VINCI TECHNOLOGIES

FLUID ANALYSIS

PRODUCT CATALOG

2026

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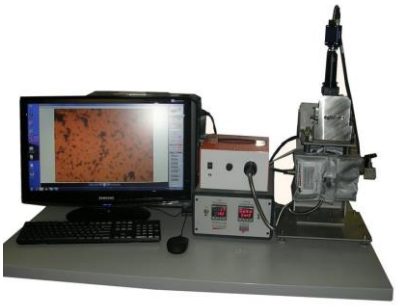
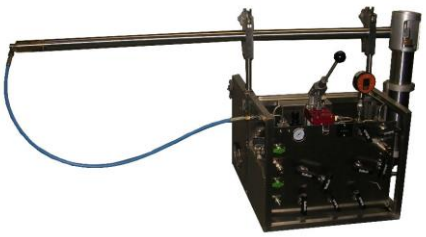
FLUID ANALYSIS

PVT

H/C Composition



Flow assurance



Fluid sampling

ISO 9001
BUREAU VERITAS
Certification

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PVT SYSTEM FOR PVT AND ASPHALTENE & WAX STUDIES (STANDARD & MAXI FLUID EVAL)

The Fluid Eval PVT system performs hydrocarbon phase behavior studies at reservoir-representative conditions of pressure and temperature. The apparatus warrants excellent reliability on black oil, volatile oil and gas condensate samples. It can also be configured with an infrared laser-based solid detection system (SDS) and high pressure microscope (HPM) to enable a variety of asphaltene and wax solid deposition experiments.

FEATURES

Cell volume / Pressure : 500 cc / 20,000 psi (standard Fluid Eval model)
1,000 cc / 15,000 psi (maxi Fluid Eval model)
Temperature: Ambient to 200°C (option: -20°C)
Temperature regulation: ± 0.5 °C
Volume accuracy: 0.01 ml
Pressure accuracy: 0.1% Full scale
Liquid deposit accuracy: ± 0.01 ml
Power supply: 220 VAC, 50/60 Hz

BENEFITS

- ✓ Versatile design
- ✓ Mercury free operation
- ✓ Large cell volume for representative sample studies
- ✓ Automated phase detection and phase volume measurement
- ✓ Embedded pump for precise pressure control and volume measurement
- ✓ Video camera system for recording PVT experiments in real time
- ✓ Magnetic driven stirrer for rapid phase equilibrium
- ✓ Motorized rocking system for cell positioning
- ✓ Sub-ambient temperature control
- ✓ Add-on modules for solid detection, viscosity and density measurement

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FULL VISUAL PVT SYSTEM (VISUAL FLUID EVAL)

The Visual Fluid-Eval PVT system performs hydrocarbon phase behavior studies at reservoir-representative conditions of pressure and temperature. Characterized by a full visual cell, the apparatus warrants excellent reliability on black oil, volatile oil and gas condensate samples. The full visual cell is particularly suited for studies requiring visual monitoring of the hydrocarbon sample, e.g. swelling tests, volatile oil and gas condensates studies. The system utilizes an embedded high-pressure pump to control and monitor the fluid's pressure and volume within the cell. A single cell is employed for both oil and gas condensates studies. For oil studies, the cell is in the upright position whereas for gas condensate studies, it is inverted to maximize the dew point detection efficiency. Cell rotation is achieved via a powerful motorized rocking mechanism. A video camera system continuously surveils the gas/liquid interface and measures the volume of retrograde condensate during gas condensate studies. A magnetically coupled stirrer mounted inside the sample chamber provides efficient fluid mixing and ensures fast thermophysical equilibrium. Homogeneous sample heating is generated by heating cartridges embedded in the cell body.

FEATURES

Volume / Pressure: 15,000 psi /400 ml (Visual Fluid Eval model)
25,000 psi / 250 ml (HP Visual Fluid Eval model)

Temperature: up to 200°C

Temperature regulation: ± 0.2 °C

Volume accuracy: 0.001 ml

Liquid deposit accuracy: 0.005 ml

Power supply: 220 VAC 50/60 Hz

BENEFITS

- ✓ Versatile design
- ✓ Mercury free operation
- ✓ Minimum dead volume
- ✓ Full sample visibility for greater operational capability
- ✓ Embedded pump for precise pressure control and volume measurement
- ✓ Video camera system for recording PVT experiments in real time
- ✓ Magnetic driven stirrer for rapid phase equilibrium
- ✓ Motorized rocking system for cell positioning
- ✓ High temperature pressure transducer with extreme accuracy of 0.02% FS
- ✓ Special polyimide sealing resistant against fast gas decompression
- ✓ Sub-ambient temperature control

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FULL VISUAL PVT SYSTEM FOR CO2 SOLUBILITY TRAPPING STUDIES (300CC - HC)

The FULL VISUAL 300-HC FLUID-EVAL ANALYSER is specifically designed for brine-CO2 thermodynamics studies in CCUS programs. With a sapphire window and a short-wave infrared (SWIR) video system, it enables visual observation and precise determination of the bubble point of the CO2-brine complex. Diffusion rate of CO2 in brine can also be determined. It provides a controlled environment for in-depth investigations into CO2-brine interactions and phase behavior. This cell is valuable for CCUS research, providing insights into CO2 behavior. It contributes to decision-making in carbon capture, utilization and storage. The Full Visual PVT cell is most probably the most accurate method to measure the solubility of CO2 in aquifer reservoir, which is a key step to calculate the CO2 storage capacity of a specific site (solubility trapping). The system can also be equipped with a Salt Crystallization System (SCS) to detect salt deposition in CO2 brine complexes by measuring visible light transmittance through fiber optic probes in a PVT cell. It helps identify the onset conditions for salt precipitation, aiding in understanding and mitigating potential issues in CO2 storage and related applications.

FEATURES

Pressure: 15,000 psi
Cell volume: 300 cc
Temperature: Ambient to 200°C (-10°C optional)
Wetted parts: Hastelloy
Volume accuracy: 0.001 ml
Temperature regulation: ± 0.2 °C
Pressure accuracy: 0.02% Full scale
Power supply: 220 VAC 50/60 Hz

BENEFITS

- ✓ Most accurate method for CO2 solubility measurement
- ✓ Outstanding bubble point detection with SWIR camera
- ✓ Versatile design
- ✓ Mercury free operation
- ✓ Minimum dead volume
- ✓ Full sample visibility for greater operational capability
- ✓ Embedded pump for precise pressure control and volume measurement
- ✓ Special polyimide sealing resistant against fast gas decompression
- ✓ Automated phase detection and phase volume measurement

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FIELD PVT SYSTEM (MOBILE FLUID EVAL)

The elegant yet robust mobile Fluid Eval PVT system adequately performs PVT studies in a laboratory or under the harsh site conditions, e.g. dust, vibrations, temperature fluctuations etc. The system utilizes an embedded high-pressure pump to control and monitor the fluid's pressure and volume within the cell. The apparatus warrants excellent reliability on black oil, volatile oil and gas condensate samples. A single cell is employed for both oil and gas condensates studies. For oil studies, the cell is in the upright position whereas for gas condensate studies, it is inverted to maximize the dew point detection efficiency. Cell rotation is achieved via a powerful rocking mechanism. A video camera system continuously surveils the gas/liquid interface and measures the volume of retrograde condensate during gas condensate studies. A magnetically coupled stirrer mounted inside the sample chamber provides efficient fluid mixing and ensures fast thermophysical equilibrium. Homogeneous sample heating is generated by an efficient isothermal heating jacket.

FEATURES

Pressure: 15,000 psi

Temperature: Ambient to 200°C (400 °F)

Temperature regulation: ± 0.5 °C

Cell volume: 300 cc with 30 cc visual

Volume accuracy: 0.01 ml

Pressure accuracy: 0.1% Full scale

Liquid deposit accuracy: ± 0.01 ml

Power supply: 220 VAC 50/60 Hz

BENEFITS

- ✓ Versatile design
- ✓ Mercury free operation
- ✓ Automated phase detection and phase volume measurement
- ✓ Embedded pump for precise pressure control and volume measurement
- ✓ Video camera system for recording PVT experiments in real time
- ✓ Magnetic driven stirrer for rapid phase equilibrium

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EDUCATIONAL PVT CELL (EDUCATIONAL FLUID EVAL)

The educational Fluid Eval is a compact PVT cell designed for small volume PVT, thermodynamic properties and phase behavior studies of black oil and gas condensate samples. The PVT cell is composed of an efficient fluid mixer mounted on the piston, a dedicated visual head, two sampling valves, an accurate pressure transducer and an electric heater enabling a homogeneous temperature control. A digital camera system monitors the liquid/gas interface through the sapphire windows. During differential vaporization or flash liberation, the removal of the gas phase is facilitated by the full visibility of the gas/oil interface through the cell window. For oil studies, the cell is in an upright position, and is inverted for gas condensate experiments.

