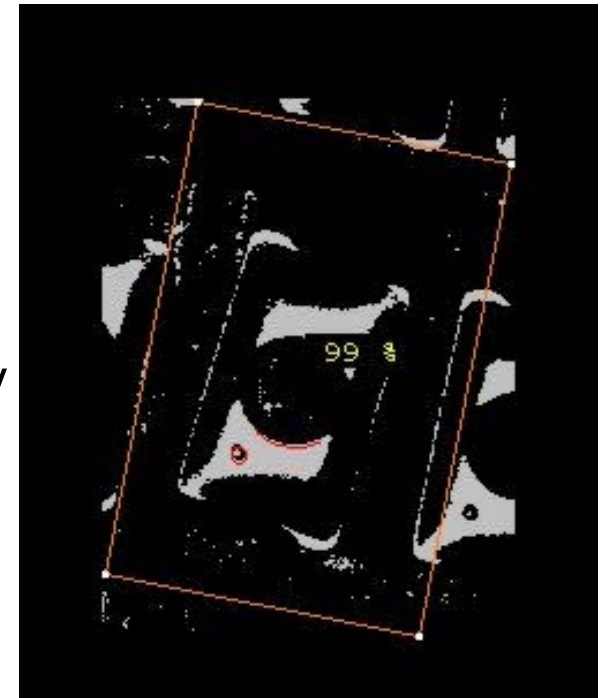
# VISION SYSTEM VG+



Detection also of complicated geometries, in palette nests or in irregularly position on sinter palettes



Orientation by numbers



Automatic orientation by sinter marks

# ALPHA 350/370



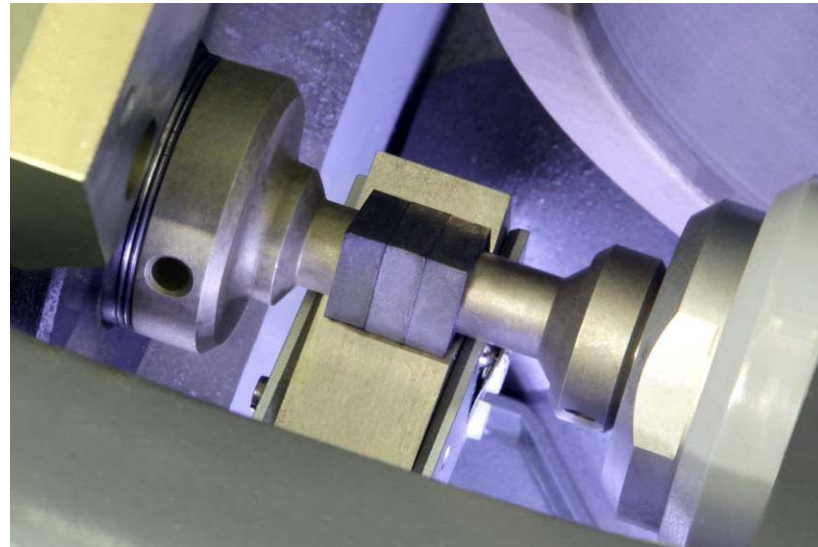
ALPHA 350 Periphery grinding machine for cutting inserts

ALPHA 370 Periphery grinding machine for cutting inserts with SCARA roboter

# ALPHA 350/370



- Working area of Alpha 350
- Dressing with AUTODRESS



- Clamping of more than one work piece is possible
- Reduction of grinding time

# WAC 715/735 QUATTRO



WAC 715 QUATTRO with palett storage for small to middle batch sizes

WAC 735 QUATTRO with palett storage for 32 palettes



# WORK PIECE RANGE

WAC 735 QUATTRO for grinding periphery and T-lands of tungsten carbide ceramic, CBN or PKD



Schutzfasen abhängig von der Tip-Orientierung maßgerecht anschleifen (KOMPENSA 3D).



Schutzfasen beidseitig an negativen Wendeplatten schleifen.



Schutzfasen maßgerecht zur Auflagefläche schleifen (KOMPENSA S).



Definierbarer Abschleiß bei vorgesinterten Spanleitstufen. Automatische Konturanpassung.



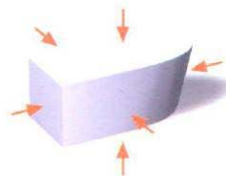
Automatische Korrektur der Höhenlage durch Messung nach Anschliff.



Auflagefläche schleifen.



CBN-Schleifen. Optimales Schärfen der Schleifscheibe. Gezielter Abschleiß.



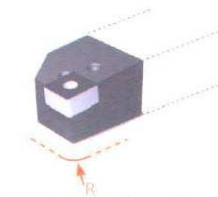
Allseitenbearbeitung.



Beliebige Konturen (Spline-Interpolation).



Tiefschliff.



Elliptische Konturen für positive Anstellung im Plattensitz.



Umlaufende Radien bis zur Anlagefläche.

# WORKING AREA



- The axis principal „grinding edge in round table center“ guarantees highest precision
- High machine stiffness by short move distances
- Grinding wheel diameter of 400 mm stabilizes the process
- Short setup times by magnetic connection of wheel, dress role and accessories components

# WAC 735 QUATTRO- IMPORTANT FEATURES



- Proven LHC / RHC principle for safe work piece clamping
- KOMPENSA MY allows centering, alignment and measuring of work pieces
- KOMPENSA M with PCD – measuring plate optionally available



# WAC 735 QUATTRO- IMPORTANT FEATURES



## Central prism

central prism in the round table  
allows exact centering directly  
in the clamping range

- reduction of the measuring work
- automatic vertical adjustment
- magnetic prism connection



# **ROTODRESS**

The kinematics of **ROTODRESS** allows due to the big contact surface and the favorable relative speed efficient in process dressing also with finest-grained grinding wheels.

