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TECHNICAL DATA SHEET

POLYWATER® PRELUBE 2000™

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DESCRIPTION

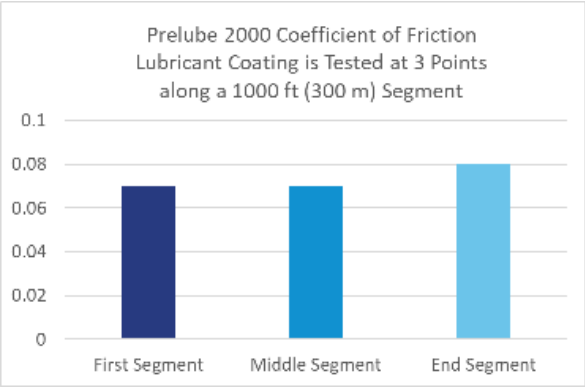
Polywater® Prelube 2000™ reduces frictional drag during cable blowing and increases both length and speed of the installation. Prelube 2000 has a proven record with air-assisted installation of cable.

Prelube 2000 is a high-performance, lubricant designed specifically to coat duct prior to cable installation. It is highly concentrated and works with a very thin coating. Once dried, it continues to perform. It is suitable for all types of communication cables and ducts. The residue is a thin, slippery film that retains lubricity for months after use.

Prelube 2000 was formulated while the first cable blowing machines were being designed and introduced. Field studies quickly proved the benefit of this specialty lubricant. Prelube 2000 is optimized to this installation technique.

FRICTION TESTING

Prelube 2000 was blown through 1000 ft (300 m) polyethylene duct using standard cable blowing equipment and sponge applicators. Coefficient of friction (COF) was tested at three different points through the length of the installation. COF was determined using a standard reel test procedure.[1]



Prelube 2000 shows good coating and friction reduction throughout the installation length.

Prelube 2000 applied to duct prior to blowing fiber cable

PRODUCT FEATURES

- **Superior performance:** Increases blowing speed and distance.
- **Low-friction coating:** Coats duct efficiently and lubricates after drying.
- **Concentrated:** Works at very low coating thickness.
- **Easy to use:** Simply squeeze into duct before blowing cable.
- **Compatible with cable jackets:** Suitable for all types of cable jackets.

APPROVALS

Recommended by most blowing equipment manufacturers.

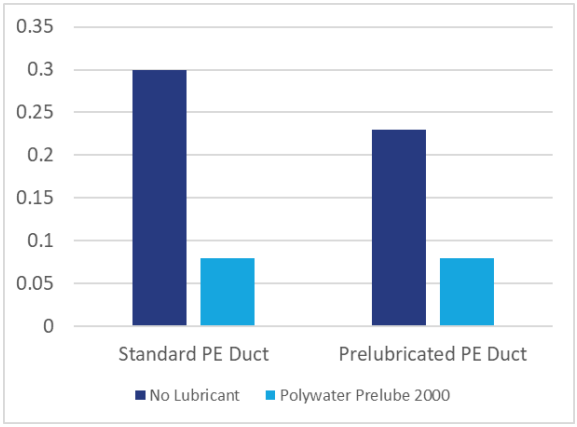
CABLE COMPATIBILITY

Polyethylene stress cracking:
Prelube 2000 does not cause environmental stress cracking of polyethylene jackets commonly found on communications cables.

Medium density polyethylene jacket material was tested according to ASTM standard method.[2] After 168 hours exposure, none of the test specimens showed failure.

Polycarbonate stress cracking:
Prelube 2000 will not stress-crack polycarbonate. Polycarbonate bars are bent to a defined strain and exposed to lubricant as described in the Telcordia standard,[3] Section 8.2, Stress Cracking of Polycarbonate. After 48 hours, none of the test specimens showed signs of crazing or cracking.

Compatibility with factory lubricated duct:
Prelube 2000 is compatible with prelubricated ducts. To determine compatibility, prelubricated ducts were tested with Prelube 2000. Tension measurements from a standard Telcordia reel test procedure[1] were used to calculate coefficient of friction. Prelube 2000 lowers the tension in all cases.



Prelube 2000 has no adverse effect on prelubricated duct and improves performance. Prelube 2000 outperforms the friction reduction of standard prelubricated duct.

PHYSICAL PROPERTIES

PROPERTY	RESULT
Appearance	Slightly thickened, white liquid
% Non-volatile solids	6%
VOC content	0 g/l (standard) 278 g/l (wintergrade)
Viscosity	5000–15000 cps @10rpm
pH	6.5–8.0

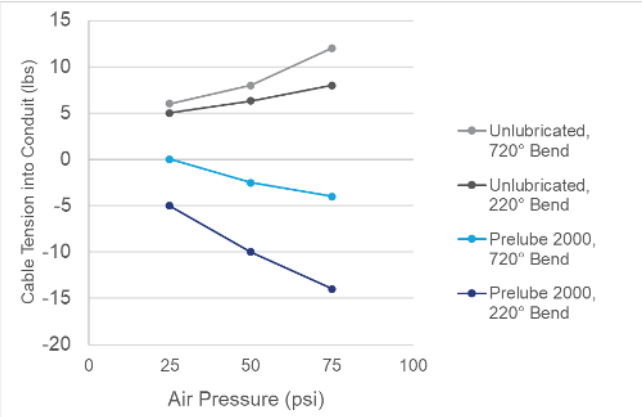
PERFORMANCE PROPERTIES

Prelube 2000 Lubricant continues to reduce friction once it is dried and will continue to work for over 6 months after installation. Friction testing shows less than 20% change after drying. It continues to lubricate and effectively lower friction when tested 6 months after application.

