GWT



# CUTTING TOOLS FOR MACHINING

## automotive engine parts

**CONTENT:**

GWT

# AUTOMOTIVE ENGINE PART

# CUTTING TOOLS

## Machining valve guide & valve seat ring

The machining precision valve seat ring and guide hole directly effects the power and exhaust emission index of the engine. **GWT** cutting tools can easily achieve precise combined before and after the valve seat and the value guide ring assembling, accurately assured clearance of valve seat ring, ensure valve heat dissipation and sealing performace.

At the same time solve the processing engineering of the tool setting repeatedly, deformation and wear fast, low machining efficiency.

## Bottom hole finish machining tools

- The thermal shrinkage process realizes two kinds of materials composed with high precision.
- Accurate concentricity ensured tool's super long durability and dimensional precision.
- Flange connection can achieve radial run out adjustment.
- The internal cooling structure ensures better chip removal effect.

**FINISH MACHINING BEFORE PRESSING RING**

Valve guide & valve seat machining tools

1. PCD.
2. Internal cooling structure.
3. Thermal Shrinkage compound processing.
4. Flange connection

**ROUGH MACHINING BEFORE PRESSING RING**

Throat form tool

## Valve guide & valve seat finish machining tools

- Semi-finish and finish machining tools are capable of distribute the processing in more reasonable method and ensure longer tool durability.
- Rational guide pad distribution design assured reaming precision.
- Boring blade can achieve tine-adjustment operation.
- Machining processing combined PCD and PCBN material. Double promotion of tool durability and processing quality.
- Excellent precision over repeatability clamping, easy and reliable adjustment.

Finishing tool Pilot tool

**MACHINING AFTER PRESSING RING**

Valve guide & valve seat machining tools

1. Runout 0.003mm.
2. Rational guide pad distribution.
3. Excellent precision over repeatability.
4. PCD.
5. PCBN.
6. Fine-adjustment structured.

## Gun reamer for finish machining of valve guide

- Optimized cutting edge material and structure, suitable for precision reaming of super length-diameter ratio work piece.
- A variety of blade number and material, can match different processing conditions.
- Front edge rounout 0.003mm,
- PCD and carbide materials are available.
- Reliable tool durability.
- Welding type and mechanical clamping type.
- Provide reconditions services to reduce to tool cost.

# CUTTING TOOLS

## For the series of complicated hole machining

To ensure the hole coaxiality of tappet, spark plug, fuel spray nozzle, and machining efficiency at the same time, **GWT** uses the multi-processing compound tools, realized concentration processing for multi-step holes, optimize processing steps, decrease tool changing times and save production time, then reduce the cutting tool inventory at the same time.

With the high precision and wear resistance of PCD tools, from processing optimization to high efficiency and stable processing, the machining problems of complicated holes are perfectly solved.

## Finish machining tools (mechanical clamping type) for tappet hole

- Mechanical clamping inserts replacement and adjustment simple and convenient
- Precise design of the guide structure to ensure smooth processing.
- Flange connection can adapt different types of tools holders.
- Excellent tool rigidity.

1. Mechanical clamping inserts is adjustable
2. Guide structure.
3. Adjustable flange connection.

## Rough machining tools for tappet hole

- Carbide drill and PCD reamer assembly together with thermal shrinkage connection.
- Cutting edge runout within 0.003 mm to ensure longer tool life and machining precision.
- Drilling and reaming combine structure, it wil get precision reaming guide while drilling.
- Unique tool retipping technology can get precision as new tools so that customer can save
- cost and resources.

1. Combined drilling and reaming.
2. Thermal Shrinkage combination.
3. Retipping technology service aviable.

## Finish machining tools for spark plug hole & fuel spray nozzle hole

- Complex cutting edge with the back taper of 0.003mm manufacturing tolerances, can reach IT7 level tolerance
- Thermal Shrinkage processing helps the compound tools to ensure a higher precision and rigidity.
- Excellent surface quality.

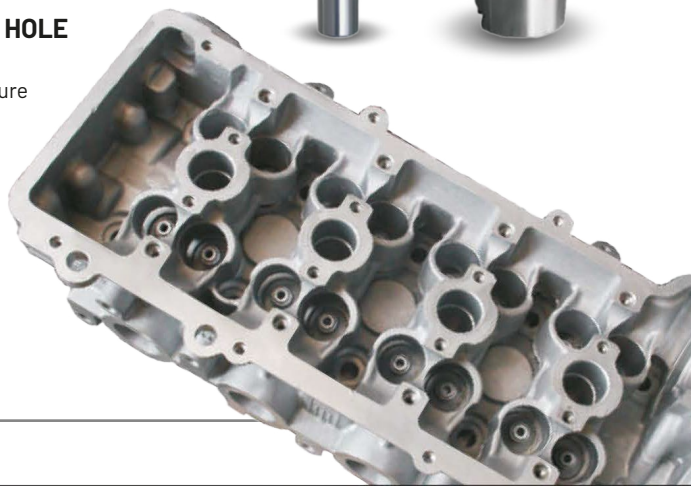
1. Compound reamer.
2. Finishing reamer for spark plug hole.
3. Finishing reamer for fuel spray nozzle hole.

