

Polywater® CLR Clear Cable Lubricant



TECHNICAL SPECIFICATION

Description:

Polywater® CLR Clear Cable Pulling Lubricant is a clear, colorless, clean, slow-drying, easy-to-apply gel lubricant. This thick gel lubricant was developed with “clingability” for easy handling and application. Polywater® CLR Cable Pulling Lubricant is a good lubricant for everyday cable pulling of both electrical and communication cable.

Polywater® CLR Clear Cable Pulling Lubricant is popular for small cable installation in a commercial environment because it is non-staining and easy to clean up.

The dried residue of Polywater® CLR is non-conductive and non-combustible. Polywater® CLR Lubricant is harmless to humans, environmentally safe, compatible with cable jacket materials and easy to use.

Friction Testing:

Lubricity: Polywater® CLR Lubricant effectively reduces friction across a broad variety common of jacket types. Typical friction coefficients at 200 lbs/ft (2.91 kN/m) normal pressure are shown below. Test results are based on the method described in the white paper, “Coefficient of Friction Measurement on Polywater’s Friction Table, 2007” (polywater.com/FTable.pdf). Values are compiled from testing on multiple cable jacket and conduit materials from multiple manufacturers.

<u>Cable Jacket</u>	<u>Conduit Type</u>		
	<u>EMT</u>	<u>PVC</u>	<u>Steel</u>
XLPE	.14	.11	.13
PVC	.11	.11	.13

Coefficient of friction data on additional or specific cable jackets or conduits can be obtained from American Polywater Corporation.



Product Benefits:

- Excellent cling for easy hand application
- Clear and Colorless
- Clean and non-staining
- Good friction reduction
- Compatible with cable jacket materials
- Biodegradable
- Environmentally safe
- Non-toxic
- Temperature stable

End Use:

Suitable for all types of cable installations, including:

- General electrical and datacom installation
- Smaller wiring in upgrades
- Indoor construction

Cable Compatibility:

Polyethylene Stress Cracking:

Polywater® CLR shows no stress cracking on LLDPE cable jacket when tested per IEEE Standard 1210¹.

Tensile and Elongation Effects:

PVC, LLDPE and XLPE cable jacket materials aged in Polywater® Lubricant CLR per IEEE Standard 1210¹ meet the tensile and elongation retention requirements of that standard.

Volume Resistivity:

There are no significant changes in the conductive properties of XLPE and EPR semi-conducting compounds when volume resistivity is tested according to IEEE Standard 1210¹.

Building Wire Testing:

THHN and XLPE building wire meet UL tensile, elongation, and voltage withstand requirements after exposure to Polywater® CLR Lubricant as tested by UL requirements².

Corrosivity:

Lubricant is non-corrosive to steel, copper, or aluminum. Passes UL 267² corrosion testing on zinc-coated EMT.

¹ IEEE Std 1210-2004; IEEE Standard Tests for Determining Compatibility of Cable-Pulling Lubricants with Wire and Cable.

² UL Subject 267, Investigation for Wire-Pulling Compounds.

Physical Properties:

Property	Result
Appearance:	Clear, colorless gel
Wax, Grease and Silicone Content:	None
Percent Non-Volatile Solids:	5%
VOC Content:	20 gms/liter
Viscosity:	40,000 – 60,000 cps @10rpm
pH:	6.5 – 8.0

Performance Properties

Cling Factor:

Cling factor is a measure of the ability to apply the lubricant and have it stay on the jacket while the cable enters the conduit.

A six inch length (152 mm) of a one-inch (25 mm) diameter cable will hold at least 70 grams of Polywater® Lubricant CLR for one minute when held vertically at 70° F (21° C).

Coatability:

Coatability is a measure of the lubricant's ability to coat the jacket as a thin film for continued lubricity on longer pulls.

Material will wet out evenly on all surfaces. It will not bead up or rub off of the cable jacket. A one-inch (25 mm) diameter XLPE cable dipped six inches (152 mm) into the Polywater® Lubricant CLR, then withdrawn and held vertically, will retain at least 20 grams of Polywater® Lubricant CLR for one minute at 70° F (21° C).

Residue:

Residue is the percent solids remaining when the lubricant dries. A high residue can "cement" cables in place to prevent future removal or adjustment.

Polywater® CLR Lubricant has a low residue, less than 5% solids. The residue dries clear with no powders or discoloration. As Lubricant CLR dries, the product retains its lubricity.

Combustibility:

Lubricant has no flash point and dried residue is non-flammable.

Clarity:

Polywater® CLR Lubricant is completely clear and non-staining. All components are water soluble.

Application Properties:

Application Systems:

Polywater® CLR has a thick gel consistency that makes it easy to hand apply. The product will cling to the cable through vertical and long pulls.

The clear character of the lubricant and the low solids content make Polywater® CLR an ideal lube for installations where cleanliness is a concern.

Pull Planner™ Cable Tension Calculation Software is available from Polywater. Pulling tension estimations can ensure the use of appropriate pulling equipment and that the cable is installed within safe limits.

Temperature Use Range:

20° F to 120° F (-5° C to 50° C).

Temperature Stability:

No phase-out after five freeze/thaw cycles or 5-day exposure at 140° F (60° C).

Clean-Up:

Polywater® CLR is non-staining. Complete clean-up is possible with water.

Storage and Shelf Life:

Store Polywater® CLR in a tightly sealed container away from direct sunlight. Lubricant shelf life is one year.

Directions for Use:

Polywater® CLR Lubricant can be squeezed, pumped or hand applied directly onto the wire or cable. The conduit should be clean and continuous.

To prelubricate for long or difficult pulls, squirt a liberal amount of Polywater® CLR Lubricant into the conduit before the pull begins and use a mandrel or a swab on the winch line to spread the lubricant during the pull.

Clean-up by wiping off excess lubricant with a rag.

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 specific job specification to help maintain engineering standards and ensure project integrity.

The cable pulling lubricant shall be Polywater® CLR Lubricant. The lubricant shall be a clear, colorless thick gel that can be hand applied without dripping. The lubricant shall contain **no** waxes, greases, or silicones.

Cable jacket compatibility shall be tested by the IEEE 1210, Standard Tests for Determining Compatibility of Cable-Pulling Lubricants with Wire and Cable. It shall pass physical compatibility tests on PVC, LLDPE and XLPE cable jacket or sheath materials. It shall not stress crack polyethylene per ASTM Standard 1693. There shall be no significant changes in the conductive properties of XLPE semi-conducting compounds when the lubricant's effect on volume resistivity is tested according to IEEE Standard 1210.

Order Information:

<u>Cat #</u>	<u>Package Description</u>
CLR-35	1-quart squeeze bottle (0.95 Liter)
CLR-128	1-gallon pail (3.78 Liter)
CLR-640	5-gallon pail (18.9 Liter)

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Makers of Polywater® and Dyna-Blue® Cable Lubricants
and Pull-Planner™ 3000 Software

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