



BMC Global HANBOO ENGINEERING CO.,LTD

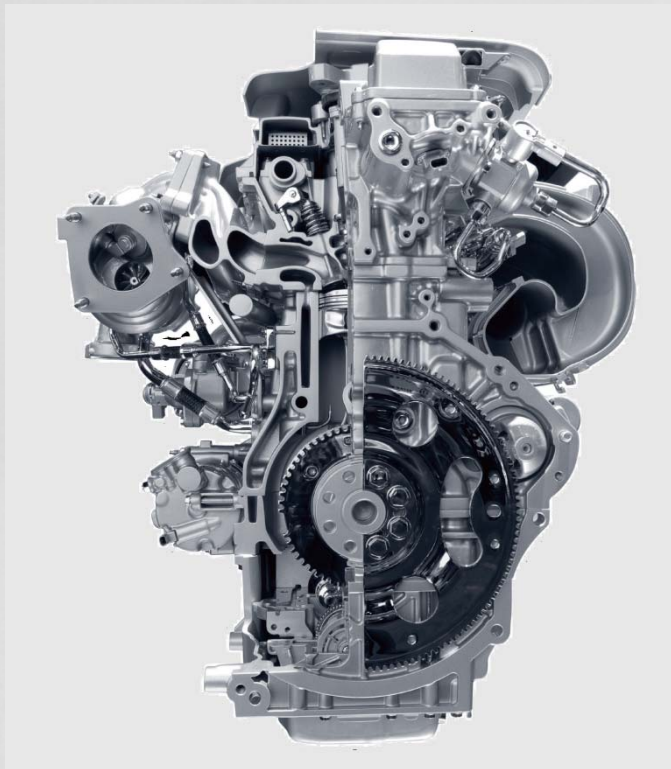
PRODUCT DESCRIPTIONS



HANBOOENGINEERING



ABOUT TOOLS (1/3)



- 1.Cylinder Block Tooling
- 2.Cylinder Head Tooling
- 3.Connecting Rod Tooling
- 4.Crank Shaft/Cam Shaft Tooling

ABOUT TOOLS (2/3)



5. Transmission Case Tooling

6. Control Valve Body Tooling

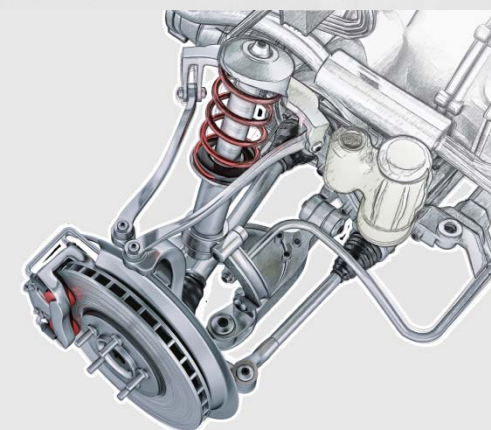
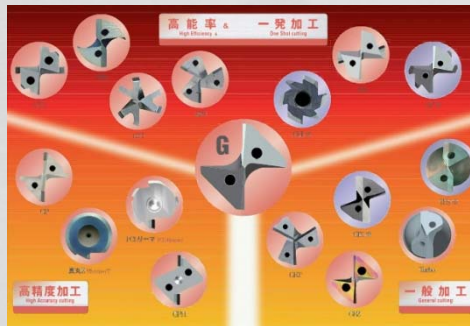
7. Transmission Gear Tooling

ABOUT TOOLS (3/3)

8. Steering Rack Housing Tooling

9. Brake Caliper Tooling

10. Cutting Tools



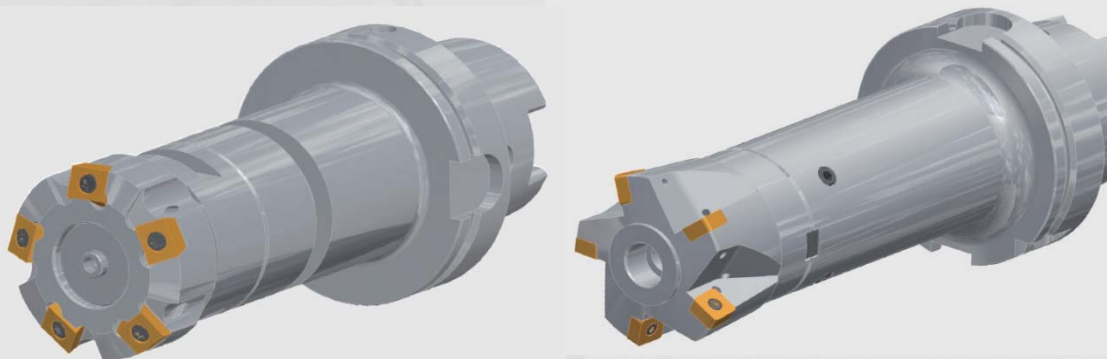
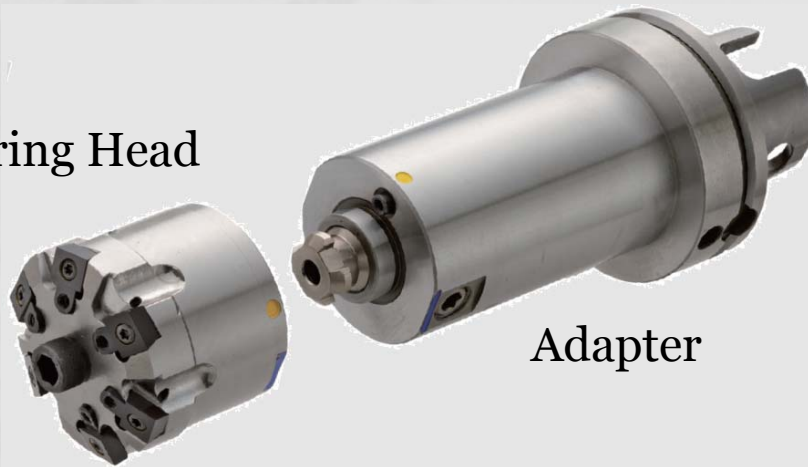
1. Cylinder Block Tooling



1. Cylinder Block Tooling

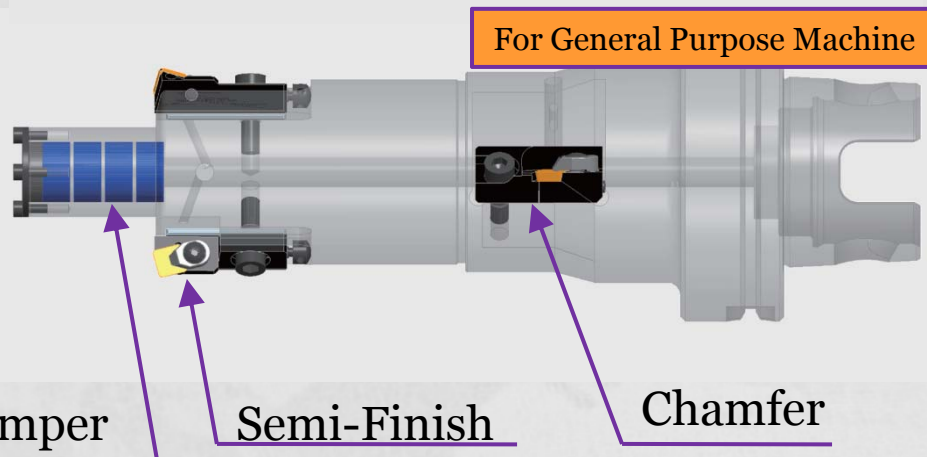
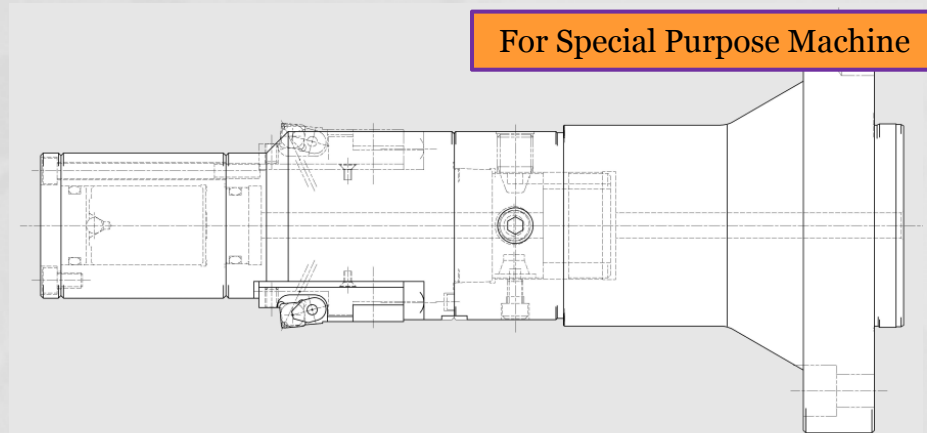
1) Cylinder Bore Rough Boring HOLDER

Boring Head



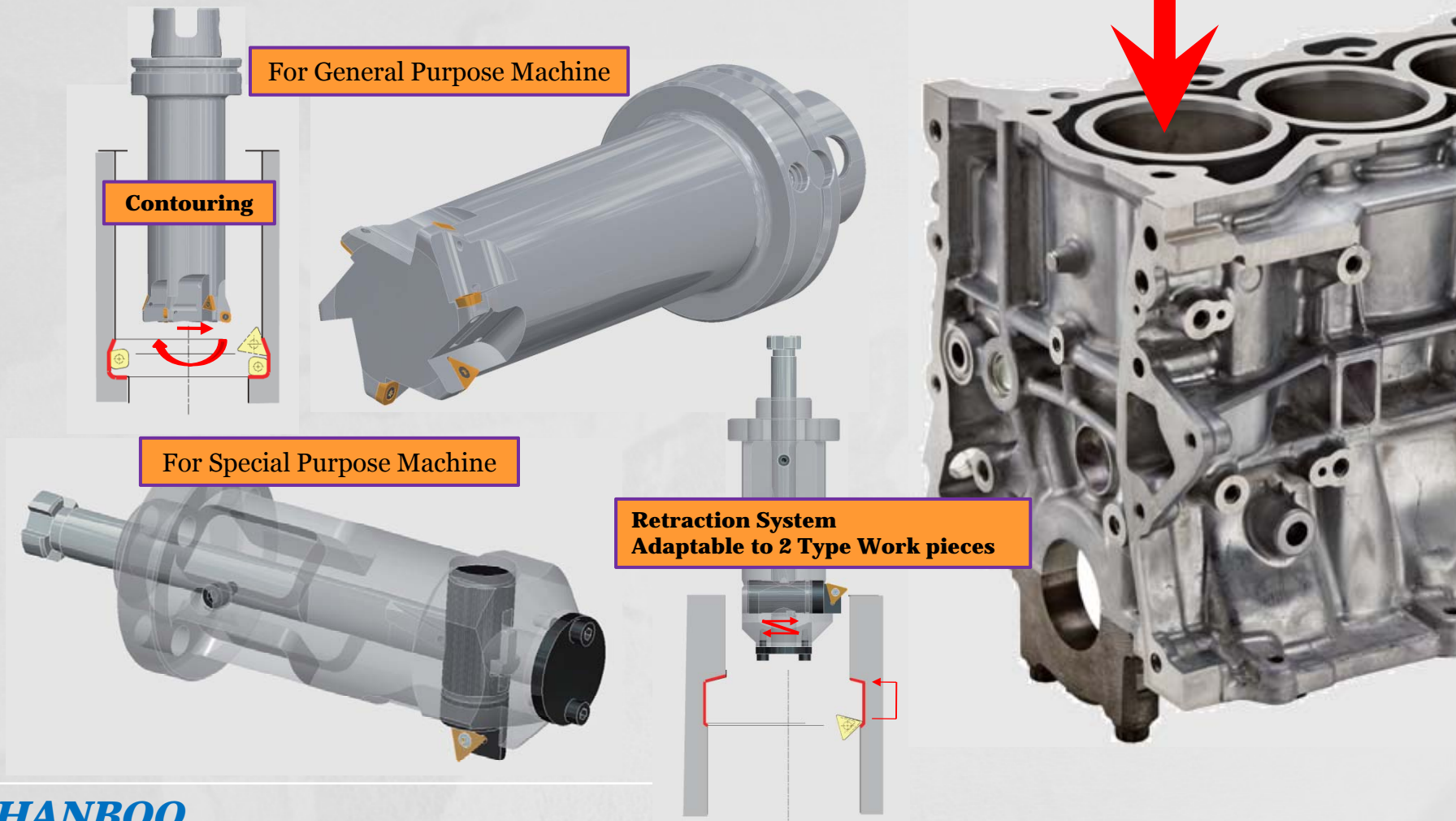
1. Cylinder Block Tooling

2) Cylinder Bore Semi Finish Boring HOLDER



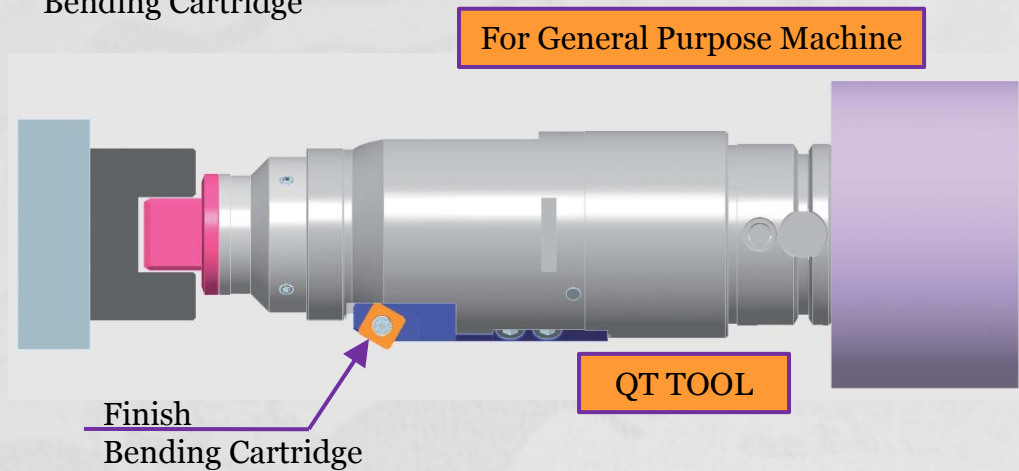
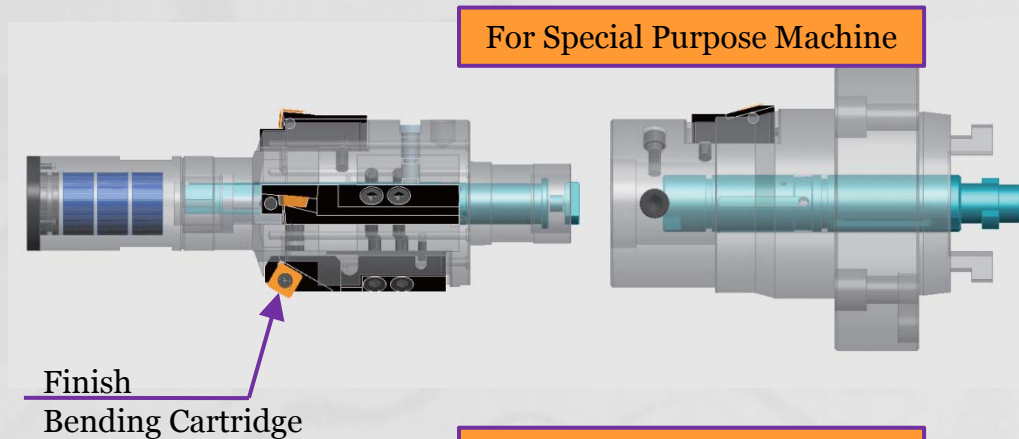
1. Cylinder Block Tooling