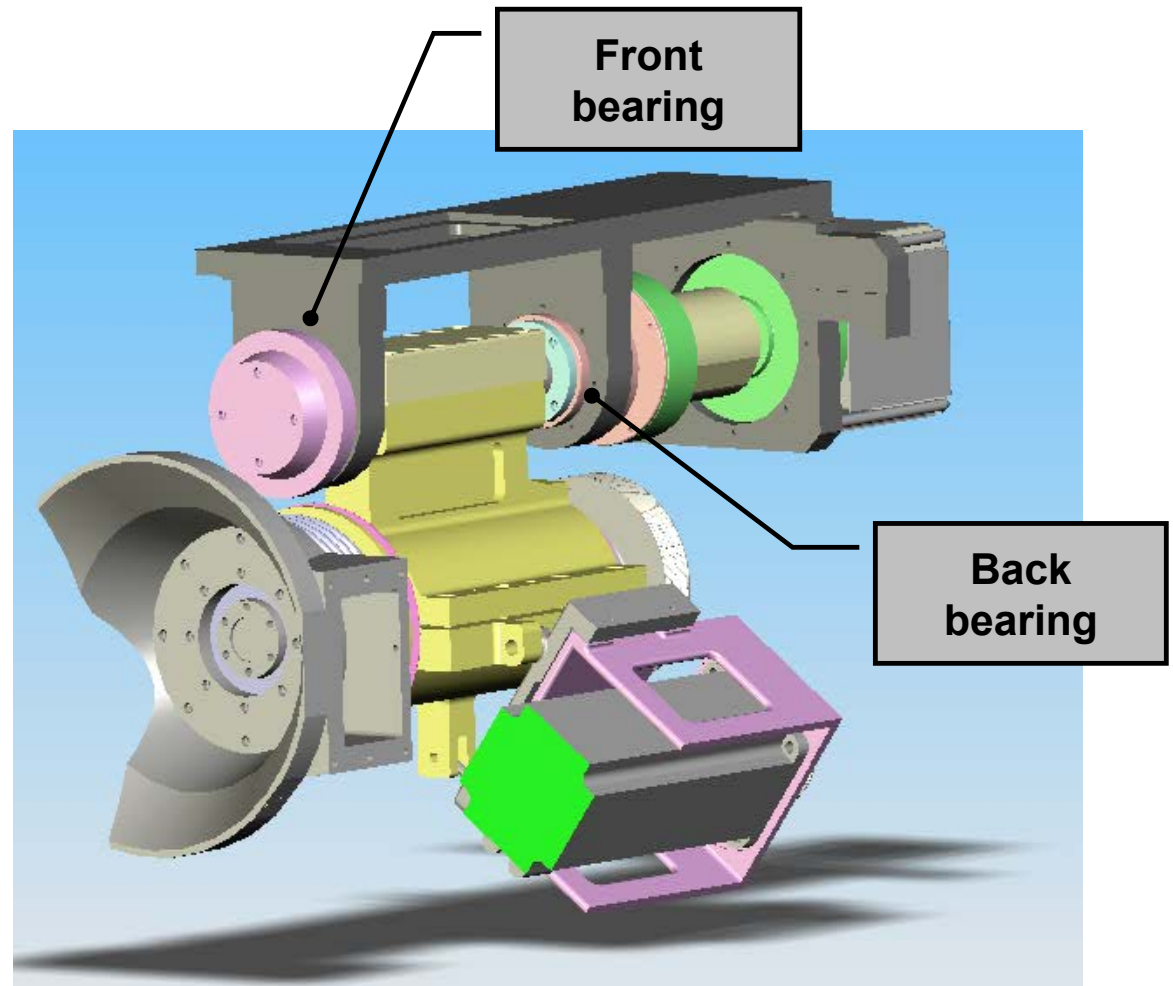


The advantages for the user are reduced edge outbreaks, reproduce able cutting edge quality and low cycle times.

