CleanPhase
Well test separator
Faster, environmentally friendly cleanup operations
Multiphase fluid separation is one of the toughest challenges in the oil field, yet separator technology has remained largely unchanged for 25 years. Now, Schlumberger Testing Services introduces next-generation separation with SmartWeir technology.

APPLICATIONS

- Onshore and offshore oil and gas well testing and cleanup
- Operations with strict water and hydrocarbon disposal requirements

BENEFITS

- Improved safety
- Reduced cleanup time
- Minimized risk to the environment while allowing the recovery of expensive fluids

FEATURES

- Adjustable weir system
- Time domain reflectometry technology to measure oil-layer thickness
- Compartment to capture and remove flowing solids
- Coriolis meters to monitor flow rate
- Enhanced mist extractor to reduce liquid carryover
- Water flow rate accommodation during cleanup
- Reliable flow rate data, including measurements in ultralow flow rates
REDUCE RIG TIME AND COSTS
The Schlumberger CleanPhase* well test separator with SmartWeir* phase separation technology brings together new and proven technologies for acquiring accurate dynamic reservoir data. The CleanPhase separator enables faster and more cost-efficient processing of well effluents from onshore and offshore development, exploration, and appraisal wells.

Combining an advanced flowmetering system and an optimized separation process and innovative level-control system designed around SmartWeir technology enables the CleanPhase separator to perform dynamic reservoir testing within a wide range of conditions. Gas flaring, oil burning, water treatment, and solids-removal components can be added to develop well testing and cleanup solution systems for specific well conditions. These conditions include solids-producing environments, low-API oils, oil-brine separation in high flow rates, high pressures, water and hydrocarbon disposal under strict environmental controls, integration with water treatment processes, and rig space limitations.

REDUCE CLEANUP TIME
The PhaseTester* portable multiphase well testing equipment with Vx* multiphase well testing technology and the CleanPhase well test separator are configured to quickly address a range of testing and cleanup situations. Increased safety for personnel and data quality improvement are among the benefits of this well testing and cleanup system.

The CleanPhase well test separator is a next-generation horizontal separator that operates as a stand-alone unit or in combination with PhaseTester equipment. In a combination configuration, high-quality flow measurements are unaffected by separation issues such as foaming oil (carryover), emulsions, and gas carryunder (gas in the oil line). All CleanPhase separators are manufactured under appropriate Type Approval and are provided with a Certificate of Conformity and a full quality file. These separators are also available with Conformité Européenne (CE) certification.

REDUCE ENVIRONMENTAL IMPACT
Operating under strict environmental requirements for water and hydrocarbon disposal, the CleanPhase well test separator increases separation efficiency while limiting environmental impact during separation and cleanup. CleanPhase separator technology eliminates the need to dispose of unseparated fluids during cleanup periods and enables the recovery of expensive fluids.

The CleanPhase separator uses SmartWeir technology and Coriolis high-accuracy meters to ensure more efficient separation and cleanup while minimizing potential risks to the environment. SmartWeir separation technology optimizes the retention times of any of the three phases and reduces the risk of releasing unseparated fluids. Coriolis meters remain in line, providing continuous measurements of all of the phases while eliminating the need to release gas into the atmosphere.

REDUCE PRODUCTION UNCERTAINTY
Reservoir characterization challenges have placed a greater emphasis on well testing and the role it plays in field assessment and development. When quantifying the dynamic properties of your reservoir, there is no room for production uncertainty. The CleanPhase well test separator optimizes your reservoir’s production through more accurate phase separation and testing.

Eliminate guesswork when accurate reservoir characterization is critical, and be certain.
Equipped with Coriolis high-accuracy meters, the CleanPhase separator provides accurate flow rate measurement for each of the three phases. The Coriolis meters monitor water flow rate with a fullbore design that prevents clogging and allows greater solids volumes to pass through the separator during cleanup. The Coriolis meters, coupled with PhaseTester equipment, provide redundant flow rate data for additional quality control independent of separating efficiency. They also provide a direct comparison of phase separability.

SmartWeir technology allows optimizing the retention times of the various phases, improving separation efficiency and reducing the risk of disposing of unseparated fluids, which could lead to potential environmental issues.
The CleanPhase separator has SmartWeir technology that uses radar to unobtrusively monitor liquid levels and adjust the height of the weir, enabling the CleanPhase separator to be a true three-phase separator.

SEPARATE THREE PHASES

SmartWeir technology

SmartWeir technology offers improved fluid handling capabilities in the form of optimized retention times while enabling the CleanPhase separator to be a true three-phase separator. The separator remains inline from initial opening of the well to final shut-in.

Coriolis high-accuracy meters

The Coriolis high-accuracy meters remain in line, continually measuring all of the phases. They also eliminate the need to release gas into the atmosphere.

Improved operations safety

Improved safety is enabled by flowing to a higher-pressure vessel during cleanups and eliminating the need to vent gas into the atmosphere when changing orifice plates.
OPTIMIZE RETENTION TIME WITH SMARTWEIR TECHNOLOGY
The CleanPhase separator, fitted with an adjustable weir, accommodates fluctuating water flow rates and high water cuts. This adjustable weir allows optimizing the retention times of the various phases to improve separation efficiency and to reduce the risk of disposing of unseparated fluids, possibly leading to environmental issues. The adjustable weir also enables the CleanPhase separator to be on line during the cleanup phase. The SmartWeir technology allows setting the oil collection point inside the CleanPhase separator vessel as high as 65% or as low as 35%, and setting the oil-layer thickness from 0% to 65% of the vessel ID.

This well test separator can also handle limited amounts of solids. Furthermore, it eliminates the need to flow through a low-pressure surge tank or gauge tank during cleanup, thereby reducing HSE hazards. Faster cleanup operations are possible because the effluents can be processed when the well is cleaned up on large chokes. Environmental risks are reduced dramatically because there is no need to dispose of unseparated fluids during cleanup periods. The optimized liquid-liquid separation results in less water in the oil line (optimizing the burning process) and less oil in the water line (conditioning the water to be treated for disposal).

MONITOR FLOW RATE DATA ACCURATELY WITH CORIOLIS METERS
The CleanPhase well test separator can be equipped with an optional single-phase flowmetering system using Coriolis meters for all three phases. This provides direct measurements of various parameters at line conditions, allowing monitoring the efficiency of the separation process.

When used in tandem with PhaseTester equipment, Coriolis meters provide redundant flow rate data for further quality control. This option enables accurate flowmetering of each phase at the separator outlets. It is useful in operations in which no PhaseTester equipment is available or when the Vx Advisor® multiphase metering advisory software indicates that well conditions fall outside the operating envelope.
**Advantages**
- Reduce rig time and costs
- Reduce cleanup time
- Reduce environmental impact
- Reduce production uncertainty
- Separate three phases
- Optimize retention time
- Monitor flow rate data

**Quick Links**

**Multimedia**
*Click images or visit [www.slb.com/CleanPhase](http://www.slb.com/CleanPhase) to watch videos.*

**Technical presentation**
The surface testing product champion talks about the benefits and features of the CleanPhase well test separator.

**Animation**
Learn about the CleanPhase separator’s innovative functions during well testing and cleanup.

**Related Information**
*Click below or visit [www.slb.com/CleanPhase](http://www.slb.com/CleanPhase) to view documents.*

**Case Study**
- CleanPhase Service Confirms Three-Phase Flow Rate Test Results
- Enable Recovery of Expensive Brine

**Product Sheet**

**Related Products**
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- **PhaseTester**
  - portable multiphase well testing equipment
- **PhaseSampler**
  - multiphase sampling equipment

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