3) Cylinder Bore Under-Cut Boring



1. Cylinder Block Tooling

4) Cylinder Bore Finish Boring HOLDER



QT TOOL



QT TOOL



Work (example)

【Cylinder Block】

Cylinder Bore



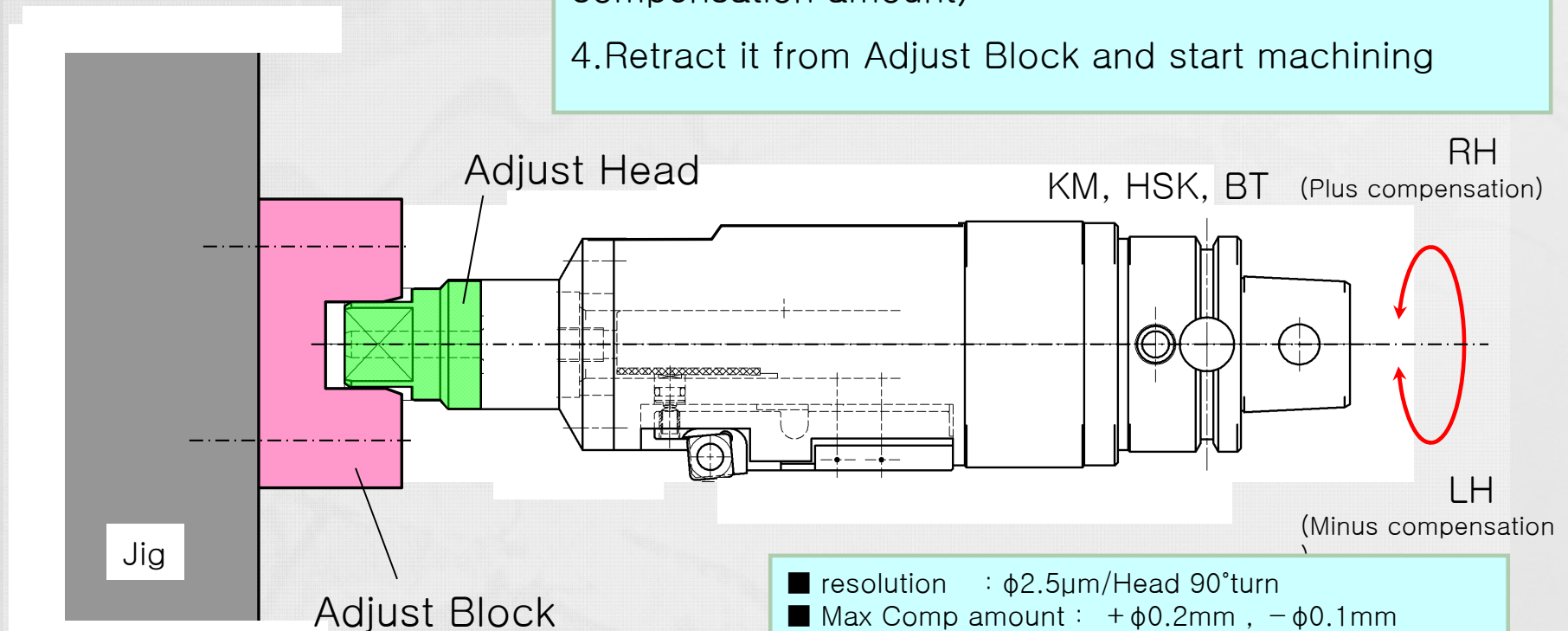
【Connecting Rod】



Auto Compensation

«Auto Compensation Cycle»

1. Main axis Orientation (Possible at ATC position also)
2. Inserting Head into Adjust Block (recommending F=300 mm/min)
3. Turn the main axis 90° unit (rotate required compensation amount)
4. Retract it from Adjust Block and start machining

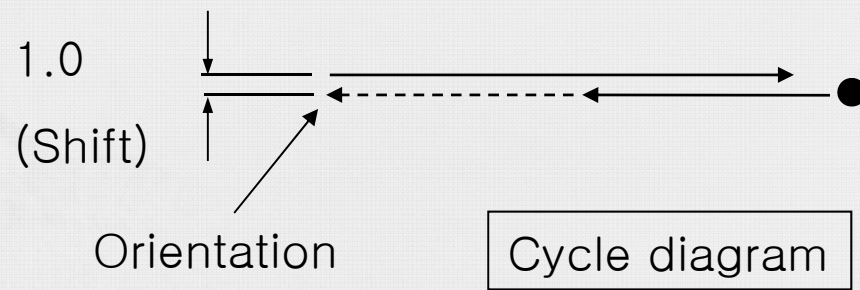
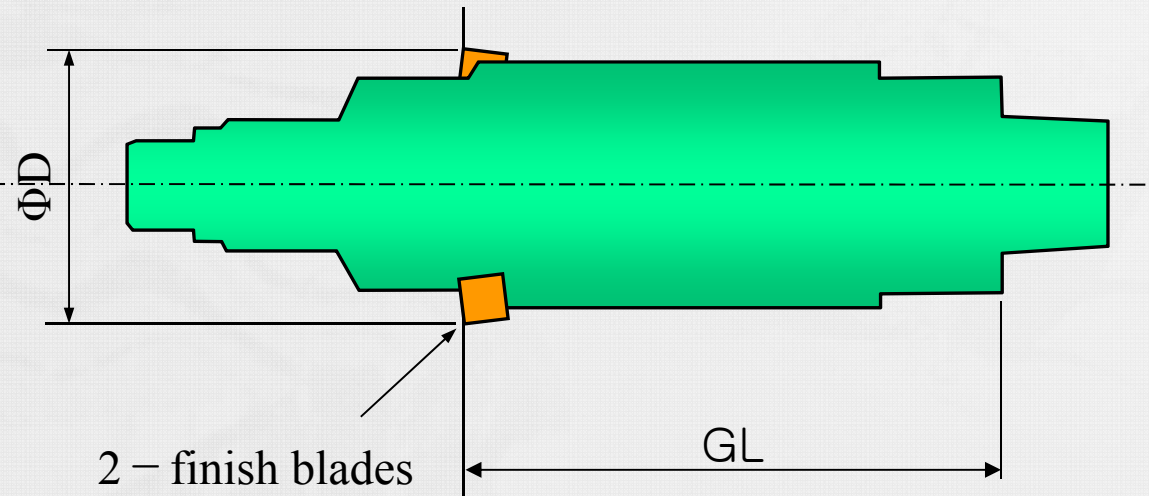
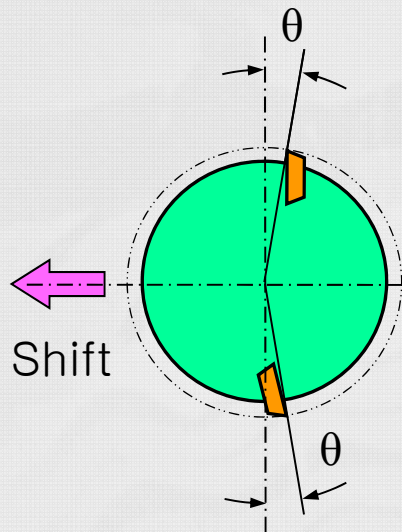


- resolution : $\phi 2.5\mu\text{m}/\text{Head } 90^\circ\text{turn}$
- Max Comp amount : $+\phi 0.2\text{mm}$, $-\phi 0.1\text{mm}$
- Max allowed RPM : 6,000rpm
- ※ Main axis phase is constant when inserting
- ※ Main axis of machine should be splitted!

Cutting Layout

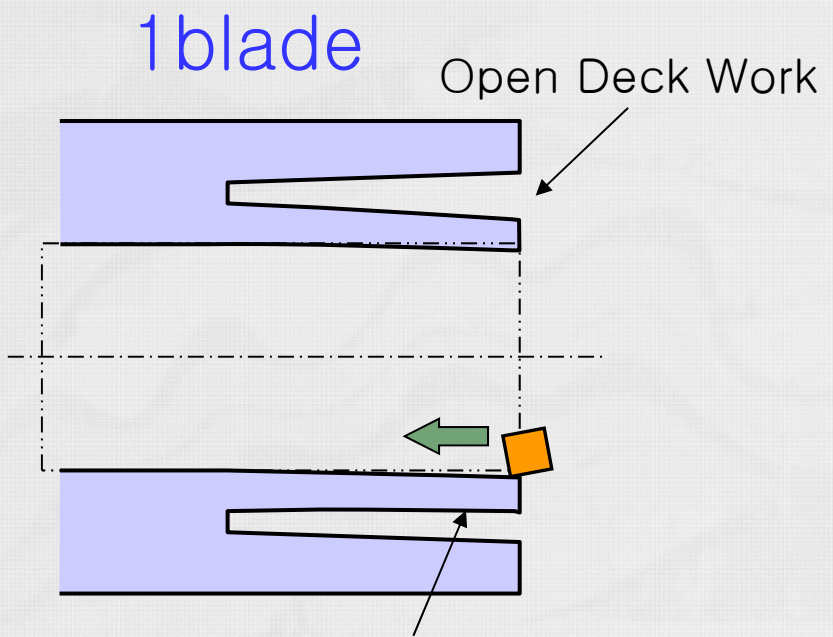
Purpose : Improve Roundness by Balance Cut

Finish 2blades

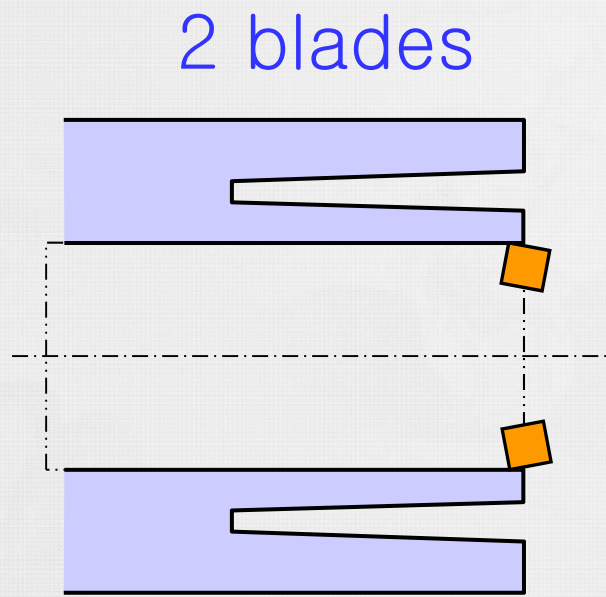


Effect of Balance Cut

Specially Cylinder Bore



Due to the cutting force, workpiece can be deformed and influence on the geometric accuracy

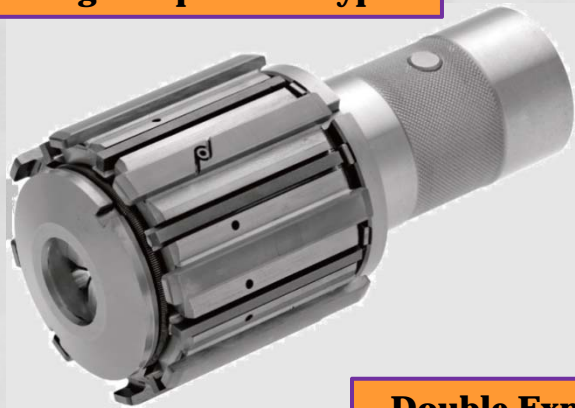


- Better Roundness, Straightness
- Minimized Honing stock removal
- Reducing Honing cycle time

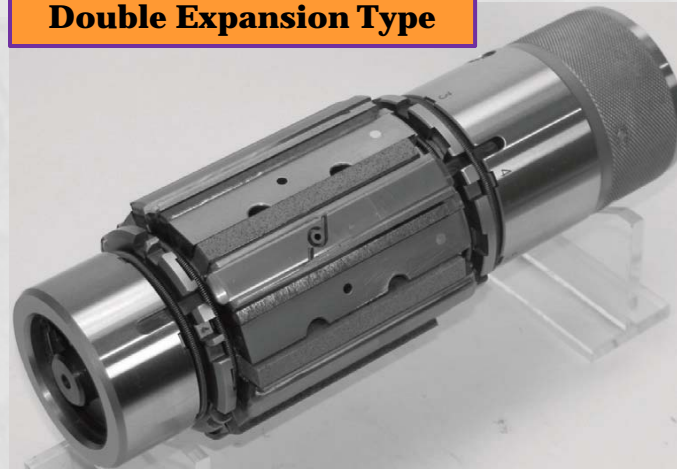
1. Cylinder Block Tooling

5) Cylinder Bore Honing HOLDER

Single Expansion Type



Double Expansion Type

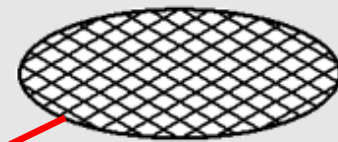


HONING

HONING HOLDER

Purpose

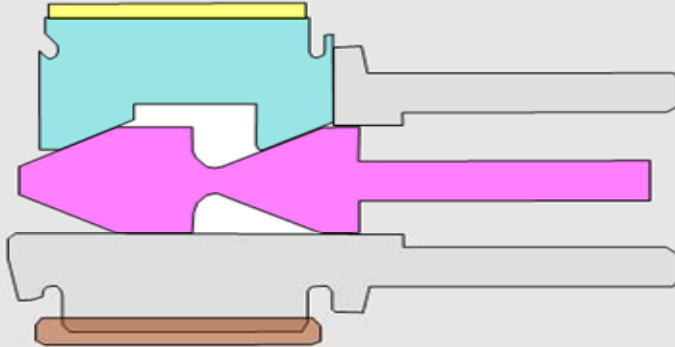
- **High accuracy and Cylindricity of Bore**
- **Create CROSS ANGLE**



