

PRODUCT CATALOG



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➤ ABOUT US

PhyMet, Inc., named for the physicist and metallurgist who founded the firm in 1986, provides high-quality solid lubricants. In response to customer demand for greater efficiency and longer service life, our innovative Research & Development team has developed several high-performing bearing lubrication products.

PhyMet has built a strong reputation for product quality and technical service and is recognized as a leader in the solid lubrication industry. As part of our commitment to customer satisfaction and quality, the company is certified to the ISO 9001:2015 standard.

PhyMet was acquired by Lubrication Engineers, Inc., in 2021 and, with its MicroPoly® lubricants, is now part of a family of brands dedicated to solving lubrication challenges and helping customers achieve more uptime.

➤ PRODUCT SOLUTIONS

We have the technology and proprietary products to solve your difficult applications, including MicroPoly lubricants in a variety of formulations. MicroPoly is the industry leader in microporous polymeric lubricants (MPL) for sliding friction and bearing applications. These include products for high speeds, high temperatures, low temperatures, and heavily loaded applications, as well as food grade formulations.

MicroPoly lubricants make bearings last longer by reducing the infiltration of dirt and other contamination. The advanced technology contributes to lower maintenance and associated costs, thus channeling saved dollars to your bottom line.

We have developed additional products beyond our filled bearings. MicroPoly can also be used to lubricate chains, gears, bushings, wear plates, wheel flanges, ball screws, and can be processed into a variety of solid profile shapes with various polymer processing techniques. Other offerings include chain lubrication systems and sprockets, and lube arcs for wheel flange lubrication.

➤ ENVIRONMENTALLY FRIENDLY

The oil is released from the microporous structure to the bearing surfaces only as it is needed to keep the bearing properly lubricated. That means little, if any, oil drips into the surrounding environment. MicroPoly eliminates the dripping and leakage of oil that can contaminate the environment.

➤ CUSTOMIZATION

For an additional charge, PhyMet can laser mark your bearings with a logo, suffix or part number

INDUSTRIES SERVED

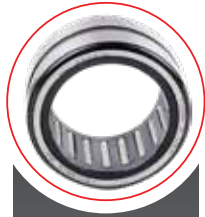
MicroPoly lubricants are recommended for a wide array of industries and applications, including:

- INDUSTRIAL
- AUTOMOTIVE
- FOOD PROCESSING
- MINING
- FOUNDRY
- OEM
- PRINTING
- STEEL
- AND MORE

CONTACT US

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MICROPOLY LUBRICANTS



MICROPOLY GENERAL PURPOSE

MPI-0800

For use in most general-purpose applications

- Can be used to lubricate bearings in an operating temperature range of 10 to 200°F (-12 to 93°C).

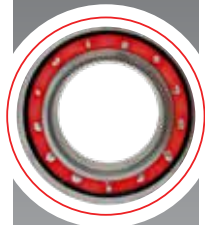


MICROPOLY GENERAL PURPOSE

MPI-0779

For use in wide range of temperatures, particularly low-temperature applications

- Can be used to lubricate bearings in an expanded operating temperature range of -49°F (-45°C) to 225°F (107°C).
- Formulated with a high quality synthetic oil.
- Available for standard and customized profiles.

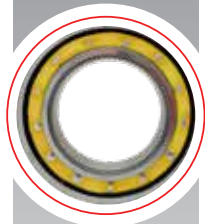


MICROPOLY HIGH TEMPERATURE

MPI-2000 & MPI-2400

Good for higher temperature applications with oil that resists oxidation

- Extends operating temperature range up to 350°F (177°C).
- **MPI-2000** and **MPI-2400** filled bearings can be used in washdown conditions, although one of MPI-2000's oils is slightly soluble in water.

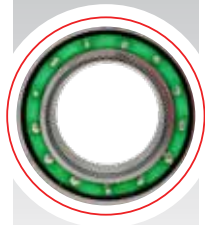


MICROPOLY HEAVY LOAD

MPI-2500 & MPI-4500

Designed specifically for higher load applications

- **MPI-2500** contains a high viscosity synthetic oil and can be used in heavily loaded bearings, especially at low speeds.
- **MPI-4500** contains a higher viscosity synthetic oil and can be used in very heavily loaded bearings.