## Finish machining tools for tappet hole

- Axial rake angle reduces axial force and let the cutting light and fast.
- Uneven blades structure effectively avoids the indentation and majes the cutting more stable.
- Cutting edge runout within 0.003 mm to sure longer tool life and machining precision.
- Internal cooling ensures better chip removal effect.

**FINISH MACHINING TOOLS FOR TAPPET HOLE**

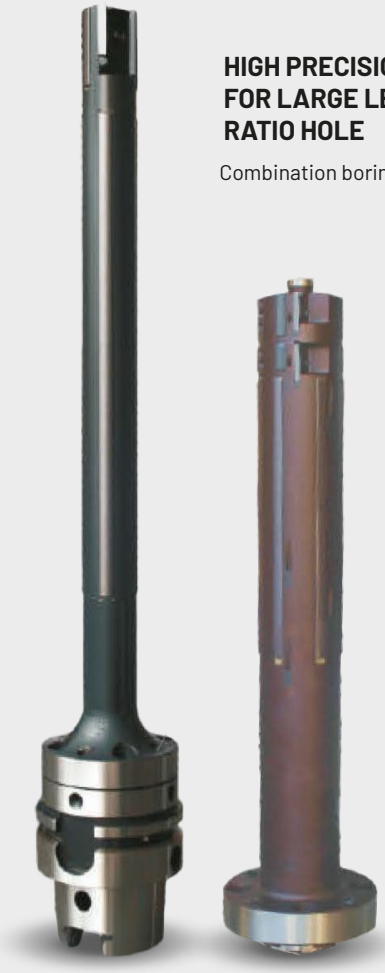
1. Big rake angle.
2. Internal cooling structure
3. Uneven cutting edges.



# CUTTING TOOLS
## for machining crankshaft & camshaft holes

### Cutting Tools for machining high precision and large length-diameter ratio hole

- Boring tools for guide, semi-finish and finish machining.
- The guide pad structure ensures the precision and stability of large length-diameter ratio boring.
- Cutting edge runout within 0.003 mm to ensure longer tool life and machining precision.
- Adjustable flange connection structure.
- Used in high demand condition for crankshaft and camshaft holes.



**HIGH PRECISION MACHINING FOR LARGE LENGTH-DIAMETER RATIO HOLE**

Combination boring tools with guide pad

1. Cutting edge runout within 0.003 mm.
2. Guide pad structure.
3. Flange connection

# CUTTING TOOLS
## for machining cylinder head joint surface

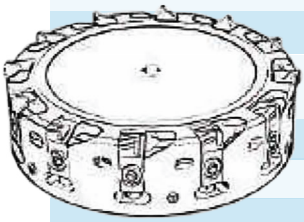
### Aluminum base face milling cutter (PCD)

- Suitable fir high efficiency rough & finish milling.
- Different No. of blade with same diameter.
- Internal cooling design optimizes cutting processing.
- Using high-strength aluminum alloy.
- Dia. runout within 0.003mm.
- Axial adjustment range is 2mm.

**CYLINDER HEAD JOIN SURFACE MILLING**

High precision mirror surface milling tool

| GWT series of face milling cutters |
|---|
| **Diameter**: D63-315 |
| **Number of edges:** 3-20 |
| **Tool holder type:** Optional keyway connection Tool holder |
| **Axial rake angle:** + |
| **Cooling:** Internal cooling |
| **Tool body material:** High strength aluminum alloy |



# CUTTING TOOLS
## for machining cylinder bore

## Rough boring tools

- The monoblock structural design ensures sufficient strength to meet the needs of roughing.
- Guidance and semi-finishing design to reduce the blade cutting force, and improving tool life.
- Semi-finishing tool holder structure can be adjusted for the axial and radial precision, meanwhile, machining precision is also boosted.
- The design of the chip flute is optimized for cutting.

1. Indexable inserts.
2. Cartridge.
3. Through chip flutes.
4. The integral structure.

## Rough boring tools

- Adopted guide pad design to ensure the cylinder bore precision.
- The integral design of the tool holder ensures the tool body has sufficient strength to meet the requirement of rough machining.
- Using hexagonal full-face insert design which has six cutting edges.
- Boring head and shank design, you can just replace the boring head and achieve one tool.
- With multi-purpose application.

**CUTTING TOOLS FOR MACHINING CYLINDER BORE**
Finish boring tools

1. PCBN
2. Guide pad structure.
3. Boring head and tools body split design.
4. Tool holder and tool body design.

## Honing head for machining cylinder bore

**NEW TYPE FLOATING CONNECTION**

- Connect system structure optimization to avoid stress concentration and extension tool life.
- Easy to maintaining and cleaning.
- Floating connection flexible and moreaccurate positioning.

**HONING STONES ARE MADE OF DIAMOND ABRASIVES.**

Diamond honing stones have good wear resistance, good stability and machinability which can effectively improve the processing efficiency and extend tool life greatly.

1. Flexible and reliable connection.
2. Honing stones with good wear resistance.

# CYLINDER BLOCK JOINT SURFACE PROCESSING TOOL SERIES

## High speed PCBN indexable face milling cutter for finish machining

- Inserts height and tool diameter can be adjustable.
- Height adjustment runout within 0.003mm.
- Outer diameter runout within 0.01mm, the insert can achieve regrinding for 3 times.
- Processing roughness less than Ra 1.6.

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