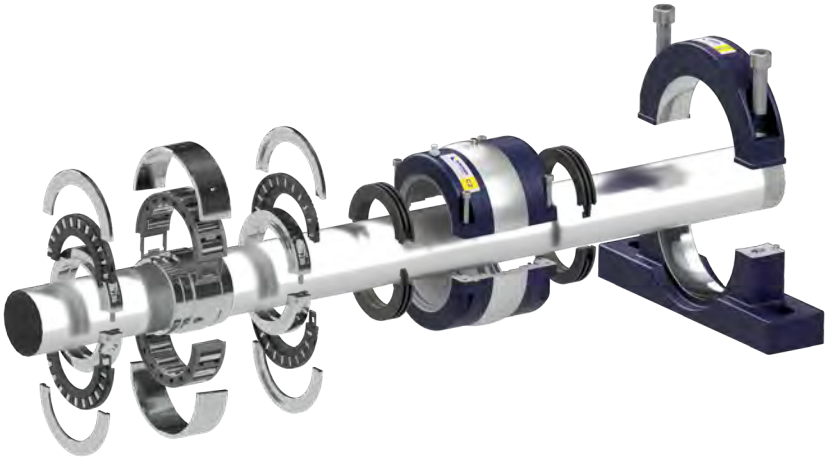
Bowman Split Bearings

Advanced Split Roller Bearing Solutions



Product Information and Technical Data

Bearings to suit shaft diameter from (metric) 30mm to 300mm and (inch) 1 3/16" to 12"

www.bowmansplitbearings.com

BOWMAN Abingdon
(Headquarters)

The Bowman Group

The Bowman Group is a group of divisions dedicated to innovation, reliability and quality customer service within the engineering sector. Our aim is to stock everything where possible to offer fast delivery and offer competitive pricing and performance. The Bowman Group incorporates Bowman International, Bowman Additive Production, Bowman Advanced Engineering, Bowman GmbH and Bowman Split Bearings. The Split Bearing is the result of a collaboration between different parts of the Bowman Group, utilising design and manufacturing expertise across the various divisions.

BOWMAN Birmingham
(Bowman Split Bearings)

BOWMAN GmbH
(München)

BOWMAN

BOWMAN Additive Production | BOWMAN INTERNATIONAL GmbH | BOWMAN SPLIT BEARINGS

Bowman Advanced Split Roller Bearings *Introduction*

The split roller bearing was invented at the beginning of the 20th century and has been an industry stalwart ever since. Split roller bearings are renowned throughout industry for their ability to improve efficiency by reducing downtime, resulting in increased production. They are highly regarded for saving time during installation, inspection and maintenance for end-users, whilst also offering simplified machine and shaft design for equipment manufacturers. Essential for applications where bearing locations are trapped or access is limited, split roller bearings also eliminate the need to remove ancillary equipment from the shaft when installing or replacing the bearing.

The design of the split roller bearing has remained largely unchanged for over one hundred years.... **until now!**

The Bowman Group, have developed a split roller bearing with significantly increased load capacities with an innovative new design which incorporates separate radial and axial elements. We have updated the split roller bearing for the modern world by extending its operating envelope into high thrust load applications that cannot be covered by existing split roller bearings.

The Bowman Advanced Split Roller Bearing is designed and manufactured in the UK and is offered with price and numerous performance advantages over existing split roller bearings as well as exceptional technical support through Bowman Advanced Engineering – the technical wing of the Bowman Group.

What Advantages does the Bowman Range have over all the other Manufacturers?

Increased radial capacity of between 25% and 70% dependant on the size of the unit

Axial capability in both directions 1000% higher than the competition

Stronger ductile (SG) cartridges and pedestals as standard

The axial bearing design enables calculation of L_{10} life

Screw sizes have been increased to accommodate increased capacities for the clamp rings, cartridges and pedestals

Patented triple labyrinth seals as standard

Quieter Running

Longer Life

Patented triple labyrinth extended seals available to overcome worn shaft problems

Far less down time especially on the SN range

Reversible Clamp Rings

Mounting Options

The most popular method of mounting is via standard pedestal housings, however Bowman bearings can also be mounted in a variety of outer supports, including flanges, take-up, rod ends and hangers depending on the application.

Our range includes pedestals with critical dimensions to match industry-standard bearing housings, however Bowman has the capability to design and manufacture bespoke housings. Please contact our Technical Department with details of your requirements.