MICROPOLY HIGH SPEED

MPI-S700

Can operate at speeds higher than any other microporous polymeric lubricant (MPL) on the market

- Can be used in a variety of applications that previously were outside the speed limitations of this technology.
- For example, the max RPM for MPI-S700 for a 45mm bore radial ball (single row) bearing is 7,170, as compared to 4,615 max RPM for MPI-0800.



MICROPOLY H1 FOOD GRADE

MPF-0696 & MPF-1150

For food & beverage manufacturing applications

- Registered NSF H1 for incidental food contact; can also be used for any H2 applications.
- MPF-0696 can be used to lubricate bearings and can be provided in solid profiles.
- MPF-1150 has a higher viscosity oil and can be used to lubricate large, heavily loaded bearings.

CROSS REFERENCE GUIDE

There are several critical parameters that determine which MicroPoly grade is best for your specific bearing application. Our sales and technical staff can help you select the proper MicroPoly product for your needs.

TECHNICAL DATA

PRODUCT #	MPI-0800	MPI-0779	MPI-2000	MPI-2400	MPI-2500	MPI-4500	MPI-S700	MPF-0696	MPF-1150
COLOR	BLACK	BLACK	RED	OFF WHITE	YELLOW	LIGHT BLUE	GREEN	WHITE	WHITE
BASE OIL	PARAFFINIC	SYNTHETIC	BLEND	SYNTHETIC	SYNTHETIC	SYNTHETIC	SYNTHETIC	SYNTHETIC	SYNTHETIC
LOWER TEMP. LIMIT	10°F (-12°C)	<-49°F (-45°C)	10°F (-12°C)	-22°F (-30°C)	5°F (-15°C)	-35°F (-37°C)	-49°F (-45°C)	<-49°F (-45°C)	-39°F (-38°C)
UPPER TEMP. LIMIT	200°F (93°C)	225°F (107°C)	350°F (177°C)	350°F (177°C)	210°F (99°C)	210°F (99°C)	250°F (121°C)	210°F (99°C)	210°F (99°C)
OIL VISCOSITY AT 40°C/100°C CST	139.7/14.2	150/19.3	305/27.95	550/48.2	483/42.7	950/77.0	149/19.0	150/19.1	232.3/25.6
VISCOSITY INDEX	96	146	164	150	139	91	144	145	126
OIL SPECIFIC GRAVITY	0.88	0.86	0.97	0.97	0.97	0.86	0.86	0.86	0.86
COPPER CORROSION	PASS	1A (3 hrs @ 100°C)	PASS	PASS	1B	1A	1B (24 hrs @ 121°C)	1A (3 hrs @ 100°C)	1B (24 hrs @ 250°C)

PRODUCT FEATURES

PRODUCT #	MPI-0800	MPI-0779	MPI-2000	MPI-2400	MPI-2500	MPI-4500	MPI-S700	MPF-0696	MPF-1150
EP*		✓	✓	✓	✓	✓	✓	✓	✓
ANTI-WEAR			✓	✓					
ANTI-RUST / ANTI-CORROSION**	✓	✓	✓	✓	✓	✓	✓	✓	✓
ANTIOXIDANT	✓	✓	✓	✓	✓	✓	✓	✓	✓
H1 FOOD GRADE								✓	✓
WASHDOWN FRIENDLY***	✓	✓	✓	✓	✓	✓	✓	✓	✓
WATER RESISTANCE	GOOD	GOOD	GOOD	VERY GOOD	GOOD	GOOD	GOOD	GOOD	GOOD
AVAILABLE AS SOLID PROFILES		✓						✓	

*EP = Extreme Pressure (reduces friction between heavily loaded rolling elements)

**Anti-rust/anti-corrosion additives in MicroPoly will inhibit, but not prevent, rust and corrosion.

***Washdown Friendly = Will not be washed out by standard water cleaning methods. Please note that MPI-2000 meets this standard; however, one of its oils is slightly soluble in water.

► HOW DOES IT WORK?

