



# Abhi Fine Products

A Complete Solution for All your Honing Requirement

## Honing Products Portfolio



A Complete Honing Solutions  
Under One Roof

# About Honing

## What is Honing?

Honing is a metal removal process by using a hard tool with super abrasives sintered stones or plated sleeves for the correction of

- Diameter of the bore
- Shape of the bore
- Surface finish of the bore
- Positional tolerances of bores

The hone process was developed to achieve the perfection in bore geometry, size control, surface finish and surface structuring. The honing process provides the final sizing and creates the desired finish pattern on the inner bores. Finishing is accomplished by expanding abrasive stones or sleeves of suitable grit and grade against the working surface. The stones or sleeves are rotated or reciprocated or both in the part with hone abrasive under controlled pressure. A controlled combination of rotation and reciprocation can also produce the desired cross-hatch pattern in the surface of the part being honed.

## Types of Honing?

There are 2 types of Honing process

1. Single Pass / Single Stroke Honing Process
2. Multi pass / Expansion Honing Process

Single Pass Honing:

A single Pass Honing is where abrasives are coated on the cylindrical surface called the sleeve and these sleeves are assembled on the mandrels through which the material is removed and the desired size, geometry and surface finish are achieved.

Multi Pass / Expansion honing:

Expansion honing is where abrasives are coated on the rectangular surface called the honing sticks and these sticks are assembled in such a way that they can expand and retract based on the stock removal through which the material is removed. In some cases the no. of sticks in each tool may vary based on the requirements.

## Why Honing?

Cost effective machining method for:

- Removing stock
- Creating exact bore tolerances
- Achieving the surface finish
- Finishing bores of almost any material such as Cast Iron, Steel, Glass, Ceramics, and some of the Aluminium components etc.,
- It eliminates several time & cost consuming processes such as Lapping, Bore Grinding, Jig Grinding, Hard part reaming or Boring.

## Types of Bore forms which can be corrected through Honing process



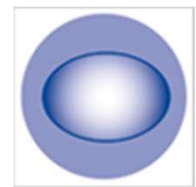
curvature



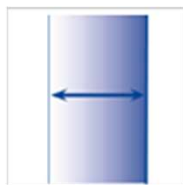
conicity



barrel form



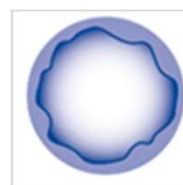
lack of roundness



undersize



taper



waviness

## AB - 2204 Series

### High Precision CNC Vertical Expansion Honing Machine



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## CNC Vertical Expansion Honing Machines

### Columns, Spindles & Stations

- Abhi's Vertical Expansion Honing machines are manufactured with latest technologies in various combinations of Columns, Spindles and Stations such as Single Column with 1 Spindle and 2 Stations, Double Column with 2 Spindles and 4 Stations and many more based on the customer requirements and these Vertical Expansion Honing Machine are capable to hone the bore diameter range of 5mm to 65mm

### Machine Base

- Heavy and stress relieved, Rigid fabricated base

### Spindles

- Smooth & Precise Spindles which can withstand the heavier loads.
- Each Spindles are Mounted with Individual Servo Motor, So that It is capable to work with customizable Spindle speed.

### Rotary Indexing Table

- Based on the customer requirement it can be mounted with fixed rotary indexing table with any no of fixed stations or with an Indefinitely adjustable Servo NC Rotary indexing table will be used with High precision indexing..

### Control panel

- Easily understandable circuits
- A Simple, User friendly, universal design electric control panel.

### Pneumatic Equipment and accessories (Optional)

- All our machines are manufactured with standard products of Pneumatic items incorporated with Maintenance free auto lubrication.

### Vertical Slide

- Each Column has the Servo Driven Vertical slide with high torque capacity and high feed rate with large overall stroke limit which enables to hone the bigger bore length.
- The movement of each spindle housing can be easily controlled with Jog wheel which give precise positioning.
- 3 level protection is enabled to control the over travel of the spindle housing which ensures 0% failure of positioning.
- The High Precision Ball Screw rod, LM rail and LM Block is used for the precise positioning which is also protected from atmosphere with metallic telescopic for improved life
- Centralized Automatic lubrication system for LM guideways & Precision ball screws with pressure and level feedback.
- 750mm of overall carriage ravel which enable to hone the bigger bore length.

### High Precision Auto Tool Expansion system

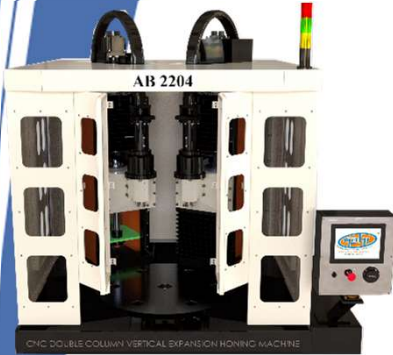
- Servo controlled tool expansion for precise adjustments with accuracy of 0.1Micron.