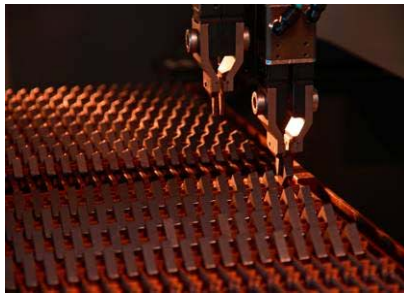
# HYDROSTATIC BEARING

Combined hydrostatic bearing of X and W axis

- ✓ **high stiffness and damping**
- ✓ **no wear**



# WAC 735 CENTRO

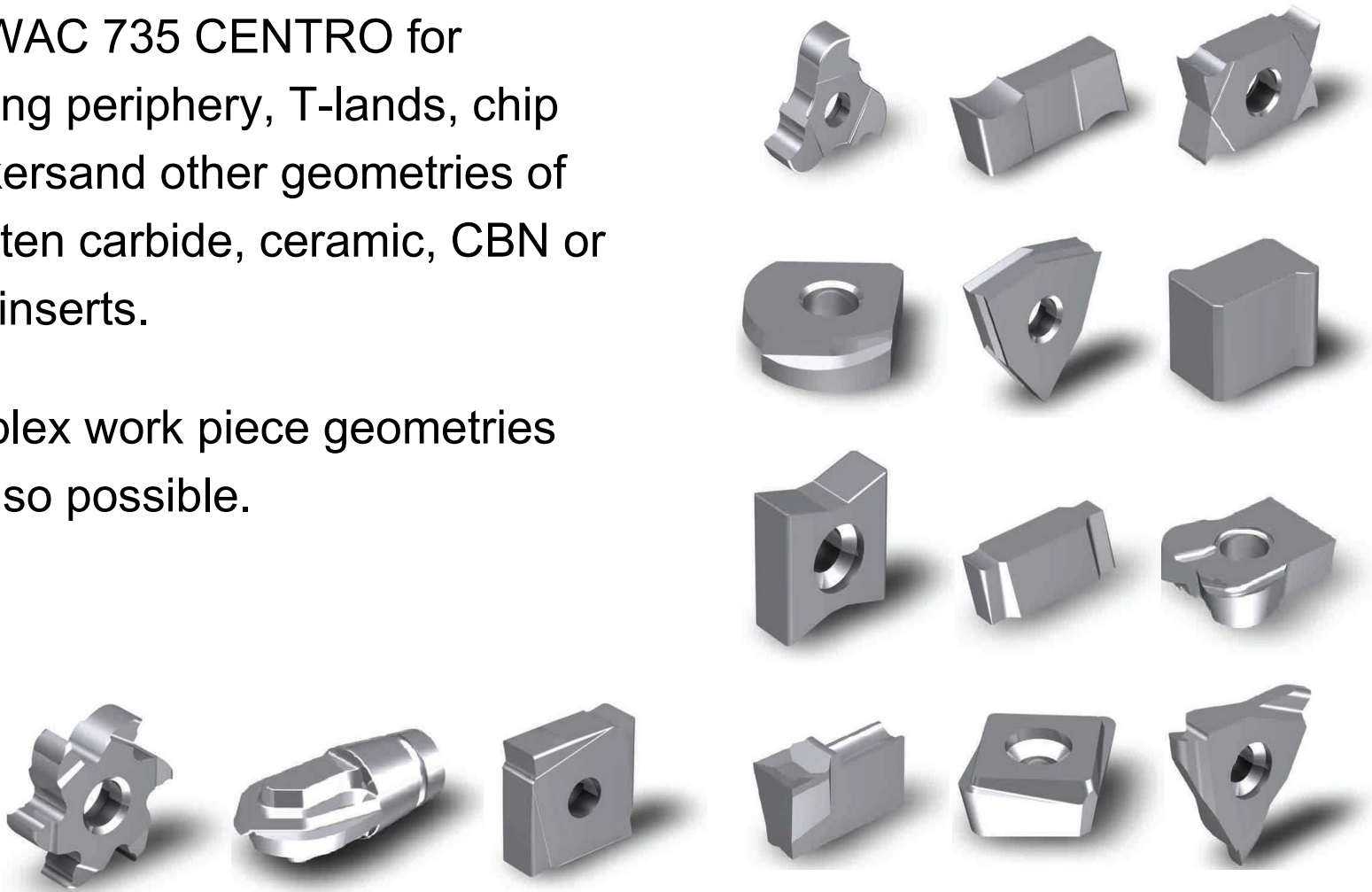


# RANGE OF WORK PIECES



The WAC 735 CENTRO for grinding periphery, T-lands, chip breakers and other geometries of tungsten carbide, ceramic, CBN or PCD inserts.

Complex work piece geometries are also possible.





# 360° x 360° PRINCIPLE

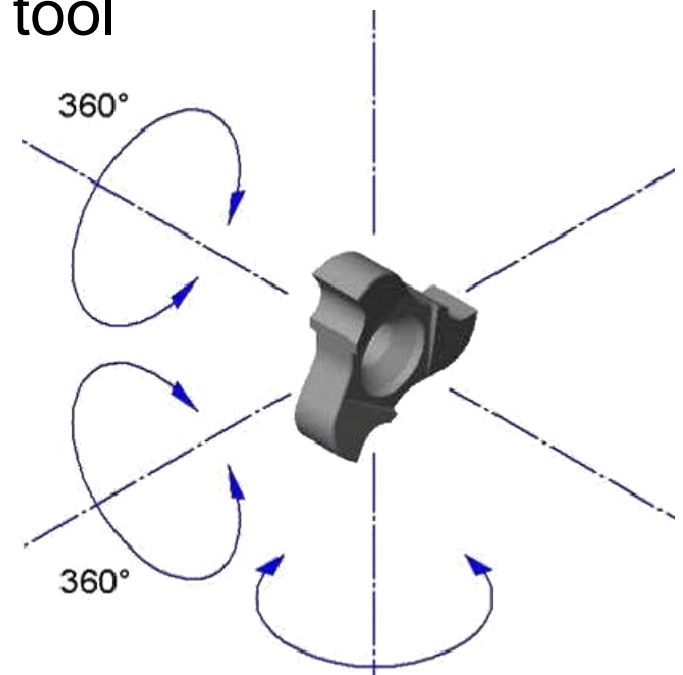
**Two 360° round axis** are located on the round table.

- ✓ Five interpolating CNC axis
- ✓ completely turnable A-axis
- ✓ very compact design of the clamping tool