- Microporous polymeric lubricants (MPLs) can provide continuous source of lubrication.
- Polymer is inserted into space between the rolling elements and race of bearings, sealing bearings from contamination.
- Two major components of MPLs are the polymer containing continuous microporous network and the oil within the pores.
- Corrosion inhibitors, friction modifiers and solids are added to oil to meet specific application requirements.
- Polymer acts like a sponge releasing and absorbing oil. Oil is released from polymer through capillary action and is transferred to metal surface.
- As film of oil on the surface decreases, polymer releases more oil. If excess oil is present, it is reabsorbed by polymer.
- As temperatures increase, more oil is released, then reabsorbed as temperature decreases.
- If MPL's upper temperature limit is exceeded, polymer softens and can be ejected from bearings.
- MPLs do not dissipate heat rapidly; as a result, there are rotational speed limitations based on bearing type and size.

MICROPOLY® FILLED BEARINGS

PhyMet's processing creates a solid lubricant with an oil-filled porous structure. The MicroPoly fills the space between the rolling elements and races in a bearing, providing constant and consistent lubrication. There is no need for additional lubrication during the life of a MicroPoly filled bearing.

Because it is a solid, MicroPoly can help block debris and reduce foreign contamination of the bearing. Reducing the incursion of debris into the bearing can significantly extend the bearing's life. The solid structure of MicroPoly also improves housekeeping, as it does not drip out of the bearing and contaminate the environment.

➤ LIMITING SPEEDS

BEARING TYPE	NDM VALUE
Single row ball bearing, metal cage	300,000
Single row ball bearing, plastic cage	40,000
Double row ball bearing	150,000
Angular contact ball bearing	150,000
Self-aligning ball bearing	150,000
Cylindrical roller bearing	150,000
Needle roller bearing	150,000
Spherical roller bearing	85,000
Tapered roller and roller thrust bearings	45,000
Double tapered roller bearing	22,500

This table gives the Ndm values for MicroPoly at ambient temperatures. The maximum operating speed (RPM) for our standard products (MPI-0800, MPI-0779, MPF-0696, MPF-1150, MPI-2500, and MPI-4500) can be calculated for different bearing types using the following formula:

$$\text{Maximum RPM} = \frac{\text{Ndm Value}}{1/2 (\text{Bore} + \text{O.D.})}$$

Note: Bore and O.D. must be in mm.

The maximum operating speed may need to be decreased as the operating temperature increases. The values given in this table may be affected by the quality of the bearings used. High quality bearings generally outperform lower quality bearings.

➤ BEARINGS THAT CAN BE FILLED WITH MICROPOLY

- Angular contact bearings
- Ball bearing inserts
- Ball thrust bearings
- Cam followers
- Cylindrical roller bearings
- Double row ball bearings
- Housed ball bearings
- Housed roller bearings
- Needle roller bearings
- Roller thrust bearings
- Self-aligning ball bearings
- Single row ball bearings
- Spherical roller bearings
- Slim line ball bearings
- Split roller bearings
- Tapered roller bearings
- Trolley wheels



Bearing without MicroPoly



Bearing with MicroPoly

MICROPOLY® HIGH SPEED FORMULATION

➤ MPI-S700

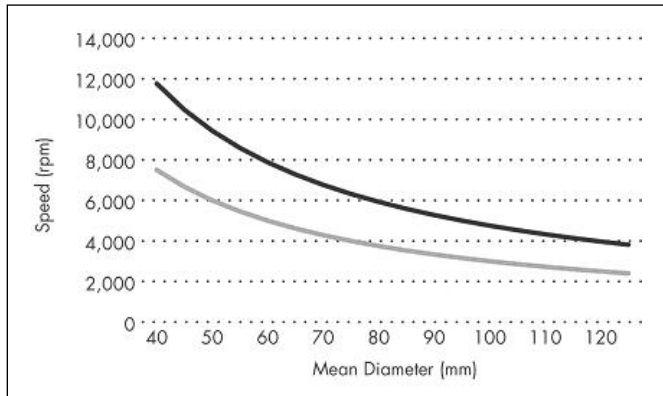
PhyMet offers a MicroPoly® formulation that can operate at speeds higher than any other MPL product on the market. This product – MPI-S700 – enables MicroPoly to be used in a variety of lubrication applications that previously were outside the speed limitations of this technology. It contains corrosion inhibitors, antioxidants, and extreme pressure additives.

