



VERTICAL PUMP BEARINGS

THORDON

ZERO POLLUTION | HIGH PERFORMANCE | BEARING & SEAL SYSTEMS

HIGH PERFORMANCE OIL & GREASE-FREE PUMP BEARINGS

Thordon Bearings is the world's leading manufacturer of high performance, long lasting bearings that require no oil or grease. Thousands of pump repair shops, OEM's and end users around the world recognize Thordon bearings as the proven choice for performance and value. Thordon bearings are built to last, with no impact to the environment.

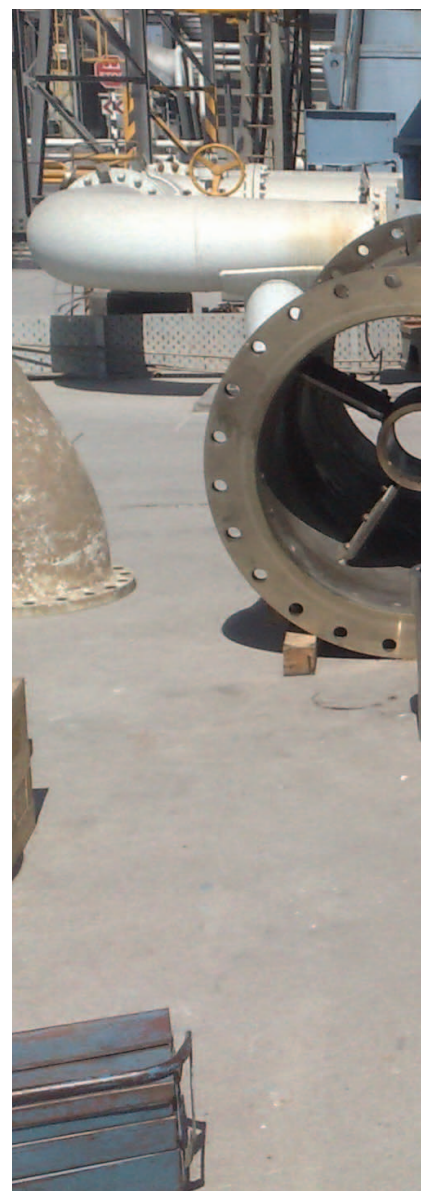
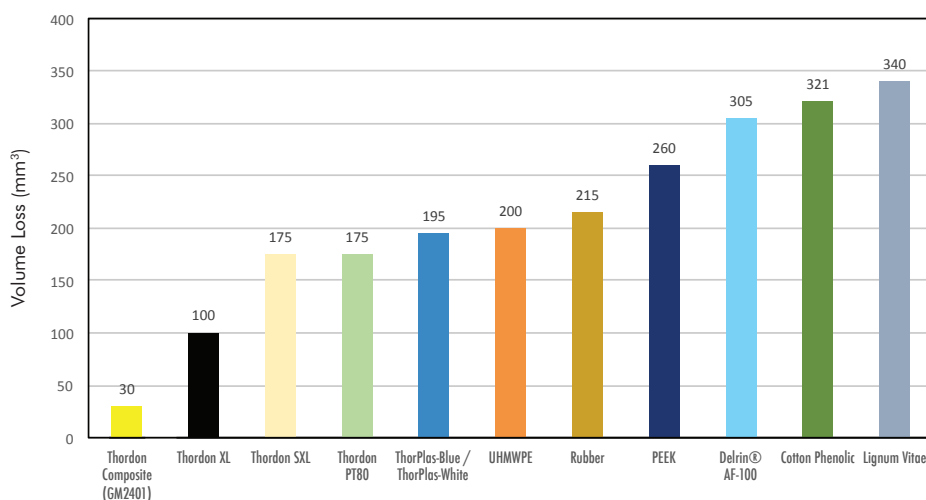
We design and manufacture the most complete line of oil and grease-free vertical pump bearings in the industry. Our elastomer grades offer the best combination of strength and stiffness with flexibility and elasticity, along with high abrasion resistance. Our thermoplastic grades operate at higher temperatures and pressures than Thordon elastomers with improved chemical resistance.

Regardless of grade or configuration, Thordon bearings do not require grease or oil lubrication in dry or wet conditions, and can be used in a wide range of water and product lubricated vertical pumps.