FEATURES

Pressure: 10,000 psi
Temperature: Ambient to 175°C (350 °F)
Temperature regulation: ± 0.5 °C
Cell volume: 100 cc
Volume accuracy: 0.01 ml
Pressure accuracy: 0.1% Full scale
Liquid deposit accuracy: ± 0.01 ml
Power supply: 220 VAC 50/60 Hz

BENEFITS

- ✓ Versatile design
- ✓ Cost effective PVT cell
- ✓ Designed for instructional purposes
- ✓ Perfectly suited for educational and research establishments
- ✓ Mercury free operation
- ✓ Requires small sample volume
- ✓ Computer controlled with PVT reporting facilities
- ✓ Automated phase detection and phase volume measurement
- ✓ Video camera system for recording PVT experiments in real time
- ✓ Magnetically driven stirrer for rapid phase equilibrium
- ✓ Manual rocking system for cell positioning

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POROUS MEDIA PHASE BEHAVIOR TESTING SYSTEM (POROPHASE)

The POROPHASE system is designed to investigate the thermodynamic behavior of petroleum fluids within porous media under representative reservoir pressure and temperature conditions. The apparatus enables precise determination of the saturation point (bubble point or dew point) of a fluid confined within a porous sample. The tested fluid may consist of live oil or gas condensate, allowing the study of multiphase behavior in reservoir rock. Real-time visualization of phase transitions is achieved using a high-resolution video camera positioned at the front face of the core sample. The porous sample is installed in a high-pressure core holder and subjected to controlled confining pressure and absolute temperature representative of reservoir conditions, enabling faithful reproduction of in-situ environments. The core holder features a transparent sapphire end cap, providing complete visual access to the sample throughout the experiment, while the integrated video system continuously monitors the transition from single-phase to two-phase flow.

FEATURES

Temperature:	Ambient to 150 °C (300 °F)
Pressure:	up to 10,000 psi
Core diameter:	1’’1/2
Core length:	1’’ to 6’’
Loading type:	Hydrostatic
Wetted material:	Stainless steel
Fluids:	Gas condensates, live oil, dead oil
Power supply:	220 VAC 50/60 Hz

BENEFITS

- ✓ Real reservoir simulation: Operates up to 700 bar and 150°C, reproducing true HPHT reservoir conditions
- ✓ Real-time phase visualization: Sapphire window and video system allow direct observation of bubble/dew point and condensate formation
- ✓ High measurement accuracy: Precise pressure, flow, and volume control with automated data acquisition

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MANUAL GASOMETER (MG SERIES)

Designed for gas volume measurements at ambient conditions. The apparatus comes fully equipped with a glass tube, floating piston, crank, two valves, temperature probe, pressure sensor, encoder, display panel and two years spare and consumable items. The gas volume is measured in a tube with a ±0.04 mm accurate diameter accurate in which slides an air tight piston, creating a chamber with variable (up to 4 liters) volume. Injection or withdrawal causes volume and pressure variations inside the gasometer. The volume and corresponding pressure can precisely be measured by manually moving the piston via a rotary crank.

FEATURES

Volume:	4 liters
Pressure:	Vacuum to 20 psi
Volume reading:	0.1 ml
Pressure accuracy:	0.1%
Temperature resolution:	0.1°C
Weight	21 Kg
LxDxH	350 x 250 x 820 mm
Wetted parts:	Stainless steel
Power supply:	220 VAC 50 Hz

BENEFITS

- Easy operations
- Accurate volume, pressure and temperature measurements

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AUTOMATED GASOMETER (AG SERIES)

The automated gasometer accurately measures gas volumes at standard conditions; i.e. ambient temperature and atmospheric pressure. The gasometer encompasses a calibrated stainless steel chamber and a motor-driven piston. In the chamber, the gas influx can be set at either constant pressure or constant flow rate. Pressure, Volume, and Temperature of the test fluid are continuously monitored and displayed on an interactive touch screen panel. Manual inlet and outlet valves are utilized to control the flow. The assembly is mounted on a chassis supported by four heavy-duty casters.

FEATURES

Volume:	10 liters
Max Gas flow rate:	10 Liters/min
Pressure:	Vacuum to 58 psi
Volume accuracy:	0.1 ml
Pressure accuracy:	0.1%
Temperature resolution:	0.1°C
Temperature:	Ambient, option 50°C
Wetted parts:	Stainless steel
Power supply:	220 VAC 50 Hz

BENEFITS

- Accurate volume measurement
- Gas transfer at constant pressure or constant flow rate
- Automated operations

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LIQUID CONDENSATION TRAP

Designed to trap heavy compounds which might be produced during the liberation of the gas phase from the reservoir to the atmospheric conditions. The cooling trap is installed between the PVT cell and the gasometer. It consists of a cooling unit based on Peltier effect and a pyrex trap cylinder of 10 cc capacity. The temperature can reach up to -10°C. The composition of the trapped condensates can be analysed by gas chromatography.

FEATURES

Volume: 10 cc
Volume accuracy: 0.1 ml
Temperature: -10°C to Ambient
Power supply: 220 VAC 50 Hz

BENEFITS

- Compact, no use of cooling liquid.

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GAS OIL RATIO APPARATUS

The GOR apparatus measures the gas-oil ratio of live oil sample at standard conditions. The system comprises two 75cc pycnometers, a liquid trap, a gas recirculation pump and a flow meter. Live oil is transferred from the PVT cell into the first pycnometer whose atmospheric pressure conditions cause a flash liberation. Then the outlet valve of this pycnometer is opened, so that the gas phase can travel to the gasometer via another pycnometer. In order to ensure that vapor-liquid equilibrium has been reached, after the gasometer, the gas is recirculated through both pycnometers and readings are subsequently performed after stabilization. After the gas recirculation, the gas volume is read from the gasometer, while the dead oil volume is measured gravimetrically. The ratio of these quantities yields the GOR.

FEATURES

Temperature: Ambient
Flow rate: 100 cc/min
Pressure: atmospheric
Wetted parts: Stainless steel

BENEFITS

- Representative homogeneous samples
- Easy to use

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GOR SAMPLE PYCNOMETER

This U-tube pycnometer is used for determining the GOR of a live oil. It is based on a flow through vessel equipped with two needle valves and a burst disc. It is provided with a tare weight and calibrated volume. A predefined volume of lived oil sample is transferred into the pycnometer and the gas is released from the pycnometer to the gasometer by opening the valve slowly for determining the gas volume. The volume of flashed liquid remaining in the pycnometer is determined by measuring its weight and density. The GOR can then be derived.

FEATURES

Volume : 75 cc
Max pressure: 1,800 psi
Max temperature: Ambient
Material: Stainless steel

BENEFITS

- Easy to use

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GAS PYCNOMETER

This pycnometer is used for gas sampling and GC analysis. It is based on a flow through vessel equipped with two needle valves and a burst disc.

FEATURES

Volume : 75 cc
Max pressure: 1,800 psi
Max temperature: Ambient
Material: Stainless steel

BENEFITS

- Easy to use

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EQUILIBRIUM FLASH SEPARATOR APPARATUS

Designed to flash pressurized liquids and measure the gas oil ratio at equilibrium conditions. The liberated gas is measured with the gasometer at ambient conditions while the liquid is read in a graduated pyrex tube. Based on a two stage system with first stage maximum pressure of 500 psi while the second is at atmospheric. It consists of a precision bore, 40 cc high pressure pyrex cylinder with stainless steel closures on both ends, pressure gauge, backpressure regulator, valves and tubing. All components are assembled on a metal panel.

FEATURES

Volume: 40 cc
Pressure: Vacuum to 500 psi
Volume accuracy: 0.1 cc
Wetted parts: Pyrex and stainless steel
Power supply: 220 VAC, 50 Hz

BENEFITS

- Very easy to use
- Accurate liquid volume measurement
- Possibility to heat sample with an external heating fluid

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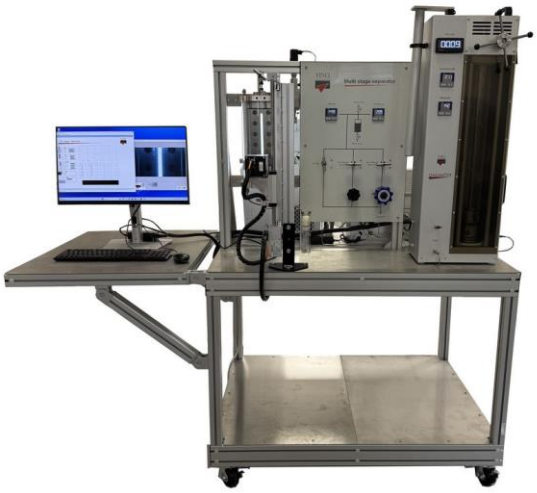
1500 PSI MULTI STAGE SEPARATOR (MS1500)

The MS1500 multistage separator is specifically engineered to evaluate the pressure-driven gas expansion of reservoir oil samples, enabling optimal oil–gas phase separation and accurate determination of the gas-oil ratio (GOR). The liberated gas is measured with the gasometer at ambient conditions while the liquid is read in a see-through visual cell. The system is designed to perform routine, multi-stage GOR measurements across a wide range of pressures and temperatures, including: a high-pressure separation stage from 1,500 psi down to atmospheric pressure at temperatures from ambient to 100 °C; an intermediate stage from 100 psi to atmospheric pressure at ambient temperature; and a final atmospheric stage at room conditions. This multi-stage approach replicates field separation conditions and ensures reliable PVT and flash characterization. The main parameters evaluated by the experiment include the formation volume factor, the separator volume factor and the solution gas-oil ratio. In tandem, specific gravity of the stock tank oil and oil & gas composition at each separator stages can be deduced.



