

DESCRIPTION

Polywater® CPL Lubricant is a pourable, high-performance pulling lubricant formulated for the communications industry. Use it for long fiber optic, copper, or coaxial cable pulls.

Polywater CPL provides maximum friction reduction between cable and conduit under both low and high sidewall bearing pressures. It is slow-drying and leaves a lubricating film after its water base has evaporated. Polywater CPL is suitable for use on polyethylene communications cables. It coats evenly and clings well to cable.

Polywater CPL is safe for the aquatic environment. It meets California regulation CCR 22.

FRICITION TESTING

Friction is measured using a standard Telcordia test procedure.¹ HDPE duct is wrapped 420° around a three-foot-diameter (0.9 m) cylinder. In this study, a variable weight is attached to the cable. Pulling force is measured as the cable is pulled at 65 ft/min (19.8 m/min) through the wrapped duct. Friction coefficient is calculated from the pulling force/back tension ratio. Results below are typical values.

COEFFICIENT OF FRICTION FOR MDPE JACKET CABLE INTO HDPE SMOOTHWALL INNERDUCT			
BACK TENSION	CONDITION		
	NO LUBE	INITIAL	DRY
14 lb	>0.30	0.10	0.12
25 lb	>0.30	0.09	0.11

For the dry test, continuous, warm air was run through the conduit until the lubricant volatiles had evaporated (~1 hour). Polywater CPL shows good friction reduction even after drying. Dry coefficient of friction values are within 30% of initial value.

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



Polywater CPL is a thick liquid that can be poured directly into the duct system.

PRODUCT FEATURES

- Superior friction reduction
- Easy to apply
- Compatible with communications cable jackets
- Meets California CCR 22 Fathead Minnow Screen
- Wets out and covers polyethylene cables
- Slow drying with lubricious residue
- Available in winter grade formula

END USE

Use for all types of communications cable installations, including:

- Network cabling
- Silicone-lined and prelubricated ducts
- Lightweight cable, underground installation
- Heavy cable

CABLE COMPATIBILITY

Polyethylene Stress Cracking:

Polywater CPL does not stress-crack polyethylene jackets commonly used on communications cables. Untreated polyethylene (Union Carbide DYNK) and MDPE jacket material were both tested according to ASTM standard method.¹ After 168 hours of exposure, none of the test specimens showed failures.

Polycarbonate Stress Cracking:

Polywater CPL will not stress-crack polycarbonate. Polycarbonate bars are bent to a defined strain and exposed to lubricant as described in the Telcordia standard,² Section 8.2, Stress Cracking of Polycarbonate. After 48 hours, none of the test specimens showed signs of crazing or cracking.

¹ ASTM Test Method D1693, Environmental Stress-Cracking of Ethylene Plastics.

² Telcordia Standard TR-NWT-002811; Generic Requirements for Cable Placing Lubricants.

PHYSICAL PROPERTIES

PROPERTY	RESULT
Appearance	Opaque white, stringy liquid
Percent nonvolatile solids	2.0%
VOC content	0 g/L 300 gms/liter (Winter Grade)
Viscosity	1,000–3,000 cps @10 rpm

PERFORMANCE PROPERTIES

Specialty pulling lubricants are required for the long installation lengths and significant time duration of the fiber optic pulls. The lubricant must coat the cable jacket and stay evenly coated since lightweight cable can rub on the top as well as the bottom of the conduit. The lubricant must remain slippery over time, and not dry to a higher-friction residue.

Wetting—Continuous Coat:

Wetting is a measure of the lubricant's ability to completely coat the jacket for continued lubricity on longer pulls.

Polywater CPL will wet out evenly on cable jacket surfaces. It will not bead up or rub off the cable jacket. Lubricant will completely coat a 1-inch diameter PE-jacketed cable dipped 6 inches into the lubricant, then withdrawn within 10 seconds. The lubricant coating shall cover 80% of the cable jacket without dripping off, beading up, or pulling away from the edges as it is held horizontally for one minute at 70°F (21°C).

Stringy Rheology:

Polywater CPL shows a strong, cohesive "string" character. Lubricant will follow and stay with cable over long distances.

A ¼-inch fiber cable (MDPE jacket) dipped 2 inches into the lubricant and pulled out (40 inches per minute) will produce a continuous, nonsupported, lubricant string length greater than 6 inches (150 mm).