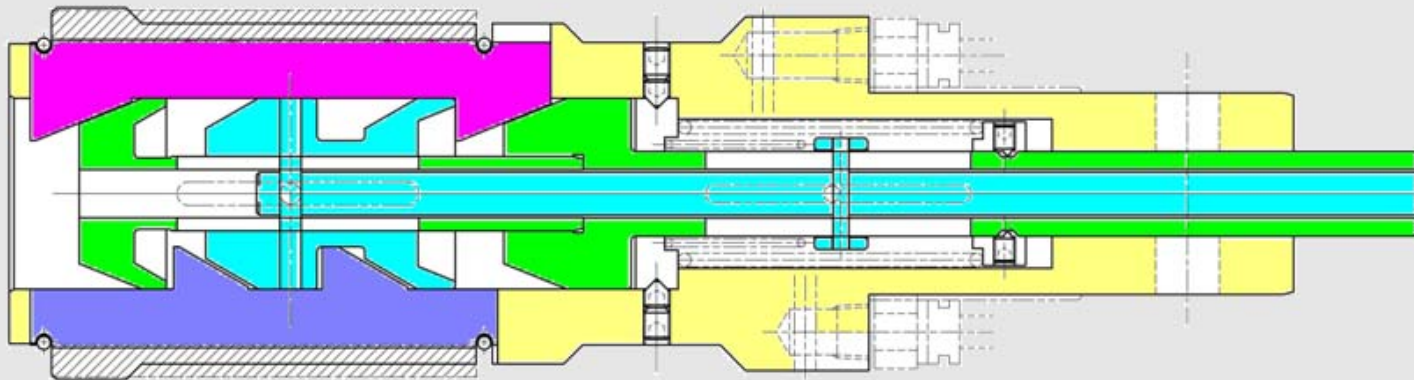
CROSS ANGLE

HONING

Single Expansion Type

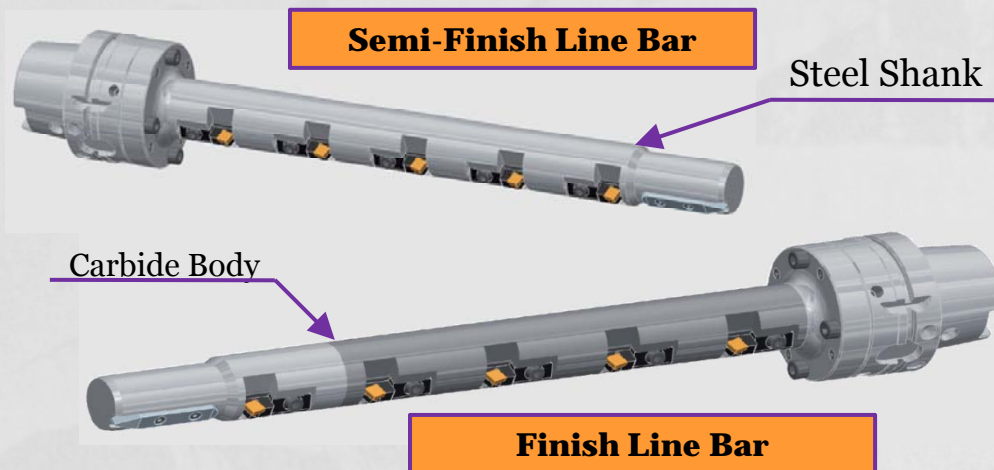
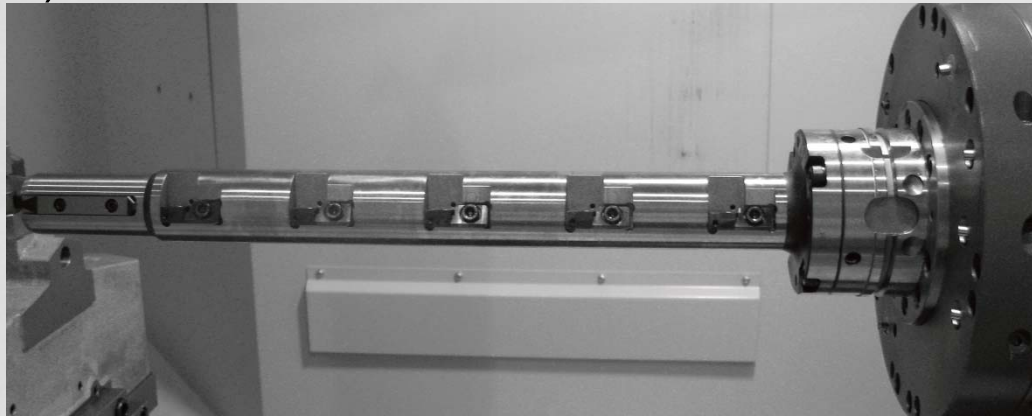


Double Expansion Type



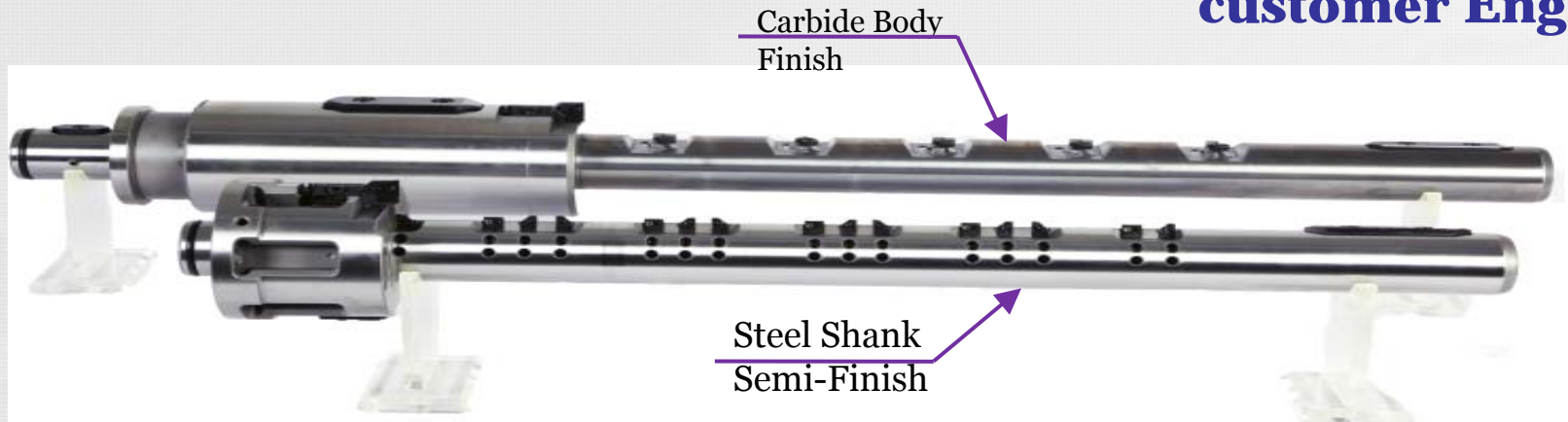
1. Cylinder Block Tooling

6) Crank Bore HOLDER

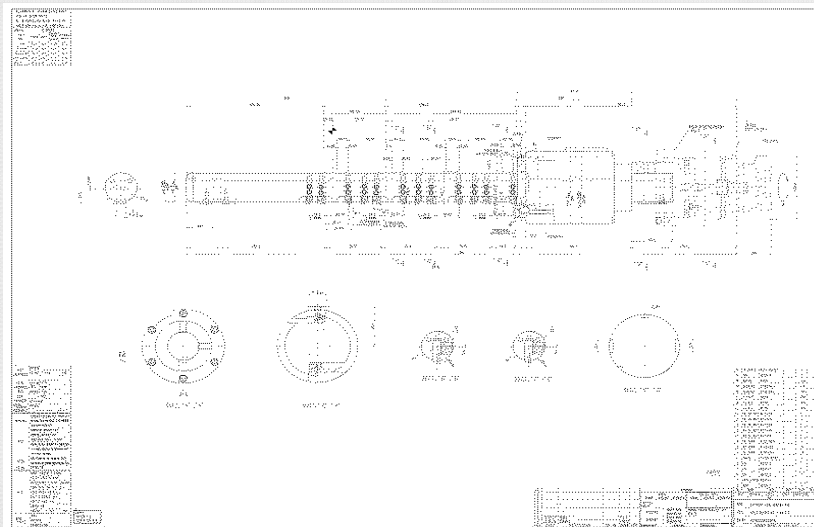


Crank bore Tool

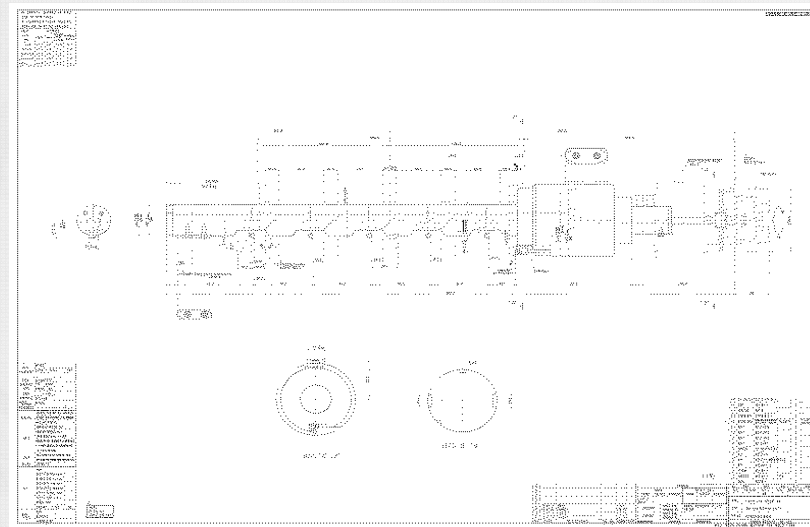
**“H” and “K”
customer Engine.**



ROUGH

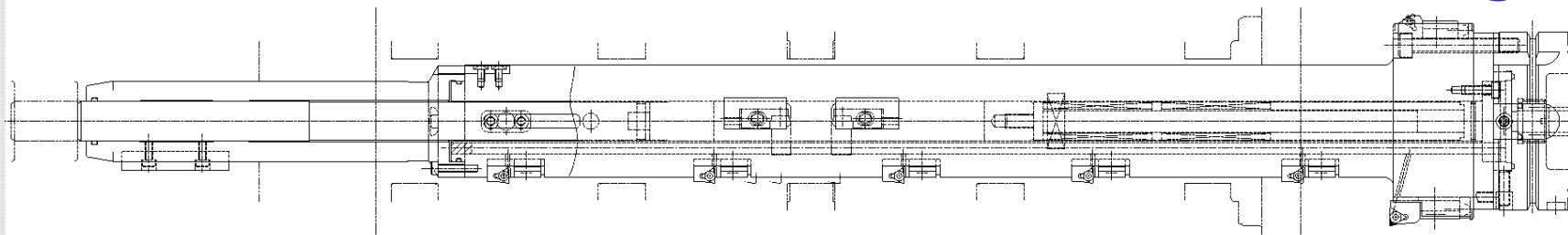


FINISH

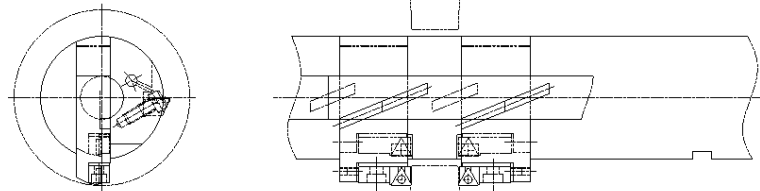


Crank bore Tool

“H” and “K”
customer Engine.