FEATURES

Working pressure:	Up to 1,500 psi
Working temperature:	10 to 100 °C (215 °F)
Volume of the separator cell:	80 ml
Pressure accuracy:	0.1 %
Temperature accuracy:	+/-0.1 °C
Volume accuracy:	0.1 ml with the ruler and 0.01 with the camera
Electrical:	220 VAC, 50/60 Hz, 1 phase

BENEFITS

- Accurate GOR measurement through controlled multi-stage flashing.
- Realistic high-pressure separation up to 1,500 psi.
- Full sample visibility with a see-through high-pressure cell.
- High-precision readings for pressure, temperature, and volume.
- Optional automation with video interface detection and digital data acquisition.

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3000 PSI MULTI STAGE SEPARATOR (MS3000)

In the high-pressure reservoir, fluids exist for the most part, in one phase. Upon exiting the well, the phases dissociate and therefore must be transported separately. Therefore, the effluent hydrocarbons from the well head pass through a set of separators at different pressures which yield the optimum economical recovery of liquid and gaseous hydrocarbons; in an oil field, this equates to maximizing the produced liquid volume, i.e. minimizing the oil formation volume factor (B_o) and Gas-Oil-Ratio (GOR); the opposite being true for a gas field. The optimization parameters in the separation process are pressure and temperature. The MS300 multi-stage separator apparatus accurately simulates the reservoir fluid surface separation process and allows the optimum pressure variation regime to be determined by monitoring pressure and/or temperature-related changes in formation volume factor and gas-oil ratios. The device can also be utilized to validate theoretical models.

FEATURES

Working pressure:	Up to 200 bar (3,000 psi)
Working temperature:	10 to 100 °C (215 °F)
Volume of the separator cell:	250 ml
Stirring mechanism:	Magnetic driven stirrer
Pressure accuracy:	0.1 %
Temperature accuracy:	+/-0.1 °C
Volume accuracy:	0.01 ml
Electrical:	220 VAC, 50/60 Hz, 1 phase

BENEFITS

- Rapid equilibrium conditions
- Accurate liquid and gas volume measurements
- Efficient sample agitation

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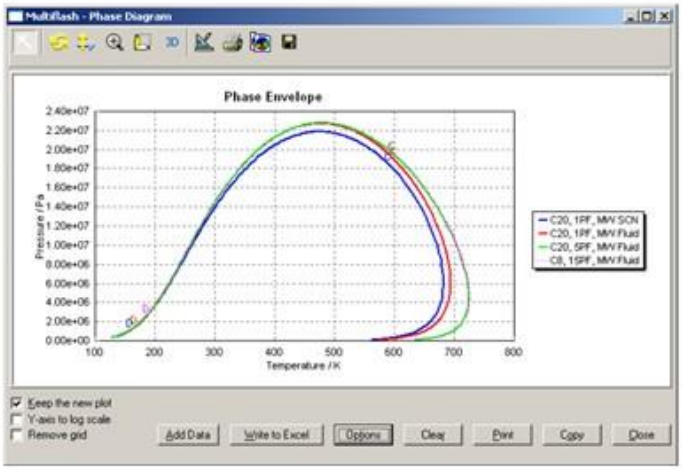
PVT SIMULATION SOFTWARE (FLUIDWORKS)

With years of reservoir and flow assurance analysis and software engineering experience, Vinci Technologies has developed the most efficient and ergonomic program to predict and validate fluid behavior by inputting critical parameters: Fuildworks®. For example, the operator can enter and characterize fluid composition which can obtained from Hydrocarbon Analysis experiments. The software will then compare these to its built-in database and report any statistical anomalies. Furthermore, PVT experiment results such as Bubble Point and fluid properties, e.g. viscosity can be inputted to refine the model. The latter may be tuned so that the outputs match the inputs and vice-versa. Another great feature is the Fluid Mixing module, where different composition hydrocarbons are inputted, and the software computes the composition of the mixture. PVT simulations (Constant Mass Expansion, Constant Volume Depletion, Differential Liberation, Multi-Stage Separator Test…) are performed by virtue of an adequately selected Equation of State (Peng-Robinson, Redlich-Kwong…).



The Fluidworks PVT software can be upgraded with optional solid precipitation modules (Asphaltene, Wax, Hydrates) which are available for users focusing on Flow Assurance studies.

ASPHALTENE MODULE:

Asphaltene is a highly viscous hydrocarbon deposition solid whose precipitation results from a drop in pressure which can occur in the well or pipeline during normal production or as a result of gas injection. By inputting the necessary parameters (composition of the live oil, reservoir temperature, bubble point,…) this module can predict the asphaltene onset pressure (AOP).

WAX MODULE

Wax is a highly viscous hydrocarbon deposition solid whose precipitation results from a drop in temperature which can occur in the well or pipeline during normal production. By inputting the necessary parameters (composition of the live oil including n-paraffin, reservoir pressure,…), this module can predict the Wax Appearance Temperature (WAT).

HYDRATES MODULE

Natural Gas Hydrates are a solid compound formed by the combination of free water and natural gas at high pressures and low temperatures. By inputting the necessary parameters (composition of the live oil or gas, reservoir pressure,…), this module can predict Hydrate formation and dissociation temperature. It can also simulate the effects of the most common hydrate inhibitors as well as water salinity.

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ROLLING BALL VISCOMETER (RBV 1000)

The rolling ball viscometer determines the viscosity of samples collected either down hole or at the surface. It uses the rolling ball principle where the travel time of a piston is used to obtain viscosity data, which are derived from correlation with curves of fluids with known viscosities. The RBV 1000 consists of a calibrated barrel equipped with two laser detectors at each end and a latch at its upper end. The latch holds and releases the piston while the lasers detect its departure and arrival, thereby allowing the travel time to be determined. A homogeneous, constant temperature profile is ensured by virtue of a heating mantle wrapped around the barrel. A computer system acquires the falling time and calculates the viscosity value.

FEATURES

Pressure range:	15,000 psi
Temperature range:	ambient to 190°C
Viscosity range:	0.2 to 10,000 cP
Cylinder slope:	45°, 65°
Sample volume required:	11 ml
Power supply:	220 VAC, 50 Hz

BENEFITS

- Easy to use
- Calibration procedure provided
- Accurate measurement for particular heavy oil
- Reservoir conditions of pressure and temperature
- Large range of viscosity
- Cost effective

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CAPILLARY VISCOMETER (CAVIS)

The CAVIS high-pressure capillary viscometer accurately determines the viscosity of single phase reservoir fluids. The apparatus is based on Poiseuille's law; specifically the relationship between pressure drop, flow rate, fluid viscosity and pipe geometry for a Newtonian fluid flowing in the laminar regime (Re<2300) through a constant cross-section pipe. By measuring the pressure drop and flow rate, fluid viscosity can be deduced. The computer-controlled instrument consists of a high-pressure opposed pump, two highly accurate pressure transducers, an isothermal convection air bath and a capillary tube. Moreover, to augment the range of measurable viscosities; a set of four different diameter capillary tubes are supplied.

FEATURES

Viscosity range:	0,02 cP to 10,000 cP
Sample volume:	10 ml
Pressure:	15,000 psi
Temperature:	Ambient to 200°C (400°F)
Temperature regulation:	±0.5°C
Pressure accuracy:	±0.02 % full scale
Wetted parts:	Stainless steel
Power supply:	220 VAC 50/60 Hz

BENEFITS

- Accurate viscosity measurement
- Provided with calibration procedure
- Broad viscosity range

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ELECTROMAGNETIC VISCOMETER (EV 1300)

The EV1300 is an advanced electromagnetic viscometer designed for precise measurement of fluid viscosity under controlled pressure and temperature conditions. It operates using a rigid, corrosion-resistant rod that is electromagnetically vibrated, with vibration amplitude directly influenced by the viscosity of the surrounding fluid. By analyzing this response, the device accurately calculates and displays dynamic viscosity on a computer screen. The EV1300 features a compact 20 cc measurement cell, making it efficient in terms of sample volume. It is supplied with two interchangeable probes covering a wide viscosity range from 0.2 to 10,000 cP. The instrument supports high-pressure applications up to 20,000 psi and temperatures up to 200°C. An integrated air bath ensures uniform thermal control during testing. Continuous monitoring is provided through built-in temperature and pressure sensors. The system is factory-calibrated and can be recalibrated on-site using NIST standards for long-term accuracy. Robust, reliable, and versatile, the EV1300 is well suited for demanding laboratory and industrial applications.

FEATURES

Temperature range:	up to 200°C
Pressure range:	up to 20,000 psi
Viscosity range:	0.2 cP to 10,000 cP
Accuracy:	±2% FS
Sample volume	20 cc
Wetted material:	Stainless steel
Dimensions:	700x950x650 mm
Power supply:	220 VAC 50 Hz

BENEFITS

- Wide measurement range for viscosity, pressure, and temperature.
- High accuracy and repeatability for reliable results.
- Low sample volume requirement (20 cc).
- Robust stainless-steel design for demanding applications.

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HEAVY OIL VISCOMETER (HOV 700)

The Heavy Oil Viscometer mainly consists of a rigid, corrosion-resistant rod which is electromagnetically vibrated by a constant power source. The amplitude of the vibrations depends on the viscous damping of the rod's surrounding fluid medium; by measuring these and inputting them into the rod's equation of motion, the dynamic viscosity can be calculated and digitally displayed on the electronic panel. The stainless steel viscometer includes a measurement cell designed for easy removal and fast & efficient cleaning.