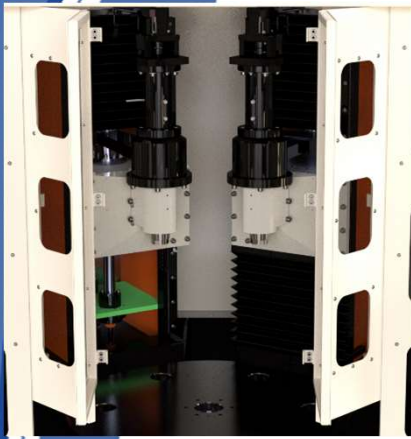
### High Precision Auto gauging & Auto Expansion System (Optional)

- Auto Tool Expansion in steps of 0.1Microns & Auto gauging arrangements will optional based on customer requirement.
- Abhi has developed a new Auto gauging & Auto expansion arrangement with high precision adjustments, Thanks for our R&D team for their invention.

### Electrical items

- All electrical items are branded products.
- Only CE certified products with high rated items are used which is available globally.





## Features of Our CNC Machine Controller

- Machine is constructed to meet **Industry 4.0** and **Industrial IoT** for smart factory compliance (Optional)
- High speed communication protocol is used for machine controls to reduce cycle time and data loss
- Based on the requirement HMI / IPC are used and theses HMI / IPC Supports additional storage capacity of 16Gb to 32 GB CF card which helps to store recipe and program for easy operation.
- Data logging and production details of the machine can be shared in a network (Available for specific models only)
- Machine connectivity to cloud is possible ((Available for specific models only)
- Control panel is designed with high standard materials to meet all safety and environment conditions
- If any error occurs troubleshooting guides are available in pdf format and can be access thru HMI for easy maintenance
- Higher resolution feedback encoders are used to ensure the repeatability and quality production (Available for specific models only)
- Spindle motor speed can be easily varied via HMI
- Machine can connect with any mobile or tablet via Wi-Fi connectivity to view machine status (optional with Additional Cost)
- Robot control inputs can be connected for pick & place application with this machine (optional with Additional Cost)
- Component feed conveyor control input and output from the machine can be integrated (optional with Additional Cost).

## Optional Accessories

- Custom Specified Honing Tools / Cutting Stones including Rough and Finish.
- Floating Tool Holders
- Coolant Filtration System with Magnetic Separator or centrifugal system.
- Chiller Unit
- Special Custom Floating Fixture Package

## Uniqueness of Vertical Expansion Honing Machines & Tools

- High Production rate with Shorter Cycle Time
- High accurate Geometry achieved consistently
- Reduced labor cost through Automation
- Lower cost per component as a result of better Tool life
- Desired Hatch Patterns can be achieved based on the application requirement, This is contingent based on the workpiece material.

## Applications

- Automotive Industries such as finishing of small cylinders for internal combustion engines, air bearing spindles and gears including transmission and other precision gears.
- Hydraulics Industries such as finishing of Hydraulic Valves, Valve Bodies, Pumps, Diesel Fuel Injectors.,
- Aerospace Industries
- Gun barrels, Gear hobs
- Refrigeration compressor components
- Turbocharger housings and bearings
- Connecting rods
- Small engine cylinders
- Medical parts.





## CNC Double Column Vertical Expansion Honing Machine

### Specifications:

#### Diameter Range:\*

In Standard Machine: 5 to 65 mm  
We can customize the machines to honing the diameter upto 500mm  
Based on the customer requirement.

#### Maximum Workpiece Dimensions:\*

200 L x 200 W x 250H

#### Carriage Travel :

750 mm

#### Stroker Speed:

Upto 30000mm/min

#### Reciprocation Rate (Stroke):

10 to 400 spm

#### Max Dial Plate Diameter:

800mm

#### Spindle Speeds: 1 to 2000 RPM

#### Column Motor: 9.5 Nm

#### Coolant Sump Pump:

Centrifugal Pump  
(Separate Coolant Filtration System)

#### Floor Space

#### (Coolant Tank Not Included):

2050 W x 2900L x 2800 H

#### Pneumatic Requirements:

Optional

#### Electrical Requirements:

415V, 50Hz, 3Phase

#### Rotary Indexer :

(2, 3, 4, 6, 8, 10... Fixed stations or  
Infinitely adjustable servo driven  
(Optional with additional cost) are  
easily configured with high accuracy &  
repeatability.