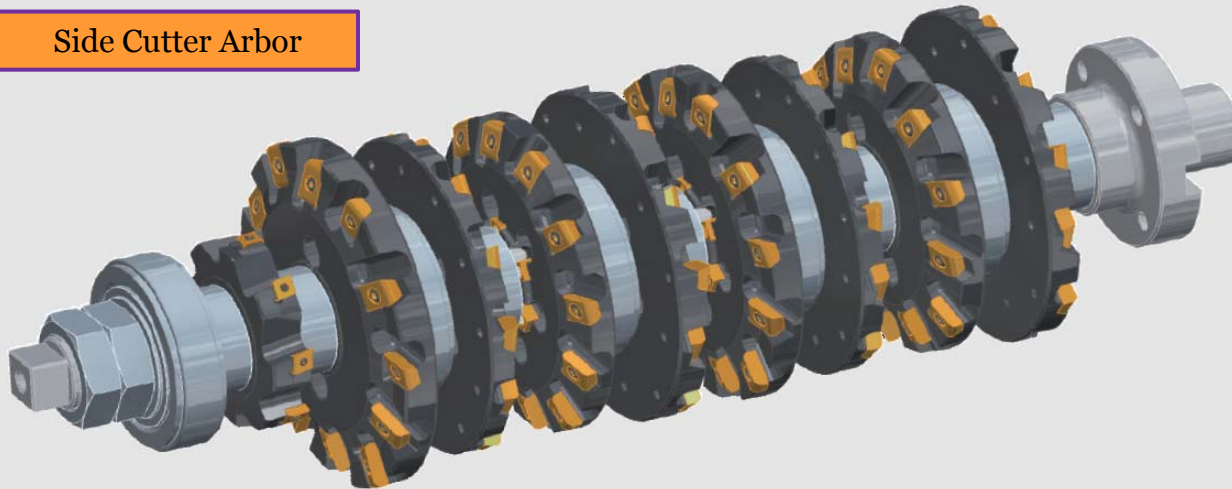


Semi-Finish Line Bar
+
Trust Facing

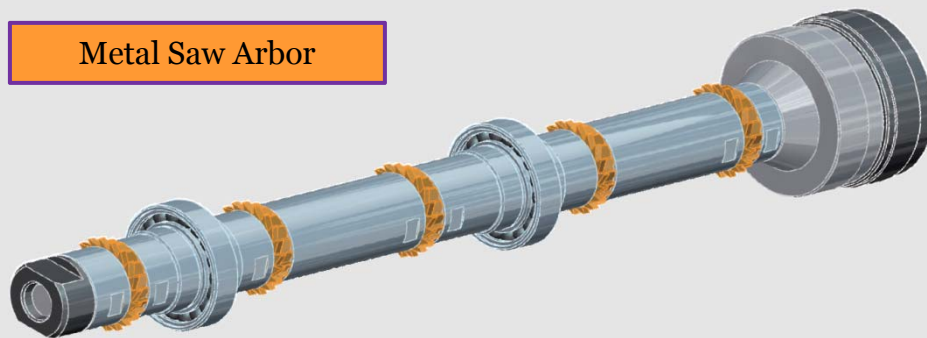


Etc. Crank bore Tool

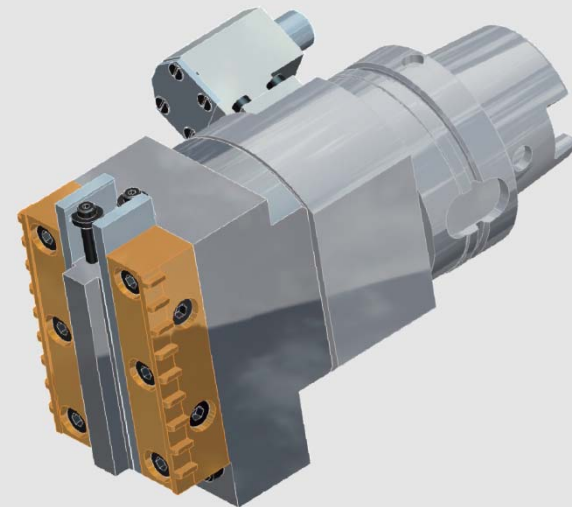
Side Cutter Arbor



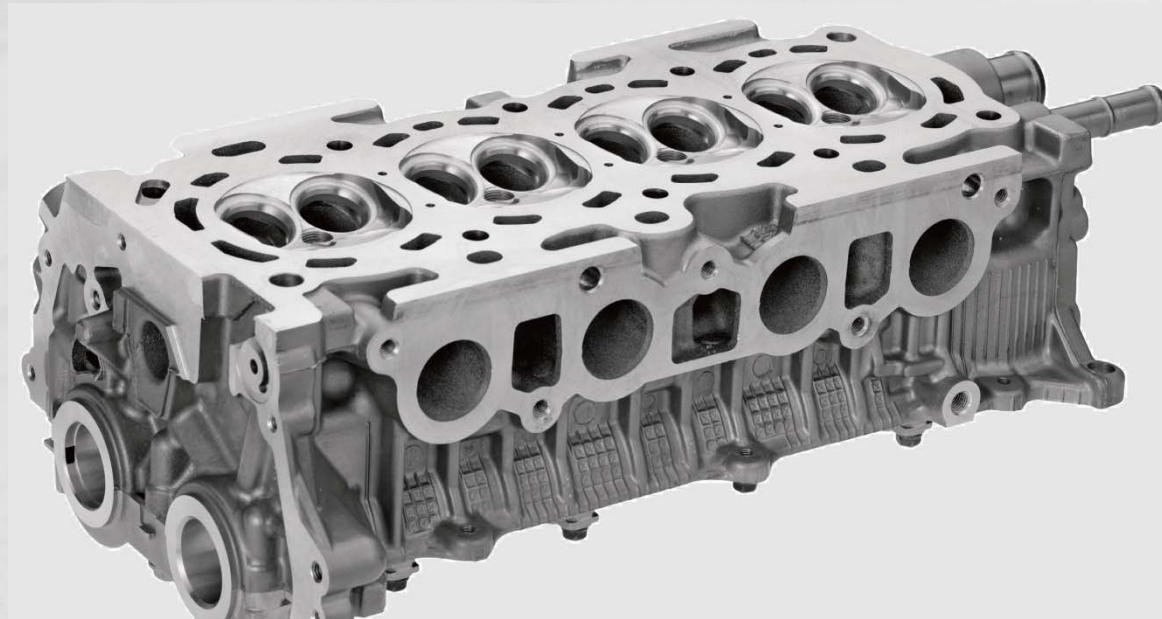
Metal Saw Arbor



Broach Holder

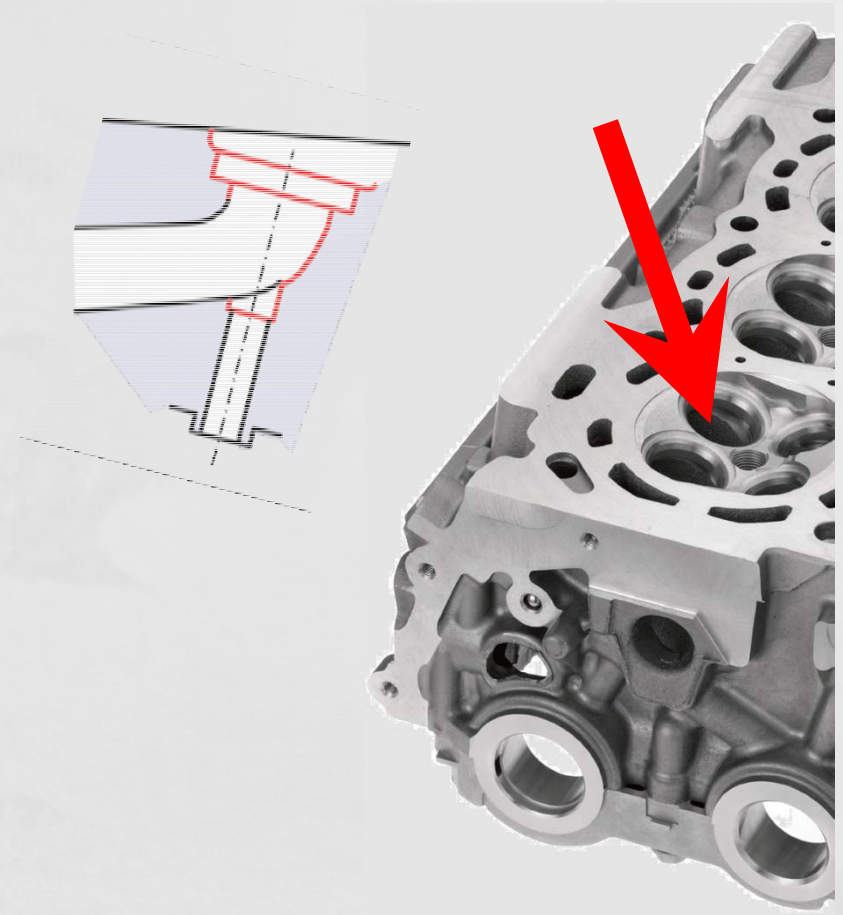
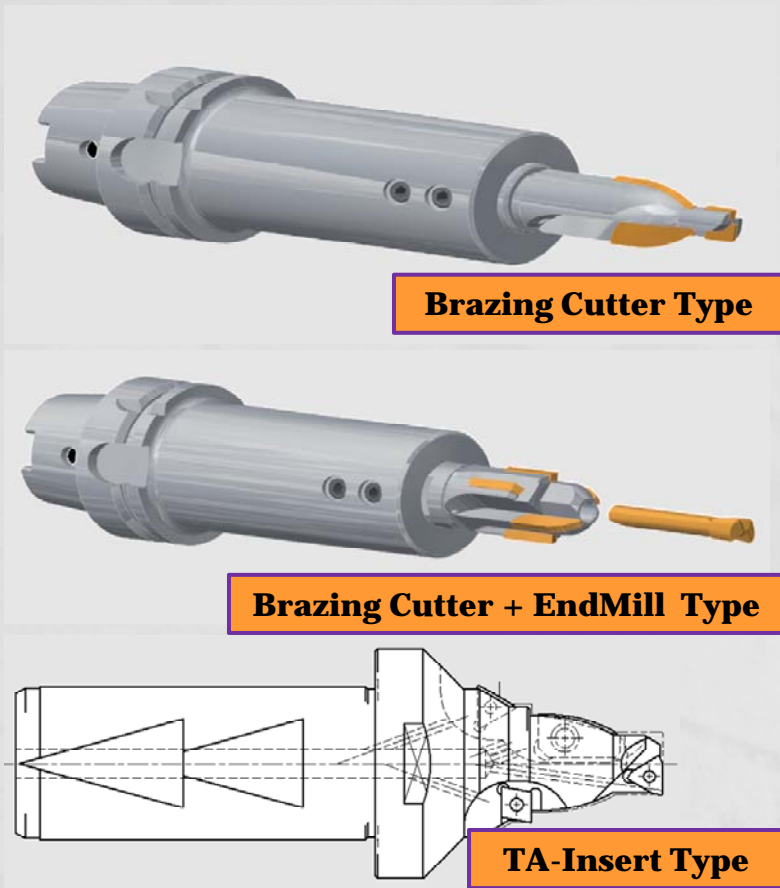


2. Cylinder Head Tooling



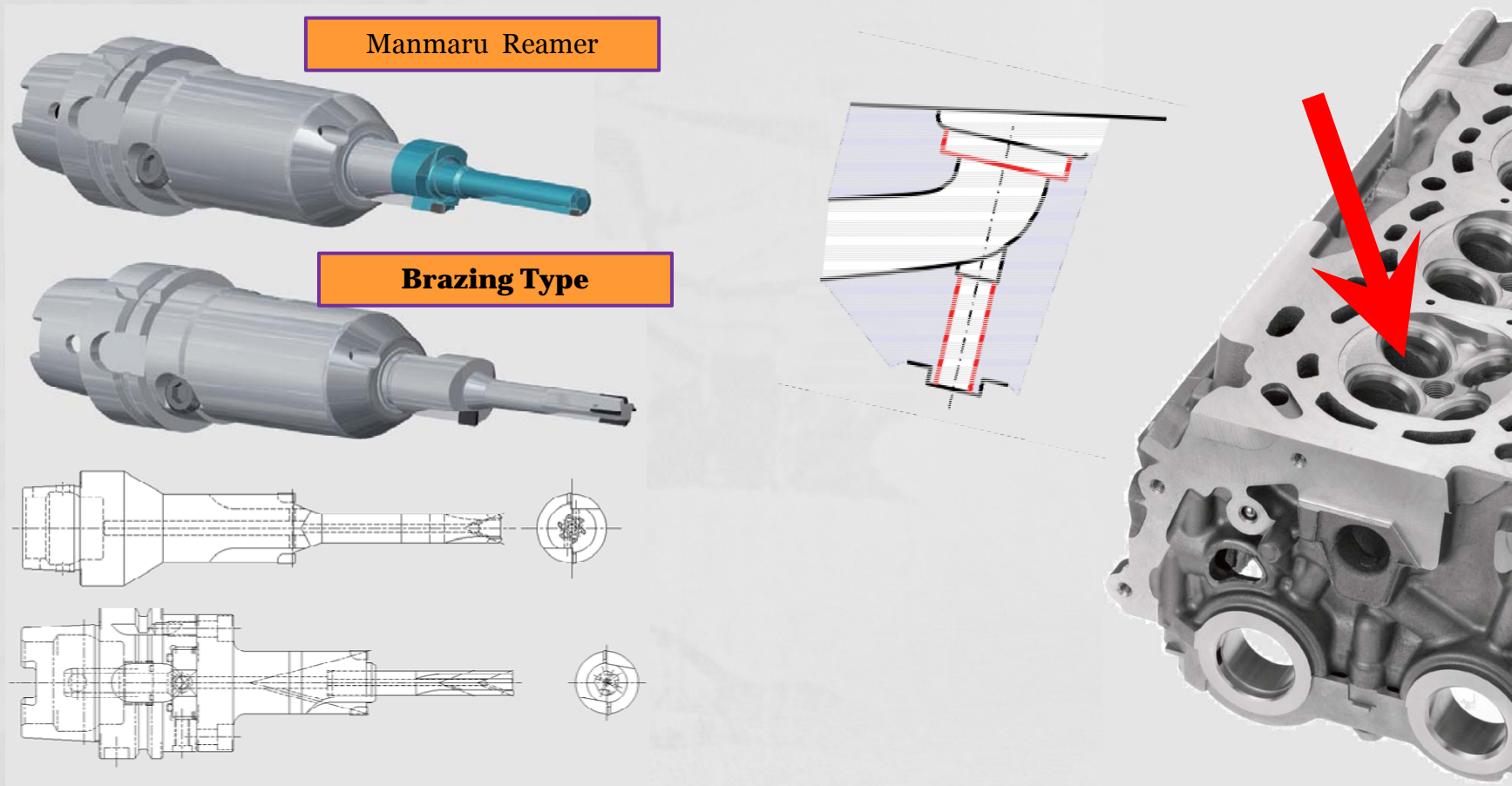
2. Cylinder Head Tooling

1) Valve Guide/Seat Rough / Port Cutter



2. Cylinder Head Tooling

2) Valve Guide/Seat Finish Reamer (Cutting Edge 1~6)

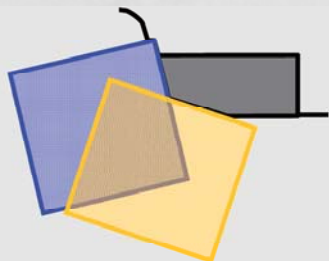


2. Cylinder Head Tooling

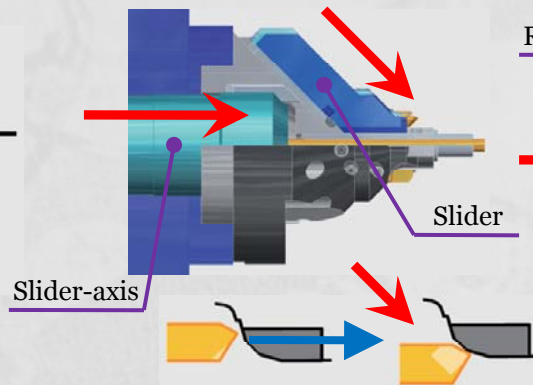
3-1) Valve Guide/Seat Finish (Traverse Type - For Special Purpose Machine)



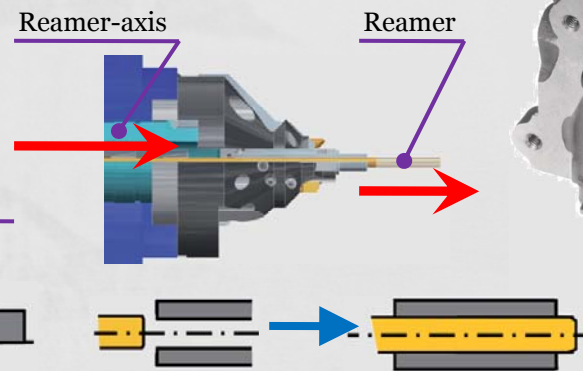
1st Process :
2 Chamfers
by Plunge Cutting