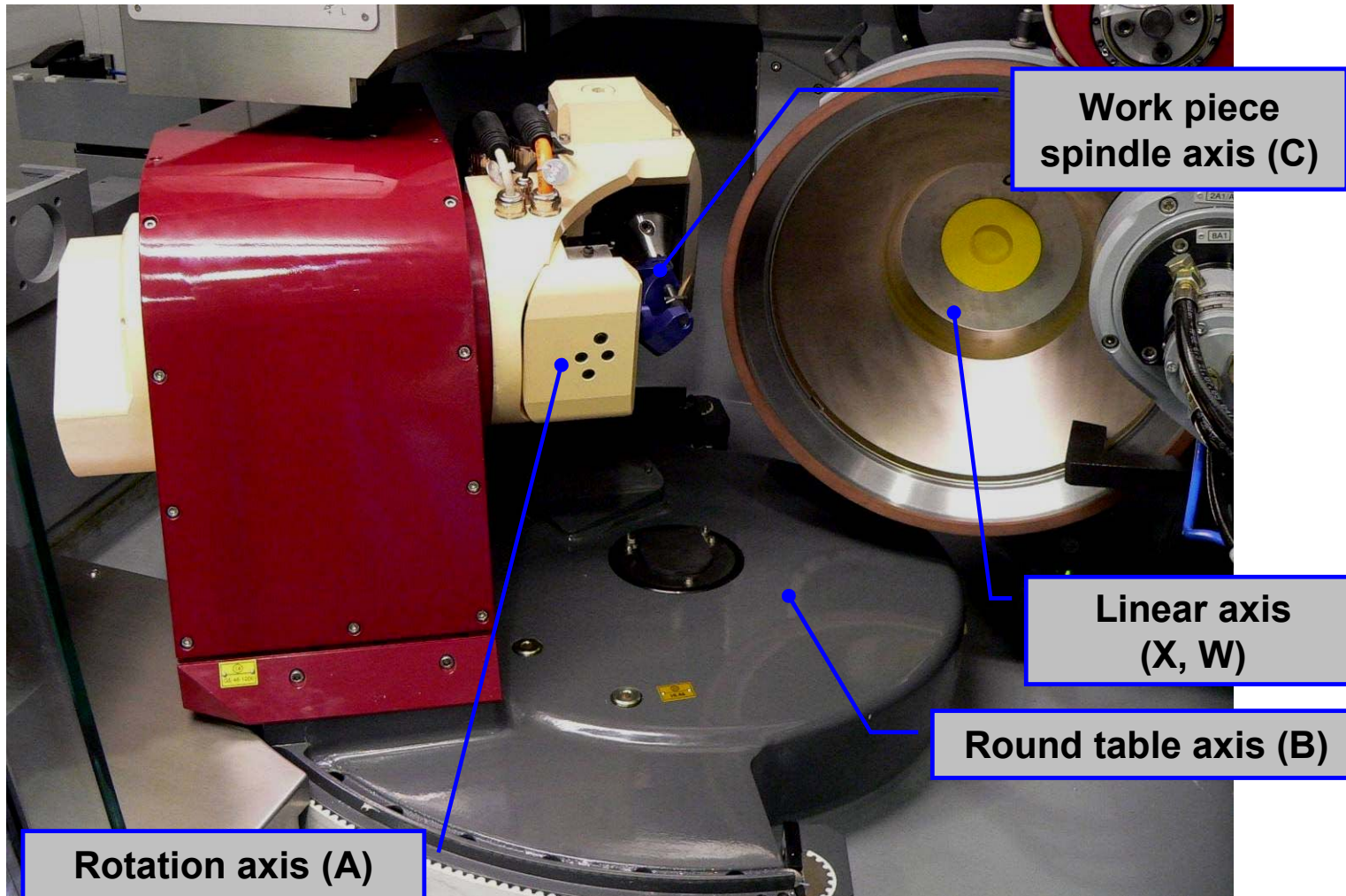
Result:

**Grinding operation on all 6 sides are possible with only one clamping**

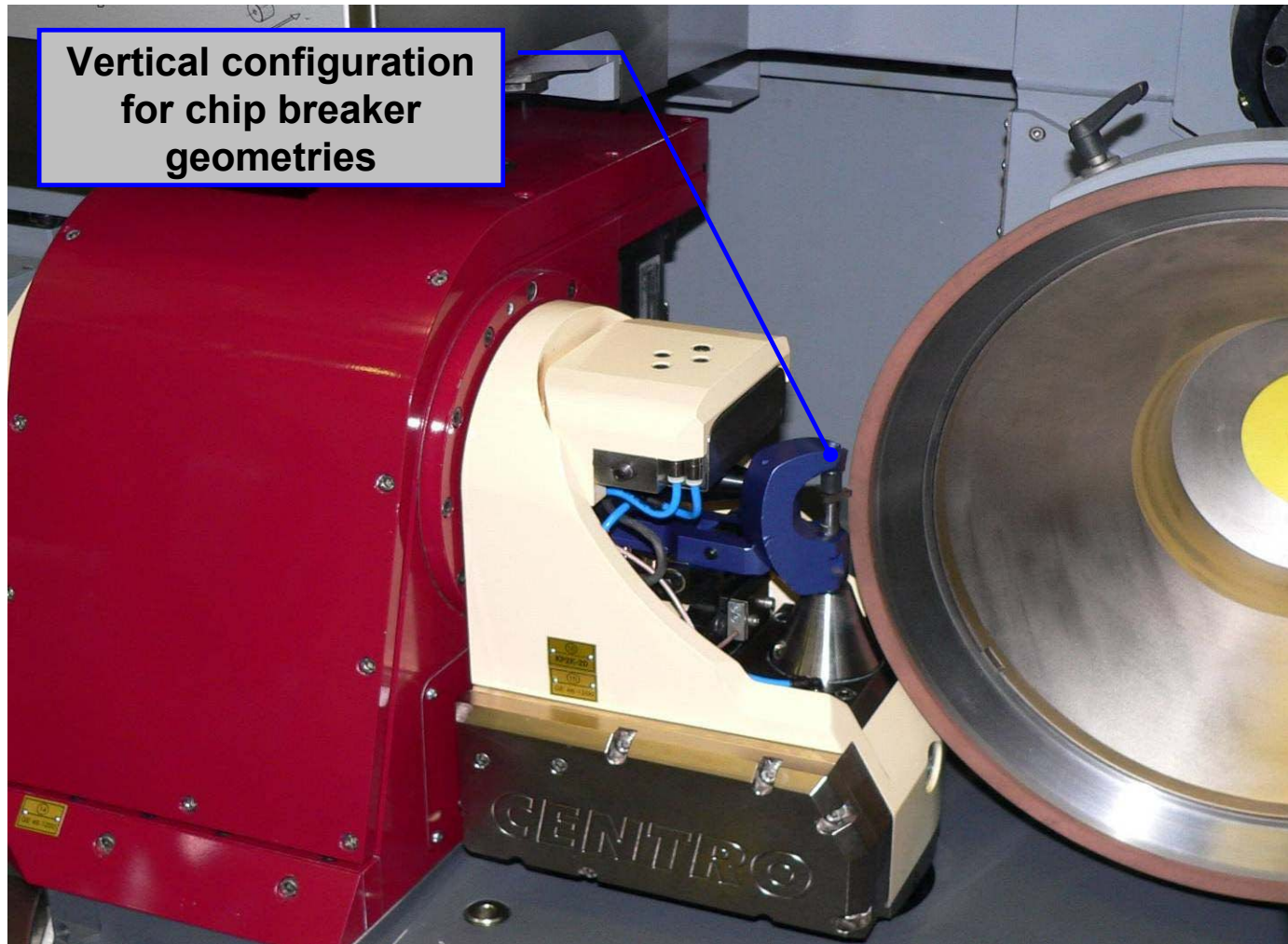
180° turnover of the A-axis reduces a long movement of the oscillation axis.