Max RPM Comparison of MPI-0800 vs. MPI-S700

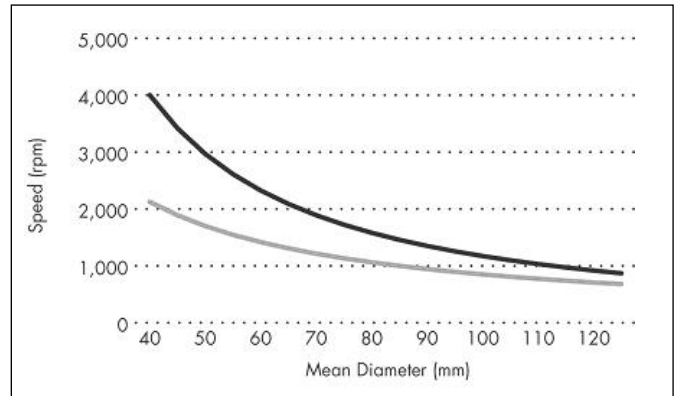
Bearing Type 45mm Bore	Mean Diameter, mm Mean diameter = 0.5(ID + OD)	MPI-0800 Max RPM	MPI-S700 Max RPM
Single row ball	65	4,615	7,170
Spherical roller	65	1,308	2,190
Tapered roller	65	692	1,560

➤ SPEED LIMIT COMPARISON

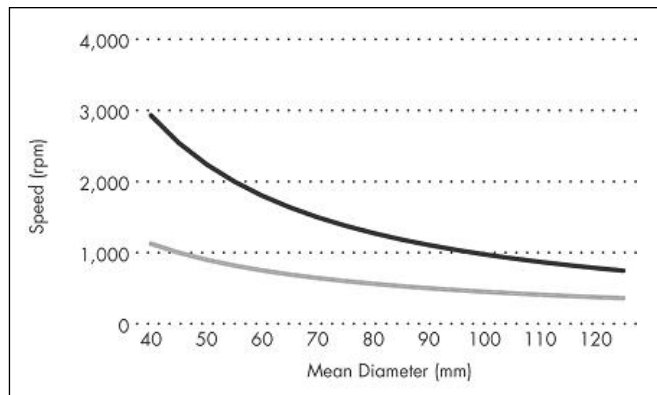
The following charts show the speed limits for MPI-S700 vs. MPI-0800 in three common types of bearings at ambient temperature.



Single Row Ball Bearings



Spherical Roller Bearings



Tapered Roller Bearings

— MPI-S700 — MPI-0800

CHECKLIST FOR MICROPOLY® FILLED BEARINGS

Several critical parameters determine which MicroPoly grade is best for a specific bearing application. The information below will be used by our Sales & Technical staff to help you select the proper MicroPoly product for your needs. Please have this information handy when you call or complete the form and email it to salesteam@micropoly.com. Or, you can complete this form online; just scan the QR code at bottom right of this page.

DATE _____ COMPANY NAME _____

CONTACT NAME _____

EMAIL _____ PHONE _____

APPLICATION _____

WE DO NOT SELL BEARINGS. WHAT BEARINGS WOULD YOU LIKE US TO QUOTE FILLING WITH MICROPOLY?

