

Pipeline Restart Loop

for simulation of wax, paraffin and asphaltene deposition behaviour and yield strength measurement



- Yield strength measuring at zero shear rate
- For wax inhibitor, flow improver and anti-fouling agent testing
- Special pump: absolutely pulsation free, full pressure starting at zero flow rate, temperature controlled
- Optional second pump for oil/oil or oil/water mixtures and sectionwise fluid mixing
- Pressure and flow rate monitoring
- Available in varying levels of automation
- Test loops exchangeable easily
- Easy handling and cleaning
- Custom made versions available

Deposition of complex and heavy organic compounds, which exist in petroleum crude and heavy oil, can cause a number of severe problems up to pipeline blocking.

The Pipeline Restart Loop is suitable to perform pipeline restart tests regarding wax/paraffin and asphaltene deposition:

- Pipeline blocking simulation with **exchangeable test pipelines**
- **Yield stress** tests (**yield strength** measurements)
- Creep tests (with additional pump at pipeline outlet)

The test pipeline is filled with oil and cooled down. Then, the pulsation-free pump system increases the pressure at small flow rates. The pressure is measured by a fast data acquisition system (see next page). Measurements with untreated and treated samples can be compared to show the chemical's effectiveness.

The especially designed, heated pump system provides an absolutely **pulsation-free flow**, with **maximum pressure starting at zero flow rate**.

The instrument provides yield stress measurements in a most realistic environment. The test pipelines are exchangeable easily. This provides high flexibility in pipeline length and diameter to change cross section to circumference ratios.

All tubing is stainless steel, and especially the test pipelines have a defined inner roughness, which is highly important to assure reproducible paraffin deposition and pipeline rheology test results.

Heating and cooling devices are scalable to exactly meet your requirements.

Pressure and flow rate are stored and exported in an Excel readable format.

Applications:

- Wax inhibitor effectivity testing
- Selection of wax inhibitors
- Yield stress and pipeline restart
- Flow improver testing

Options/Accessories:

- Full automation with automated cleaning procedure
- Multiple sample/cleaning fluid containers
- Computer controlled magnetic stirrer



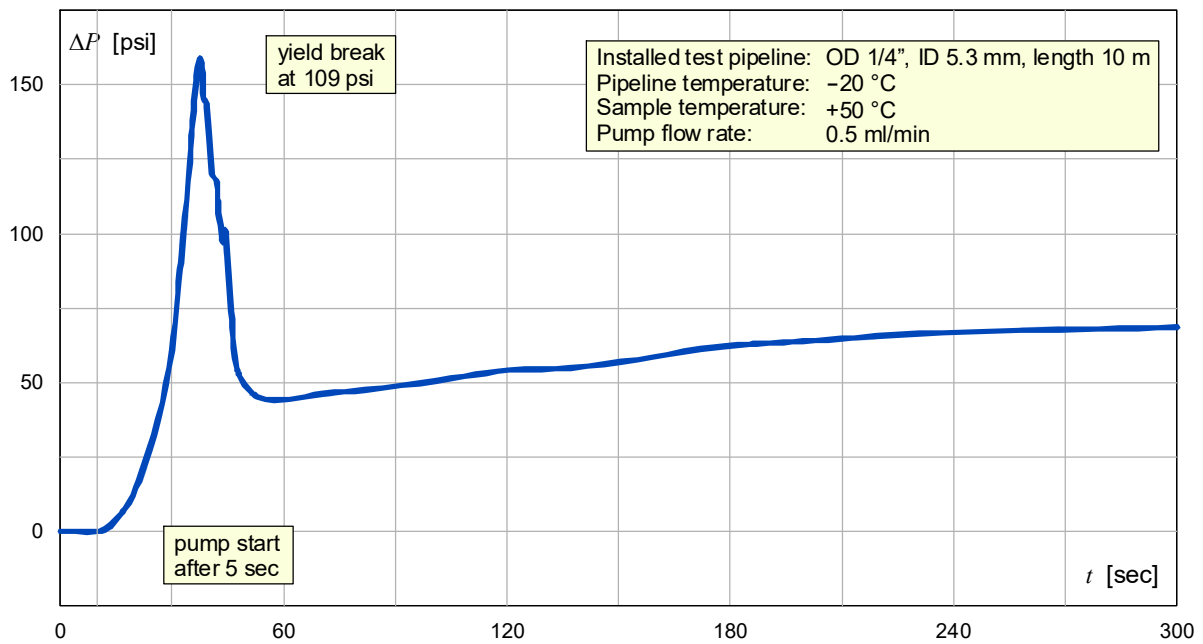
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Pipeline Restart Test: Heavy Crude Oil



Technical Data:

| | |
|--------------------------|--|
| Absolute pressure range: | 40 bar (580 psi), alternatives possible |
| Temperature range: | of sample: ambient to +80 °C of test loop: -30 °C to +90 °C (alternatives possible, depending on cooling/heating devices) |
| Flow rate: | 0.01 to 80 ml/min, alternatives possible |
| Display: | PC display and temperature display on instrument |
| Software: | Windows 9x/2k/XP/7 |
| Power supply: | 240 VAC / 50Hz, alternatives available |
| Power consumption: | 3100 W max |



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