## AB - 2204 Series

- Diameter range, length range and workpiece weight are contingent on workpiece and application.
- \*\*No of Spindles & Stations are contingent based on the Stock removal and out parameters of honing.

### Customize Abhi's Vertical Expansion Honing machines:

In order to meet Your Exact Requirements, Abhi's high-precision honing machines with very high accuracies can be supplied anywhere in the world.

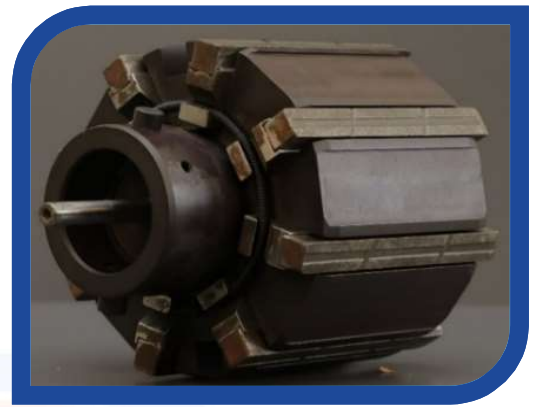
These Products are reliable, durable, and flexible Honing systems designed to deliver the production quality and precision to our customers.

Abhi's commitment to service and quality assurance. Is in such a way that Our technical team will work with you in determining the number of spindles, type of tooling, fixtures, abrasives, in-process and/or post-process gaging, and method of parts loading and unloading (including robotics) if customer require.

After which a written proposal will be sent to you.

When your system is built, we'll set up a live run-off / Prove out at our facility. Once all specifications are met, we'll commission your system and train our customer.

## Multi Pass / Expansion Type Honing Tools



- Suitable for through bores, Blind bores and Key way components with or without Undercuts.
- Stock removal range 0.1mm to 0.2mm
- Expansion stones consist of Aluminum oxide, silicon carbide (Conventional stone), CBN and Diamond stones (Super abrasives).
- These types of tools can produce the required Hatch Pattern in the components consistently
- These types of tools have the guaranteed tool life which can achieve a very less cost per component with consistent results in the output.
- Expansion honing is available with single stone cutting tool, four stone cutting tool, six stone cutting tool and Eight Stone cutting tools are available based on the customer applications..

# Special Honing Fixtures

## Basics of Fixture Design

Since the Fixtures for honing has a major role and impact in the geometry of the output components, Abhi has designed the fixtures in such a way that it can achieve the required geometry and also an operator friendly i.e., even an inexperienced operator can load the components without any mistakes and difficulties.

Honing is a typical process where the tool and the fixture must follow the correct path along with axis of the component's bore, whereas the Geometry will get affected if these doesn't follow the correct path, so the fixture takes a major role in defining the tool's path. For which Abhi has designed the Rigid fixtures, Axial floating fixtures and Radial and Axial Floating fixtures based on the honing component in such a way that the tool and the fixture will guide without disturbing the present axis of the component's bore during the Honing process.

### Rigid Fixture

The Rigid fixture for a lengthy and Tandom bore component with manual clamping which is mounted with very close tolerance, through which we can achieved very close Bore geometry

### Axial Floating Fixture

The Axial floating fixture with pneumatic clamping which reduces cycle time and takes care of the axis straightness between the Tool and Components, through which we can achieve very close Bore Geometry.

### Radial & Axial Floating Fixture

The Radial and Axial floating fixture which takes care of both the axial and radial shift between the Tool and Components, through which we can achieve very close Bore Geometry.

Rigid Fixture



Axial Floating Fixture



Radial &amp; Axial Floating Fixture





# Special Floating Tool Holders

Collet Type Floating Holders



During Honing process, the alignment of the pilot bore with the tool axis is a prerequisite for the correct function of the honing tool. On the usage of Honing tools on a vertical Honing machine, it is often necessary to compensate for axial errors between the tool adapter and the bore to be Honed. This error can be corrected either by aligning the tool on the machine or using a floating holder. A floating holder is particularly useful if the offset changes continuously due to the thermal expansion of the machine or at different positions during the rotation of Spindles.

Side Lock Floating Holders



## Collet Type Floating Holders

- Collect Type Floating Holders can Float Axially and guide the tool axially to enter in the proper axis of the component.

## Side Lock Floating Holders

- Floating Holders with side lock arrangement for easy mounting of the tools also it can Float Axially which guides the tool to enter in the proper axis of the component.

Link Type Floating Holders



## Link with Side Lock Floating Holders

- Link Type Floating Holders with side lock arrangements to easy mounting and unmounting of tools which can Float Radially and Axially which guides the tool to enter in the proper axis of the component even if the component has some radial shift.

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