Benefits for Pump Operators:

- Long wear life and lower maintenance costs mean predictable, lower life-cycle costs
- Self-lubrication eliminates pollution
- Global availability provides superior customer service and quick turnaround
- Full-cycle technical support includes system design, machining, installation and after-sales service
- ThorPlas-White has been listed by the NSF International Certification and WRAS for NSF/ANSI 61 Drinking Water System Components
- Certification to ISO 9001:2008 ensures consistent quality of custom and stock solutions

Typical Bearing Abrasive Wear Rates
Rotary Drum Abrasion Test (ASTM D 5963-96)



ZERO POLLUTION | HIGH PERFORM



WHY USE THORDON PUMP BEARINGS?

- Long Wear Life & High Abrasion Resistance
- Dry Start Up Capability
- Low Friction – No “Stick-Slip”
- Sizing Flexibility – Easily Installed On-site
- Pollution Free Operation – Wet or Dry
- High Resilience & Impact Resistance
- Reduced Starting Torque
- Easy & Safe To Machine

THORDON MATERIAL SELECTION GUIDE FOR PUMP BEARING APPLICATIONS

Parameter	Thordon Grades					
	XL	SXL	Composite (GM2401)	PT80	ThorPlas-Blue	ThorPlas-White
Description	Elastomeric Polymer Alloy	Elastomeric Polymer Alloy	Elastomeric Polymer Alloy	Elastomeric Polymer Alloy	Engineered Thermoplastic	Engineered Thermoplastic
Temperature Limit	60°C (140°F)	60°C (140°F)	60°C (140°F)	80°C (176°F)	80°C (176°F)	80°C (176°F)
Suitable for Dry Start Up	NO	YES**	NO	YES**	YES**	YES**
Resistance to Acids	Limited	Limited	Limited	Fair	Good	Good
Resistance to Alkalies	Limited	Limited	Limited	Fair to Good	Fair	Fair
Suitable for Hydrocarbons	YES	YES	YES	YES	YES	YES
Abrasion Resistance	Good	Better	Best	Better	Acceptable	Acceptable
Installation Clearance	Medium	Medium to Low	Higher	Medium to Low	Lowest	Lowest
Shaft Sleeve Material	Bronze, Stainless Steel	Bronze, Stainless Steel	Ni-Cr-B Recommended	Bronze, Stainless Steel	Bronze, Stainless Steel	Bronze, Stainless Steel
Lubrication	Water, Seawater, Most Fluids (pH 5-10)	Water, Seawater, Most Fluids (pH 5-10)	Water, Seawater, Most Fluids (pH 5-10)	Water, Seawater, Most Fluids (pH 3-11)	Water, Seawater, Most Fluids (pH 3-11)	Potable Water
Remarks	Good balance between abrasion resistance and medium level of friction	Low friction; Suitable for dry start-up; Good abrasion resistance	For use in highly abrasive operating environments	Suitable for higher temperatures up to 80°C (176°F); Low friction; Suitable for dry start-up; Good abrasion resistance	Lowest friction. Good for low abrasion applications and for use at temperatures and in chemical solutions unsuitable for Thordon elastomers	NSF International Certification for NSF/ANSI 61 Drinking Water System Components

** For dry start up times longer than 30 seconds, please contact Thordon Engineering for grade selection.

Note: For Nuclear use, Quality Control certificates including certified test reports can be supplied. Thordon Bearings Inc. operates under the provision of 10 CFR21.

COMPLETE LINE OF HIGH PERFORMANCE VERTICAL PUMP BEARINGS



Thordon SXL

- Preferred choice for dry start-up capability
- Lower dry coefficient of friction typically 0.10 - 0.20
- Working pressure to 10 MPa (1450 psi)
- Wet or dry operation
- High resistance to abrasion, shock loading and vibration



Thordon Composite (GM2401)

- Made specifically for use in very abrasive water environments
- Stiffer and at least twice the abrasion resistance of rubber
- Lower coefficient of friction than rubber
- Reduced maintenance downtime
- Water lubricated – no grease
- Easy installation



PT80

- Excellent mechanical property retention (in water), at higher temperatures
- Internal lubricants provide dry run capabilities similar to Thordon SXL
- Wear characteristics similar to existing Thordon elastomer grades
- High abrasion resistance
- Low coefficient of friction



Thordon XL

- Long life with low dry coefficient of friction
- Good abrasion resistance
- Optimum performance in clean water applications



ThorPlas-Blue

- Dry start up capability
- Operates in water and chemicals up to 80°C (176°F) and 110°C (230°F) dry
- Engineered thermoplastic capable of design pressures up to 45 MPa (6527 psi)
- Very low wear in non-abrasive environments



ThorPlas-White for Drinking Water Applications

- NSF/ANSI 61 and WRAS approval
- Low friction operation
- Very low wear
- Good dry run capability due to built-in lubricants
- Easy to machine – no nuisance dust
- Easy to install