Prelube 2000 has excellent wetting and coating characteristics. It is compatible with moisture or condensation in duct.

PERFORMANCE ANALYSIS

Prelube 2000 has over 25 years of proven experience. A series of experiments were run to test its effectiveness in “real world” conditions. In these tests, a cable blowing machine was used with the mechanical pushing unit deactivated. A 365 cfm (10.3 m^3/min) compressor was regulated to produce varying pressures at the head of the blowing unit. Tension data was captured as either the positive force to push the cable into the duct or the negative force pulling the cable into the duct with the air assistance.



This study shows that high speed, laminar air flow minimizes the effect of bends in the installation design. Lubricant improves performance and Prelube 2000 is particularly effective.

Fee, J.M., et al (1995, June 18-22) *Analysis and Measurement of Friction in High-Speed Air Blowing Installation of Fiber Optic Cable.* [Paper presentation]. National Fiber Optic Engineers Conference NFOEC 1995. Boston MA, United States.

INSTALLATION

Blown cable installation requires different techniques than traditional cable pulling. In this method, a belt-driven mechanism pushes the cable into the duct at high velocity, compressed air floats the cable inside the duct. Lubricating the duct before the cable is blown will increase the distance, safety, and speed of installation.

1. Clean conduits thoroughly by blowing a mandrel or foam disc through the conduit prior to lubricating the conduit. This will remove water, dirt, sand, mud, or gravel and make sure the conduit is not blocked by ice or displaced sections and is not collapsed. Continue to blow foam discs through the conduit until they come out dry and clean. Sponges that are torn or damaged may indicate sharp edges or other obstructions within the duct system.
2. Squeeze appropriate lubricant quantity into duct. Insert 2 to 3 foam sponge spreaders to distribute lubricant throughout the duct. Sponges should be tight-fitting. A mesh bag can be attached to the end of the conduit to catch foam spreaders at the far end.
3. Follow equipment manufacturer recommendations to install cable. Run a pre-installation test to determine drive wheel/belt settings. Once cable is moving, do not stop.

OTHER CONSIDERATIONS

Fill Ratio – Refer to cable and equipment manufacturer for recommended cable to duct ratio.

Cleanliness – Keep the fiber cable clean before entering the blowing equipment and duct. Use tarps or other precautions to keep cable clean.

Bend Radius – Consider the minimum recommended bend radius and keep all conduit bends, cable guides, sheaves, and capstans greater than this value.

Duct Type and Condition – Duct integrity and cleanliness are important. All couplings should be airtight and smooth (without sharp edges).

Air Compressors – In warm or hot weather, an air compressor cooler is needed. Air dryers are recommended. Precipitation and humidity in the air flow can increase friction and reduce the distance cable can be blown.

Communication and Safety – A good method of communication between both ends of the installation is strongly recommended.

QUANTITY RECOMMENDATION

Prelube 2000 Lubricant is effective at very thin coating levels.

DUCT SIZE (SDR 11)	LUBRICANT QUANTITY	
	PER 1000 FT	PER 1000 M
(0.75 inch) 25/20 mm	3.5 fl. oz.	300 ml
(1 inch) 32/26 mm	4 fl. oz.	400 ml
(1.25 inch) 40/32 mm	5 fl. oz.	500 ml
(1.5 inch) 50/40 mm	6 fl. oz.	600 ml
(2 inch) 63/51 mm	8 fl. oz.	800 ml

Prelube 2000 lubricates efficiently at coating levels of 0.5 mg/cm^2. Prelube 2000 works best with a foam sponge spreader to help coat through the entire length of the conduit. Foam sponge should have a snug fit inside the duct with some compression.

USE AND STORAGE CONDITIONS

Temperature use range:
Prelube 2000 (P)
20°F to 140°F (-5°C to 60°C).

Winter Grade Prelube 2000 (WP)
-20°F to 140°F (-30°C to 60°C).

Temperature stability:
Prelube 2000 is freeze/thaw stable.

Clean-up:
Prelube 2000 is non staining. Complete clean-up is possible with water.

Storage and shelf life:
Store Prelube 2000 in a tightly sealed container away from direct sunlight. Lubricant shelf life is 24 months.

MODEL SPECIFICATION

The statement below may be inserted into a customer specification to help maintain engineering standards and ensure work integrity.

The blowing lubricant shall be Polywater® Prelube 2000™. Lubricant shall produce a low coefficient of friction on communication cable jacket materials and shall lubricate at extremely low-coating thickness. Lubricant shall continue to reduce friction after it has dried. The blowing lubricant shall be approved and/or tested by the equipment manufacturer. It shall conform to the physical and performance requirements of Telcordia Standard, GR-356-CORE, Generic Requirements for Optical Cable Innerduct, Associated Conduit, and Accessories. It shall not contain solvents and shall not have a flash point.

No substitutions are permitted without certification from an officer of the manufacturer that the substitute product meets all the requirements of this specification.

ORDER INFORMATION

CAT #	PACKAGE DESCRIPTION
P-35	1-qt. (.95 liter) bottle 12/case
P-128	1-gal. (3.8 liter) jug 4/case
P-640	5-gal (18.9 liter) pail
	Winter Grade
WP-35	1-qt. (.95 liter) bottle 12/case
WP-128	1-gal. (3.8 liter) jug 4/case
WP-640	5-gal (18.9 liter) pail

[1] Telcordia Standard GR-356-CORE, Section 4.2.5, Generic Requirements for Optical Cable Innerduct, Associated Conduit, and Accessories (Issue 2, June 2009).

[2] ASTM Test Method D1693, Environmental Stress-Cracking of Ethylene Plastics.

[3] Telcordia Standard TR-NWT-002811, Generic Requirements for Cable Placing Lubricants.

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