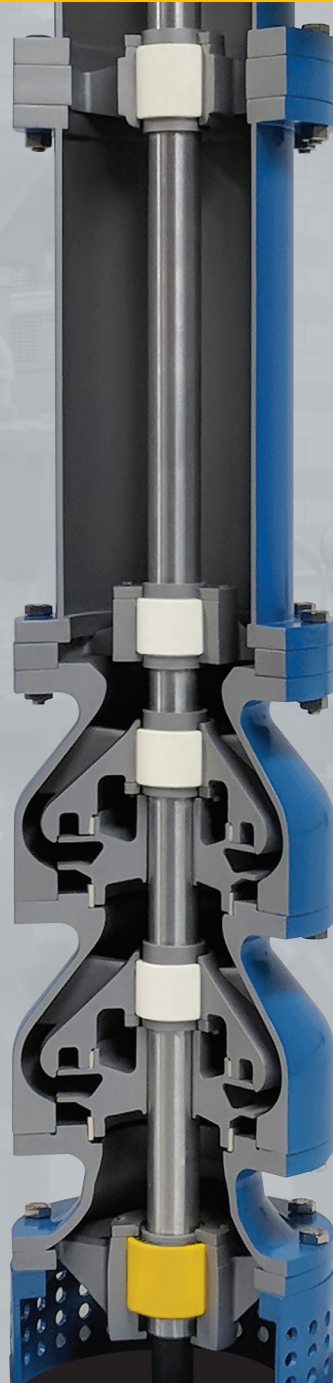


PUMP BEARINGS OIL AND GREASE FREE SOLUTIONS



THORDON
THORDON BEARINGS INC.

ZERO POLLUTION | HIGH PERFORMANCE | BEARING & SEAL SOLUTIONS

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 made to last, with no negative impact to the environment.

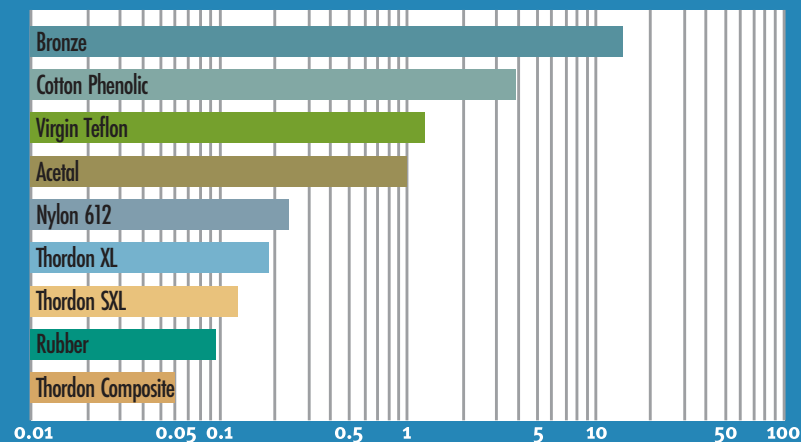
We design and manufacture the most complete line of product lubricated vertical pump bearings in the industry. Our elastomeric grades offer the best combination of strength and stiffness with flexibility and elasticity, along with high abrasion resistance. Our thermoplastic grades operate at higher temperatures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

Due to dry start up capabilities, there are no grease, booster pumps, or primer pumps required at start up.

BENEFITS FOR PUMP OPERATORS:

- ◆ Long wear life and lower maintenance costs mean predictable, lower life-cycle costs
- ◆ Self Lubrication allows dry start-up for bearings, eliminating pre-lubrication systems
- ◆ Global availability provides superior customer service and quick turnaround
- ◆ Full system bearing design and technical support including sizing, machining, installation and after-sales service
- ◆ ThorPlas-White has been listed by the NSF International Certification and WRAS for NSF/ANSI/CAN 61 Drinking Water System Components, as well as is classified as an accepted material by CFIA.

Typical Bearing Abrasive Wear Rates



Projected Bearing Wear by Volume (cc/24 Hours)

(Independent Testing at University of Cincinnati, USA)

NOTE: Wet third particle abrasion.

Shaft material: carbon steel; Bearing I.D.: 2.5cm (1 in.); Abrasive slurry mixture: 2% bentonite, 6% sand, 6% clay, 86% water.

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WHY USE THORDON PUMP BEARINGS?