BEARING # _____ BORE SIZE _____ OD _____ AMBIENT TEMP _____ SPEED _____

BEARING # _____ BORE SIZE _____ OD _____ AMBIENT TEMP _____ SPEED _____

BEARING # _____ BORE SIZE _____ OD _____ AMBIENT TEMP _____ SPEED _____

CURRENT METHOD OF LUBRICATION _____

CURRENT BEARING LIFE _____ DESIRED BEARING LIFE _____

OPERATING CONDITIONS (WATER, CONTAMINANTS, CHEMICALS, ETC.) _____

DO YOU NEED A FOOD GRADE LUBRICANT? YES ___ NO ___ NOT SURE ___

CAGE MATERIAL

METAL _____ PLASTIC _____

LOAD CONDITIONS

LIGHT _____ MEDIUM _____ HEAVY _____

QUANTITY TO BE QUOTED _____

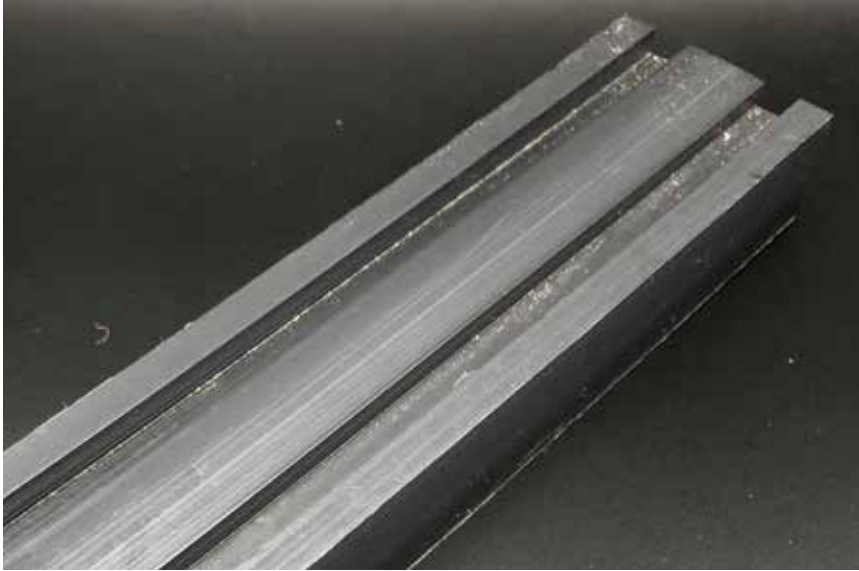
COMMENTS _____



Scan to open online form.

MICROPOLY® CHAIN LUBRICATION SYSTEM

This system employs grooved blocks of MicroPoly to lubricate chains. The block's profile is designed to fit into the chain profile. The oil contained in the MicroPoly is transferred as the chain moves along the blocks. Because MicroPoly has a large reservoir of oil, the blocks provide a long-lasting method of chain lubrication with reduced maintenance and improved housekeeping and safety.



MICROPOLY® CHAIN LUBRICATING SPROCKETS

When inserted as an idler sprocket in a chain line, oil is transferred from the MicroPoly Chain Lubricating Sprocket to the chain as the sprocket rotates against the chain. Because the MicroPoly Sprocket has a large reservoir of oil, it provides a long-lasting method of chain lubrication with reduced maintenance and improved housekeeping and safety. MicroPoly Sprockets are used as idler sprockets, not drive or tensioning sprockets. They should be mounted on the slack side of the chain.

Available Sprockets

- 3519
- 4018
- 5017
- 6015

Custom Sprockets

- Call our Technical staff at (937) 743-8061 to inquire about custom sprockets.



MICROPOLY® LUBE ARCS FOR CRANE WHEEL FLANGES

PhyMet's revolutionary MicroPoly Lube Arcs dramatically reduce wear on overhead crane wheel flanges.

This patented system (US 8,002,085) consists of two MicroPoly arcs and a mounting system that makes use of existing axle bolts on each side of the crane wheel assembly. The mounting systems are custom made to fit each crane precisely.

MicroPoly MPI-0779 is standard for all MicroPoly lube arcs. Other formulations may be available upon request.

➤ BENEFITS

- Easy to install
- Cut maintenance costs and downtime
- Can increase wheel life over 10 times
- Custom made to fit your application