# WORKING AREA



# WORKING AREA



# CENTRO HIGHLIGHTS



flexible A-axis with **360° slewing range.**



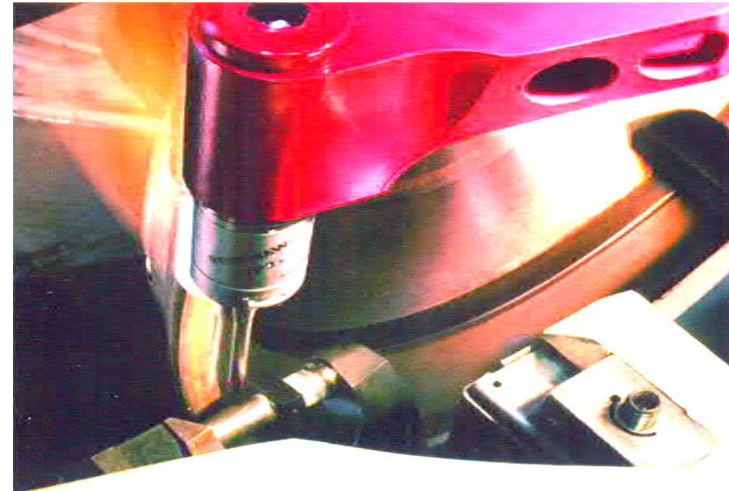
The clamping unit **C-Force** guaranteed excellent clamping combined with enough moving space for the work piece.



# CENTRO HIGHLIGHTS



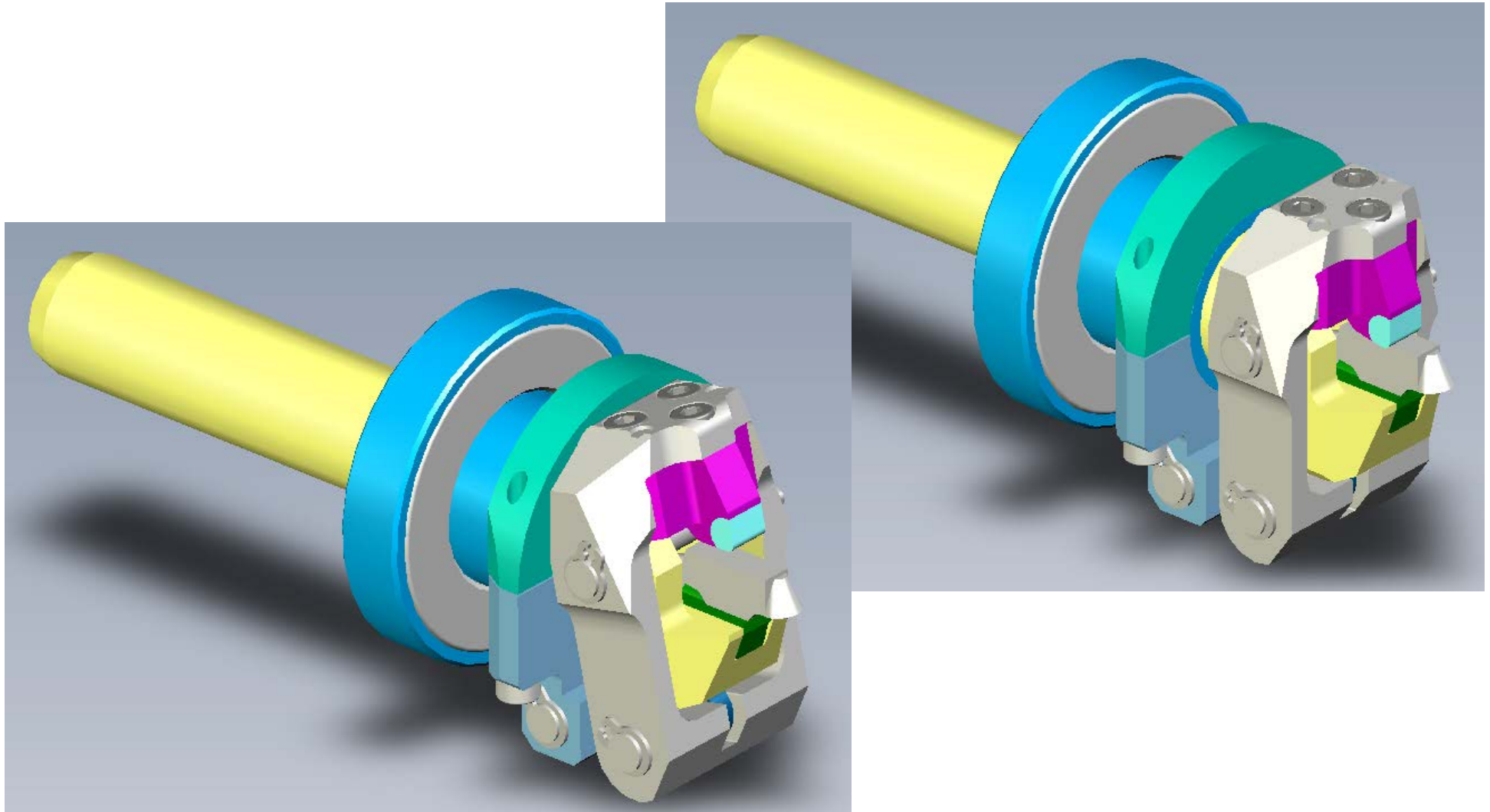
Innovative measuring system  
KOMPENSA 3D for complex  
geometries.