- ◆ Long Wear Life & High Abrasion Resistance
- ◆ Dry Start-up Capability
- ◆ Low Friction – No “Stick-Slip”
- ◆ Fully Customizable for Any Shaft and Housing Combination
- ◆ Easily Installed with Freeze Fit, Press Fit, or Bonded Fit
- ◆ High Resilience & Impact Resistance
- ◆ Reduced Starting Torque
- ◆ Easy & Safe To Machine



BENEFITS TO PUMP MANUFACTURERS:

- ◆ Fully Customizable: To suit any shaft and housing combination
- ◆ Dry Start-up Capability: Allows elimination of pre-lubrication systems
- ◆ Sizing Flexibility: Provides an easy design experience
- ◆ Easy to Machine: No harmful dust
- ◆ Easy to Install: Freeze fit, press fit or bond fit.
- ◆ Thordon material is homogeneous – easily machined to suit shaft and housing sizes

THORDON MATERIAL SELECTION GUIDE FOR PUMP BEARING APPLICATIONS

	THORDON GRADES				
Parameter	SXL	Composite (GM2401)	XL	ThorPlas-Blue	ThorPlas-White
Description	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)
Suitable for Dry Start-up	YES**	NO	NO	YES**	YES**
Resistance to Acids	Limited	Limited	Limited	Limited	Good
Resistance to Alkalies	Limited	Limited	Limited	Limited	Fair
Suitable for Hydrocarbons	YES	YES	YES	YES	YES
Abrasion Resistance	Very Good	Excellent	Good	Acceptable	Acceptable
Installation Clearance	Medium to Low	Higher	Medium	Lowest	Lowest
Shaft Sleeve Material	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)	Potable Water
Remarks	Low friction. Suitable for dry start-up. Good abrasion resistance.	For use in highly abrasive operating environments.	Good balance between abrasion resistance and medium level of friction.	Lowest friction. Good for low abrasion applications. For use at temperatures and in chemical solutions unsuitable for Thordon elastomers.	NSF International Certification for NSF/ANSI 61 Drinking Water System Components. Accepted Material by CFIA.  <small>Certified to NSF/ANSI/CAN 61</small> <small>Certified to NSF/ANSI 51</small> WRAS Material Approval

** 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

	<p>Thordon SXL</p> <ul style="list-style-type: none"> • 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
	<p>Thordon Composite (GM2401)</p> <ul style="list-style-type: none"> • 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 • Product lubricated • Easy installation
	<p>ThorPlas-Blue</p> <ul style="list-style-type: none"> • Dry start-up capability • Operates in water/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
	<p>ThorPlas-White for Drinking Water Applications</p> <ul style="list-style-type: none"> • NSF/ANSI 61 and WRAS Material Approval; FDA Compliant • Dry start-up capability • Operates in water/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 • Easy to install
	<p>Thordon XL</p> <ul style="list-style-type: none"> • Long life with low dry coefficient of friction • Good abrasion resistance • Optimum performance in clean water applications

OTHER PUMP APPLICATIONS

- ◆ Inclined Turbine Pump
- ◆ Volute Pump
- ◆ Submersible Pump
- ◆ Fire Pumps

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

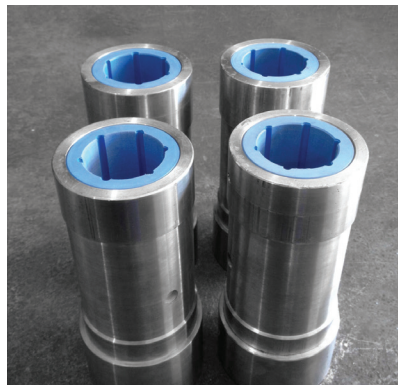
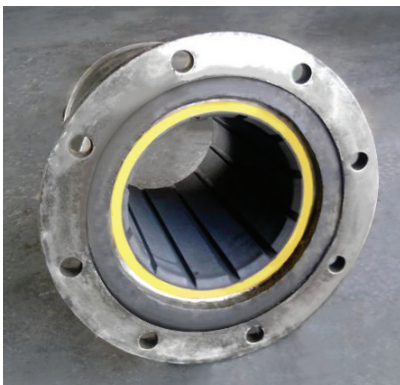
Thordon bearings are easily machined to exact dimensions and can either be press-fit or freeze-fit using dry ice or liquid nitrogen, or bonded using a Thordon approved adhesive.

Over 50 Years of 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, Irrigation Stations, Flood Relief Stations, Pumping Stations, Pulp & Paper Mills, Sewage & Water Treatment Plants, Steel Mills, Oil & Chemical Refineries, Shipyards, as well Marine & Offshore applications.