Pourability:

A 5-gallon pail of Polywater CPL will empty from a Reike flex spout without an air relief hole in lid in less than 90 seconds and with an air relief hole in lid in less than 60 seconds.

Combustibility:

Lubricant has no flash point and dried residue is nonflammable.

APPLICATION PROPERTIES

Temperature Use Range:

Polywater CPL:

20°F to 120°F (-5°C to 50°C).

Polywater WCPL (Winter Grade version):

-20°F to 140°F (-30°C to 60°C).

Temperature Stability:

No more than a 20% change in Brookfield viscosity from 40°F to 100°F (5°C to 40°C). No phase-out after five freeze/thaw cycles or 5-day exposure at 120°F (50°C). *Will not phase out or separate during the shelf life of lubricant.*

Environmental Testing:

Polywater CPL is safe in the aquatic environment and passes CCR Title 22 Fathead Minnow Hazardous Waste Screen Bioassay.

PRODUCT	RESULT
Polywater CPL	PASS (LC ₅₀ > 750 mg/L)

Clean-up:

Nonstaining. Complete clean-up with water.

Storage and Shelf Life:

Store tightly sealed, away from direct sunlight. Lubricant shelf life is 24 months past the date of manufacture.

DIRECTIONS FOR USE

Polywater CPL can be poured directly into the conduit. Directly lubricate the cable or wire during the entire portion of the pull. It is best to coat the entire cable or wire as it enters the conduit.

Polywater CPL may be gravity fed or pumped into a conduit using the LP-D5 automatic pump, allowing the lubricant to fully coat the outside of the cable.

For clean-up, use a rag to squeegee the end of the cable, tightly gripping the cable with a rag. The remaining residue will evaporate quickly.

Recommended Lubricant Quantity

$$Q = k \times L \times D$$

Where:

Q = quantity in gallons (liters)

L = length of conduit run in feet (meters)

D = ID of the conduit in inches (mm)

k = 0.0015 (0.0008 if metric units)

The quantity that is appropriate for any given pull can vary from this recommendation by 50%, depending on the complexity of the pull. Consider the following factors:

Cable weight and stiffness
(Increase quantity for stiff, heavy cable)

Conduit condition
(Increase quantity for old, dirty, or rough conduits)

Conduit fill
(Increase quantity for high percent conduit fill)

Number of bends
(Increase quantity for pulls with several bends)

Pulling environment
(Increase quantity for high temperatures)

MODEL SPECIFICATION

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

The cable pulling lubricant shall be Polywater CPL. The lubricant shall be a high-performance, silicone-enhanced liquid with excellent tension reduction properties.

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 produce a typical friction coefficient less than 0.10 using MDPE-jacketed cable and HDPE innerduct. When lubricant is dried with continuous warm air flow for one hour, it shall have a friction coefficient less than 0.12.

The lubricant shall be safe for the environment and conform to California CCR 22 Fathead Minnow Screen. The lubricant shall not stress-crack polyethylene when tested by ASTM 1693. The lubricant shall have a neutral pH and shall be nontoxic and non-sensitizing. It shall be nonstaining.

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
CPL-128	1-gal. jug (3.78 liter) 4/case
CPL-320	2½-gal. jug (9.6 liter) 2/case
CPL-640	5-gal. pail (18.9 liter)
	Winter Grade
WCPL-35	1-qt. squeeze bottle (0.95 liter) 12/case
WCPL-128	1-gal. jug (3.78 liter) 4/case
WCPL-320	2½-gal. jug (9.6 liter) 2/case
WCPL-640	5-gal. pail (18.9 liter)

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IMPORTANT NOTICE: The statements here are made in good faith based on tests and observations we believe to be reliable. However, the completeness and accuracy of the information is not guaranteed. Before using, the end-user should conduct whatever evaluations are necessary to determine that the product is suitable for the intended use.

American Polywater expressly disclaims any implied warranties and conditions of merchantability and fitness for a particular purpose. American Polywater's only obligation shall be to replace such quantity of the product proven to be defective. Except for the replacement remedy, American Polywater shall not be liable for any loss, injury, or direct, indirect, or consequential damages resulting from product's use, regardless of the legal theory asserted.

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