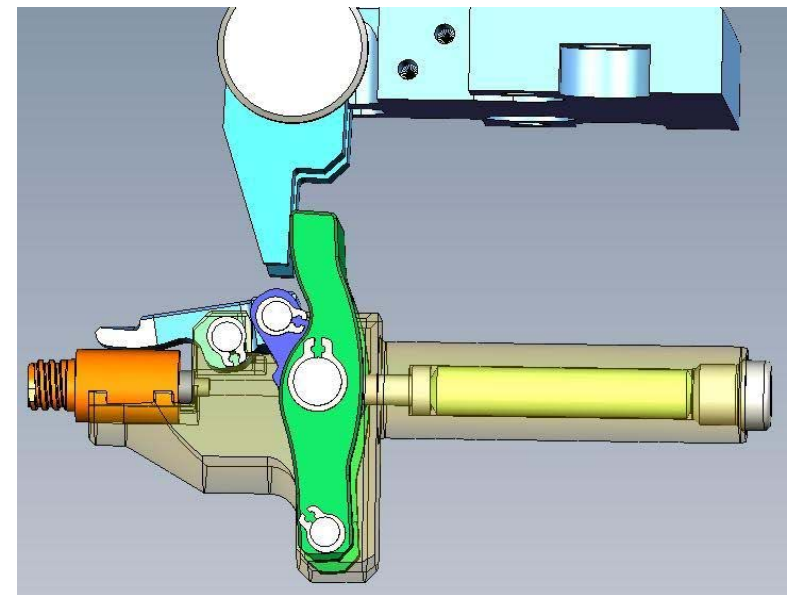
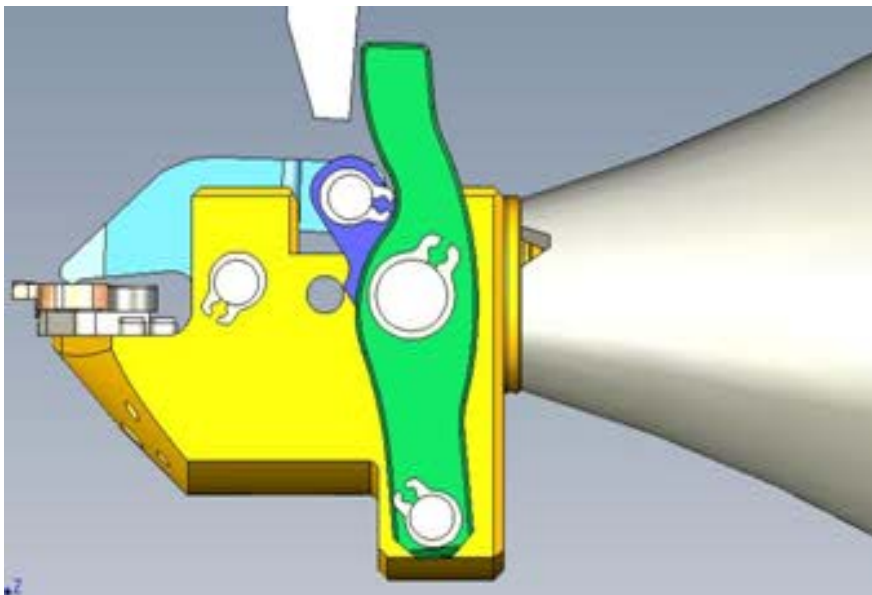
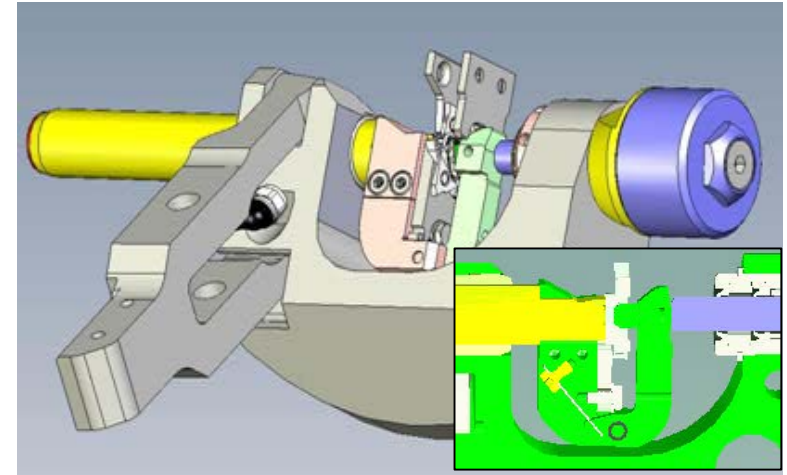
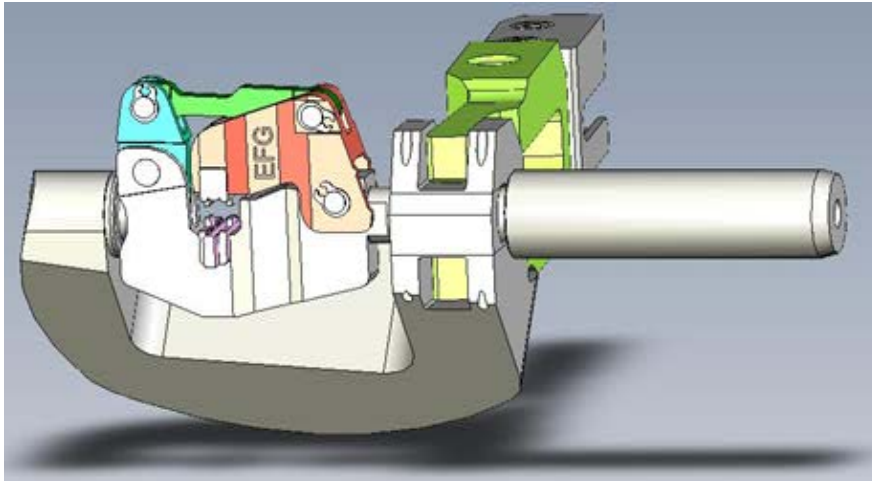
Optional central prism to the  
mechanical centering.