2nd Process :
45° Chamfer
By Traverse Cutting

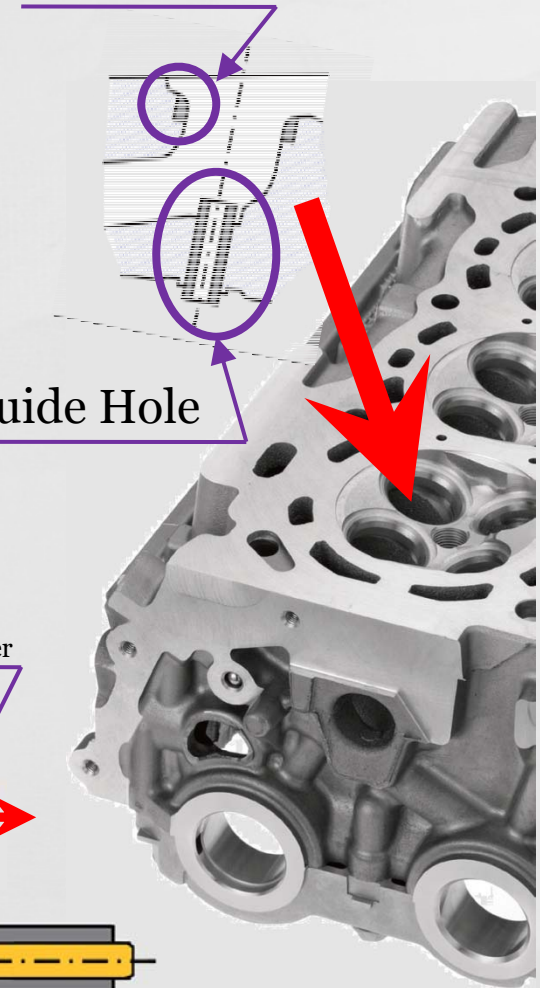


3rd Process :
Valve Guide Hole Finish
by Reamer

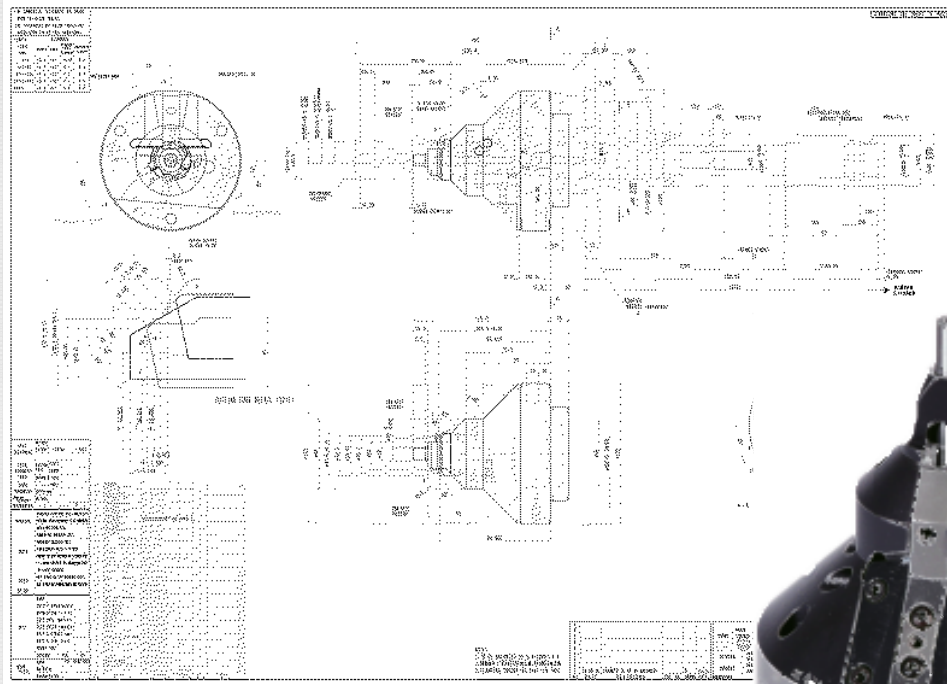


Valve Seat

Valve Guide Hole



2.Cylinder Head Tooling

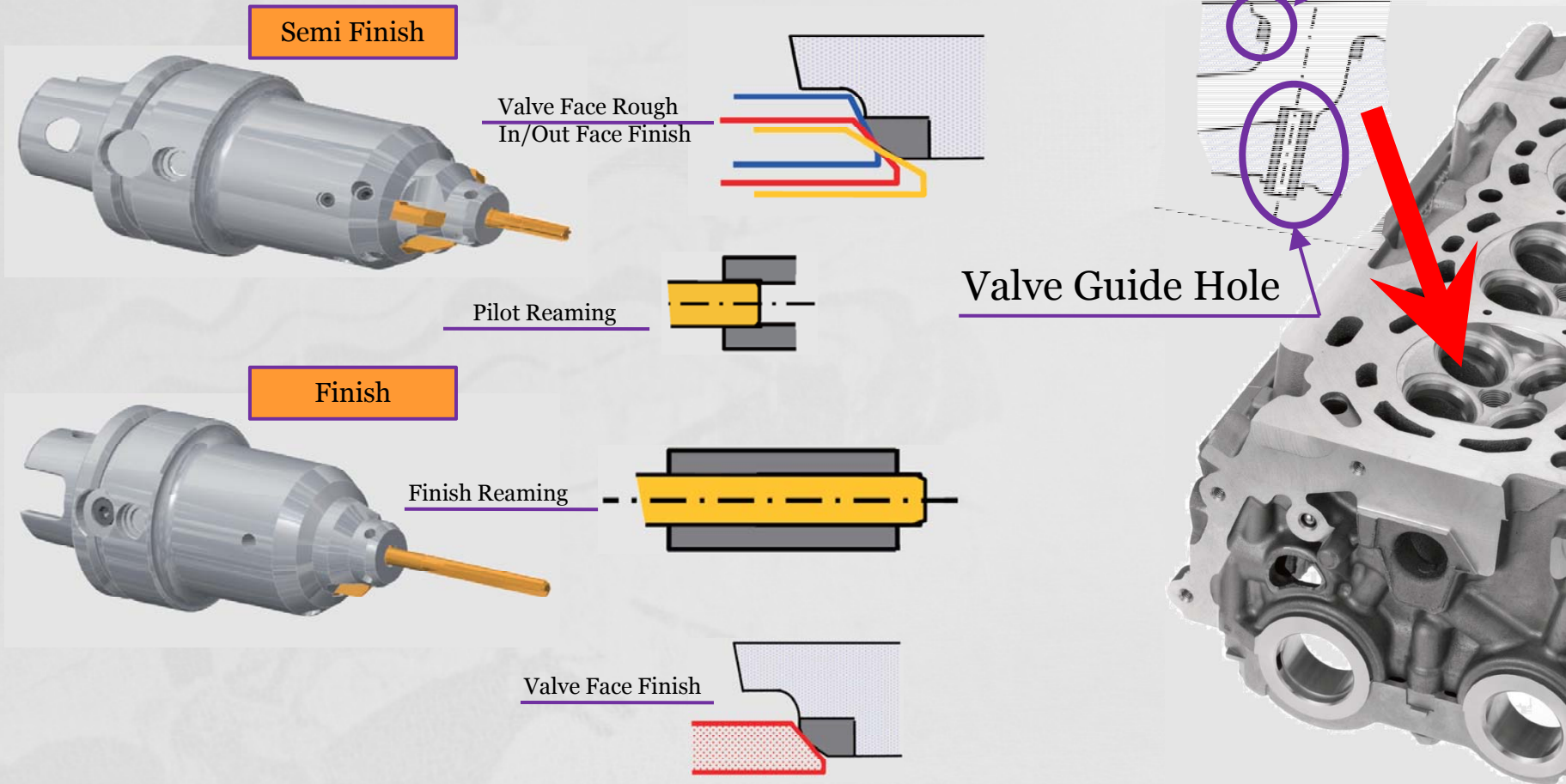


Traverse Type



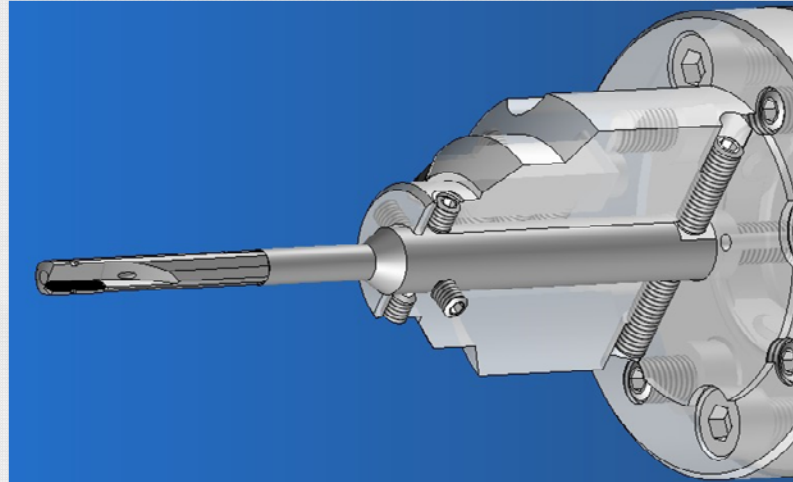
2. Cylinder Head Tooling

3-2) Valve Guide/Seat Finish (Plunge Type - For General Purpose Machine)

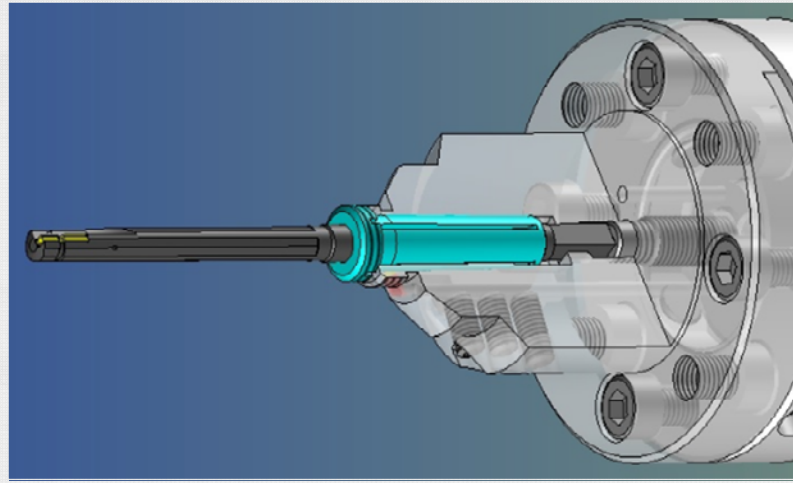
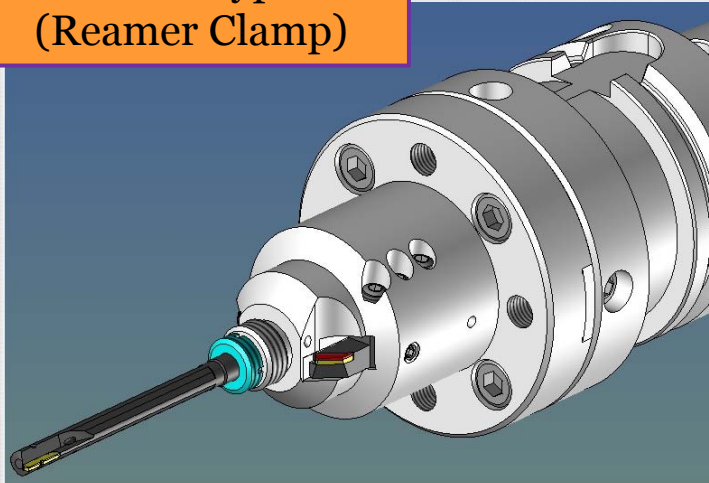


Valve- FINISH TOOL

Side Lock Type
(Reamer Clamp)



Collet Type
(Reamer Clamp)

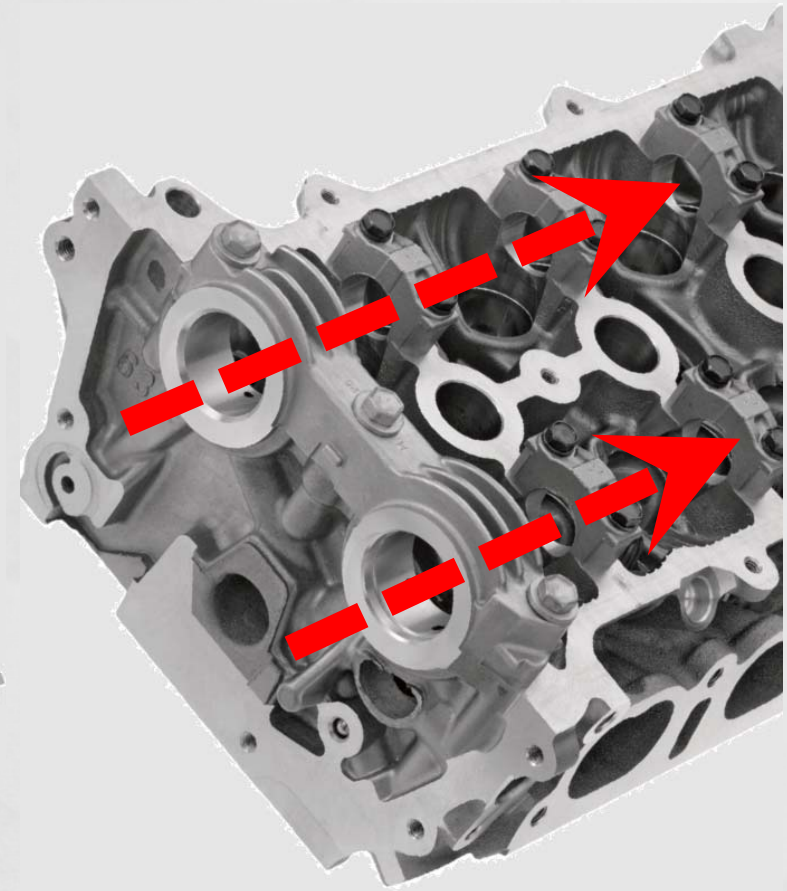


2.Cylinder Head Tooling

4) Cam Finish Line Boring HOLDER

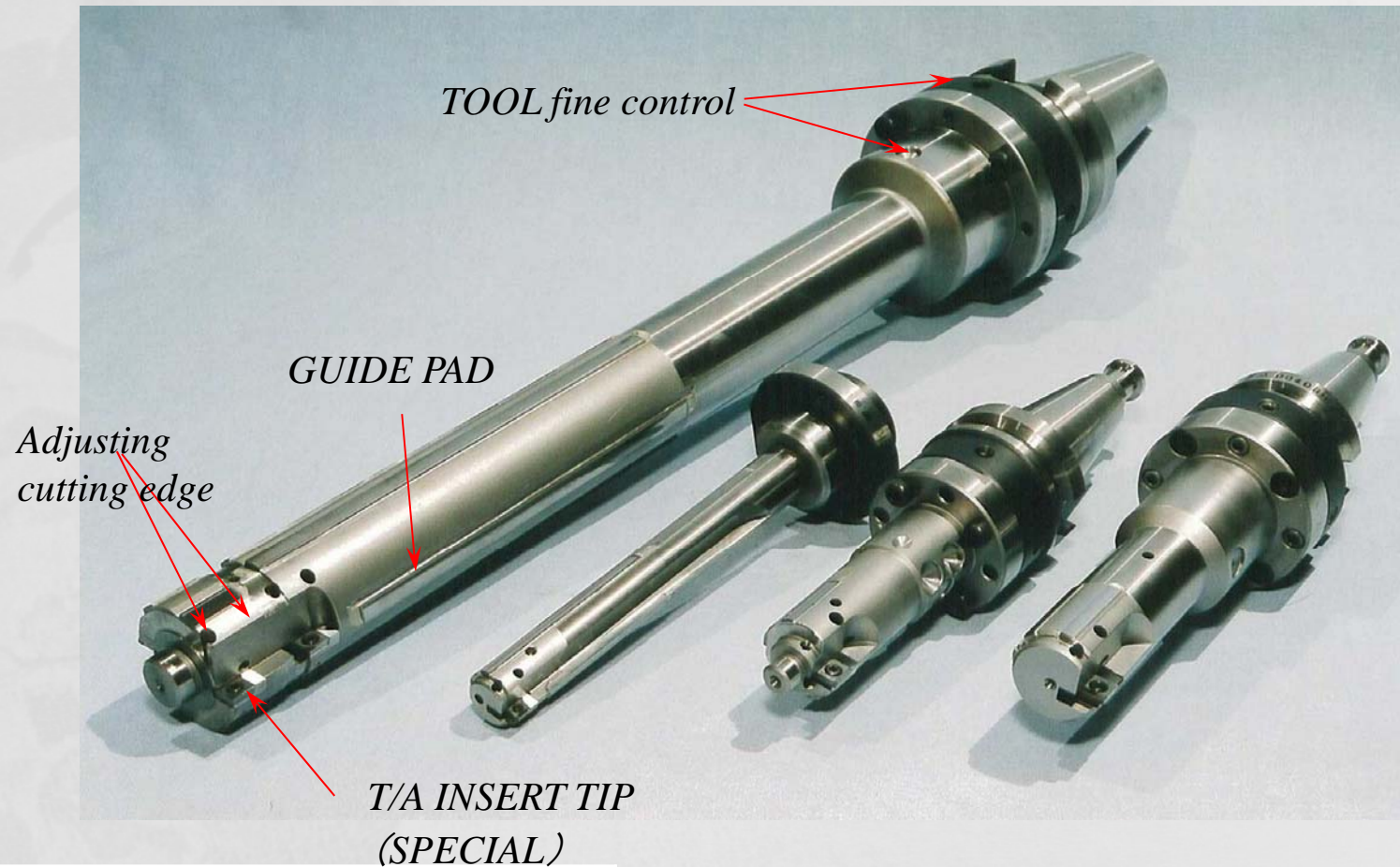


GB-TOOL



GB TOOL

1. Guide PAD and Fine Control to acquire High Accuracy and High Performance
2. Decreasing running cost by Throw away insert tip

