

## Super Precision Bearing Solutions



HQW Precision GmbH The Barden Corporation (UK) Ltd

Partners in Precision

# Precision with Vision

For more than seven decades the Barden name has been synonymous with precision and excellence. From its outset the company has specialised in the manufacture of bearings that provide rotational precision and tolerance control beyond the scope of accepted technology and standards.

Barden continues to meet this challenge today, manufacturing bearings to super precision standards for critical and challenging applications ranging from aerospace equipment to turbomolecular pumps and specialist medical systems. Since its acquisition, Barden has combined forces with precision partner HQW Precision GmbH, to offer a wider range of specialist bearing solutions to Industry. With a shared focus on technology, innovation and quality, these two market leaders manufacture many of the world's most complex and sophisticated precision bearing products.



## **Unmatched** Quality

Barden operates from a purpose-built factory in Plymouth on the South West Coast of the UK. The plant is certified to ISO9001 and aerospace standards AS9100 and AS9120. It is also certified to ISO14001 and applies a continuous improvement philosophy throughout the business.

Self-established standards using proprietary test and measuring equipment, ensure the delivery of quiet, smooth running bearings with exceptional performance.

Quality is a key part of the Barden service and is applied to every element of the business, from the customer interface and design through to production, packaging and delivery of assembled bearings.







#### Aerospace & Defence

Custom designed and manufactured aerospace bearings are the cornerstone of the Barden product line. Manufactured to ISO P4/P2 (ABEC 7/9) standards and fully certified, Barden has supplied bearings for applications including pneumatic and electric starters and generators, fans and blowers and a variety of auxiliary aircraft positions.

Precision remains paramount across the product range; raceway roundness of better than  $0.5\mu m$  ( $20\mu$ ") can be attained. Similarly, these raceways can be finished to a high standard with surface roughness less than  $0.025\mu m$ Ra ( $1\mu$ " Ra).

Full traceability is available on request for all bearings supplied to the aerospace and defence sectors. Bespoke features, such as custom geometries, calibrated fitting diameters and partially or fully integrated shafts and housings, can be accommodated. Special materials selected for operation in extreme environments and innovative lubrication systems complete the picture.

#### Vacuum Technology

Super precision bearings excel in the harsh environments experienced in many industrial applications, where reliability and long operating life requirements make them the bearing of choice.

Using high performance materials and lubrication systems, bearings can be designed to meet the demands of the vacuum technology sector. For turbomolecular pumps and emergency touchdown bearings for magnetically supported spindles, Barden offers a complete range of products. These precision bearings provide exceptional quality for optimum running conditions.

TMP bearings manufactured by Barden are specially designed for optimised performance in ultra-high vacuum environments. Hybrid designs are available which incorporate ceramic balls and Cronidur 30 (AMS 5898) stainless steel, reducing wear and increasing life.





#### **Medical Systems**

Advances in modern medical and dental technology mean component precision has never been more vital. Barden bearings are used in applications ranging from high speed dental handpiece turbines to surgical tools and medical robotics.

Barden has been at the forefront of dental bearing design for more than 30 years. Operating at speeds of up to 500,000 rpm, Barden bearings can withstand repeated sterilisation and extend turbine life significantly. All Barden dental bearings have super finished raceways with strict controls on component geometry.

With the exacting standards of the medical and dental sectors in mind, Barden ensures all assembly, testing and packing operations take place in fully equipped, onsite ISO Class 7 cleanrooms.

#### **Specialist Solutions**

In addition to meeting the needs of traditional markets, Barden's engineering expertise has been called upon to design bearings for many specialist applications, including space systems, energy production and the nuclear industry.

In these types of application, Barden engineers work closely with customers to develop unique bearing designs with specialised features to meet application requirements and solve functional problems. In many instances the overall cost of a piece of equipment can be reduced by incorporating special or customised bearings.

Performance and installation benefits include improved assembly reliability, enhanced system rigidity, reduced handling operations and contamination, improved alignment of the rotating assembly, reduced weight and improved resistance to temperature extremes.

The result is the maximum performance and highest reliability from the smallest design envelope.





## Performance Materials

Barden produce thousands of bearing variations – predominantly single and double row, super precision angular contact and deep groove ball bearings with tolerances measured in microns – for a wide range of precision applications in highly demanding market segments.

A wide variety of seals, shields, metallic and nonmetallic cage designs and calibration options are available together with speciality lubricants where required.

Barden's super precision bearings are available in metric or inch dimensions with diameters ranging from 1.5mm (0.06") bore diameter to 180mm (7.1") OD, with many able to operate comfortably at speeds up to 2.0 million dN (bore in mm x rpm) or above.

Because ball quality affects the ability of a bearing to run smoothly with a high level of rotational accuracy, Barden use both steel and ceramic balls, produced to exacting specifications for ball geometry, finish and size control.



## Innovation & Design

Barden offers a comprehensive catalogue of high-quality standard products. However the company's strength lies in its innovative, bespoke design and manufacturing service for high performance applications.

The engineering team employ specialist software for static and dynamic mechanical analysis. Sophisticated calculation methods are used to analyse a multitude of factors, including contact stresses, loads, load distribution and detailed bearing kinematics.

Creativity is built into Barden's DNA and our engineering team uses imagination and expertise to develop new ideas and conceive unique solutions. Working in close partnership with customers, Barden engineers will find perfect-fit solutions, and if there is no solution currently available, Barden has the vision to create one.



Gothic arch aerospace bearing. Barden products can incorporate bespoke design features, such as flanges, direct lubricant injection slots and fixings, as shown here.



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