Two Bolt Case


Large Bore Base


Rod End Casting


Take Up Push Casting


Square Flange Casting


Take Up Tension Casting


Hanger Casting


Round Flange Casting


Stepped Bolt Case

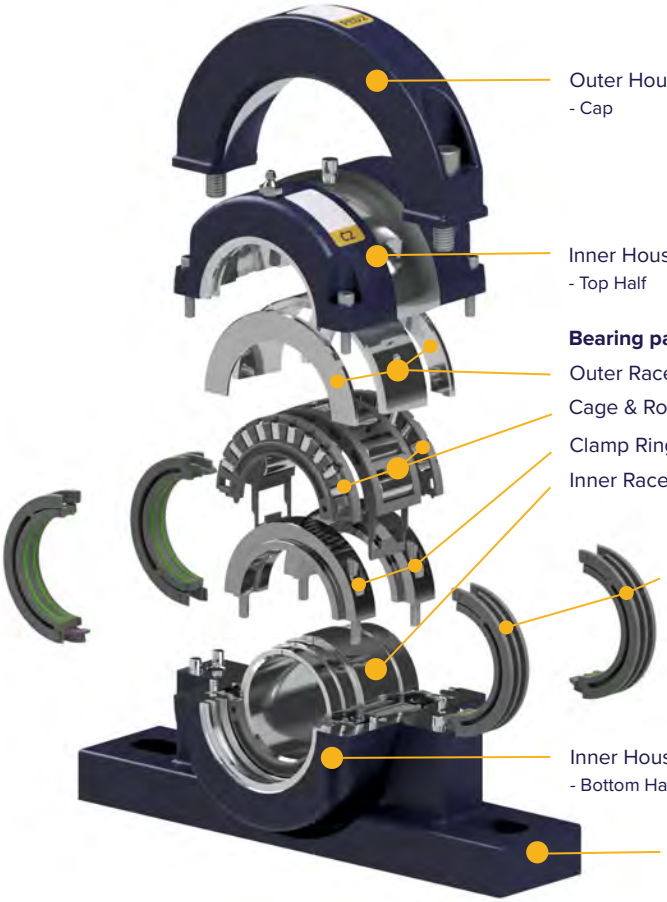
Design Ethos

- The remit for the product was to design a bearing with:
  The highest radial and axial capacities (static and dynamic) of any split-to-the-shaft bearing currently available in any format, cylindrical; spherical; taper or ball bearing – by completely re-engineering the split roller bearing and utilising the new technologies now available.
  ▶ Radial Capacity 70% Increase ▶ Axial Capacity 1000% Increase
- High strength housings to cope with increased loads.
- Uprated fixing hardware compared to currently available product.
- Simplified installation and maintenance – run-safe bearing design / minimised bearing failure strategy by designing cage jointing method with no loose parts, housings with no grub screws/ side rods to axially locate the fixed bearing outer races.
- ROLLER TRAIN 3D printed bearing cages allow complex geometries and flexible design to be utilised.
- Separate rolling elements accommodate axial loads independently of radial loads enabling, for the first time, calculation of an axial L10 life.
- Greater axial expansion of the non-locating bearing than leading competitors.
- Extended working life by the ability to replace or re-use components.
- Inner housing is interchangeable within existing manufacturers outer housings. Inner housing incorporates patented SEAL TRAIN composite multi labyrinth seals.
- Triple labyrinth seals which are intrinsically safe unlike other manufacturers.
- Inner and outer housings manufactured from ductile (SG) cast iron for high strength and durability.

Minimising Inventory

- Interchangeable bearing components within a group size.
- Using one inner housing per bearing group size, by use of independent seals, enabling inner housing seal bore variation within the same inner housing.
- Designing one series of bearing with the capacity to replace five series of existing manufacturers product range, whilst remaining interchangeable with existing products.
- To maintain the highest stock levels to improve product availability and minimise customer spares holding requirements.

BOWMAN
SPLIT BEARINGS



Outer Housing (Pedestal)
- Cap

Inner Housing (Cartridge)
- Top Half

Bearing parts:

Outer Races (1x Radial & 2x Axial)

Cage & Rollers (1x Radial & 2x Axial)

Clamp Rings

Inner Race

Triple Labyrinth Seals

Inner Housing (Cartridge)
- Bottom Half

Outer Housing (Pedestal)
- Base

Product Technical Data

Advanced Split Roller Bearings

Delivering the highest radial and axial capacity split roller bearing currently within the market and intended for both the 'free' and 'fixed' bearing positions, Bowman split bearing units have the ability to adapt the 'free' bearing into a 'fixed' bearing via the addition of split thrust roller (axial) bearings within the bearing housing.