Trilor: Thordon Non-Metallic Carrier

If a carrier or housing is required for Thordon elastomer bearings, Thordon Trilor non-metallic carriers can be used as a cost effective alternative to metallic carriers

- Lower weight (approximately $\frac{1}{5}$ the weight of bronze) making it easier to move and install
- Cost effective – pricing not influenced by external factors (e.g. Copper commodity index)
- Fit for long term life in water and marine conditions
- Good dimensional stability – low water absorption and low thermal expansion
- Corrosion free
- Compatible with chocking and bonding



PROVEN BENEFITS OF USING THORDON PUMP BEARING PRODUCTS

Pollution-Free High Performance Bearings

Thordon's pollution-free bearings help preserve the environment. They require no oil or grease lubrication and offer an outstanding wear life, reduced downtime and lower life cycle costs.

Long Wear Life, Low Friction & High Abrasion Resistance

Thordon bearings absorb impact or shock loads with a dampening capacity that is nearly 500% greater than rubber!

Our bearings are self-lubricating which reduces abrasion and prevents wear. They also have a lower dry coefficient of friction which improves efficiency in frequent stop-starts. Low friction bearings also operate longer, wear less and have reduced start-up torque and "stick-slip".

High Temperature & Improved Chemical Resistance

Thordon bearings are corrosion resistant and can withstand high temperatures. ThorPlas-Blue can be used in water and chemicals up to 80°C (176°F) while our polymer grades operate up to 60°C (140°F).

Easily Machined & Installed On-site

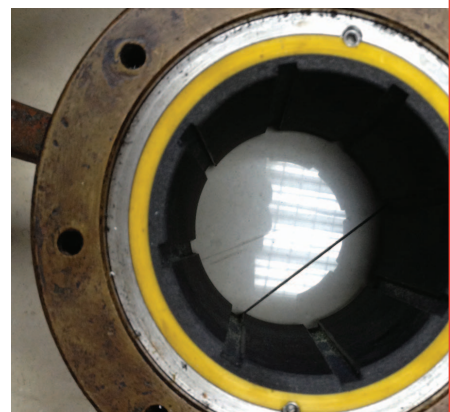
Thordon bearings are easily machined to exact dimensions and can either be press-fit or freeze-fit using dry ice or liquid nitrogen, or bonded using a Thordon approved adhesive.

Over 40 Years Experience in a Variety of Pump Applications

Thordon pump bearings have been used in open and closed tube vertical pumps in a variety of applications including power plants, pulp and paper mills, sewage and waste water treatment plants, nuclear power plants, steel mills, oil and chemical refineries, and shipyards.

Continuous innovation along with a variety of bearing grades and configurations position Thordon bearings as the ideal solution for cooling water, potable water, circulating, drain, stock, fire, dry dock, deep well, drain water lifting, condensation, submersible and screw lift pumps.

For pump-turbine applications refer to Thordon's Hydro-Turbine Bearings brochure.