FEATURES

Viscosity range:	10,000 Cp to 10^6Cp (model A) 1,000 Cp to 10^5Cp (model B)
Accuracy:	3% RM
Repeatability:	±0.2%
Volume of sample:	15cc
Working temperature:	up to 180 °C
Working pressure:	700 bar
Construction:	Stainless Steel 316L, Hastelloy

BENEFITS

- Sensor without moving parts
- Very high viscosity range
- Robust and reliable
- Accurate
- Zero maintenance
- Simple operation by immersing the sensor probe into the fluid, measure and wipe after use.

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HP HT DENSITY CELL

The HP HT density cell handles reservoir fluids at pressures and temperatures up to 10 Kpsi and 175 °C, respectively. The principle consists of transferring the sample into the cell at reservoir conditions and weighing it using a high resolution balance. The sample density is calculated by simply dividing the weight of the sample (i.e. weight of the filled cell minus weight of the evacuated cell) by the known, precisely measured cell volume. This method provides reliable, exact and repeatable results under any condition. The density resolution is mainly dependent upon the accuracy of the balance used. Combined with a balance with a weighing accuracy of 1 mg, a resolution of 0.0006 g/cm3 is achieved.

FEATURES

Volume: 4 cc
Weight 182.15 grams
Max pressure: 10,000 psi (700 bar)
Max temperature: Ambient to 175°C (350°F)
Material: Titanium

BENEFITS

- Simple operation
- Cost effective

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DIGITAL DENSITY METER

Digital density meter consisting of a Hastelloy, high pressure, high-temperature cell covering the range of fluid densities encountered in a Petroleum reservoir, i.e. 0 to 3 g/cm^3. Maximum operating temperature and pressure are 200°C and 20,000 psi, respectively. A fluid sample is first introduced into a tube, after which the latter is magnetically excited to vibrate at its natural frequency. The latter is a function of the body's geometry, fixation, material and hence the internal fluid's density. The device is calibrated at specific, constant pressure and temperature with two fluids of known density, to derive the linear relationship between the natural frequency and fluid density at that pressure and temperature. The density can therefore be deduced from the measured frequency. The apparatus is provided with a control station and thermostatic bath.

FEATURES

Model: Anton Paar DMA HPM
Temperature range: up to 200°C
Pressure range: up to 20,000 psi
Density range: 0 to 3 g/cm^3
Accuracy: $\pm 10^{-3}$ g/cm^3
Fittings: ¼ HP
Wetted material: Hastelloy
Power supply: 220 VAC, 50 Hz

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HYDROCARBON COMPOSITIONAL ANALYSER

Determining hydrocarbon's molecular composition is the ultimate step of PVT analysis. Achieved via Gas Chromatography (GC), the results of the analysis can be utilized to select the most appropriate production facilities (e.g. separators, sulfur removal, pipelines) and estimating the overall potential economic profit of a project. Following the live oil sample's flash separation process at ambient conditions in a gasometer, liquid and gas samples are collected and transferred into the GC Analyzer. The analysis of hydrocarbon gas and liquid phases are carried out using two specially configured Agilent 7890-A gas chromatographs. A Vinci proprietary software uses the data files of the gas and liquid GC to generate the PVT compositional reports including the separator report, the separator liquid and the recombined sample.

FEATURES

Performing the analysis described above requires the following:

- Methodology for gas analysis
- Methodology for oil analysis
- Gas analyzer based on chromatograph 7890 A for light and heavy gas analysis.
- Liquid analyzer based chromatograph 7890 A for dead oil analysis.
- Chemstation (acquisition software) and a computer for the two chromatographs
- Reporting facilities to generate the PVT reports.
- Cryette for total molecular weight determination
- GOR determination facility to deduce the composition of the recombined live oil sample.

BENEFITS

- Hydrocarbons analysis up to C_{36}
- Weight %, mole %, volume % provided
- Molecular weight and distribution up to C_{36}
- Reporting facilities provided

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MOLECULAR WEIGHT TESTER

This instrument yields the liquid sample's total molecular weight allowing the fraction of components heavier than C_{36+} undetected by the HC analyzer to be deduced. This laboratory model automatic cryoscope allows molecular weight, solution concentration, and freezing point depression determinations for 2.0 ml aqueous and various solvent solutions.

FEATURES

Cell temperature range:	−6 to +26°C
Operation:	Automatic or manual
Speed:	2 minutes per measurement
Precision temperature:	0.001°C, 1S.D. depends of solvent used
Precision molecular weight:	1% typical, depends of solvent used
Calibration:	Two non interacting controls
Bath:	55 ml 15 minute cool down from ambient temperature
Power:	230 V 50/60Hz
Weight:	13.6 kg
Dimensions (mm):	35.5 x 20.3 x 25.4 cm

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FLOW ASSURANCE SYSTEM (FLASS)

The FLASS system allows for complete reservoir fluid PVT studies and a variety of asphaltene and wax solid deposition experiments, including constant mass expansion, differential vaporization, separator test, swelling tests, isothermal depressurization and isobaric temperature decrease experiments, titration experiments, bulk filtration tests, particle size distribution, and solids onset determination. The apparatus can accurately detect and quantify organic solid precipitation at onset conditions. The system enables the identification of solid particles and size & morphology monitoring of wax crystals and asphaltene solids as a function of temperature, pressure, time and various chemical treatments. Solid detection is achieved by virtue of a solid detection system with a laser source. An organic solid filtration system is used to determine the amount of solid deposits as a function of pressure, temperature or fluid composition and a High-Pressure microscope permits a visual observation of solid precipitation and displacement.

FEATURES

Pressure range:.....up to 15,000 psi
Temperature range:.....Ambient to 200°C (cooling option: -20°C)
Volume:.....up to 200 cc
Wetted material:.....Stainless steel, sapphire.
House software for particle size distribution and light absorbtion measurement.

BENEFITS

- Versatile system (Phase behaviour studies and complete solid deposition experiments)
- Full description of the asphaltenes precipitation (pressure, temperature, growth, morphology,..)

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RESERVOIR FLUID PARTICLE ANALYSER (RFP)

The RFP analyzer permits a variety of asphaltene and wax deposition experiments including isothermal depressurization and isobaric temperature decrease experiments, titration experiments, bulk filtration tests, particle size distributions and solids onset determination. The apparatus accurately visualizes wax and asphaltene precipitation onset at pressures and temperatures up to 20,000 psi and 200°C, respectively. The system enables the identification of solid particles and continuous monitoring of particle size and morphology as a function of temperature, pressure, time and various chemicals. Solid detection is achieved by virtue of a solid detection system with a laser source. An organic solid filtration system is used to determine the amount of solid deposits as a function of pressure, temperature or fluid composition.

FEATURES

Pressure: Up to 20,000 psi
Temperature range: −30 to 200°C (400°F)
Mixer accumulator: 100 ml
Stirring mechanism: Magnetic mixer
Electrical: 220 VAC 50/60 Hz 1 phase

HPM system:
Particle size detection 0.2 µm
Microscopic zoom: x500
House software for particle size distribution measurement

SDS system:
Wavelength Near infrared
Laser power: 250 mWatts
Detector sensitivity: 1 pWatt
Dynamic range: 100 dB

BENEFITS

- Versatile system that can be used for organic solid detection, solid particle visualization, and bulk solid filtration studies
- Highly efficient magnetically driven stirrer.

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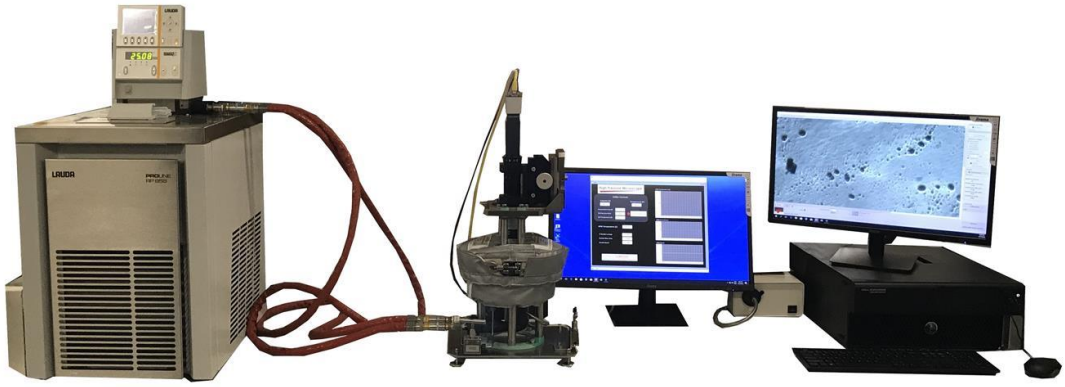
HIGH PRESSURE MICROSCOPE (HPM)

The HPM is designed to accurately visualise the onset of wax and asphaltene precipitation for pressure and temperature conditions of up to 20,000 psi and 200°C, respectively. The HPM can not only detect solid particles but also monitor physical variations of wax crystals and asphaltene solids with changing pressure, temperature, time and chemical inhibitors. The fluid under consideration is homogenized at the desired conditions in an external PVT cell. The fluid is simultaneously depressurized and extracted from the HPM cell at specified, constant pressure and flow rates. The high resolution HPM camera records the flow, and results such as particle size distribution can be interpreted by the provided Vinci software. The HPM system can be delivered either as a stand-alone system or as an add-on module to the Fluid Eval system.



