ForeSite Flow VSR

Provides unprecedented flow intelligence with non-nuclear simplicity

Applications

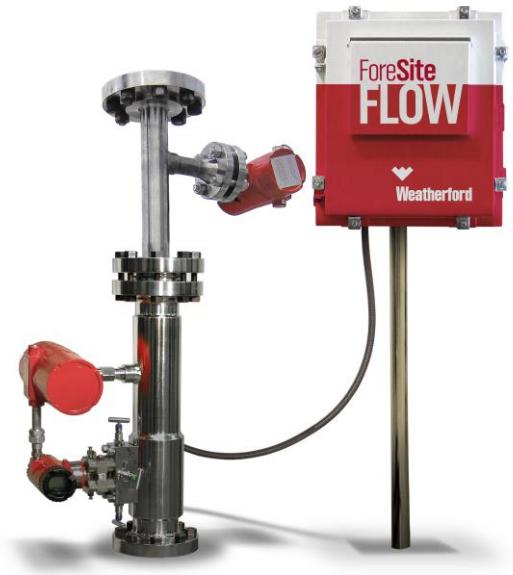
- Individual or group wells
- Wells where nuclear-sourced flowmeters are restricted
- Wells with challenging fluid regimes, including corrosive fluids, high pressures, salinity, impurities, and transient slug conditions
- Wells with space limitations
- Test-separator replacement

Features and Benefits

- Continuous, real-time multiphase flow-measurement capabilities provide precise reservoir and production reporting with split-second resolution for every well environment from heavy oil to wet gas.
- Eliminating the gamma densitometer enables full-range flow-measurement data without the restrictions, costs, and HSSE risks associated with nuclear-source management.
- Production 4.0 capabilities and intuitive dashboards deliver real-time data, alarms, and alerts to any PC or smart device.
- Intelligent built-in diagnostic mechanism confirms that the system is performing within the design and operating conditions.
- Remote connectivity allows users to automate the well-testing process, validate results, and deliver production-management analysis and recommendations. It also supports remote meter configuration, PVT uploading, and data-reprocessing capabilities.
- Sonar technology delivers precise flow rates at any gas-to-liquid ratio.
- Industry-leading Red Eye near-infrared absorption technology measures the full range of water cut from 0 to 100 percent for any environment, including wet gas.
- Separation-free measurement reduces equipment, installation, and maintenance costs associated with three-phase separation systems.
- Simplified design has no moving parts, level-control issues, or frequent-calibration needs for enhanced personnel efficiency.
- Durable construction withstands extreme environments and works with solar-powered applications.

Tool Description

ForeSite Flow VSR is a full-range, non-nuclear multiphase flowmeter that delivers unprecedented flow-data intelligence with non-nuclear simplicity. This technology monitors individual or group wells with real-time, split-second accuracy. Built for any production environment including heavy oil and wet gas, this exclusive flow-measurement system performs flawlessly in any gas-to-liquid ratio without requiring separation or a gamma densitometer.



ForeSite Flow VSR is a full-range, non-nuclear multiphase flowmeter that provides complete flow-measurement precision while reducing wellsite complexity, equipment costs, and pad-size requirements when compared with conventional three-phase separators.

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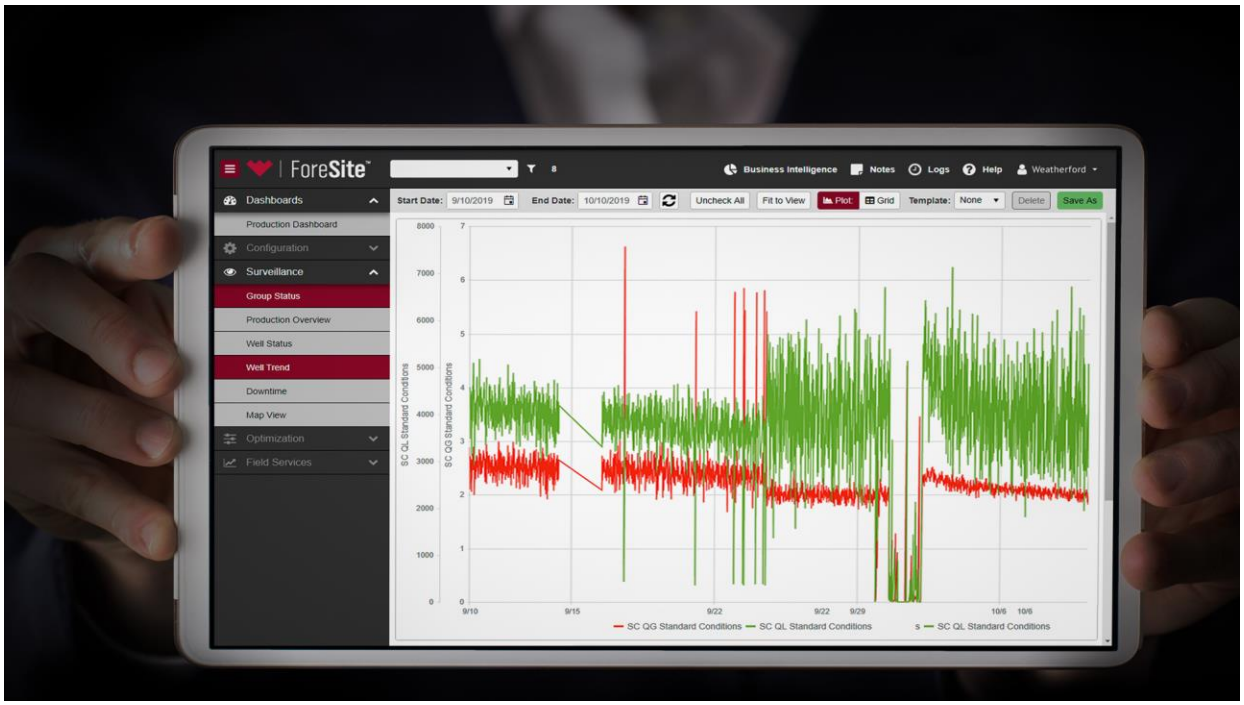
ForeSite Flow VSR