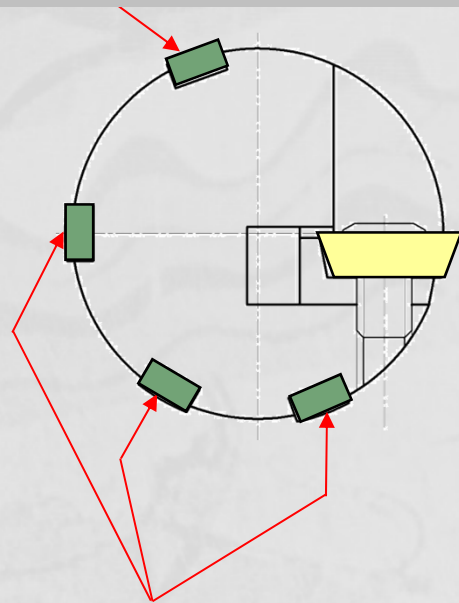


GUIDE PAD

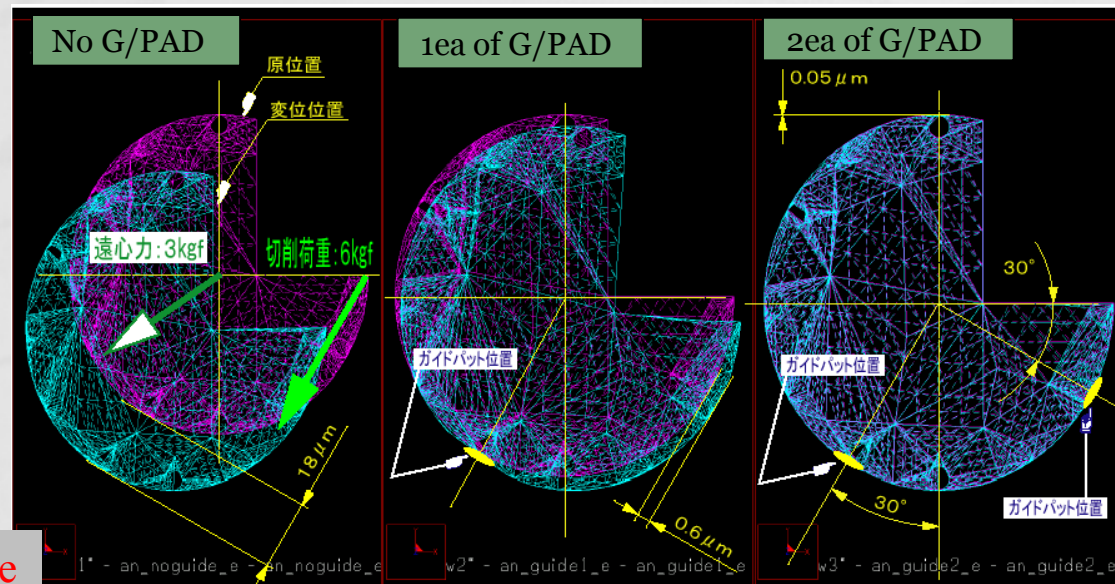
TOOL 경	Φ16mm
돌출경	100mm
절삭하중	6Kgf
회전수	3000rpm

Pad to verify Guide diameter

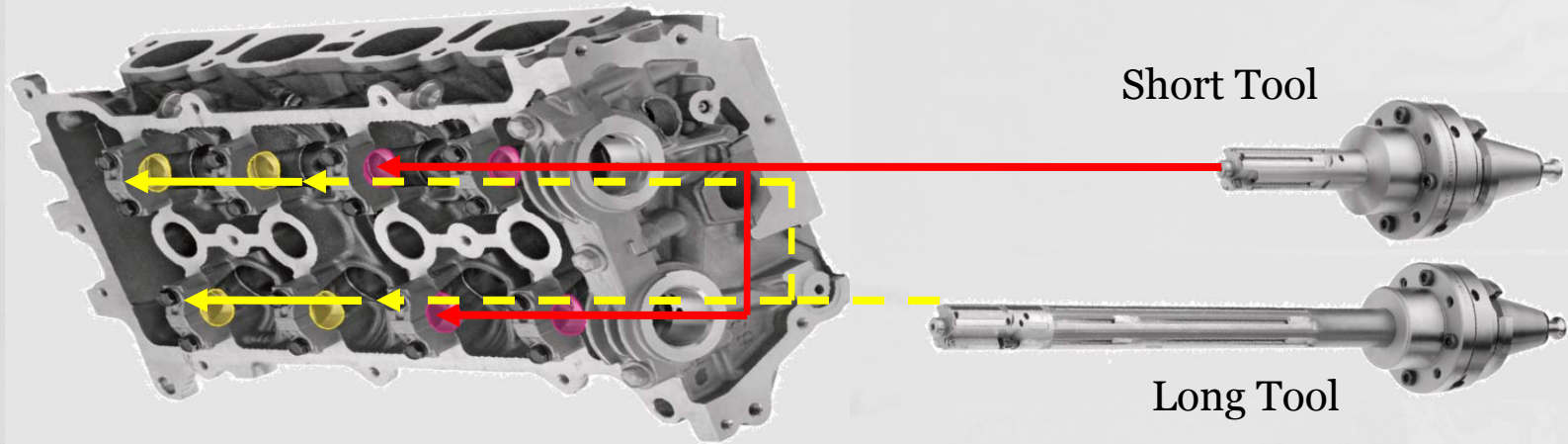
TOOL variance analysis



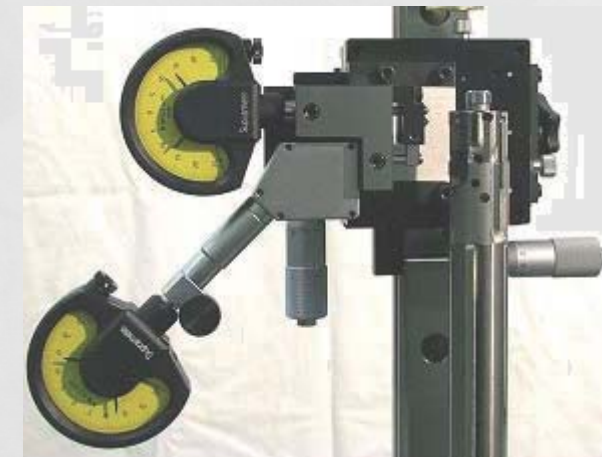
Guide to control tool variance



Machining Example (Cylinder Head)

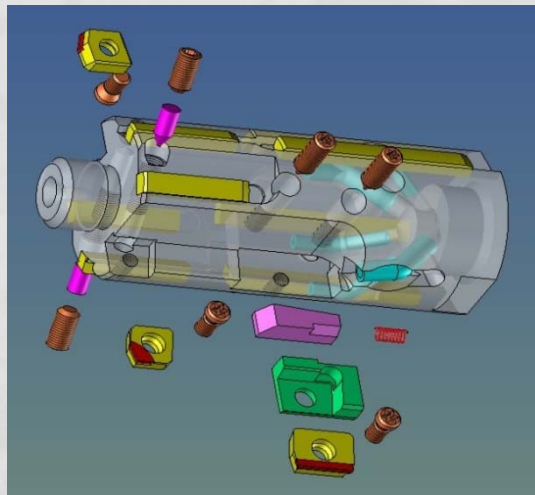
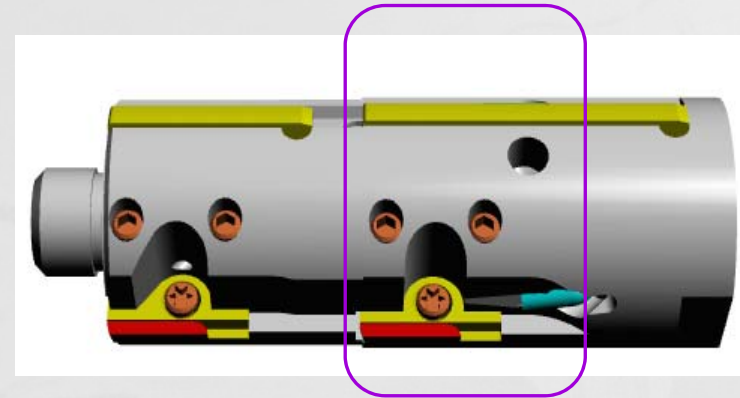
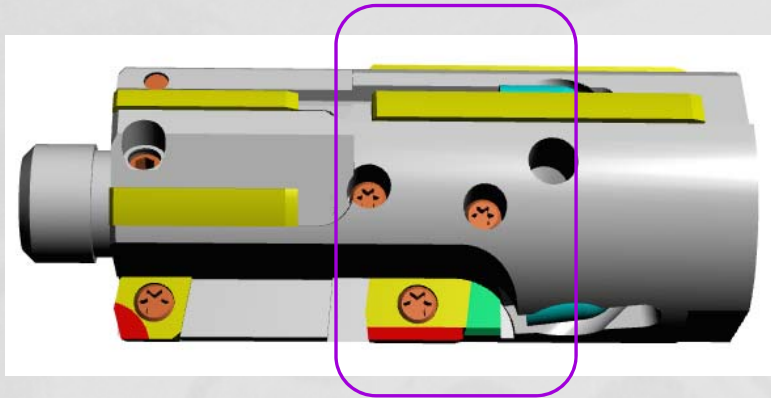


- Circularity : $3\mu\text{m}$
- Roughness : **Rz3.2**
- Hole Dia. Accuracy : **IT7**
- Cutting Speed 200~300m/min
Feed Rate 0.1~0.2mm/rev
Internal coolant
Coolant concentration : 5% or more
- Cylinder Head/Cam hole, Steering Housing
- Easy setting by using dedicated setting gauge (sold separately)

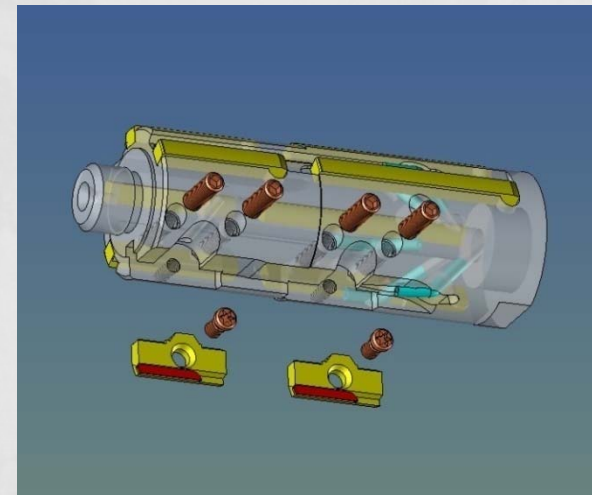


● **Setting gauge(sold separately)**

GB TOOL Insert Adjust Pattern



1. Finish Edge Seat Adjust Type

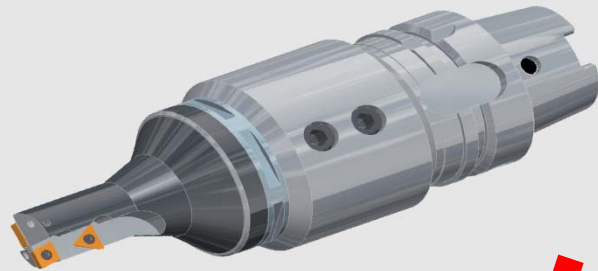


2. Finish Edge Direct Adjust Type

3. Connecting Rod Tooling

1) Small End Hole

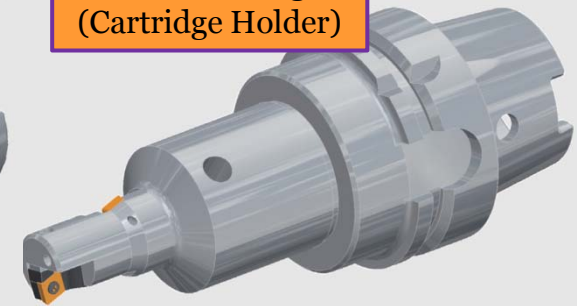
UP Boring Holder + Drilling



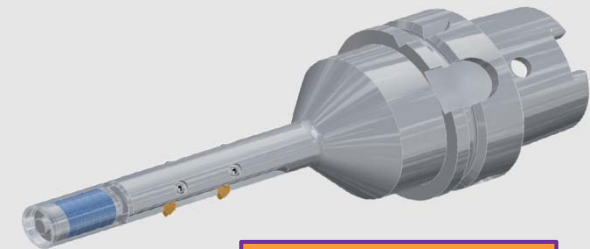
Contouring(Chamfer)



Finish Boring (Cartridge Holder)



Plunge



Finish Boring (BITE Holder)