FEATURES

Pressure range:..... Ambient to 20,000 psi
Temperature range:..... ambient to 200°C
Particle size detection:..... from 1 µm
Wetted material:..... Stainless steel, sapphire.
Microscope zoom:..... up to x 500
House software for particle size distribution measurement

BENEFITS

- Can be connected to any PVT cell
- Provides visual definition of the types of solids present in the sample
- Permits to directly observe the onset and growth of organic solid precipitates at pressure and temperature
- Complete system provided with interpretation facilities

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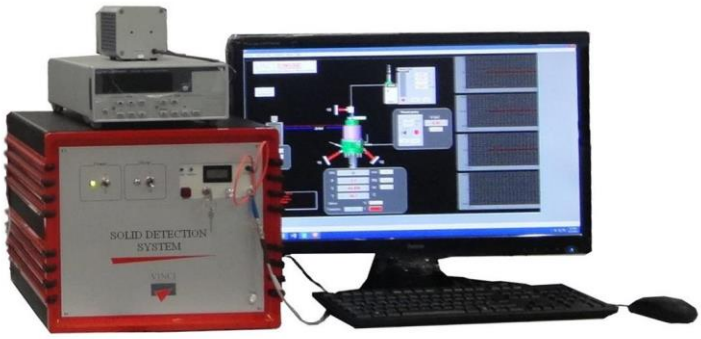
SOLID DETECTION SYSTEM (SDS)

This device is designed to detect when the organic deposition takes place, in other words it measures the onset conditions of live oil precipitation. The instrument is based on the transmittance of a low intensity laser light through fiber optic transmission probes mounted across a windowed cell. The instrument is composed of an optic source to generate the signal crossing the fluid, a power meter to measure the attenuated signal, two fiber optic transmission probes and a data acquisition software used to record the system pressure, temperature, solvent flow rate and the power of the transmitted light. The SDS can be used with different Vinci instruments such as Fluid Eval, Flass, FT700,..



FEATURES

Pressure:	Up to 20,000 psi
Temperature range:	Ambient to 200°C (400°F)
Laser power:	250 mWatts
Wavelength:	Near infrared
Detector sensitivity:	1 pWatt
Dynamic range:	100 dB

BENEFITS

- Extreme accuracy at high pressure and temperature
- Sample is always at pressure and temperature during experiment

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FLOCCULATION TITRIMETER (FT SERIES)

The flocculation titrimeter is specifically designed to evaluate the precipitation and crystallisation conditions of asphaltenes and paraffins in very dark, undiluted crudes and oil products. The apparatus encompasses a robust stirred sample vessel combined with special fiber optic transmission probes that emit and measure the transmittance of a low intensity laser in the sample. Specifically, when asphaltene precipitation or wax crystallization occurs, the transmittance signal sharply decreases due to the presence of solid particles. Hence, the FT allows the determination of Asphaltene Onset Pressure (AOP) and Wax Appearance Temperature (WAT).

FEATURES

Standard:	ASTM D6703
Pressure:	Up to 10,000 psi (option: 20,000 psi)
Temperature range:	−20 to 200°C (400°F)
Vessel volume:	100 ml
Wetted parts:	Stainless steel (option : Hastelloy)
Stirring mechanism:	Magnetic mixer
Wavelength	Near infrared
Laser power:	250 mWatts
Detector sensitivity:	1 pWatt
Dynamic range:	100 dB
Electrical:	220 VAC 50/60 Hz 1 phase

BENEFITS

- Can detect solid particles in very low API oil sample.
- Fully automated instrument
- Very efficient mixing of the sample thanks to a magnetically driven stirrer inside the fluid vessel

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ATMOSPHERIC FLOCCULATION TITRIMETER (FT-1)

Asphaltene deposition in crude oil production and processing can cause severe plugging and fouling issues. The stability of the crudes and their blends can be predicted using the solvent titration method with a laser-based solids detection system. More precisely, the ASTM D7157 introduces the "S-value" as an indication of the intrinsic stability or available solvency power of an oil with respect to precipitation of asphaltenes. The computer-operated FT-1 instrument accurately determines asphaltene flocculation onset of a crude or blend sample by means of the solvent dilution method. The apparatus comprises a stirred sample vessel with a dedicated optical probe which measures the transmittance of a low intensity laser light in the fluid. While a metering pump precisely injects solvent (heptane) in the crude oil, asphaltene flocculation onset is identified by a sharp decrease of signal transmittance. The concentration of solvent required to initiate asphaltene precipitation is then used to assess the stability of the crude sample and compute the S-value, Sa (peptizability of an asphaltene), and So (peptizing power of the oil matrix).

FEATURES

Standard:	D7157
Pressure:	atmospheric
Temperature range:	ambient
Detection wavelength	IR
Vessel volume:	100 ml x 3
Wetted parts:	Stainless steel
Sample mixing:	Magnetic type
Temperature range:	15°C to 60°C
Electrical:	220 VAC 50/60 Hz 1 phase

BENEFITS

- Fully automated apparatus
- Rapid, accurate and reproducible data

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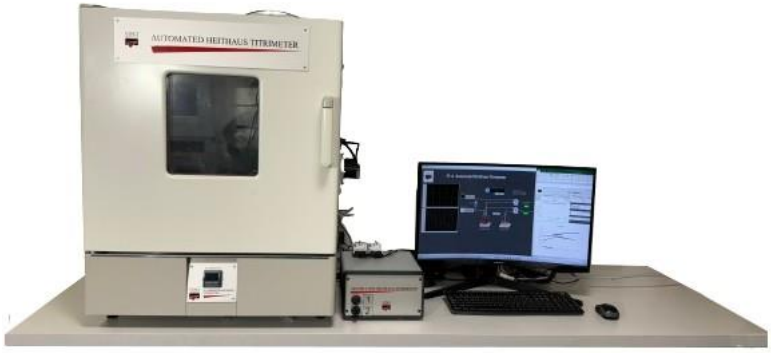
AUTOMATED HEITHAUS FLOCCULATION TITRIMETER (FT-A)

The computer-operated FT-A instrument is a stability diagnostic tool utilized to quantify the three Heithaus compatibility parameters which estimate the colloidal stability of asphalts and asphalt cross blends, aged asphalt, pyrolyzed asphalt, and heavy oil residuum; the device abides to the ASTM D6703 norm for automated Heithaus titrimetry. The samples (asphalt, heavy oil or residuum) are dissolved in toluene and titrated with iso-octane or n-heptane at controlled temperatures to determine the flocculation point and calculate the Heithaus compatibility parameters. The relevance of the FT-A in Hydrocarbon Fluid Analysis arises from the significant influence of compatibility on petroleum physical properties as well as coke formation; a highly undesirable phenomenon that causes fouling in refinery processes.



FEATURES

Standard:	ASTM D6703
Pressure:	atmospheric
Temperature range:	ambient to 100°C
Detection wavelength	UV visible
Reaction vial volume:	30 ml
Circulation pump flow rate:	up to 20ml/min
Titrant vessel volume:	30 ml
Titrant pump flow rate:	up to 1 ml/min
Wetted parts:	Stainless steel
Sample mixing:	Magnetic type
Electrical:	220 VAC 50/60 Hz 1 phase

BENEFITS

- Fully automated apparatus
- Rapid, accurate and reproducible data
- Homogeneous temperature with no cold point

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ORGANIC SOLID FILTER (OSF)

The organic solid filter is connected to the PVT cell and is used to determine the amount of solids formed in the fluid sample when altering the pressure, temperature or composition of the fluid. The instrument uses a filtration method to isolate and remove the solids from the fluid for qualitative and quantitative analysis. Typically, the fluid sample is mixed with a solvent or equilibrated at temperature or pressure sufficient to induce solid precipitation. The solids are then isolated at temperature and pressure and brought to ambient conditions. The total mass of precipitated solid is then measured. The solids are also analysed to obtain the property and compositional information. The device is composed of a high pressure, high temperature stainless steel filter holder using filter disc to retain the solid particles. The fluid sample is transferred from the PVT cell to the floating piston accumulator through the filter at controlled pressure and flow rate. Different ranges of filter size are given along with the filter.

FEATURES

Max pressure: 15,000 psi or 20,000 psi
Max temperature: 200 °C
Material: Stainless steel
Filter size range (µm): 0.02 - 0.1 - 0.2 - 0.45 - 1 - 3 (pack of 50)

BENEFITS

- Easy to dismount

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AUTOMATED ASPHALTENE EXTRACTOR

N-heptane titration of asphaltene in petroleum fluids is described by ASTM D6560, IP143 and NF 60115 standards. Conventional methods are very time consuming, lack accuracy and require continuous supervision throughout the experiment. The Vinci automated asphaltene extractor is an innovative automated instrument which greatly improves the reliability of the ASTM/IP/NF procedures due to its impressive repeatability and accuracy. Additional advantages include rapid measurements and an almost fully automated operation.