# SPECIAL CLAMPING DEVICE



# OTHER SPECIAL-CLAMPING DEVICES



# USER FRINDLY PROGRAMMING

Schulter schleifen

Geometrie

X1 [mm]  CS [°]

X2 [mm]  dW [mm]

Aufmaß [mm]

---

A0 [°]  B0 [°]  C0 [°]

A1 [°]  B1 [°]  C1 [°]

A2 [°]  B2 [°]  C2 [°]

Radius

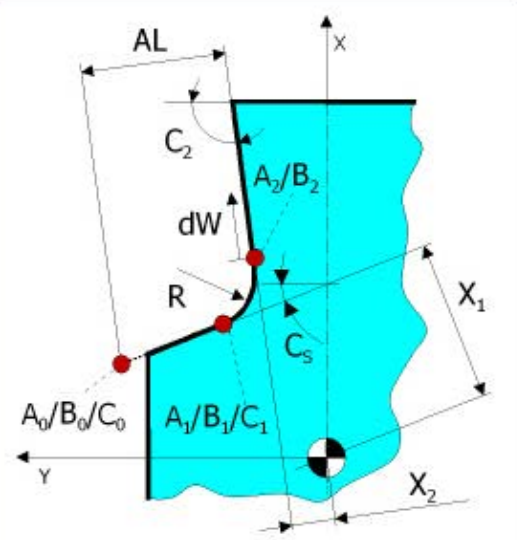
ohne  R  Z  K

Radiengröße [mm]

Radiengröße unten [mm]

Dicke [mm]

Geometrie



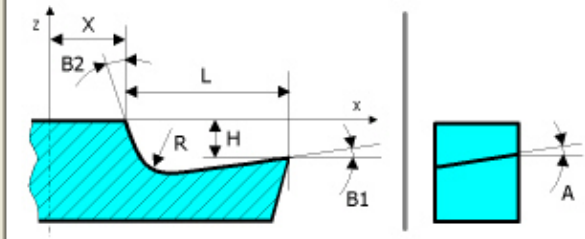
Template  
chip breaker

Template  
shoulder grinding

Geometrie

Abstand (X)	6.3	mm
Werkstückwinkel (C)	0	°
Länge (L)	2.5	mm
Höhendifferenz (H)	0.3	mm
Radiengröße (R)	0.5	mm
Spanwinkel (B1)	10	°
Auslaufwinkel (B2)	35	°
Kippwinkel (A)	0	°
Aufmaß	1	mm

Erweiterte Einstellungen



Vorschub[mm/min]