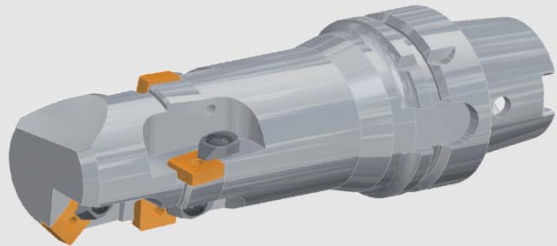


Connecting Rod

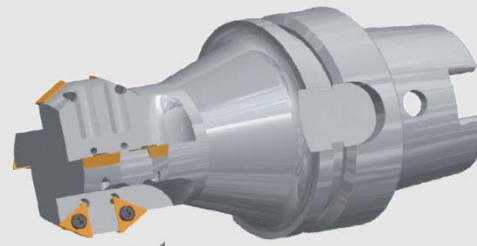
3. Connecting Rod Tooling

2) Large End Hole

UP Boring Holder + Drilling



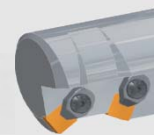
Contouring(Chamfer)



Micro-Adjust Holder



Plunge

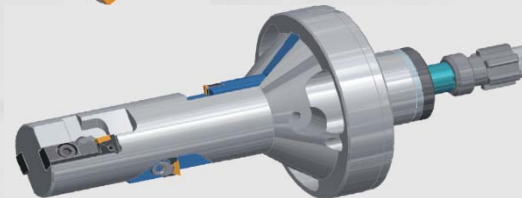


Honing Head



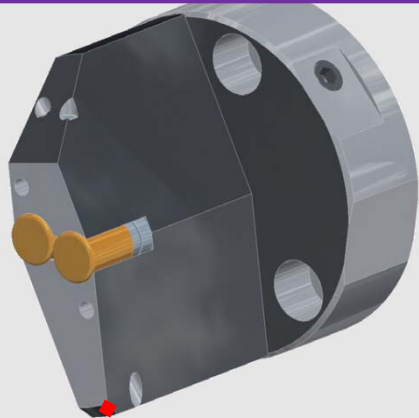
Connecting Rod

Sliding Holder

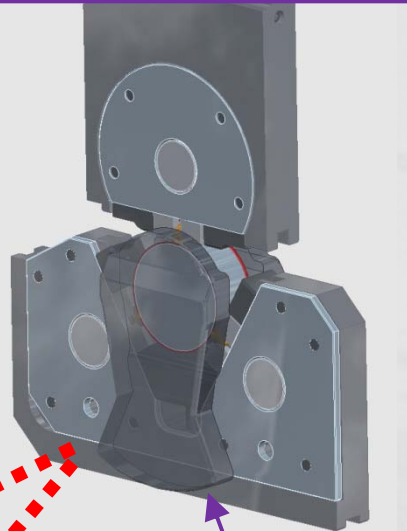


4. Crank Shaft/Cam Shaft Tooling

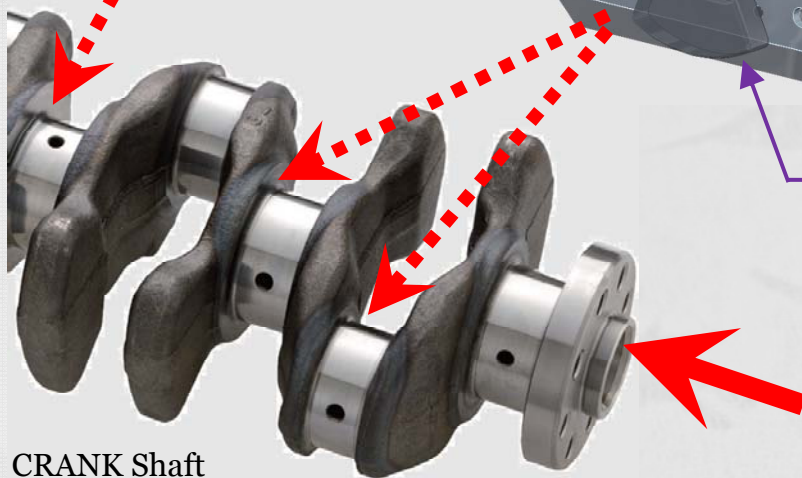
Pin Roller Holder
For Journal Thrust Wall Facing



Fillet Roller Holder
For Pin / Journal Groove



Support



CRANK Shaft

Centering Holder



For Special purpose machine For Quick Change



For General purpose machine



CAM Shaft

5. Transmission Case Tooling



5. Transmission Case Tooling

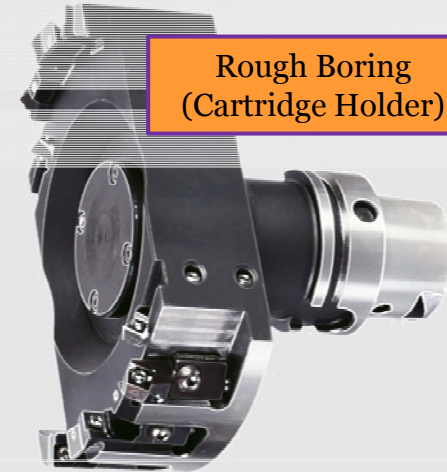
1) Rough Boring



Rough Boring
(Direct Holder)

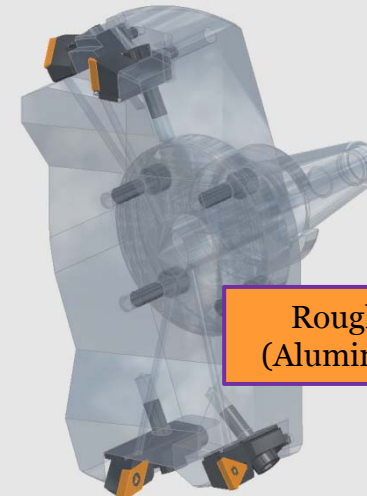


Rough Boring
(Cartridge Holder)



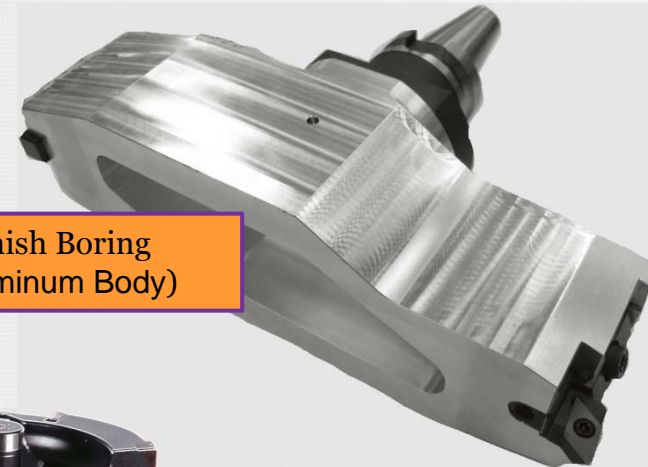
BH TOOL
(Blade Hive Tool)

Rough Boring
(Aluminum Body)



5. Transmission Case Tooling

2) Finish Boring



Finish Boring
(Aluminum Body)



Finish Boring
(PCD PAD)

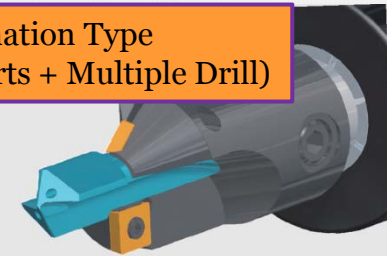
5. Transmission Case Tooling

3) Etc. TOOL



DIC ENDMILL
(ENDMILL + Rough Boring)

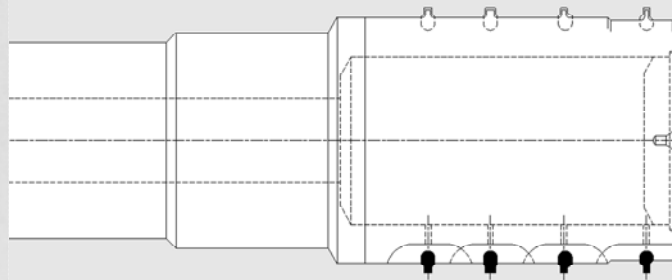
Combination Type
(Indexable Inserts + Multiple Drill)



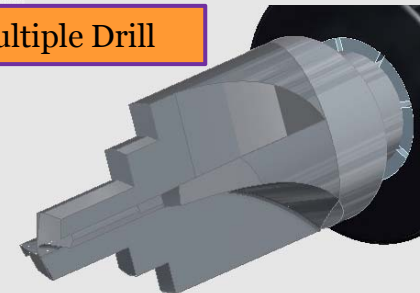
G7X Drill
(IT7 Tolerance)



Groove Cutter

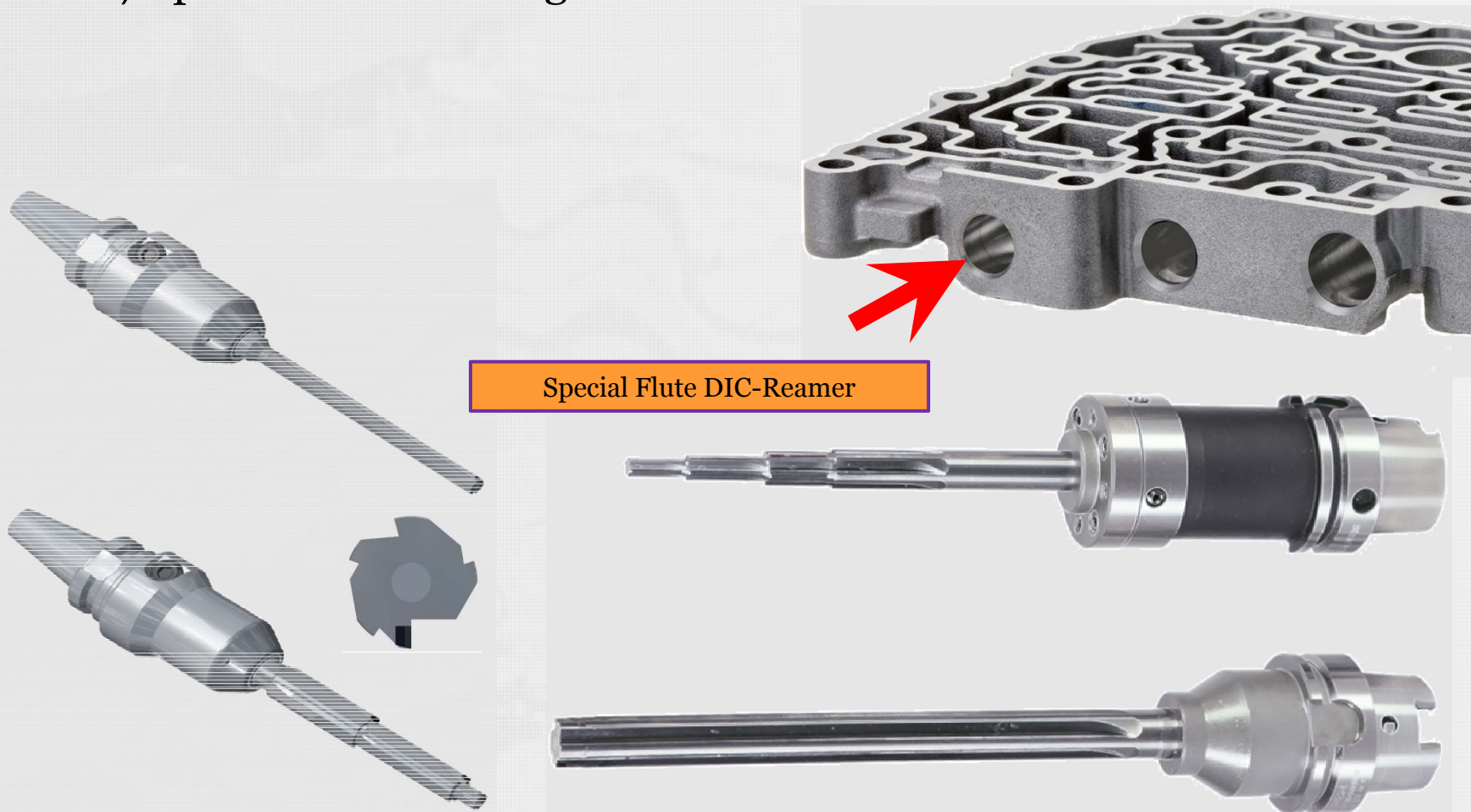


GK Multiple Drill



6. Control Valve Tooling

1) Spool Hole Finishing



6.Control Valve Tooling

2) Hole Drilling

Multiple Step Drill



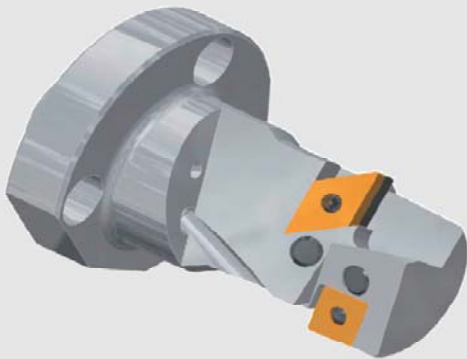
7. Transmission Gear Tooling



Honing Head
($\Phi 15.3 \sim$)

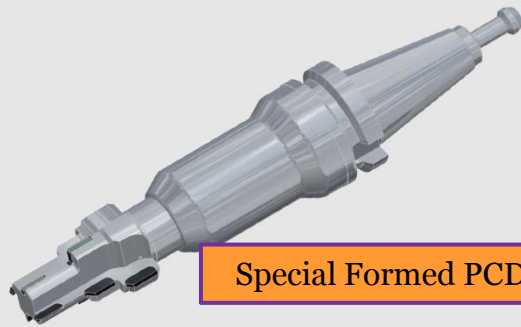


Hob Arbor

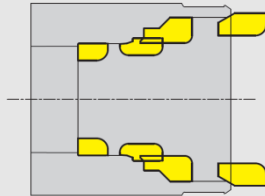


Multiple-Edge Holder

8. Steering Rack Housing Tooling



Special Formed PCD Reamer



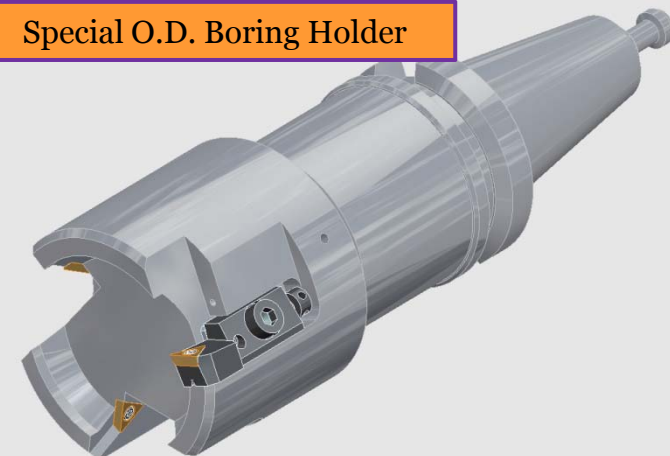
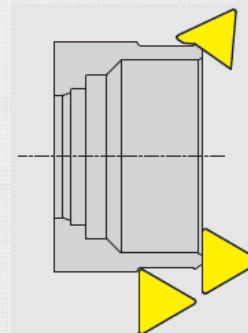
PCD Reamer
(High Speed and High Feed)



