

# Network Loop™ Lubricant NL Communications Lubricant



## TECHNICAL SPECIFICATION

### Description:

Network Loop™ Lube NL is a pourable, high-performance pulling lubricant recommended for underground pulling of communication cables (copper, fiber optic, and coaxial).

Lubricant NL is a silicone-enhanced lubricant. This clean, slow-drying pulling compound offers economical friction reduction and universal compatibility with communication cable jackets, including polyethylene types. It coats evenly and clings well to cable. Network Loop™ Lube continues to lubricate after its water-base has evaporated.

Lubricant NL is a thick liquid. Apply by pouring or pumping the lubricant into the duct system.



### Friction Testing:

Friction is measured using a standard Telcordia test procedure<sup>1</sup>. HDPE duct is wrapped 420° around a three-foot-diameter cylinder. A variable “back tension” weight is attached to the cable and the cable is pulled through the wrapped duct at a speed of 65 ft/min. A load cell measures pulling force, which, combined with the “back tension”, is used to calculate a friction coefficient. Results below are typical values.

Coefficient of Friction for MDPE Jacket Cable  
into HDPE Smoothwall Innerduct

Back Tension	Condition		
	Unlubricated	Initial	Dry
14 lb <sub>f</sub>	>0.30	0.10	0.12
25 lb <sub>f</sub>	>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). Network Loop™ Lube shows good friction reduction even after drying. Dry coefficient of friction values are within 30% of initial value.

<sup>1</sup> Telcordia Standard TR-NWT-002811, Section 4.1.3 and 4.1.4; Generic Requirements for Cable Placing Lubricants.

### Product Benefits:

- Silicone enhanced for superior friction reduction
- Effective lubrication when dry
- Pour lubricant for easy underground application
- Carries with cable for long distance - liquid clings to cable.
- Compatible with cable jackets—including polyethylene
- Clean and non-staining

### End Use:

Suitable for all types of cable installations, including:

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

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## Performance Properties

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*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.*

Network Loop™ Lube will wet out evenly on cable jacket surfaces. It will not bead up or rub off of the cable jacket. Lubricant will completely coat a one-inch diameter PE-jacketed cable dipped six 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:

Network Loop™ Lube shows a strong, cohesive "string" character. Lubricant will follow and stay with cable over long distances.

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

### Pourability:

A five-gallon pail of Network Loop™ Lube will empty from a Reike® 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 non-flammable.

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## Physical Properties:

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<u>Property</u>	<u>Result</u>
<b>Appearance:</b>	Opaque-white, stringy liquid
<b>Percent Non-Volatile Solids:</b>	2.0 %
<b>VOC Content:</b>	0 gms/liter
<b>Viscosity:</b>	1,000 – 3,000 cps @10rpm
<b>pH:</b>	6.5 – 7.5

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## Application Properties:

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### Temperature Use Range:

Network Loop™ Lube:  
20°F to 120°F (-5°C to 50°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.*

### Clean-Up:

Non-staining. Complete clean-up with water.

### Storage and Shelf Life:

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

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## Cable Compatibility:

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### Polyethylene Stress Cracking:

Network Loop™ Lube 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.<sup>1</sup> After 168 hours exposure none of the test specimens showed failures.

### Polycarbonate Stress Cracking:

Network Loop™ Lube will not stress crack polycarbonate. Polycarbonate bars are bent to a defined strain and exposed to lubricant as described in the Telcordia standard<sup>2</sup>, Section 8.2, Stress Cracking of Polycarbonate. After 48 hours, none of the test specimens showed signs of crazing or cracking.

<sup>1</sup> ASTM Test Method D1693, Environmental Stress-Cracking of Ethylene Plastics.

<sup>2</sup> Telcordia Standard TR-NWT-002811; Generic Requirements for Cable Placing Lubricants.

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## Directions for Use:

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Network Loop™ Lube can be 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.

Network Loop™ Lube may be gravity fed or pumped into conduit using the LP-D5 automatic pump, allowing the lubricant to fully coat the outside of the cable. SureGrip™ Nonslip Cable Handling Gloves offer maximum grip for pulling slippery, lubricant-covered wires and cable into or out of conduit.

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)*

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## Model Specification:

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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 Network Loop™ Lube. The lubricant shall be a high performance, silicone-enhanced liquid with excellent tension reduction properties.

When tested according to Bellcore test procedure TR-TSY-00356 Sections 4.1.3. and 4.1.4, it shall produce low friction coefficient. It shall have a friction coefficient less than 0.12 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 0.16.

It shall conform to the physical and performance requirements of Telcordia Standard, TR-NWT-002811, Generic Requirements for Cable Placing Lubricants. The lubricant shall not stress crack polyethylene when tested by ASTM 1693. The lubricant shall have a neutral pH and shall be non-toxic, non-sensitizing. It shall be non-staining.

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

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## Order Information:

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<b>Cat #</b>	<b>Package Description</b>
NL-128	1-gallon pail (3.78 Liter) 4/case
NL-640	5-gallon 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.

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