



Material Choice

Material Choice

Made of thermoplastic materials, BNL bearings are all lightweight, have low inertia, are water-resistant, non-magnetic and need no lubrication. We use a range of materials to meet a variety of application requirements, from room temperature operation and immersion in water, to high operating temperatures and significant chemical exposure. Our most commonly used materials are below.

Acetal / Polyoxymethylene (POM)

Most of our products are made from Acetal. This is a widely used engineering plastic that is dimensionally stable when subjected to a range of loads, temperature fluctuation and fluids. It has excellent abrasion and fatigue resistance and low moisture absorption. It has a low co-efficient of friction delivering good long-term wear performance.

Polypropylene (PP)

Polypropylene offers excellent chemical resistance, especially to acids, alkalis and alcohol. It has good fatigue and impact resistance. It is also lighter than water and has low moisture absorption.

If you would like advice on the best bearing material for your application, please contact us and we will be happy to advise you.

| | POM | PP |
|-----------------------------|-------|-------|
| Temperature | | |
| Min Service Temperature | -50°C | -10°C |
| Max Service Temperature | 90°C | 70°C |
| Chemical Resistance* | | |
| Petrol | ✓ | |
| Brake Fluid | ✓ | ✓ |
| Diesel Fuel | ✓ | |
| Kerosene | ✓ | |
| Mineral Oil | ✓ | |
| Chlorine Water | ✓ | ✓ |
| Ozone | | |
| Hydrochloric Acid | | |
| Hydrofluoric Acid | | ✓ |
| Sulphuric Acid | | ✓ |
| Ammonia | | ✓ |
| Sodium Hydroxide | ✓ | ✓ |
| Ammonium Hydroxide | | ✓ |
| MethylAlcohol (Methanol) | ✓ | ✓ |
| EthylAlcohol (Ethanol) | ✓ | ✓ |
| Acetone | ✓ | ✓ |
| Formaldehyde | ✓ | ✓ |
| MethylEthyl Ketone | | |
| Sea Water | ✓ | ✓ |
| Distilled Water | ✓ | ✓ |

*The above table is for guidance only. Resistance is affected by variation in the concentration of solution. All details based on operation at approx 23°C.

Material Choice

Polyetheretherketone (PEEK)

PEEK is a high performance engineering plastic that is resistant to a wide range of chemicals even at very high service temperatures.

Ultra High Molecular Weight Poly Ethylene (UHMWPE)

UHMWPE has good resistance to a range of chemicals, a very low co-efficient of friction and can operate effectively at low temperatures.

Both PEEK and UHMWPE are featured in our speciality bearing range for their ability to withstand the chemical baths and high temperature drying procedures used manufacturing in processes, such as the etching process in Liquid Crystal Display (LCD) manufacture.

If you require bearings in any other materials or would like advice on the best bearing material for your application, please contact us and we will be happy to advise you.

| | PEEK | UHMWPE |
|-----------------------------|-------|--------|
| Temperature | | |
| Min Service Temperature | -30°C | -40°C |
| Max Service Temperature | 250°C | 80°C |
| Chemical Resistance* | | |
| Petrol | | ✓ |
| Brake Fluid | ✓ | |
| Diesel Fuel | ✓ | ✓ |
| Kerosene | | ✓ |
| Mineral Oil | ✓ | ✓ |
| Chlorine Water | ✓ | |
| Ozone | ✓ | ✓ |
| Hydrochloric Acid | ✓ | |
| Hydrofluoric Acid | | |
| Sulphuric Acid | ✓ | ✓ |
| Ammonia | ✓ | |
| Sodium Hydroxide | ✓ | |
| Ammonium Hydroxide | | ✓ |
| Methyl Alcohol (Methanol) | | |
| Ethyl Alcohol (Ethanol) | | ✓ |
| Acetone | ✓ | ✓ |
| Formaldehyde | ✓ | ✓ |
| MethylEthyl Ketone | ✓ | ✓ |
| Sea Water | ✓ | ✓ |
| Distilled Water | ✓ | ✓ |

*The above table is for guidance only. Resistance is affected by variation in the concentration of solution. All details based on operation at approx 23°C.

Material Choice

Ball Materials

Our products are made with stainless steel balls as standard but there are some exceptions and options. Information on the ball materials used in each product can be found on the specific product pages in the catalogue, which can be downloaded from the product page.

Our most popular ball options are:

Stainless Steel

Stainless steel balls have excellent corrosion resistance. We offer two types:

- *The SS420 ball is resistant to steam, oil, alcohol, ammonia and mildly acidic environments. It is magnetic.*
- *The SS316 ball has superior corrosion resistance to the SS420, withstanding acidic environments including sulphuric and nitric acid, photographic chemicals, bleach and solvents. It is non-magnetic.*

Glass (Borosilicate)

Suitable for applications with highly corrosive environments or when excellent electrical insulation is needed. Borosilicate glass has a low co-efficient of thermal expansion (approx. 1/3 of ordinary glass) making it more resistant to stresses caused by temperature.

Carbon steel

Cost-effective, hard-wearing balls for use in semi-precision and commercial applications such as conveyors, casters, drawer slides and trolleys. They have poor corrosion resistance to water and chemicals.

Our speciality bearings are also available with balls made of:

Zirconium oxide

An extremely tough ceramic, this material withstands extremely high temperatures and most chemicals. These balls are available in our speciality range of bearings for use in highly corrosive environments and high temperatures.

Polyethylene

A cost-effective plastic ball, with excellent abrasion resistance. Their very smooth surface prevents chemical build up on the balls. These balls are used in our speciality range of bearings because of their excellent chemical resistance.

For applications where other ball materials may be more suitable, we can suggest alternatives and provide prices on request. If you specifically require a certain ball material, please contact us for more information.



BNL (UK) Ltd

T +44 01423 799200

E sales@bnl-bearings.com

bnl-bearings.com