FEATURES

Minimum sample weigh: 1 gram
Toluene volume: 1 liter
N-heptane volume: 1 liter
Max temperature: 110 °C
Material: glass
Particle pore retention: 0.8µm
Electrical: 220 VAC 50/60 Hz 1 phase
N2 requirement: 30 psi

BENEFITS

- Process simplification as the measurement is faster and automated, in accordance with ASTM D6560-IP143
- Great repeatability <= 5% Wt.
- Extreme filtration (detection threshold at 0.3% Wt.)
- Hermetic enclosure (no toxic emissions, no loss of sample material)
- Low solvent consumption as it can be recycled

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ASPHALTENE DEPOSITION INHIBITOR TESTER (ADIT)

The ADIT quantifies and monitors asphaltene deposition in a production-representative, turbulent hydrocarbon flow regime. Asphaltene inhibitors or dispersants can independently be injected at different concentrations in live oil and their efficiency in terms of deposition reduction can therefore be assessed. Critical parameters, such as temperature, pressure and flow regime can be isolated to yield insight into their effect on deposition behavior. Stored in two injection pumps, live oil and an inhibitor/dispersant solution, can independently be injected through a fooling cell filled with glass or stainless steel beads, at selective constant flow rates. At the cell outlet, the mixture exits the system via a receiving pump whose main function is to keep a constant system outlet pressure. Asphaltene particles deposit on the beads' surface and agglomerate between them. The amount of solid deposit formed is determined using a dedicated, standardized measurement procedure designed to ensure reliable, accurate, and repeatable results across a wide range of experimental conditions. The test can be repeated several times with different inhibitor or dispersant concentrations in order to identify the minimum concentration required to avoid asphaltene deposition. A cleaning procedure of the fooling cell is required between each test and consists of flushing solvent through the fooling cell to remove asphaltene residue.

FEATURES

Working pressure……. up to 20,000 psi
Working temperature……Ambient to 200 °C
Sample volume required…….. 100 to 500 ml
Fooling cell volume…..……10 ml
Wetted material…… Stainless steel
Flow rate…….…….. 0.001 to 50 ml/min
Power supply…… 110-220 VAC 50/60 Hz 1 ph

BENEFITS

- Mimic the process of asphaltene deposition from live reservoir fluids under realistic production and transportation conditions.
- Measures the true mass of asphaltene deposit

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SOLID DEPOSITION FLOW LOOP FOR LIVE OIL SAMPLE (SDL 1000)

The SDL-1000 solid deposition flow loop is a lab-scale flow loop designed to study asphaltene & wax deposition under dynamic conditions to mimics real production and transportation condition. In other words, the loop permits the investigation of temperature, pressure, flow regime and shear rate effects on asphaltene/wax deposition behavior. Crude oil, live oil or even crude oil blends can be evaluated on the unit. Last, but not the least, inhibitor performance can be also assessed with the apparatus. For a complete description of the deposition process, the first crystals or solid particles in the fluid are accurately detected using a solid detection system based on laser light scattering. Then, a high pressure fouling cell enables to collect the solid deposit which remains on the internal wall of the pipe for further analysis and deposition rate measurement.

FEATURES

Deposition loop 1 outside diameter	9/16”
Deposition loop 1 length	1 meter
Deposition loop 2 outside diameter	1/4’’
Deposition loop 2 length	6 meters
Pressure:	15,000 psi
Temperature:	− 10°C to 200°C
Sample volume:	300 to 1000 ml
Flow rate:	up to 1 L/min
Temperature accuracy:	0.1°C
Material:	Inconel / Hastelloy / PTFE
Power supply:	220 VAC 50 Hz

BENEFITS

- Wax Appearance Temperature
- Asphaltene Onset Pressure
- Minimum Inhibitor Concentration, Dispersant efficiency
- Deposition rate
- Compatibility assessment of crude oil blending, Titration
- Gel strength / Yield strength (only for Wax)

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WAX DEPOSITION FLOW LOOP FOR STOCK OIL SAMPLE (WAX-EVAL A)

The WAX-EVAL A studies the wax deposition phenomenon by circulating an oil sample in a loop and gradually reducing the temperature until reaching the WAT. Essentially, the device is an excellent tool that rapidly generates accurate & reliable results and can be utilized to evaluate the performance of inhibitors or dissolving agents as well as performing quality control. The oil sample which can contain wax inhibitors, circulates in the loop using a recirculation pump whose flow rate is controlled by a flow meter. The sample is circulated inside the loop and pre-heated to a set temperature while the cooling bath progresses to its set temperature. Differential pressure and temperature are monitored and their derivatives over time are utilized to evaluate inhibitor efficiency.

FEATURES

Pressure:	up to 100 psi,
Temperature:	-20°C to +90°C
Sample volume:	500 cc
Test coil diameter:	1/8”
Test coil length:	2 meters
Flow rate:	up to 30 ml/min
Material	Stainless steel
Power supply:	220 VAC 50 Hz

BENEFITS

- Easy operations
- Accurate flow, pressure and temperature measurements

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SMALL SIZE WAX FLOW LOOP FOR LIVE OIL SAMPLE (WAX-EVAL SS200)

The Wax-Eval SS200 is a miniature wax deposition flow loop in which live oil is circulated and subjected to a range of heat fluxes and shear rates representative of production flowline conditions. An experiment mainly consists of four stages, namely, live oil introduction in the loop, thermal pre-treatment, cooling and ungelling. It allows the evaluation of the wax appearance temperature WAT and wax deposition rate. The WAT defines the temperature at which viscosity increases and wax deposition begins; it is associated with a noticeable increase in pressure drop across the test deposition coil. The wax deposition rate corresponds to the wax deposition speed on the wall versus time and is calculated from the time rate of change of pressure drop in the test deposition coil. An optional restart test loop allows the determination of the gel strength (or yield strength) which is derived from the nitrogen pressure required to initiate flow in the loop. The experimental results can also be inputted into a simulation software to generate a thermodynamic model which can be utilized to simulate pipeline petroleum transport.

FEATURES

Deposition loop outside diameter	1/8 inch
Deposition loop length	2 meters
Gel strength coil inside diameter	7 mm
Gel strength coil length	12 meters
Pressure:	3,000 psi
Temperature:	− 20°C to 120°C
Sample volume:	600 ml
Flow rate:	up to 175 ml/min
Temperature accuracy:	0.1°C
Material:	Stainless steel
Power supply:	220 VAC 50 Hz

BENEFITS

- Automated test
- wax inhibitor assessment
- Generate representative model of the oil sample in real pipeline conditions

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MEDIUM SIZE WAX FLOW LOOP FOR LIVE OIL SAMPLE (WAX-EVAL MS150)

Wax deposition inside tubes and pipelines reduces the effective flow area, hence increasing the pressure drop and potentially causing complete blockage. Therefore, developing an understanding of hydrocarbon phase behaviour throughout the pressure and temperature regime, i.e. from the formation to the production facilities, is primordial. The Wax Eval MS 150 is a realistic medium-sized loop in which live oil is circulated and subjected to a range of heat fluxes and shear rates representative of production flowline conditions. An experiment mainly consists of four stages, namely, live oil introduction in the loop, thermal pre-treatment, cooling and ungelling. It allows the evaluation of the wax appearance temperature WAT, wax deposition rate, pigging frequency and pipeline restart pressure for gel breaking. The experimental results can also be inputted into a simulation software to generate a thermodynamic model which can be utilized to simulate pipeline petroleum transport.

FEATURES

Deposition loop outside diameter	1 inch
Deposition loop length	16 meters
Gel strength coil outside diameter	3/8”
Gel strength coil length	16 meters
Pressure:	2,175 psi (150 bar)
Temperature:	− 20°C to 100°C
Sample volume:	40 Litres
Flow rate:	up to 300 L/hour
Temperature accuracy:	0.1°C
Material:	Stainless steel
Power supply:	380-400 VAC 50 Hz 3 ph

BENEFITS

- Representative of pipeline conditions
- Assess wax inhibitor assessment
- Generate representative model of the oil sample in real pipeline conditions

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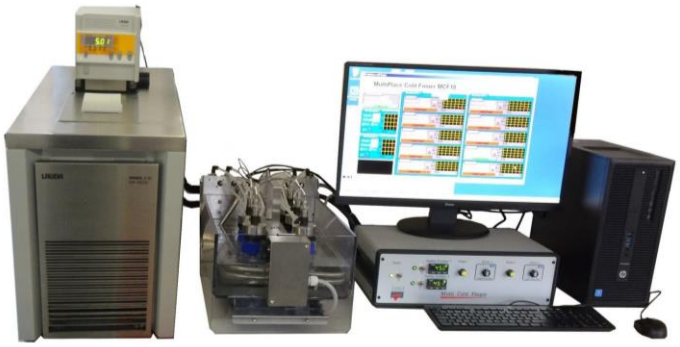
MULTI-PLACE COLD FINGER (MCF SERIES)

The cold finger apparatus provides a fast and reliable method of quantifying the efficiency of wax deposition inhibitors. A hydrocarbon sample is stored in multiple cells; each having a different inhibitor. The cells are placed in an isothermal bath at a production-representative temperature. Hollow cylindrical rods, referred to as "fingers", submerged in the samples are cooled by an internally circulating refrigerant and the finger temperature is monitored by an internal temperature probe. Wax progressively deposits itself on the fingers and the latter are removed and weighed at the end of the experiment. The relative performances of the different inhibitors can then be deduced from the deposition amounts. Furthermore, the wax can be collected and its composition analyzed. The MCF series can be configured with 6, 12 or 18 sample bottles.



FEATURES

Number of sample bottles:	MCF 6: 6 sample bottles MCF 12: 12 sample bottles MCF 18: 18 sample bottles
Pressure:	atmospheric
Temperature of oil:	ambient to 100°C
Temperature of cold finger:	-10°C to 80°C
Temperature difference between cold finger and oil	Up to 8°C
Temperature difference between two cold fingers	Up to 12°C
Stirrer speed:	100 to 2,000 rpm
Sample volume required:	100 ml
Temperature control:	1 temperature sensor per cold finger
Power supply:	220 VAC 50 Hz or 220 VAC 60 Hz

BENEFITS

- Fully automated
- Parallel measurements
- Temperature ramp and variable stirring speed available
- Individual temperature control on each cold finger

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FLOW-THROUGH SDS CELL (FTC SERIES)

The FTC series cell is a critical component of the Vinci Solid Detection System which identifies the presence of solid particles (asphaltenes and paraffins) in hydrocarbon samples under realistic production conditions, i.e. pressure, temperature and shear. The cells are mostly used in deposition flow loops to investigate the effects of flow rate, inhibitor concentration, temperature and pressure on solid precipitation and deposition. The cell can be described as a pressure vessel equipped with fluid inlet and outlet axial ports and two lateral ports to mount the SDS's optical fibers.

