

UNLOCKING THE POWER OF ASPHALTENE INHIBITORS



Enhancing Flow Assurance Crude Oil Production

What are Asphaltenes, and How Do They Cause Flow Issues?

Asphaltenes are massive organic molecules present in most crude oils, especially heavy oils and bitumen extracted from oil sands. Asphaltenes, waxes, and other scales can deposit on the surfaces of wellbores or pipelines and create flow assurance issues.

PETROSTEP® D Series: Novel Solutions to Organic Flow Assurance Problems

Asphaltene inhibitors can play a crucial role in maintaining the integrity of petroleum production systems. These advanced chemicals are strategically injected into wellbores to prevent or minimize asphaltene deposition. The effectiveness of asphaltene inhibitors can be dependent on crude oil composition and changes in operational temperatures and pressures. Therefore, a comprehensive understanding of asphaltene deposition locations is essential for optimizing treatment outcomes to avoid reducing the effectiveness of other chemical treatments, such as a paraffin inhibition and corrosion inhibition.

Discover PETROSTEP D-7E, D-8E, and D-12E

PETROSTEP D-7E, D-8E, and D-12E are Stepan's unique chemistries for preventing asphaltene flocculation. All products are soluble in alcohol. They can be easily formulated and compatible with most production or workover fluids for various applications.

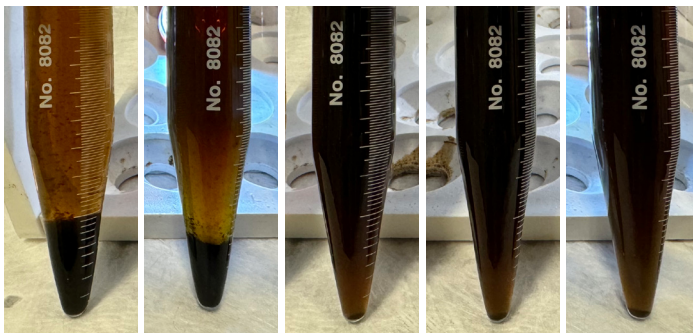
PHYSICAL PROPERTIES

General Properties & Application	PETROSTEP D-7E	PETROSTEP D-8E	PETROSTEP D-12E
Appearance	Clear, yellow liquid	Clear, yellow liquid	Clear, yellow liquid
Surfactant type	Nonionic	Nonionic	Nonionic
Solubility in aliphatic solvents	Dispersible	Dispersible	Insoluble
Solubility in alcohols	Soluble	Soluble	Soluble
Solubility in aromatic solvents	Soluble	Soluble	Soluble
Solubility in water	Soluble	Soluble	Soluble
Treating rate (based on 10% solution as is)	0.5–1 gpt* (500-1,000 ppm)	0.5–1 gpt (500-1,000 ppm)	1–2 gpt (1,000-2,000 ppm)
Suggested formulation usage	Soluble	Soluble	Soluble

*GPT = gallons per 1,000 gallons

Application Testing Results

TEST RESULTS IN LATAM HEAVY CRUDE (API < 20°C) IN N-HEPTANE*



Control DDBSA-based dispersant PETROSTEP D-7E PETROSTEP D-8E PETROSTEP D-12E

Treating rate: 1000 ppm of 10% by weight product diluted in aromatic solvent

Results (24 hours static): Less than 0.1% of sediment was observed from the ones treated with PETROSTEP D-7E, 8-E, and 12-E. As evidenced by the above test tubes, the PETROSTEP products prevent or significantly delay asphaltene precipitation relative to the untreated and dispersant-treated crude oil.

*Procedure was adapted from ASTM D3279

The Role of Asphaltene Inhibitors

Our innovative **PETROSTEP D-7E, D-8E, and D-12E** inhibitors are proactive. Unlike asphaltene dispersants, with address existing clusters these inhibitors prevent aggregation from the outset of depressurizing and cooling of the crude oil during production from the reservoir to the surface.

Here's How:

- Agglomeration Prevention:** By modifying asphaltene surface properties, the PETROSTEP D Series inhibits clumping, ensuring smoother flow.
- Fluid Composition Optimization:** PETROSTEP D Series fine-tunes fluid composition, discouraging asphaltene molecules from forming solid deposits.

What Makes PETROSTEP D Series a Smart Choice?

- Solubility in Alcohol and Aromatic Solvents:** Seamless integration into various formulations.
- Compatibility with Fluids:** Whether production or workover, PETROSTEP D plays well.
- Flow Assurance Champion:** Maintains fluid integrity and operational excellence.

In Summary

While asphaltene dispersants address the aftermath, PETROSTEP D Series prevent issues at the source.

For more information on the PETROSTEP D Series for use as an Asphaltene Inhibitor, call 713.955.8100 or for information on other Stepan products visit stepan.com/oilfield

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