

SPECIAL APPLICATIONS

Introduction

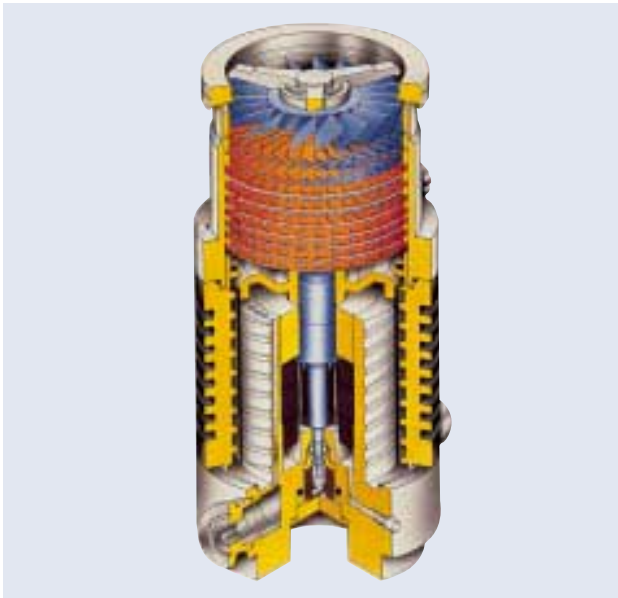
Barden innovations in special bearings range from nearly standard bearings with slightly modified dimensions, to intricate assemblies which integrate the bearing function into a complete mechanism. Our engineers work closely with customers to develop unique bearing designs with specialised features to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

Vacuum Pumps and Magnetic Spindle “Touchdown” Bearings



Vacuum pump bearings must endure a range of hostile operating conditions, an environment ideally suited for Barden precision bearings.

Barden has established an expertise in developing bearings for the whole of the pump market sector. Using new materials and by adding value, bearings can be designed to meet the harsh requirements of today's high performance pump market.

Some of the factors that make high precision bearings the first choice are high temperatures, high speeds, low vibration levels, abnormal contamination levels, poor lubrication, high reliability and long life.

Among the areas of expertise in which Barden bearings are already proven as the solution provider are turbo molecular pump bearings, dry pump bearings and emergency touch down bearings for magnetically supported pumps.

Turbomolecular Pumps

The most important requirements for a bearing used in this application are long life, reliability and high-speed performance. To this end the use of X-life Ultra bearings, ceramic balls, greased for life and special high quality raceway finishes has become the Barden standard. Current “greased-for-life” bearing technology can consistently give 30,000+ hour life at 500,000+ dN.

Dry Pump Bearings

Whilst the speed requirements on the bearings for this type of application are often lower than usual, other factors including temperature, contamination and reliability mean that a special bearing design is necessary in order to meet the application requirements. Barden is able to design dry pump bearings for optimal performance with both oil and grease lubrication. Also, by adding value to the bearing so that it reduces assembly cost and pump component count, additional performance and economic benefits can be gained from the use of Barden's special bearings.

Emergency Touchdown/Auxiliary Bearings

This special application area requires bearings that can withstand the harshest conditions. To successfully control a shaft on which the magnetic bearings have failed often requires a bearing that can accelerate from zero to 2 million or higher dN virtually instantaneously. In addition the bearing system must then control the rotor under the very high radial, axial and shock loading. Barden has developed bearings for this application using a full of ceramic ball design with Cronidur 30 material to give exceptional performance and corrosion resistance. Barden is able to optimise the bearing design for the maximum number of touchdowns.

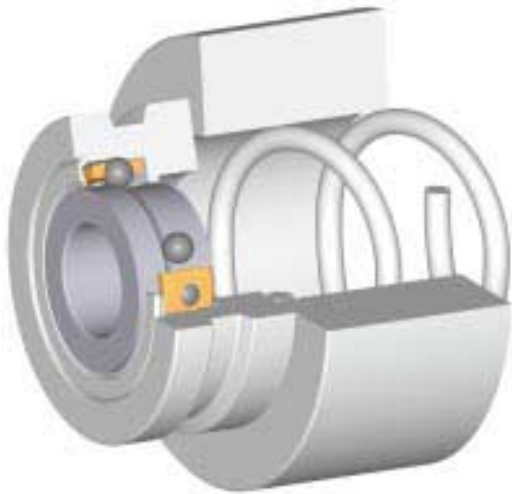
Special design features

Here are some of the added value design features that enable Barden's special bearings to work reliably in high-performance pumping applications:

- Cronidur 30 High-Nitrogen Steel — for optimum performance and reliability
- High-performance Ceramic Balls — chosen to meet the performance and corrosion-resistance requirements
- High-speed Small Ball Technology — for improved pumping speeds
- Shielded Angular Contact Design — to guard against contamination ingress and prolong lubricant life
- Special Internal Design — to maximise the in-application performance
- Special Barden “TMP Standard” Internal Finish — for quieter running, longer life and high reliability

SPECIAL APPLICATIONS

Vacuum Pumps and Magnetic Spindle “Touchdown” Bearings



TMP Integrated Spring Carrier
and Damping Ring Groove



Dry Pump Bearing
with Grease
Reservoir



TMP Integrated shaft assembly



TMP Flange Bearing with
Integral Damping Ring Groove