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TECHNICAL DATA SHEET

POLYWATER® PRELUBE 5000™

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DESCRIPTION

Polywater® Prelube 5000™ reduces frictional drag during micro cable blowing and increases both distance and speed of the installation. It is specifically formulated for the installation of small diameter, fiber optic micro cable into microtube duct. Prelube 5000 has a proven record with air-assisted installation of cable.

Prelube 5000 has a unique chemistry that allows it to spread farther in the microduct creating an ultra-thin coating. It remains effective after drying. Prelube 5000 is compatible with all types of communication cables and ducts.

FRICTION TESTING

Proper use of Prelube 5000 can lower the coefficient of friction and improve blowing distances. Data presented in an IWCS Symposium[1] shows the effectiveness of proper lubrication. Field tests were completed using 3.9 mm diameter cables jetted into a broad selection HDPE 7/5.5 mm microducts. Jetting distances were measured, and the coefficient of friction (COF) calculated. Use of lubrication had the following results:

- Lubrication improved jetting distance by 400 to 600%
- Lubrication reduced the calculated COF by 20 to 32%

This study shows that lubricating with specialty lubricants such as Prelube 5000 improves installation performance.

[1]Griffioen, Willem *Cable in Duct Installation: Lubrication Makes the Difference.* Proceedings of the 61st International Wire & Cable Symposium IWCS Conference 2012. Providence RI, United States

Prelube 5000 applied to duct prior to blowing fiber cable

PRODUCT FEATURES

- **Superior performance:** Reduces friction and increases blowing speed and distance.
- **Efficient:** Works at very low coating thickness and allows long-distance installations.
- **Easy application:** Squeeze into microduct before blowing fiber optic cable.
- **Excellent spreading:** Evenly coats microduct with an ultra-thin layer and lubricates after drying.
- **Compatible with cable jackets:** Suitable for all types of cable jackets.

APPROVALS

Endorsed and recommended by most blowing equipment manufacturers for reliable, cost-effective operation of equipment. Guidance from equipment and cable manufacturers includes the use of lubricants during installation.

CABLE COMPATIBILITY

Polyethylene stress cracking:
Prelube 5000 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.

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

Polycarbonate stress cracking:
Prelube 5000 will not cause stress-cracking of 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.

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

PHYSICAL PROPERTIES

PROPERTY	RESULT
Appearance	Slightly thickened, white liquid
% Non-volatile solids	18%
VOC content	0 g/l (standard)
Viscosity	2000–4000 cps @10rpm
pH	6.5–8.0

PERFORMANCE PROPERTIES

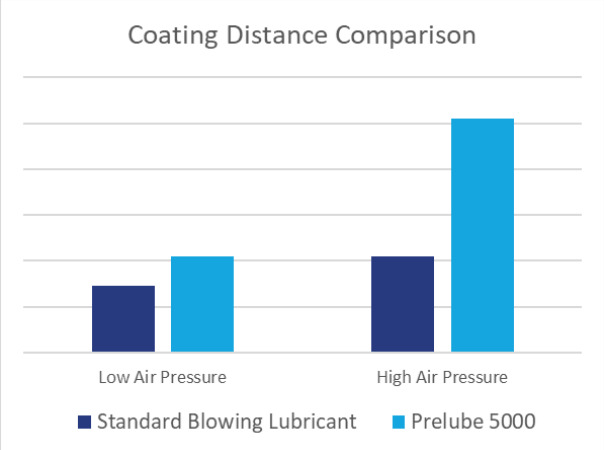
Prelube 5000 Lubricant continues to reduce friction once it is dried and will continue to work for over 6 months after installation. Friction testing shows less than 20% change after drying. It continues to lubricate and effectively lower friction when tested 6 months after application.

Prelube 5000 has excellent wetting and coating characteristics. It remains effective when moisture or condensation is present in the duct. Lubrication reduces static electric charges.

PERFORMANCE ANALYSIS

Prelube 5000 is specifically designed for micro cable installation into microduct. It has an extremely low surface tension and is optimized for coating effectiveness. Prelube 5000 produces an even, ultra-thin coating for long distances. It spreads further into the duct than conventional blowing lubricants.

To test this, lubricants were mixed with a fluorescent dye so that coating length could be determined using a fluorescent blacklight. A measured amount of lubricant was added to a 4/3 mm HDPE tube and an applicator was then blown through the tube at two different air pressures. Coating length was measured and compared.



This study shows that lubricant formulation can influence coating effectiveness. In addition, Prelube 5000 shows excellent friction reduction at this extremely low coating thickness.

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. Add a few drops of lubricant into the microduct and then insert first sponge. Push the sponge into the duct the recommended length and squeeze appropriate lubricant quantity into the microduct. Insert the second foam sponge spreader and blow through the duct at low pressure 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.

Bend Radius – Consider the minimum recommended bend radius and keep all microduct bends greater than this value.

Microduct Condition –All couplings should be airtight and smooth (without sharp edges).

Air Compressors – Lower air temperatures ensure the lowest friction between the microduct and cable sheath. Air dryers are recommended. Precipitation and humidity in the air flow can increase friction and reduce the distance cable can be blown.

QUANTITY RECOMMENDATION

Prelube 5000 Lubricant is effective at very thin coating levels.

MICRODUCT SIZE (ID)	LUBRICANT QUANTITY (DUCT FILL LENGTH)	
	PER 1000 FT	PER 1000 M
5 mm	3 ml (5 inches)	8 ml (40 cm)
6 mm	3 ml (4 inches)	9 ml (33 cm)
8 mm	4 ml (3 inches)	13 ml (25 cm)
10 mm	5 ml (2.5 inches)	16 ml (20 cm)
12 mm	6 ml (2 inches)	19 ml (17 cm)
15 mm	8 ml (1.7 inches)	24 ml (13 cm)

Prelube 5000 works best with a foam sponge spreader to help coat the entire length of the conduit. The foam sponge should have a snug fit inside the duct with some compression.

USE AND STORAGE CONDITIONS

Temperature use range:
Prelube 5000 (PM)
20°F to 140°F (-5°C to 60°C).

Temperature stability:
Prelube 5000 is freeze/thaw stable.

Clean-up:
Prelube 5000 is non staining. Complete clean-up is possible with water.

Storage and shelf life:
Store Prelube 5000 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 5000™. It shall lubricate at extremely low-coating thickness. Lubricant shall be formulated for microducts and coat small diameter ducts effectively to produce a low coefficient of friction. 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 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
PM-8	8-fluid oz./240-ml squeeze bottle 6/case
PM-8PE	8-fluid oz./240-ml squeeze bottle 24/case
PM-16	16-fluid oz./480-ml squeeze bottle 15/case

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