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.



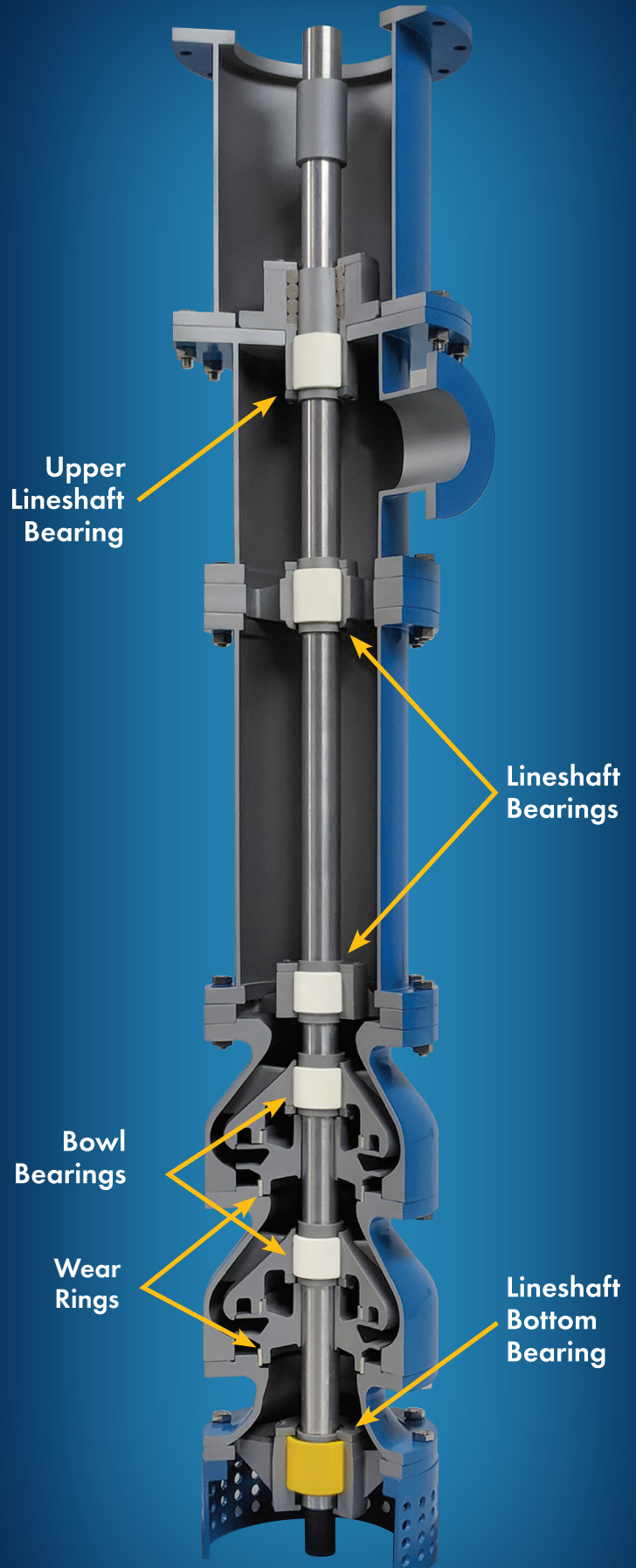
THORDON PUMP BEARING SOLUTIONS

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

Elastomeric grades XL, SXL, and Composite (GM2401) offer exceptional wear life, low friction and reduced starting torque.

Thordon Bearings 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 water-lubricated bearing and shaft seal industry. It also takes great service to keep customers coming back.

Thordon Bearings Inc. is geared to respond quickly to supply high performance bearing and seal solutions. Our products arrive quickly, fit right and last!

Extensive Distribution Network

Thordon Bearings has an extensive distribution network of more than 70 distributors in 100 countries to supply and service our global customer base. 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 and shaft seal system designs and solutions.

The Global Service and Support team can install, commission, service and maintain the full range of Thordon Bearings' environmentally-safe clean power generation products.

Manufacturing Quality

Thordon Bearings Inc. is a family-owned company with manufacturing and new product development facilities in Burlington, Ontario, Canada. In addition, we operate a leading edge manufacturing plant in Slupsk, Poland.

We manufacture to ISO 9001 Quality System requirements. Contact us for our installation references.

High Performance Bearings and Seals; Industry-Leading Service

Thordon Bearings is an industry leader in the design, manufacture, supply and installation of high performance, pollution-free, shaft bearing and seal systems.

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



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