

TSPL's wax deposition flow loop is a hub of innovation, driving transformative research in multiphase flow dynamics. With advanced instrumentation and visualization capabilities, it provides crucial insights into wax removal mechanisms. Pioneering initiatives conducted within the loop, like self-pigging technology and wax inhibition proofs, lead to substantial cost savings and enhanced operational efficiency for clients. This loop stands as a testament to TSPL's commitment to excellence and industry leadership.

Applications

TSPL's wax deposition flow loop addresses critical challenges in crude oil transportation:

- Simulates pipeline restart dynamics with gelled waxy crude oil.
- Conducts large-scale wax deposition experiments.
- Evaluates wax inhibitor effectiveness.
- Analyzes wax deposition in gas-dominated oil condensate flow.
- Optimizes parameters for efficient wax stripping.
- Provides insights for mitigating wax buildup through operational adjustments.

Testing Capabilities

Tridiagonal Solutions' testing capabilities include:

- Assessing aging and temperature effects on restart pressure.
- Evaluating wax inhibitors' impact on deposition.
- Conducting single and multiphase flow studies.
- Providing flow visualization tools.
- Quantifying wax deposition before and after experiments.
- Analyzing pressure dynamics and liquid velocities.
- Examining liquid loading effects on wax deposition.



Wax Deposition Loop



Mini Loop



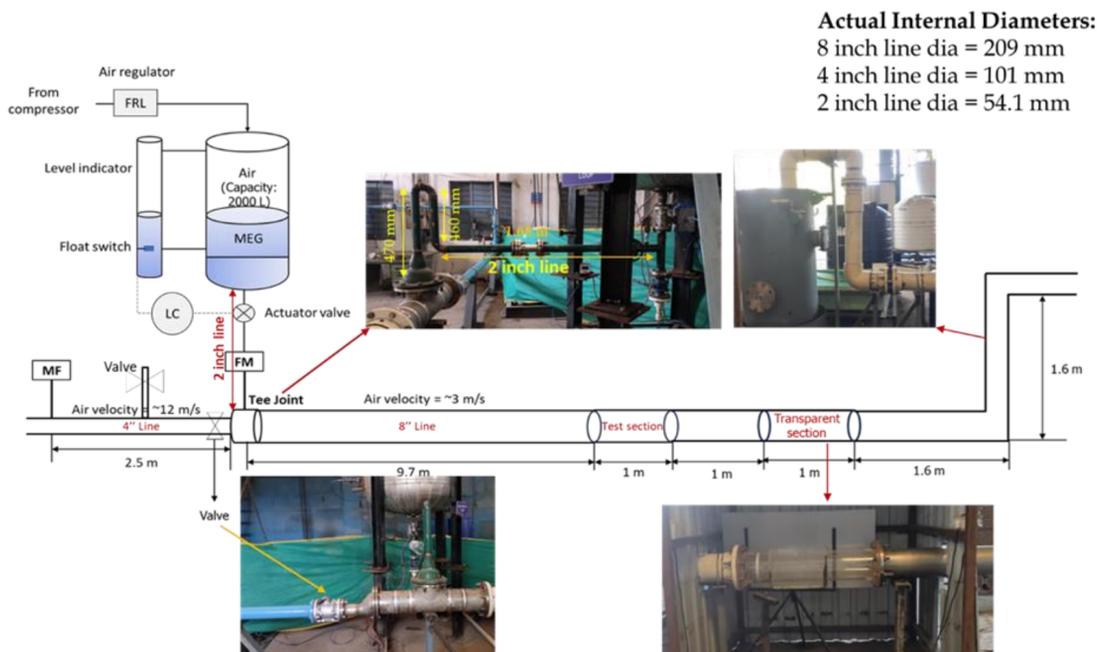
Cold Finger, Wax Deposition & Wax Stripping

Test Facility

- Wax testing facility: Largest deposition flow loops globally with 2-inch and 4-inch sections, 43 meters long.
- Equipped with temperature and pressure transmitters for data collection and specialized visualization sections.
- Innovations include self-pigging and wax inhibition technologies, saving billions.
- Mini loop (0.5-inch diameter, 1 meter long) for rapid inhibitor testing.
- MEG flushing loop for efficient wax stripping parameter determination.



Image of Wax Deposition Loop



MEG Flushing Loop

Operating Range of Multiphase Wax Deposition Loop

Test section diameter	2 and 4 inches
Test section length	43 m
Reynolds number	1,500 to 10,000
Superficial gas velocity	0 to 10 m/s
Gas flow rate	290 m ³ /h or 0.25 mmscfd
Superficial liquid velocity	0 to 1.25 m/s
Liquid flow rate	36 m ³ /h or 5500 bpd (10,000 bpd)
Cooling capacity	60 TR
Wall temperature	45 to 90 F
Crude oil temperature	50 to 110 F
Glycol temperature	40 to 70 F
Fluids	Crude Oil, Mineral Oils, Water, and Air
Measurements	DP and Mass of Wax Deposit

Operating Range of Mini Loop

Test section pipe size	0.5/15 inch/mm
Test section length	1 m
Test section outer pipe size	2 inch
Velocity	0.2 - 3 m/s
Reynolds number	400 - 1000
Oil temperature	10 - 45 °C
Wall temperature	5 - 20 °C

Operating Range of MEG Flushing Loop

Gas velocity	1 -10 m/s
MEG volume used for flushing	1- 2000 L
Pipe size	8 inch

About us: Tridiagonal Solutions, founded in 2006, specializes in process R&D and digital transformation for global industries. With a team of 300 experts, we offer consulting services and digital solutions, leveraging our strong domain expertise and technology experience.

Focus areas: Sand Transport Analysis, Wax Deposition Evaluation, Asphaltene Deposition Investigation, Erosion testing, Erosion-Corrosion testing, Multiphase FI About us: Tridiagonal Solutions, founded in 2006, specializes in process R&D and digital transformation for global industries. With a team of 300 experts, we offer consulting services and digital solutions, leveraging our strong domain expertise and technology experience.

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