The resulting 'fixed' bearing is capable of handling high axial loads in either direction – with no decrease in radial performance (unlike spherical and taper roller bearings), due to the unit's independent thrust bearings. Each bearing performs one task only – compared to competitor's units which employ multirole rollers. 'Free' bearings have plain outer races to allow unrestricted axial movement of the rollers with thermal expansion and contraction.
Bowman bearing inner race halves are retained on the shaft by hardened steel clamp rings with high-tensile (grade 12.9) socket head screws.

Bowman split bearings utilise cylindrical rollers within the ROLLER TRAIN® 3D printed cage. The cage material has excellent mechanical properties, and resistance to chemicals, and the manufacturing processes utilised allow for flexible design.
* For high temperature bronze cages are available.

Radial rollers are not located or axially loaded by the races, therefore reducing skewing within the cage pockets and reducing the minimum loading requirements.

Plain outer races are used for both locating and non-locating bearings, thus negating the need for additional retaining or side location screws within the inner housing; only one housing type is required for 'free' or 'fixed' bearing types.

Axial split thrust roller bearings use 3D printed cages with ROLLER TRAIN® joining technology.

The two halves of the cage are joined using rollers, therefore no risk of damage can occur from loose metal cage joints or clips becoming loose within the bearing.

Ceramic rollers can be provided for cryogenic applications where lubrication cannot be tolerated and for applications where the shaft needs to be electrically insulated from the housing

Additional Features

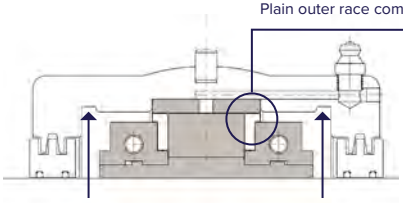
For high temperatures above 150C bronze cages can be incorporated and metallic triple labyrinth seals adopted.	Adaptations of the design can be accommodated with fast turn round usually within 12 weeks.
All screws can be supplied in stainless steel if required.	All available in metric and imperial.
Temperature monitoring sensors can also be provided which can send warnings via mobile telephones.	Vibration monitoring sensors can also be provided which can send warnings via mobile telephones.

For applications that require the shaft to be insulated from the housing ceramic rollers can be incorporated. Ceramic rollers are also ideal for cryogenic applications where lubrication cannot be accommodated and for applications where the shaft need to be electrically insulated fro the housing.

Free (Non-Locating) Bearing

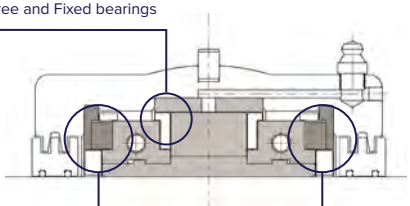
Fixed (Locating) Bearing

Plain outer race common to both Free and Fixed bearings



Machined grooves in inner housing

Both Free and Fixed bearings share the same radial bearing components (inner races, clamp rings, radial cage and roller assemblies AND plain radial outer races). For the Free bearing this plain outer race accommodates axial expansion as the radial rollers are not axially constrained.



Free bearings can be converted into Fixed bearings by adding axial bearing components (axial cage and roller assemblies and axial outer races) between the clamp rings of the free bearing and machined grooves in the inner housing.

Inner Housings (Cartridges)

Bowman split bearings are mounted within an inner housing which in turn is mounted (via a spherical ball joint) within an outer housing. The outer housing connects the Bowman split bearing unit to the mounting structure. This spherical ball joint between the inner & outer housings allows misalignment between the shaft and the mounting structure and reduces edge-loading of the bearing.

Whilst providing location for the bearing the inner housing also contains the composite multi-labyrinth seals which, via the spherical ball jointing, remain concentric to the shaft even with shaft/mounting structure misalignment. Multi-labyrinth seals are fitted to the shaft and rotate within close tolerances to the inner housing, resulting in efficient non-contact sealing for a wide range of environmental conditions.

Bowman inner housings are manufactured from high strength ductile cast iron and can be installed in outer housings (such as pedestals, flanges, take-up units etc) from other split roller bearing manufacturers.

There are two different Bowman inner housings for each bearing group size - one to fit the Light/01/E Series outer housings of other manufacturers, and one to fit the Medium/02 Series. This is because of the high capacities of the Bowman bearings which are in most cases suitable as a direct interchange for both other manufacturers bearing series.

Outer Housings (Pedestals)

Bowman split bearing unit outer housings are designed to be interchangeable with existing split bearing manufacturers outer housings and hence share the spherical ball socket dimensions, heights to shaft centre, base foot print and fixing bolt dimensions. Bowman outer housings are manufactured from high strength ductile cast iron. Bowman can also provide bespoke outer housings to order. Bowman can also provide bespoke outer housings to order, as well as our unique Stepped Pedestals which enable our units to be fitted under an existing shaft in situ.