

LP™ Arctic Grade™

For Crude Oil in Cold Climates

Background

LP™ Arctic Grade™ Flow Improver is part of the Lubrizol Specialty Products, Inc. (LSPI) range of innovative and technologically superior Flow Improver Solutions. As part of the portfolio, LP™ Arctic Grade™ Flow Improver has been designed for use in colder environments.

Characteristics

LP™ Arctic Grade™ Flow Improver is a nonaqueous based suspension product with freeze protection, suitable for use in temperatures below -40°F (-40°C). Like our other LiquidPower™ Flow Improvers, it can provide greater than 80% drag reduction.

Benefits

Great performance:

- Provides additional buffering from shear effects.
- Increases flow rates while maintaining current pipeline pressures.
- Maintains flow while reducing pipeline pressures.
- Allows shutting down of intermediate pump stations.

Superior technology:

- Improves pipeline capacity without capital investment.
- Lower injection rates than other drag reducers.
- Faster dissolution rates than other drag reducers.
- Reduces internal corrosion rate by up to 40%.
- Reduces crude heat loss.

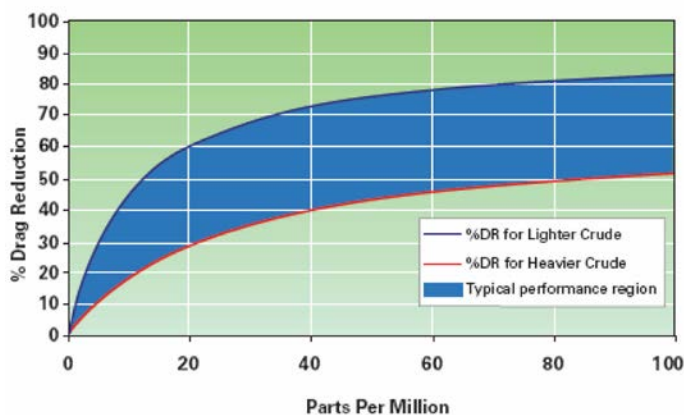
LP™ Arctic Grade™ Flow Improver allows companies to strategically reduce pipeline operating costs, increase throughput, decrease pressure or shut down intermediate pump stations.

LP™ Arctic Grade™ Flow Improver offers the same advanced polymer technology as other LiquidPower™ Flow Improvers. It dissolves into flowing product without coating pipeline walls and increases throughput while reducing internal corrosion rates. It allows greater amounts of active polymer to be deployed in a fixed amount of product while improving dissolution dynamics. The polymer of choice offers excellent hydrocarbon affinity and is able to attain elevated levels of drag reduction under varied operating scenarios. It also has the strength to effectively endure shear forces.

Handling

LP™ Arctic Grade™ Flow Improver is easy to handle, store and clean up. It flows easily and does not require nitrogen pressurized storage tanks.

See back page for product properties.



The performance curve shows the performance range in which LP™ Arctic Grade™ Flow Improver operates, depending on pipeline and crude conditions.

LP™ Arctic Grade™

Product Properties



GENERAL

Designed for use on	Petroleum crude oil in near arctic conditions
Flow Improver type	Suspension
Carrier/Solvent	Water-glycol mixture

PERFORMANCE

Maximum drag reduction	Greater than 80%
Typical concentration	5 to 50 ppm

TYPICAL PROPERTIES

Color	White
Density	7.3 lbs/gal (0.88 g/cm ³)
Flash Point	181°F (83°C)
Viscosity	150 cP @ 511s ⁻¹ (Non-Newtonian) @ 77°F/25°C
Freezing Point	<-35°F (<-37°C)
Boiling Point	365°F (185°C)
Vapor Pressure	0.02 psia (1.0 mm Hg) @ 100°F/37.8°C

HANDLING

Operating range	-40°F to 100°F (-40°C to 37.8°C)
Product stability	Stable emulsion Intermittent agitation required
Heating	Climate control environment available

INJECTION EQUIPMENT

Pumps	Various designs available for different injection range and environments
Range	5 to 2,500 gal/day (20 to 9,500 L/day)
Flow meter	Mass (Coriolis)
Automation	Available

SAFETY AND ENVIRONMENTAL

Reference country specific Safety Data Sheet for local requirements.

Safety & Health (per U.S. OSHA)	Low hazard. Combustible, nonflammable liquid Low toxicity. Conventional protection equipment
Environmental (per U.S. EPA)	Not classified as hazardous waste

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