Wencontrol benutzen

Anfahren

Schleifen

Radius/Spline

Flugkreis

Auf Flugkreis fahren

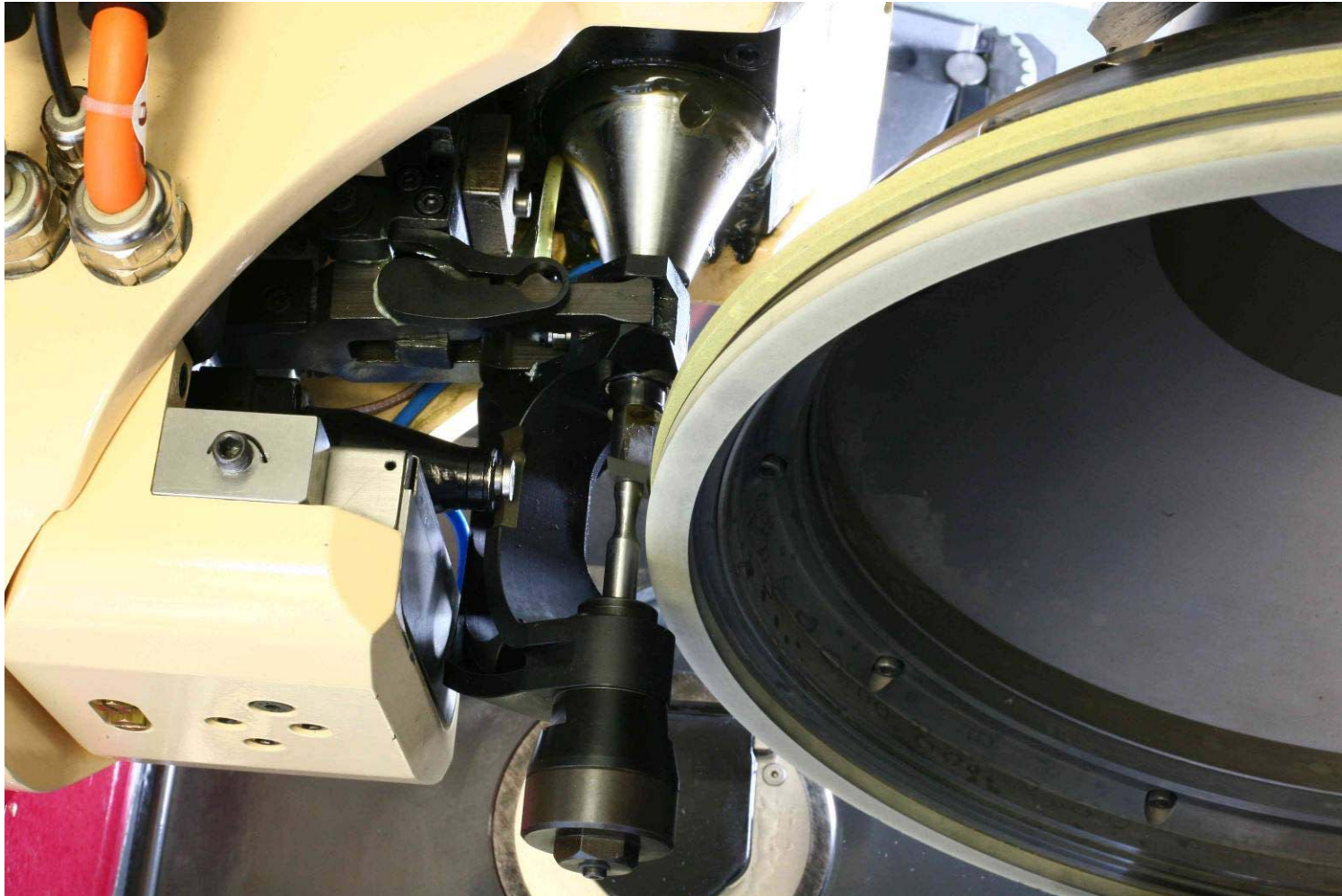
vor dem Schleifen

nach dem Schleifen

mm



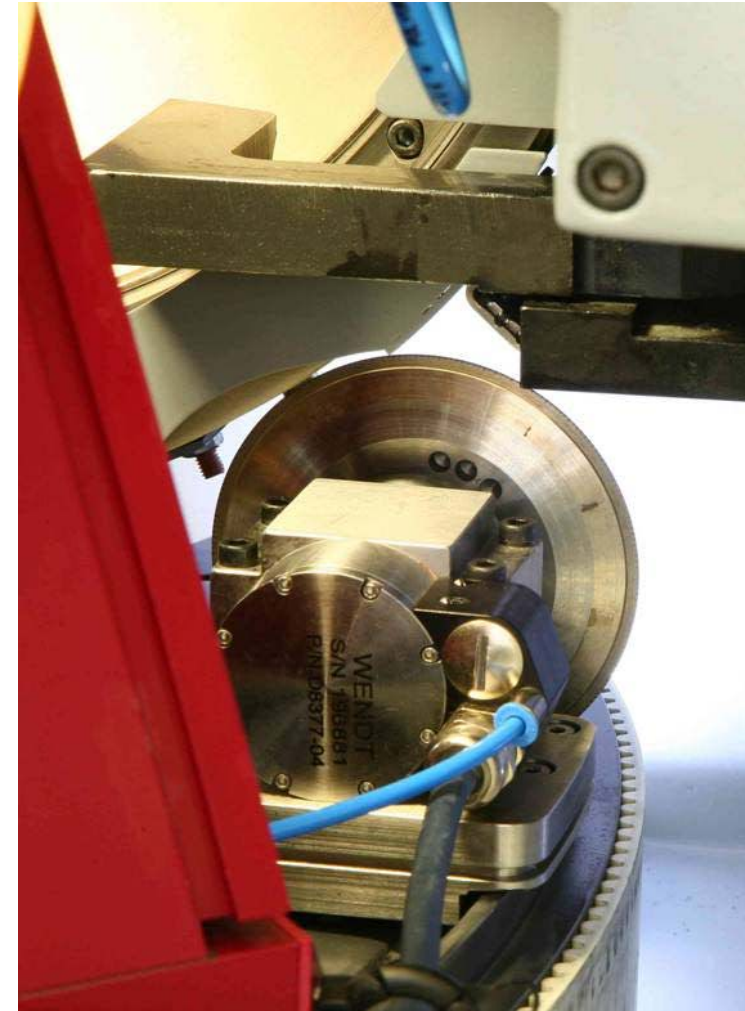
# DUOWHEEL



# DUOWHEEL



# CNC-DRESSING OF CERAMIC WHEELS



# SPECTRA 8X0 FAMILY



Soon available

**SPECTRA 820** massive construction, moved work piece and high abrasion.

**SPECTRA 840** space saving, moved laser and bigger flexibility.

# WORK PIECE RANGE – SPECTRA 820



## Creating complex 3D structures:

Chip breakers

T-lands

Clamping cavity

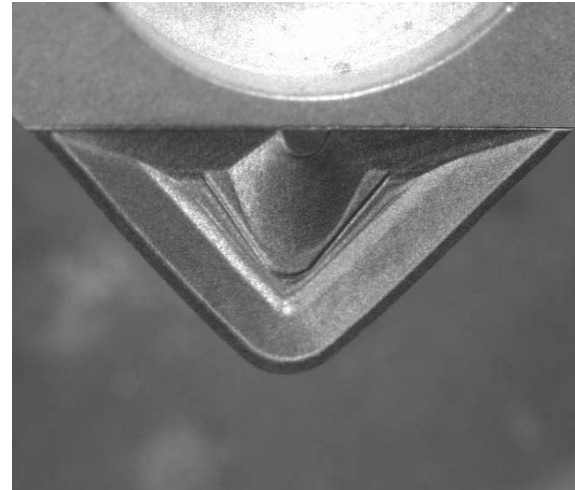
## With **adamantine materials** like:

Carbide metal

Cermets

Ceramic

CBN or PCD



# APPLICATIONS SPECTRA 840



Grinded PCD  
cutting edge

Laser processed PCD  
cutting edge



PCD rotation tool