

# SPECIAL APPLICATIONS

## Introduction

Barden innovations in special bearings range from nearly standard bearings with slightly modified dimensions, to intricate assemblies which integrate the bearing function into a complete mechanism. Our engineers work closely with customers to develop unique bearing designs with specialised features to meet application requirements and solve functional problems.

In many cases the overall cost of a piece of equipment can be reduced by incorporating special or customised bearings particularly when mating components are integrated into the bearing such as mounting flanges, gear teeth, spring carriers and integral O-ring grooves. The performance and installation benefits to be gained from using bearings specifically designed for individual applications are as follows:

- Improved assembly reliability
- Enhanced rigidity or stability of the system
- Better location control through proper bearing orientation
- Reduction in handling operations and contamination
- Improved alignment of the rotating assembly
- Weight reduction
- Improved resistance to temperature extremes
- Reduction in tolerance stack-up

## SPECIAL APPLICATIONS

### Aerospace Accessory Bearings



*Specialty bearings include the flanged split inner ring configuration, shown here, used in precision aerospace applications.*

Custom designed and manufactured aerospace bearings are a cornerstone of the Barden product line. Aerospace bearings are specifically designed according to application requirements, and the engineering staff is often involved early in the development stages of aerospace equipment.

Barden bearings are utilised in pneumatic and electric starters and generators, gearboxes, main engines, and a variety of auxiliary aircraft positions. Bearing configurations range from standard deep groove bearings to intricate split inner ring designs. Thanks to a well equipped and versatile factory with experienced and flexible staff, The Barden Corporation is able to manufacture bearings with unusual materials and designs.

Unlike the product designs which vary, the product precision remains constant. Super precision ABEC 7 bearings are standard, and as a result, Barden aerospace bearings are capable of high speed, reliable operation, running quietly with minimum power losses.

Due to their unique design, split inner configurations can accept reversing thrust and combination loads. The bearings are assembled with one-piece high strength cages that are often silver plated for improved

operation under marginal lubrication conditions. Bearing configurations can include puller grooves, bore clips, and flanges, as required. Typically split inner ring bearings are manufactured from high temperature, high strength bearings steels such as M50 and Cronidur 30. Like in other applications, ceramic balls are available and can provide for higher speed operation.

Other typical aerospace configurations include the sealed deep groove bearing shown opposite. Deep groove bearings are greased and sealed for life at the factory in clean assembly rooms, and a variety of grease lubricants are available depending on the application requirements. Barden “T” cages are often recommended for these bearings. In addition to being light weight and strong, “T” cages generally improve lubricant life and allow for high speed bearing operation. The standard high temperature seal material is Viton. This material is generally not reactive with typical chemicals present in aerospace applications. Barden Flexeals are also available when higher operating speeds are required. Cronidur 30 rings and ceramic balls are often recommended to provide corrosion protection for bearings operating in harsh environments.

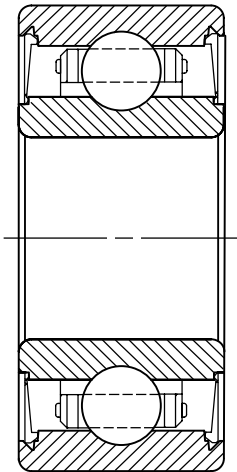
#### **Full complement bearings**

Full complement bearings capitalise on the space usually occupied by the ball retainer. This allows more balls with the consequential increase in load capacity, either predominantly radial, in the case of filling notch designs, or unidirectional axial and radial in the case of angular contact designs.

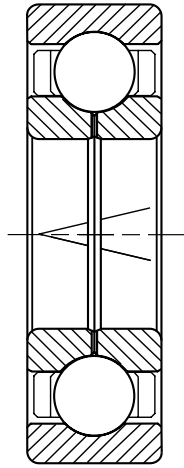
Applications vary from high temperature valves to missile fin support. Some designs meet Mil Specs AS27640, AS27641, and AS27642. Others are tailored to meet individual customer requirements.

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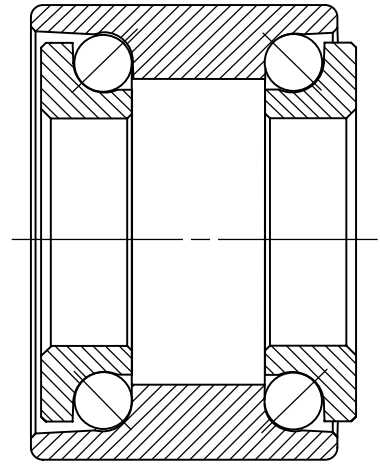
## Aerospace Accessory Bearings



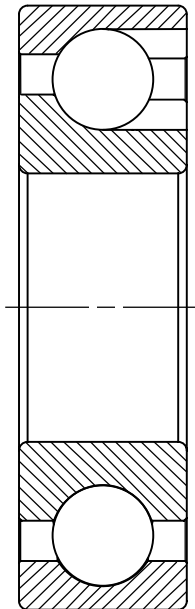
Sealed Deep Groove  
Generator Bearing



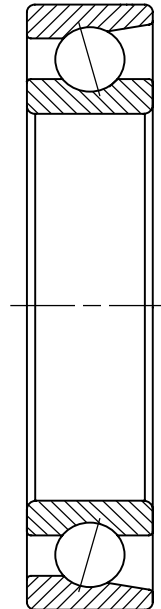
Gear Box Bearing  
With Split Inner Ring



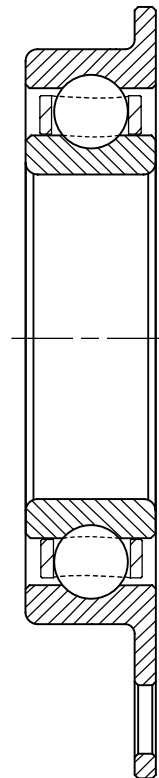
Double-Row  
Accessory Bearing



Deep Groove  
Full Complement  
Filling Notch Bearing



Angular Contact  
Full Complement  
Bearing



Flanged Deep Groove  
Gear Box Bearing