

LP™ 200W

For Crude Oil

Background

LP™ 200W Flow Improver is a part of the LiquidPower Specialty Products Inc. (LSPI) portfolio of innovative and technologically superior Flow Improver solutions. This pioneering suspension product provides the answer to crude petroleum pipeline needs in environmentally sensitive, cold weather environments.

Characteristics

LP™ 200W Flow Improver is an aqueous suspension product with freeze protection, suitable for operation in temperatures down to 14°F (-10°C). LP™ 200 has the same dose response drag reduction performance as LP™ 200, which facilitates a warm to cold weather flow improver product transition.

Developed specifically to address increasing eco-toxicity concerns, LP™ 200W is able to give high drag reduction

in crude oil applications both onshore and offshore, while exhibiting low aquatic toxicity. LP™ 200W Flow Improver can provide greater than 80% drag reduction. This benefit allows companies to strategically reduce pipeline operating costs, increase throughput, decrease pressure or shut down intermediate pump stations.

LP™ 200W Flow Improver dissolves into flowing product without coating pipeline walls.

The polymer technology developed by LSPI allows greater amounts of active polymer to be deployed in a fixed amount of product while improving the dissolution dynamics. The polymer of choice shows 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™ 200W Flow Improver is easy to handle, store and clean up. LP™ 200W Flow Improver flows easily and does not require nitrogen pressurized storage tanks.

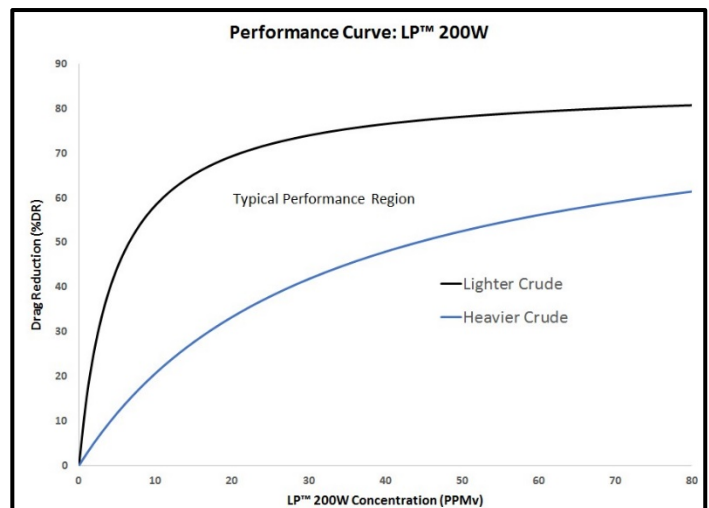
Benefits

Great Performance:

- Greater than 80% drag reduction with freeze protection in a more environmentally friendly formula
- Suitable for operation in temperatures down to 14°F (-10°C)
- 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
- Less polymer required to achieve a given performance
- Lower injection rates than other drag reducers
- Faster dissolution rates than other drag reducers
- Reduces crude heat loss



This performance curve demonstrates the range in which LP™ 200W flow improver can operate, depending on pipeline and fluid conditions.

GENERAL

Application	Light and medium petroleum crude oil
Flow Improver type	Suspension
Carrier	Water

PERFORMANCE

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

TYPICAL PROPERTIES

Color	White
Density	8.2 lbs/gal (0.99 g/cm ³)
Flash Point	Not applicable
Viscosity	160 cP @ 511s ⁻¹ (Non-Newtonian) at 77°F/25°C
Freezing Point	14°F (-10°C)
Boiling Point	221°F (105°C)
Vapor Pressure	0.46 psia (23.9 mm Hg) @ 77°F/25°C

HANDLING

Operating range	14°F to 120°F (-10°C to 48.9°C)
Product stability	Stable suspension Intermittent agitation recommended
Pressure Heating	No nitrogen or pressurized vessels required 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)	Nonflammable. Expected to be a low hazard for usual industrial handling by trained personnel.
Environmental (per U.S. EPA)	Not classified as hazardous waste

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