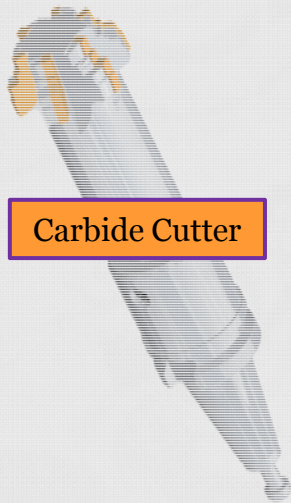
GB Tool
(High Precision)



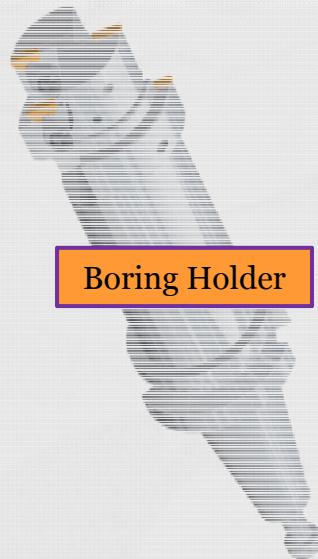
Special O.D. Boring Holder



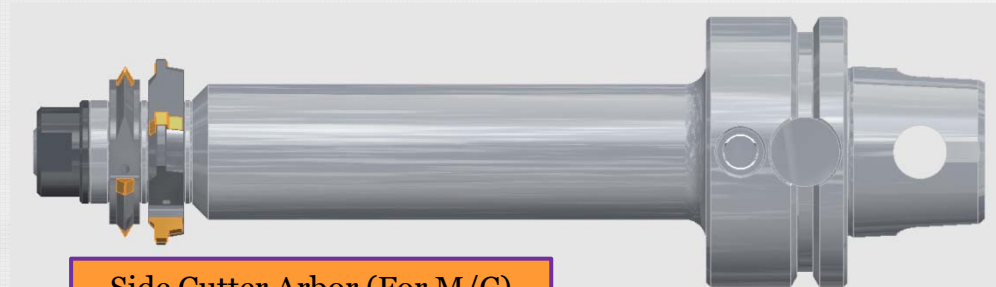
9.Brake Caliper Tooling



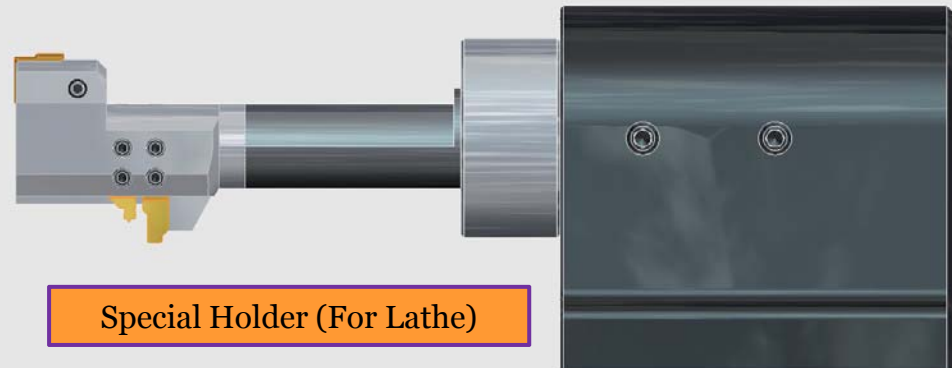
Carbide Cutter



Boring Holder



Side Cutter Arbor (For M/C)



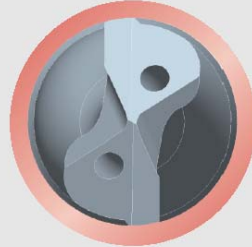
Special Holder (For Lathe)

10. Cutting Tools

General cutting



GK Drill



TWIST Drill



GIX Drill

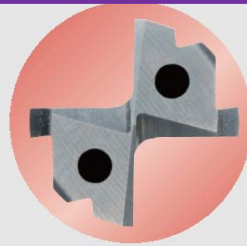


TFS Drill

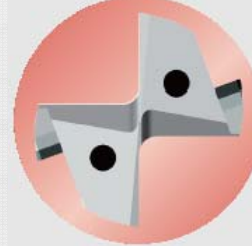
For Aluminum

For Steel & Cast Iron

One Shot cutting



G7 Drill



GD Drill



GF Drill

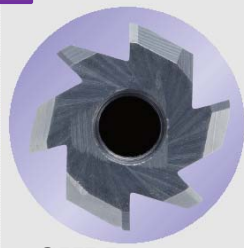
High Efficiency & High Accuracy cutting



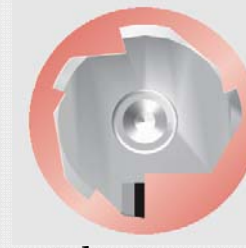
GP Drill



TFH Drill



GHI Reamer



1 Edge Reamer



Manmaru Reamer

10. Cutting Tools

1) GK Drill

(1) Characteristics

- ① Good Straightness
- ② Special shape available as requested

(2) Cutting Condition (Standard)

- ① Cutting Speed (m/min): 50~240
- ② Feed Rate (mm/rev): 0.02~0.04*Drill Dia.

For Aluminum



2) TFS Drill (Low Resistance Cutting Edge)

(1) Characteristics

- ① Outstanding chip discharging
- ② Long Tool Life

(2) Cutting Condition (Standard)

- ① Cutting Speed (m/min): 50~120
- ② Feed Rate (mm/rev): 0.03~0.05*Drill Dia.

For Steel &
Cast Iron



10.Cutting Tools

3)G7 Drill (Power of Special Edge)

(1)Characteristics

- ① One-Shot Finish IT7
- ② Drill+Reamer+Guide

(2)Cutting Condition (Standard)

- ① Cutting Speed (m/min):50~150
- ② Feed Rate (mm/rev):0.1~0.2

For Aluminum



4)GP Drill (Low Resistance Cutting Edge)

(1)Characteristics

- ① High Speed Cutting
- ② One-Shot Finish IT8

(2)Cutting Condition (Standard)

- ① Cutting Speed (m/min):50~400
- ② Feed Rate (mm/rev):0.01~0.02*Drill Dia.

For Aluminum



10. Cutting Tools

5) TFH Drill (Low Resistance Cutting Edge)

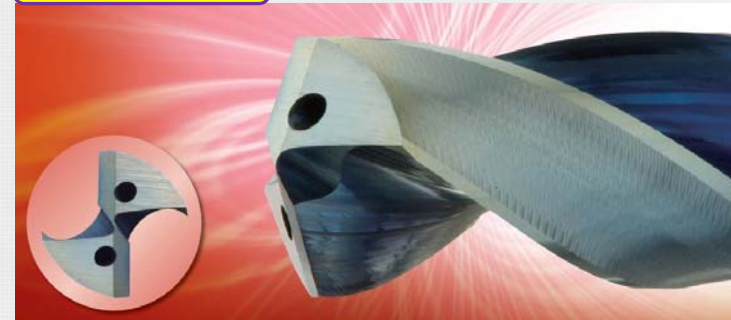
(1) Characteristics

- ① High Efficiency Cutting
- ② Feed: 15% of Drill Dia.

(2) Cutting Condition (Standard)

- ① Cutting Speed (m/min): 60~400
- ② Feed Rate (mm/rev): $0.15 \times \text{Drill Dia.}$

For Aluminum



6) GHI Drill (High Stiffness Cutting Edge)

(1) Characteristics

- ① High Efficiency Cutting
- ② Excellent Circularity
- ③ Coating : TiALN , ALCrN

(2) Cutting Condition (Standard)

- ① Cutting Speed (m/min): 20~100
- ② Feed Rate (mm/rev): 0.2~0.6

For Cast Iron



10. Cutting Tools

7) GIX Drill (Low Resistance Cutting Edge)

(1) Characteristics

- ① High Efficiency Cutting
- ② High Precision
- ③ Coating : TiALN , ALCrN

(2) Cutting Condition (Standard)

- ① Cutting Speed (m/min):60~160
- ② Feed Rate (mm/rev): 0.04*Drill Dia.

For Cast Iron



8) GF Drill (Power of Special Edge)

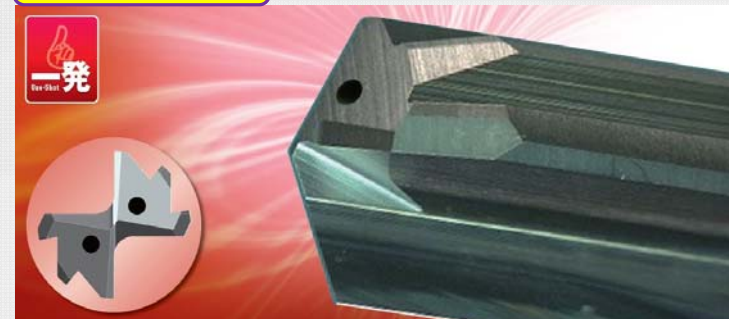
(1) Characteristics

- ① One-Shot Finish IT8
- ② Drill+Reamer+Reamer
- ③ Coating : TiALN , ALCrN

(2) Cutting Condition (Standard)

- ① Cutting Speed (m/min):20~100
- ② Feed Rate (mm/rev):0.05~0.3

For Cast Iron



10.Cutting Tools

9) Manmaru Reamer (All-Round Guide)

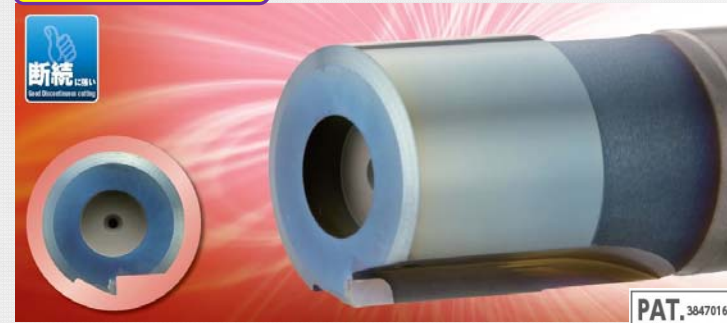
(1) Characteristics

- ① Good Guide performance
- ② Good Circularity

(2) Cutting Condition (Standard)

- ① Cutting Speed (m/min):40~400
- ② Feed Rate (mm/rev): 0.05~0.2

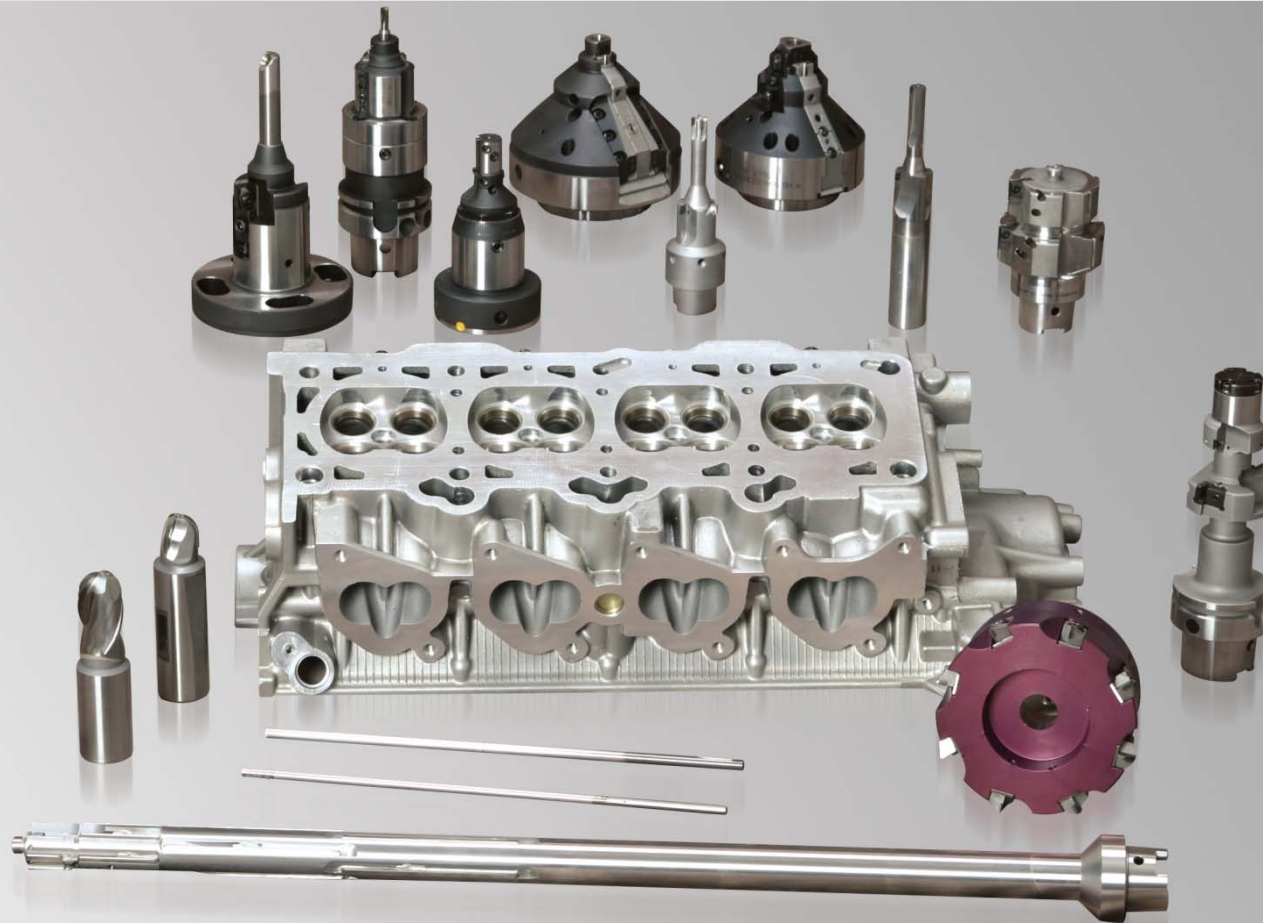
For Aluminum



※Tools Picture



※Tools Picture



※Tools Picture



Thank you!

Contact us to our local Partner,



ATI ABZAR PISHRO Co.

14th Unit, No.10, Mokhberi Boulevard,
Ashrafi Esfahani Highway, Tehran, IRAN

Mr. Reza Adinelou / Managing Director

W: www.atiabzarpishro.com
E: reza.adinelou@atiabzarpishro.com
T: +98-21-44455407-9
F: +98-21-44424066
Mobile: +98-9123181765



BMC Global Co., LTD

B-403 Woorim Lions, Yangpyungro
21Ga Gil19, Yeongdeungpo-Gu Seoul, Korea

B.H.Lee / Managing Director

Tel. +82-(0)2-2038-0279
Mobile +82-(0)10-2395-5611
Fax. +82-(0)2-2677-6808
E. bhlee@bmcglobal.co.kr
bangholee@gmail.com

Best Mechanical Consulting