➤ CASE STUDY

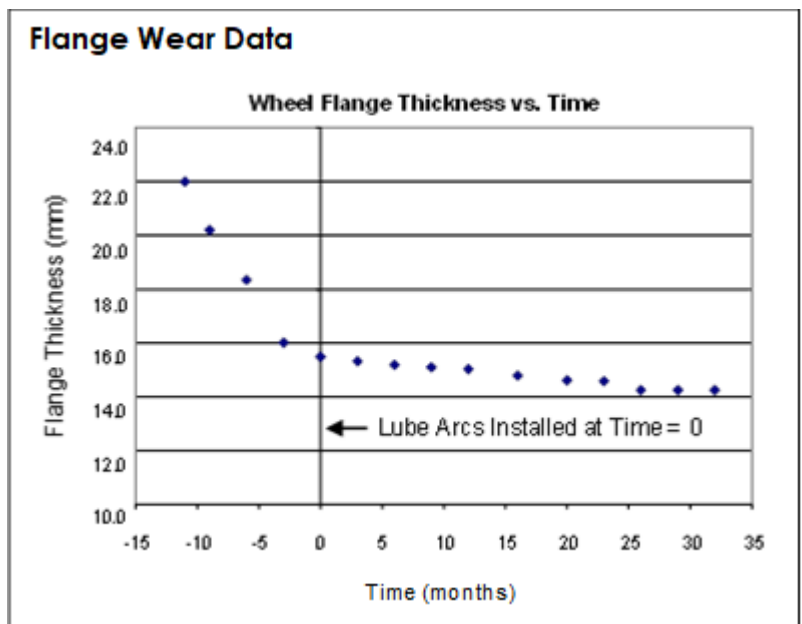
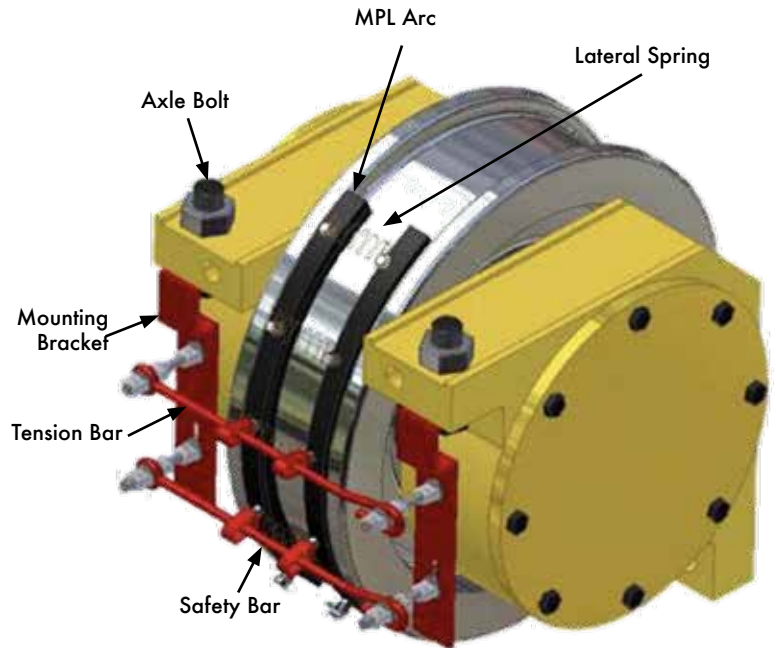
Problem

An automotive manufacturer in England was experiencing excessive flange wear and premature wheel failure. Wheel life was less than 12 months.

Solution & Results

Before installing MicroPoly lube arcs, the average wear rate was 0.712 mm/month. After installing the lube arc assembly, the wear rate was reduced to 0.034 mm/month. That represents a reduction of >90% for the wheel flange wear rate.

The customer reports that they will save \$350,000 over 10 years by installing the MicroPoly lube arcs on three cranes. This cost savings is based on purchasing fewer wheels over the life of the crane and does not include savings from the downtime involved in replacing the wheels. It also excludes additional savings that will be realized due to improved safety and housekeeping in the plant.



MICROPOLY® STANDARD SOLID PROFILES

MicroPoly Lubricants are solid and can be processed into a variety of shapes with various polymer processing techniques. They are available in MicroPoly MPI-0779 and MPF-0696.