FEATURES

Model	Pressure psi	Wetted parts	OD inch	ID inch
FTC-3-SS-8	3,000	Stainless steel	1/8	0.069
FTC-3-SS-4	3,000	Stainless steel	1/4	0.194
FTC-3-SS-2	3,000	Stainless steel	1/2	0.402
FTC-3-SS-1	3,000	Stainless steel	1	0.834
FTC-3-HC-8	3,000	Hastelloy	1/8	0.085
FTC-3-HC-4	3,000	Hastelloy	1/4	0.194
FTC-3-HC-2	3,000	Hastelloy	1/2	0.402
FTC-3-HC-1	3,000	Hastelloy	1	0.834
FTC-10-SS-8	10,000	Stainless steel	1/8	0.069
FTC-10-SS-4	10,000	Stainless steel	1/4	0.152
FTC-10-SS-2	10,000	Stainless steel	1/2	0.26
FTC-10-SS-1	10,000	Stainless steel	1	0.688
FTC-10-HC-8	10,000	Hastelloy	1/8	0.069
FTC-10-HC-4	10,000	Hastelloy	1/4	0.152
FTC-20-SS-4	20,000	Stainless steel	1/4	0.109
FTC-20-SS-1	20,000	Stainless steel	1	0.5
FTC-20-HC-4	20,000	Hastelloy	1/4	0.083
FTC-20-HC-1	20,000	Hastelloy	1	0.438

Temperature range: -20°C to +200°C

BENEFITS

- Unique device for deposit detection under flowing conditions
- Small sized cell which can be easily installed in a set –up

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FLOOR STAND STIRRED PRESSURE VESSEL (FSV SERIES)

The FSV series vessel is specifically designed to stir large volumes of fluid at pre-set pressure and temperature. The vessel consists of a cylindrical metal chamber equipped with a bolted sealed head and a manual bottom drain valve. It features an internal heavy duty stirring system, made of a motor drive magnetically coupled to an internal stirrer shaft with an attached anchor to efficiently stir viscous liquids. The head is provided with a hand operated valve, thermocouple to measure the vessel's internal temperature, pressure gauge and safety burst disc. A control panel adjusts the motor speed drive for the stirrer. Optionally, temperature and pressure transducers can be interfaced to the panel. The unit can also be connected to a computer for remote control. The vessel is mounted on a mobile trolley and a chain pulley lifting system can be implemented to facilitate assembly/disassembly.

FEATURES

Model	Volume (liter)	Presssure (psi)	Wetted parts	Weight (kg)
FSV 50-30-S	50	3,000	Stainless steel	350
FSV 50-30-H	50	3,000	Hastelloy	650

Temperature range: ..... up to 150°C
Stirring speed: ..... up to 200 RPM
Fluid viscosity: ..... 10,000 cP
Gasket material: ..... Viton
Inlet and outlet connections: ..... 1inch (other upon request)
Power: ..... 110-220 VAC, 50/60 Hz

E&P LABORATORY APPLICATION

- ✓ Store live oil fluid for large scale deposition loops

BENEFITS

- ✓ Efficient stirring of large volumes of liquid under extreme pressure and temperature conditions
- ✓ Heavy duty magnetically driven stirrer
- ✓ Corrosion-free wetted parts

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GAS HYDRATES AUTOCLAVE SYSTEM (GHA SERIES)

The GHA series is a mercury-free device designed to study gas hydrate formation, dissociation and induction time by monitoring the pressure drop during hydrate formation. The apparatus also incorporates an image capturing system permitting visual investigations of the phenomenon. The system consists of a 250 cc isochoric hydrate cell rated up to 3,000 psi. The cell temperature, monitored by a thermocouple accurate to 0.1°C, is regulated by a thermostatic bath and cell pressure is surveilled by a highly accurate transducer. The two quantities are continuously displayed in the data acquisition system. A magnetically driven, speed-adjustable stirrer ensures a thorough and efficient agitation while an integrated stethoscopic camera captures experimental images.

FEATURES

Pressure:..... 3,000 psi,
Volume:..... 250 cc
Temperature:..... − 10°C to 60°C
Pressure accuracy:..... 0.1% Full scale
Temperature accuracy:..... 0.1°C
Stirring mechanism:..... Magnetic drive
Stirring speed…….. up to 1000 RPM
Power supply:..... 220 VAC 50 Hz

BENEFITS

- Cost effective
- Accurate pressure and temperature measurements
- Video image capturing that allows for later retrieval
- Mercury free operations

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HYDRATES STUDIES SYSTEM (HYDREVAL)

A complete, mercury-free apparatus providing hydrate equilibrium data and inhibitor performance assessment. Four methods are available to study hydrates phenomena: isochoric (constant volume), isobaric (constant pressure), isothermal (constant temperature) and visual. The visual cell allowing 360° visibility throughout its length is made of synthetic sapphire (Al_2O_3). The cell is essential for the study of physicochemical phenomena requiring an integral visual observation and/or the use of optical phenomena using coherent or non-coherent light to measure and characterize mixtures.

FEATURES

Pressure: 3,000 psi,
Volume: 60 cc
Temperature: − 20°C to 175°C
Volume accuracy: 0.01 ml
Pressure accuracy: 0.1% Full scale
Temperature accuracy: 0.1°C
Stirring mechanism: Magnetic drive
Power supply: 220 VAC 50 Hz

BENEFITS

- Easy operations
- Accurate volume, pressure and temperature measurements
- Full visibility

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HYDRATES KINETICS STUDIES SYSTEM (KINETIC-EVAL)

A complete mercury-free instrument dedicated to gas hydrate kinetics studies. Specifically, the device allows the evaluation of parameters such as induction time and post-nucleation growth rate. It is also used to assess inhibitor kinetics for a diverse range of inhibitors (hydrates, anti-caking, emulsion, natural inhibitors, salts…). The system consists of a 250 cc isochoric hydrate cell rated up to 5,000 psi. The cell temperature, monitored by a thermocouple accurate to 0.1°C, is regulated by a thermostatic bath and cell pressure is surveilled by a highly accurate transducer. A magnetically driven, speed-adjustable stirrer ensures a thorough and efficient agitation. The torque required to drive the stirrer at a constant, preset speed is measured and utilized to deduce the sample's viscosity.

FEATURES

Pressure: 5,000 psi,
Volume: 250 cc
Temperature: − 10°C to 100°C
Pressure accuracy: 0.1% Full scale
Temperature accuracy: 0.1°C
Stirring mechanism: Magnetic drive
Power supply: 220 VAC 50/60 Hz

BENEFITS

- Very efficient magnetically driven stirrer with torque measurement
- Can be used to evaluate anti-caking inhibitors
- Accurate torque, pressure and temperature measurements
- Mercury free operations

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FLUID-EVAL FOR HP- HT VISUAL STUDIES (VISUAL 300 VERSION)

The Visual 300 Fluid-Eval is specifically designed for reservoir-condition, thermodynamic and phase behaviour studies of multiphase hydrocarbon samples, i.e. black oil, gas condensates, swelling tests, gas hydrates and supercritical fluids. By virtue of a see-through sapphire end-cap, the device offers full sample visibility during experiments. The system utilizes an embedded high-pressure pump to control and monitor the fluid's pressure and volume within the cell. A single cell is employed for both oil and gas condensates studies. For oil studies, the cell is in the upright position whereas for gas condensate studies, it is inverted to maximize the dew point detection efficiency. The cell is equipped with pressure and temperature sensors, electrical heating system, high-torque magnetically driven stirrer and a video camera to monitor through the sapphire window, the sample behaviour. The apparatus also encompasses a temperature jacket connected to a thermostatic bath to perform sub-ambient temperature-controlled experiments.

FEATURES

Pressure:	10,000 psi,
Volume:	100 cc
Temperature:	− 20°C to 200°C
Pressure accuracy:	0.01% Full scale
Temperature accuracy:	0.1°C
Stirring mechanism:	Magnetic drive
Power supply:	220 VAC 50 Hz

BENEFITS

- Very efficient magnetic stirrer
- Full visibility of the sample during experimental test
- Mercury free operations

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ROCK CELL FOR HYDRATES STUDIES (RF400)

The rig allows the evaluation of hydrate formation by monitoring the pressure drop. It allows full observation of the formation, precipitation and dispersion of hydrates. Performances of hydrates inhibitors can also be assessed. The device consists of a long cell covered by a cooling jacket which is connected to a chiller to control the temperature. The cell's end is equipped with a sapphire window and a camera displays on a monitor the fluids during the test. An endoscope mounted on the opposite end records inside the cell the fluids. The cell is placed on a supporting table to which a rocking movement is applied by an electric motor. The fluids in the cell are mixed and dispersed through the rocking motion, allowing one to achieve the desired flow regime by adjusting the rocking conditions (angle and speed).

