



Special Assemblies & Components

Today's high-technology products demand increasingly critical tolerances. NHBB stands ready to support your needs with:

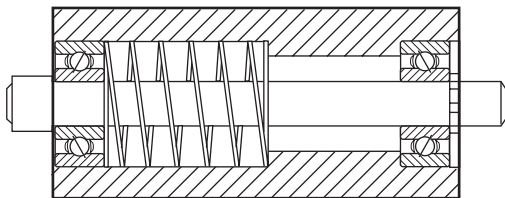
- Next-level bearing assemblies & subassemblies
- Ultra-precision components
- Leading edge automated production techniques
- Complete in-house manufacturing

- ISO 9002 Quality System approval
- 50 years of experience in precision manufacturing and assembly

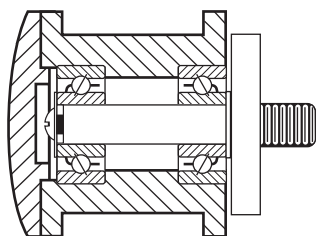
Our experienced staff can help you design quality, cost-effective subassemblies for your specific applications—and manufacture them in small or volume production quantities.

NHBB can provide complete manufacturing and assembly for a wide variety of special designs.

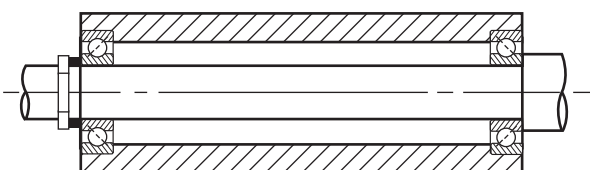
Spindle Assembly. Designed with compression coil spring — shaft rotation.



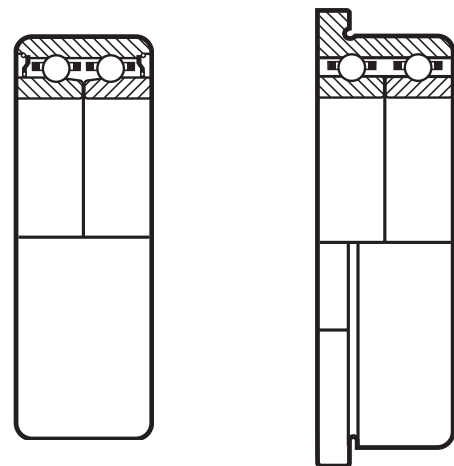
Typical Tape Guide. Design uses screw and washer to solidly preload by clamping inner rings — outer ring rotation.



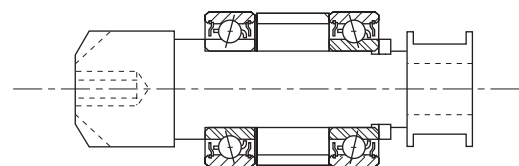
Shaft/Housing Assembly. Factory assembled to control fit ups and runouts.



Integral Super Duplex. Manufactured with outer raceway ground into housing.



Special Assembly. Manufacture and assemble several components to control proper fit and performance.





Bearing Selection

To ensure optimal speed and load carrying capacity, several factors must be considered when choosing the proper bearing for your application. These factors include the ring material, design, shields & seals, cage, ABEC grade, radial play, and lubricant.

Materials

Miniature and instrument bearings are normally made of either stainless steel or chrome alloy steel. NHBB offers 440C stainless steel for applications that require corrosion resistance, and 52100 chrome steel for maximum fatigue life. These materials are heat-treated to achieve optimum hardness and dimensional stability, and are suitable for most applications.

Design

The design of a bearing is critical in determining its load-carrying capability and maximum operating speed—factors which directly impact the bearing's operating life. Various types of bearings have been designed to meet the operating parameters of your application.

The **radial** or **conrad** bearing (also referred to as deep groove) is the most popular type due to its ability to handle radial and thrust loads in either direction. This type is offered with various seal or shield options.

The **angular contact** bearing is designed with a relieved shoulder to allow for a greater number of balls, thereby increasing its load-carrying capability. The angular contact design also allows for the use of a full section cage which is desirable for high speed applications. This type of bearing can handle thrust loads in one direction only.

Shields and Seals

Shields and seals are used in ball bearings to retain lubricants and prevent particulate contamination from reaching the critical surfaces. Shields are popular for most applications; seals are used where minimal clearance to light contact is required. Seals offer greater deterrence to particulate contamination, but increase torque and limit operating speed. NHBB offers a variety of enclosure options. The chart on page 34 in the Engineering Section describes these options in greater detail.

Cages

The cage, also referred to as the retainer or separator, is the component that separates and positions the balls at approximately equal intervals around the bearing raceway. Proper selection of a bearing cage is critical for meeting the load, speed and temperature requirements of your application.

The standard cages for radial or conrad miniature and instrument ball bearings are stamped metal ribbon or crown. The application flexibility and low-cost design of these types make them appropriate for most general purpose applications. For high-speed applications, machined cages made of phenolic, polyamide-imide and other materials are available. Refer to page 33 in the Engineering Section for more details on cage options.