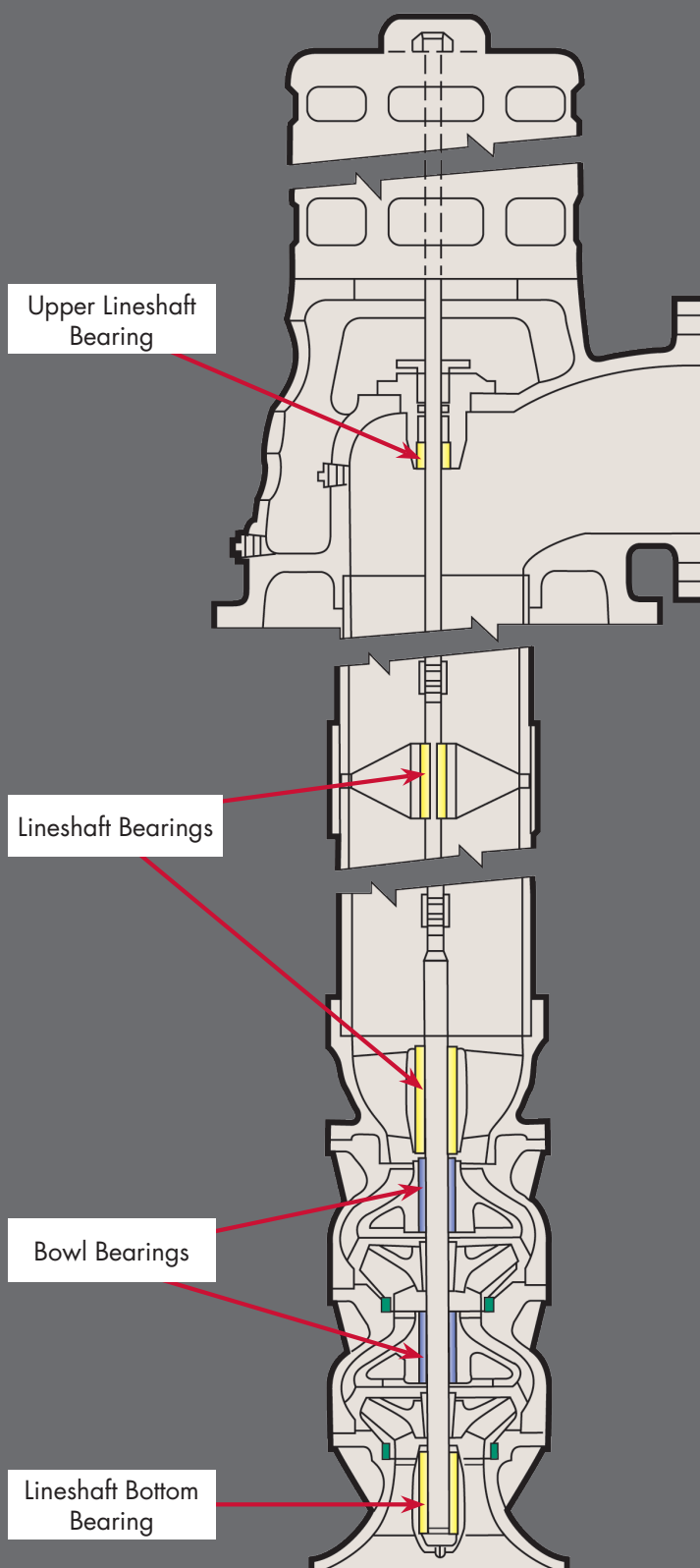


ZERO POLLUTION | HIGH PERFORM

THORDON PUMP BEARING SOLUTIONS

Thordon Bearings designs and manufactures the industry's most complete line of oil and grease-free water lubricated vertical pump bearings.

Elastomeric grades (XL, SXL, Composite, GM2401 and PT80) offer exceptional wear life, low friction and reduced starting torque. Thordon also manufactures ThorPlas-Blue and ThorPlas-White engineered thermoplastic bearings that offer better chemical resistance and operate at temperatures up to 80°C (176°F). ThorPlas-White is the newest Thordon grade, specifically developed to operate as a drinking water system component used in the treatment and distribution of potable water.



CUSTOMER FOCUSED TO QUICKLY MEET YOUR NEEDS

Quick and Responsive Service

It takes quality products to be globally successful in the industrial bearing industry. It also takes great service to keep customers coming back.

Thordon Bearings Inc. is geared to respond quickly to new and existing application requests. Our bearings arrive quickly, fit right and last!

Extensive Distribution Network

Thordon Bearings has an extensive distribution network with more than 85 distributors in 100 countries who carry extensive inventories of Thordon's common bearing sizes which are backed by large regional and head office inventories. Non-standard requests are met with responsive design, quick machining and speedy delivery.

Application Engineering

Thordon engineers work closely with customers to provide innovative bearing system designs and solutions. We offer in-house design, CAD and the proprietary Thordon Bearing Sizing Calculation Program to help correctly size our bearings.

Our decades of experience mean that we offer the right technical support during the design, machining, installation and operation stages of each project.

Manufacturing Quality

We manufacture to ISO 9001:2008 Quality System requirements. Contact us for references of our installations.

High Performance Bearings Products; Industry-Leading Service

Thordon Bearings designs and manufactures a complete range of polymer bearing products for industrial markets. Thordon's strong and recognizable global brand is known for high quality and superior performance, eliminating oil and grease from bearing applications in industrial markets as well as vertical pumps, hydro-turbines and ships.

Fourth Generation Family Business

From the first bearing fitted in 1967, Thordon Bearings is a family business started in 1911 with factories in Canada, Poland and Russia whose employees share a passion for the environment.

Your Authorized Thordon Distributor

THORDON

Thordon Bearings Inc.

3225 Mainway, Burlington, Ontario, L7M 1A6 Canada

Tel: +1.905.335.1440 Fax: +1.905.335.4033 Email: info@thordonbearings.com Website: www.thordonbearings.com



TBIPB 06/14/3000NA/4000A4
PRINTED IN CANADA