Tool Description (continued)

By eliminating test separators from the wellsite and erasing the nuclear-source management associated with other multiphase flowmeters, ForeSite Flow VSR reduces both capital and operating expenses while increasing well-test frequency and accuracy. Built upon field-proven Weatherford VSR technology, ForeSite Flow delivers real-time flow data though a proprietary combination of measurements.

ForeSite Flow VSR is the only three-phase surface system to combine two Weatherford-exclusive technologies—Red Eye water-cut meters and sonar-based velocity measurements—along with traditional Venturi measurements. Using an integrated flow computer, the flowmeter manages all fluid properties and set-up parameters for multiple well profiles. The unique sonar array—combined with Venturi measurements—provides total gas and liquid rates. An array of external strain sensors collects data for gas, liquid, and gas/liquid mixtures that is then processed with a proprietary algorithm that never requires recalibration. The Red Eye meter provides water-cut measurements that are independent from GVF and water chemistry. By measuring key wavelengths in the near-infrared spectrum, the Red Eye meter distinguishes water, methanol, and liquid hydrocarbon at the molecular level.

Accessible from any laptop, tablet, or smartphone, ForeSite Flow VSR presents intuitive dashboards that provide real-time production rates and fluid properties for true reservoir behavior and production insight. Through unprecedented flow-measurement accuracy, operators can access up-to-the-second data for wells with any gas-to-liquid ratio, while automating well-test processes and validations.



As the only flow-measurement solution with Production 4.0 intelligence, ForeSite Flow VSR enables automated well-test processes and validation through intuitive dashboards to any PC, tablet, or smartphone, anywhere in the world.

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Specifications

Operating

Supply voltage	11 to 30 VDC / 110 to 230 VAC
Power requirement[A]	<30 W
Host communications interface	Modbus RS485 or TCP/IP
Process temperature	-4 to 300°F (-20 to 150°C)

[A] Varies based on display options

Mechanical

Material options	316 stainless steel, duplex, and corrosion-resistant alloys
Nominal pipe sizes	2 in., 3 in., 4 in., 6 in., 8 in., and 10 in.
Flange pressure rating	ANSI 600, 900, 1500, and 2500
Pressure compliance	CRN and PED available

Environmental

Hazardous location ratings	Class 1, Div. 1; ATEX Zone 1; IECEx Zone 1; N.A. Class 1, Zone 1
Material	NACE MR0175/ISO 15156 compliance
Ambient temperature rating	Flowmeter: -40 to 158°F (-40 to 70°C); Flow computer: 14 to 140°F (-10 to 60°C)

Water/Liquid Ratio Performance

GVF percentage	GVF < 20%	20% < GVF < 95%	95% < GVF < 98%	98% < GVF < 99.5%
Water/liquid ratio absolute uncertainty	±2%	±3%	±4%	±10%
Water/liquid ratio absolute repeatability	±0.2%	±0.5%	±1%	±3%

Gas and Liquid Flow-Rate Performance

GVF percentage	GVF < 20%	20% < GVF < 90%	90% < GVF < 98%	GVF > 98%
Gas flow-rate relative uncertainty	±10%	±7%	±5%	±5%
Gas flow-rate repeatability	±0.1%	±0.1%	±0.05%	±0.05%
Liquid flow-rate relative uncertainty	±5%	±7%	±10%	±1.5 bbl/MMSCF
Liquid flow-rate repeatability	±0.05%	±0.1%	±0.1%	±0.1 bbl/ MMSCF