

# Ensure consistent grip and accurate work piece holding with high-quality BPT Diaphragm Chucks

**D**iaphragm chucks are increasingly becoming popular for a wide range of applications courtesy their accuracy and repeatability. Diaphragm chucks for grinding & turning centres functions similar to a human's diaphragm that contracts and retracts. They offer many advantages as compared to standard chucks.

Unlike standard chucks that rely on the wedge and master jaw linkage for clamping, a diaphragm chuck applies the principle of elastic deformation in expanding, contracting and using resistance to hold work pieces in place. Because diaphragm chucks don't have sliding components, they don't require lubrication and offer a more consistent grip force repeating to within 10 microns.

Diaphragm chucks are primarily used for secondary operations, eg., grinding, boring, facing and light turning. Preferably, the locating surface should be a pre-machined or precision cast surface. Similar chuck locating diameter tolerances should be held to a total of 0.15 mm; on the larger chucks a total of 0.38 mm can be maintained.

Standard diaphragm range is available in 160 mm, 200 mm, 250 mm, 315 mm and 400 mm sizes.

## How Diaphragm Chucks work

Diaphragm chuck utilizes the inherent strength and accuracy of spring steel to achieve the required pressure for external and internal surfaces. When the drawbar is actuated (air introduced via the spindle and adaptor plate in the case of pneumatic version), the piston moves forward 0.45mm. The movement is transmitted



to the diaphragm by a pusher sleeve.

The chuck jaws are fixed open through this movement and the component can be loaded. To chuck (i.e. to clamp the component), the drawbar is retracted (or air turned off) and the jaws move toward the clamping diameter until contact is made with the component.

## Advantages of Diaphragm Chucks

- Accurate holding of work piece
- Error averaged out
- Two level, double diaphragm effect chucking possible with standard chuck
- Cages, locating pins and end stops are interchangeable
- Cages can be furnished for other chucks
- Easy loading & unloading of work piece / component.

## Industrial Application

**Gear Industries:** All types of Gear Industries: To clamp the pitch circle diameter of various types of gears i.e. Spur and Bevel Gears for bore grinding applications to achieve concentricity/ runout of the bore with respect to PCD of the gear. Double Diaphragm Chuck / Two-Level Diaphragm Chuck are applied for

cluster gears in automobile industries.

**Liner Industries:** For Precision bore grinding / Precision boring operation in thin wall section component with respect to O.D clamping by Diaphragm Chuck.

**Thin Wall Component:** Precision Bearing Cover, Precision Thin Section Flanges.

**Aircraft Industries:** For clamping lightweight and Thin-Walled components of Aircraft i.e. Cover, Flanges, Gears..etc.

## Application uses of Diaphragm chuck

- To clamp external diameter
- Grinding of bore and taper
- Boring, facing and light turning
- Extremely tight axial tolerances
- Highest concentricity.

Birla Precision Technologies, the first Tool Holder manufacturer in India since 1986, is at the forefront in delivering high-quality Diaphragm Chucks. The company is empowered by a strong team of designers regularly bringing new technology and products to the market. With its world-class facility, established through its Joint Venture with Kennametal (USA), the company exports its products to more than 20 countries globally.

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