► TYPICAL APPLICATIONS

- Bushings
- Wear plates
- Chain lubrication
- Wheel flange lubrication
- Spherical plain bearing lubrication



Standard MicroPoly Solid Profiles – In Stock

NOMINAL DIAMETER	CROSS-SECTION	NOMINAL SIZE	CROSS-SECTION
3.3"	round	17 mm	round
2.35"	round	1" x 2"	rectangle
1"	round	1 11/16" x 3/4"	rectangle
3/4"	round	3/4" x 1 3/4"	rectangle
1/2"	round	0.18" x 3.0"	rectangle
1/4"	round	1/2" x 4"	rectangle
1/8"	round	1" x 4"	rectangle

Profiles are available in a variety of lengths. Minimum order quantities may apply.

MicroPoly Solid Profiles – Special Order

NOMINAL DIAMETER	CROSS-SECTION	NOMINAL DIAMETER	CROSS-SECTION
5/16"	round	9 mm	round
20 mm	round	0.061" x 2.6"	rectangle
13 mm	round		

MICROPOLY® CUSTOM PROFILES

MicroPoly Solid Profiles can be custom-made for specific lubrication applications. Many of the applications have replaced felt-based lubricators. MicroPoly eliminates the need for re-oiling and spillage that can occur with conventional lubrication systems. Our Engineering staff can work with you to design specific profiles to meet your lubrication needs.

► TYPICAL APPLICATIONS

- Ball bushings
- Ball screws
- Clutch bearing lubrication
- Gear lubrication
- Linear bearings
- MicroPoly washers



AUTOMOTIVE APPLICATIONS

➤ MICROPOLY® FILLED BEARINGS

- Abrasive machine bearings
- Assembly line, pallet bearings
- Assembly plant, overhead trolley wheels
- Conveyor bearings
- Crankshaft, overhead conveyor/trolley wheels
- Forging machine, auto loader bearings
- Forming machine bearings
- Grinder chuck bearings
- Machine tool bearings
- Multi-spindle screw machine bearings
- Paint system bearings
- Phosphate line, overhead conveyor/trolley wheels
- Roll bearings:
 - Special machine, index table bearings
 - Special machine, pallet bearings
 - Stamping plant, conveyor bearings
 - Stamping plant, shotblast screw conveyor bearings
 - Stamping press, flywheel & drive shaft bearings
 - Tire grinder bearings
 - Towmotor, front wheel spindle bearings
 - Truck assembly, transfer conveyor bearings
 - Truck axle, king pin bearings
 - Welding machine bearings



➤ MICROPOLY® LUBRICATION FOR BUSHINGS & WEAR PLATES

- 4-slide wire forming machine slides
- 6" forging machine slides
- Machine tool slides
- Stamping press, bushings & gear faces
- Stamping press, wear plates
- Tool room grinder slides

➤ MICROPOLY® CONVEYOR CHAIN LUBRICATION

- Assembly line, carrier & chain drive
- Car body transfer system
- Conveyor chain support
- Stamping plant, sheet metal automation

An automotive manufacturer saves over \$100,000 annually by replacing traditionally lubricated tapered roller bearings with MicroPoly Filled Bearings. The tapered roller bearings are on assembly line pallets traveling through a transmission washer. Instead of replacing the bearings every three months, the bearings are now lasting more than two years.

FOOD & BEVERAGE APPLICATIONS

➤ MICROPOLY® FILLED BEARINGS

- Bakery, depanner litter chain bearings
- Bakery, dough mixer bearings
- Bakery, proof box conveyor bearings
- Beverage bottling line bearings
- Brewery, bottling line bearings
- Brewery, packaging conveyor bearings
- Brewery, packaging equipment bearings
- Brewery, seaming roll bearings
- Canning line bearings
- Cans, seam roller bearings
- Cereal, packaging equipment bearings
- Chicken plant, feather picker bearings
- Dairy, overhead conveyor bearings
- Dairy, ice cream carton shrink wrapper bearings
- Dairy, milkshake machine bearings
- Fish canning equipment bearings
- Fish tank, agitator bearings
- Fruit, concentrator conveyor bearings
- Meat slicing equipment bearings
- Meat packing, conveyor bearings
- Meat packing, steel cart bearings
- Pickle processing, labeling machine bearings
- Pizza production, conveyor & wrapping machine bearings
- Onions, cage mill bearings
- Potato, chip sorter bearings
- Potato, cutter head bearings
- Potato, oven dryer bearings
- Soft drink, bottling line bearings
- Sugar beet, wash down & processing bearings
- Tomato, lift gate bearings
- Tomato, incline bulk dump conveyor bearings
- Trout farm, fish processing bearings
- Yogurt, container filling bearings



➤ MICROPOLY® CONVEYOR CHAIN LUBRICATION

- Breweries and soft drink manufacturing
- Candy manufacturing

A chicken processor saves over \$170,000 annually by replacing traditionally lubricated single row ball bearings with MicroPoly filled bearings. The bearings are used in a feather picker. MicroPoly lubrication has more than tripled the life of the bearings.

A potato chip manufacturer saved almost 4 million dollars over 6 years using MicroPoly in their conveyor bearings. Traditionally lubricated bearings on their potato chip sizer were lasting six to eight weeks due to salt and other seasonings penetrating the bearings. Downtime costs the customer \$25,000 per hour. Prior to using MicroPoly, bearing failure led to an average of two hours of downtime per month. Customer has experienced no downtime due to bearing failure since installing MicroPoly. In the words of this customer, MicroPoly is "One of the best things we've done in a very long time."

METAL PROCESSING APPLICATIONS

➤ MICROPOLY® FILLED BEARINGS

- Acme strip grinder/polisher bearings
- Billet turner bearings
- Coil car bearings
- Crane hook bearings
- Crane pulley bearings
- Crane wheel bearings
- Gearbox bearings
- Heat treat furnace fan bearings
- Hot strip mill, runout table roll bearings
- Quench tank bearings
- Skip car bearings
- Slab mill feeder table bearings
- Steel coil straightener bearings
- Steel pipe, coating oven bearings
- Strip grinder, squeegee & brush roll bearings
- Table roll bearings
- Tire cord, multi-strand wire cabling bearings
- Wire drawing, wire reel bearings



➤ MICROPOLY® LUBRICATION FOR BUSHINGS AND WEAR PLATES

- Coil car liners
- Edge trimmer screws
- Expansion mandrel slides
- Iron ore pellet lines
- Liners/wear plates
- Shot blast car bushings
- Slipper brasses

➤ MICROPOLY® CONVEYOR CHAIN LUBRICATION

- Re-bar and angle iron
- Conveyor return guide

➤ MICROPOLY® FLANGE WHEEL LUBRICATION

- Crane wheels
- Locomotive wheels

A steel processor saves down time costs of \$250,000 by replacing traditionally lubricated spherical roller bearings with MicroPoly Filled Bearings. The spherical roller bearings are in a steel coil straightener and are not accessible to lubricate. MicroPoly lubricants have extended the bearing life from six months to more than three years.

MISCELLANEOUS APPLICATIONS

- Agriculture
- Animated Christmas dolls
- Bar soap manufacturing
- Car washes
- Carpet mills
- Chemical processing
- Coal mines
- Concrete pipe
- Disk harrow
- Earth moving
- Fertilizer plants
- Fish pond aerators
- Floodgate actuators
- Floor buffers & strippers
- Gypsum plants
- Lamination lines
- Mattress manufacturing
- OEM
- Paper processing
- Power generation

- Pharmaceutical
- Plain spherical bearings
- Reverse vending machines
- Robotic machines
- Roofing
- Treated lumber
- Trenching machines
- Tugboats
- Vacuum chamber, tram-car wheels
- Waste treatment
- Wire drawing
- Wood products

A utility company is saving several hundred thousand dollars annually by replacing traditionally lubricated tapered roller bearings with MicroPoly filled ones. The MicroPoly bearings are lasting more than five times longer.

➤ MICROPOLY® FILLED BEARINGS FOR ...

FOUNDRY APPLICATIONS

- Bucket elevator conveyor bearings
- Conveyor bearings
- Mold conveyor, wheel & guide bearings
- Muller bearings
- Overhead conveyor/trolley wheels
- Shotblast bearings

PRINTING APPLICATIONS

- Immersion pump
- Letter press
- Printing press

OIL FIELD APPLICATIONS

- Crown blocks
- Mud pumps



MicroPoly

The solid idea for lubrication



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