FEATURES

Pressure:	6,000 psi,
Temperature:	− 20°C to 60°C
Cell diameter:	50-mm
Cell length	900-mm
Pressure accuracy:	0.1% Full scale
Temperature accuracy:	0.1°C
Wetted parts:	Hastelloy
Power supply:	220 VAC 50 Hz

BENEFITS

- Semi-batch system
- Can consider multiphase pseudo-flow (stratified, stratified-wavy, slug, disp. bubble)
- Temperature control (surface and bulk)
- Pressure control
- Need a small quantity of fluids (order of liter)
- Full visualization of cell contents
- Relatively inexpensive to build and operate

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DYNAMIC SCALE LOOP (SCALEVAL)

The Scale Eval apparatus is designed to study the precipitation and deposition of scale at reservoir and pipeline conditions of pressure and temperature. The device can be utilized to study the efficiency of chemical inhibitors to prevent the formation of mineral scales such as calcium carbonate, calcium barium and barium sulfates. Specifically, the minimum inhibitor concentration (MIC) required to prevent the deposition of scale can be determined as well as inhibitor comparison tests under the same conditions. The system uses the tube blocking test principle which is an industry practice, to evaluate at constant temperature, the minimum inhibitor concentration (i.e. MIC) in dynamic flow conditions. Inhibitor efficiency is measured by the deposition rate in terms of pressure loss in the pipe (scale and pre-scale tests). Mathematically, the inhibitor efficiency is defined as the ratio of clog time with an inhibitor over regular clog time. Experiments can be performed both manually and automatically.

FEATURES

Pressure: 6,000 psi,
Temperature: up to 150°C
Fluid flow rate up to 10 cc/min
Pressure accuracy: 0.1% Full scale
Temperature accuracy: 0.1°C
Power supply: 110 or 220 VAC - 50/60 Hz

BENEFITS

- Fully automated test
- Can be used to evaluate scale inhibitors
- Dynamic test which simulates pipelines conditions

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VISUAL SCALE TESTER (VISUAL SCALEVAL)

The visual Scaleval evaluates scale deposition and inhibitor performance in an incompatible brine mixture while controlling pH. Indeed, in the Visual Scale Tester, the brines can be saturated with gases (CO2, Nitrogen) and the gas partial pressures controlled to achieve the desired pH level. The latter being a key factor in scale deposition, the Visual Scale Tester truly provides an accurate production representative scale deposition environment. The apparatus determines inhibitor efficiency from two phenomena: scale precipitation and scale deposition, achieved via a visual mixing cell and a capillary coil respectively. Scaling is attained from a coetaneous injection of incompatible brines (e.g. different salinities) followed by the injection of various possible solutions including those mentioned above. In addition to basic scale inhibitor testing, the device adequately mimics field conditions and can help to optimize the conflicting corrosion and scale control objectives. The mixing cell will allow the visualization of scaling and/or gunking, whereas the capillary coil will indicate deposition onset and rate, from pressure drop monitoring.

FEATURES

Pressure:	10,000 psi,
Temperature:	up to 200°C
Fluid flow rate	up to 50 cc/min
Wetted parts	Hastelloy
Pressure accuracy:	0.1% Full scale
Temperature accuracy:	0.1°C
N2 requirement:	2,000 psi
CO2 requirement:	600 psi
Power supply:	220 VAC - 50/60 Hz

BENEFITS

- pH adjustment via CO2 partial pressure control
- Visual cell to observe both scaling and gunking
- Qualification of scale inhibitor performance in the presence of corrosion inhibitors

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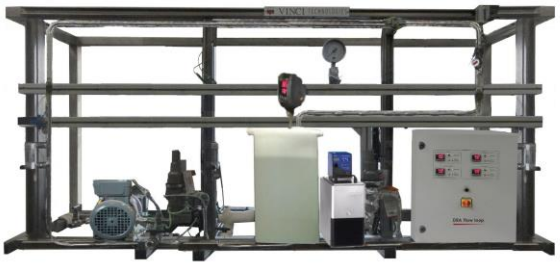
FRICTION FLOW LOOP FOR EVALUATING DRAG REDUCING AGENTS (DRA FLOW LOOP)

The DRA flow loop enables the end user to test, quantify and evaluate the performance of a friction reducer by monitoring the pressure losses of a fluid in a pipe in the turbulent flow regime. The effect of friction reducers on both flow rate and pressure are analyzed and reported. The apparatus provides fast, accurate and reliable results which provide great insight into our understanding of friction reducers. The system circulates test fluid through two different diameter test sections to generate differential pressure versus flow rate data. The test fluid injection system comprises a mixing tank to thoroughly mix and homogenize the additives in the test fluid, and a low-shear pump whose flow rate is controlled by a Coriolis flow meter. High-accuracy differential pressure transducers are implemented in each tubing diameter allowing multiple data readings per test. Additives can be injected into the flow stream via a metering pump or directly added into the mixing tank. Differential pressure, pressure, temperature, flow rate and Reynolds number are computed in real time. The system can be operated as an open or closed circuit, i.e. recirculation. Moreover, the architecture warrants simple set up, operation, maintenance, calibration and cleaning; the latter facilitated by the automatic flush-and-fill feature.



FEATURES

Working pressure……. up to 150 psi
Working temperature…… 10°C to 40 °C
Reynolds Number…….. up to 150,000
Tank volume……..……. 200 liters
Flow rate……..…….. 8 to 50 liters /min
Differential pressure range ….. 0-100 psi
Loop n°1 external diameter…… 3/4”
Loop n°1 internal diameter……. 0.607”
Loop n°1 length……..…… 3 meters
Loop n°2 external diameter…… 1/2”
Loop n°2 internal diameter……. 0.403”
Loop n°2 length……..……. 3 meters
Wetted material…… Stainless steel
Power supply…… 220 VAC 50/60 Hz 1 ph

BENEFITS

- Easy operations
- Provided with automated functions

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PVT SURFACE SEPARATOR SAMPLING KIT

The surface sampling kit comprises a set of tools used to transfer hydrocarbon liquid and gas samples from a surface separator to a storage cylinder. Once this has been done, the specimens can be transported to the laboratory for recombination at reservoir conditions and subsequent PVT analysis.

The surface sampling kit consists of the following items.

- 2 flexible hoses to connect the oil and gas cylinders to the separator

  Features:

  Maximum pressure: 350 bar

  Maximum temperature: 90°C

  Length: 2 m

- 1 set of connection adaptors including:
  - ✓ 5 sets of connection adapters per size for oil cylinder with the following sizes: 1/8" LP, ¼" MP, ¼" HP, ¼" NPT
  - ✓ 5 sets of ½" NPT connection adaptor for separator
  - ✓ 5 sets of type E connection adaptor for gas cylinder.
- 1 manifold to connect the hose to the oil cylinder. It includes the manometer (0-350 bar) to measure the separator oil pressure and the isolating valve connected to the vacuum pump.
- 1 manifold to connect the hose to the gas cylinder. It includes the manometer (0-200 bar) to measure the separator gas pressure and the isolating valve connected the vacuum pump.
- 1 vacuum pump to vacuum the sample cylinder with manometer (0-1 bar), a 1 meter hose and quick connector.
- 1 set of tools
- 1 temperature sensor to measure separator temperature.
- 1 500 cc graduated burette to determine the transferred volume of oil with manometer (0-350 bar) and isolating valve.
- labelling accessories including one crimper, 1000 leadings, 2 sets of 10 meter leading wire rolls, 200 green labels marked "EMPTY", 200 red labels marked "FULL"
- 1 heavy-duty carrying case to store all the previous components.

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BOTTOM HOLE SAMPLER

Designed to recover reservoir samples from the well, the bottom hole sampler is utilized in slick or wire line operations to directly capture representative sub-surface hydrocarbon samples and fully preserve their integrity. The tool comprises a stainless steel cylinder consisting of a hydraulic fluid chamber, a sample chamber, a floating piston, a mechanical timer, a triggering system, a hanging head and a closing mechanism. The system comes fully equipped with the sampling tool, the transportation box and the service kit.

FEATURES

Type……..…Positive displacement system (i.e. PDS)
Max Working temperature…….. 200°C / 400° F
Max Pressure…… 15,000 psi
Volume ……..… 600 cc
Wetted material…….. Stainless steel (H_2S, sour gas resistant), titanium and brass alloy
Weight…… 30 kg
Outside diameter..… ……43 mm
Length …… 3.71 meters
Clock running time…….. 5 hours, other time upon request

BENEFITS

- Mercury free
- Light and compact

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TRANSFER BENCH

The transfer bench is designed to transfer fluid sample from down-hole sampler to piston type sample cylinder at site location. After the sample has been transferred, the determination of the bubble point pressure can be performed for sample validation. The apparatus comes complete with hydraulic transfer pump, transfer and control valves, two precision gauges, valves, fittings, connections, accessories kit and stainless steel transportation box. All valves are accessible from the front side. The sampler is positioned horizontally in clamps above the rear and the sample cylinder to one side. A set of accessories including all the hoses and attachment necessary to the transfer operation.

FEATURES

Max Working pressure……..…15,000 psi (1,000 bar)
Max Working temperature……150°C
Pressure accuracy ……0,1 % FS
Wetted material…….Stainless steel
Weight……42 kg
Dimensions (HxWxL)..…….450 mm x 430 mm x 340 mm
Fluid …….. Glycol / water
Recommended air pressure…..…… 100 psi

BENEFITS

- Transportation casing easy to stack
- Light and compact

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HIGH PRESSURE PISTON SAMPLE CYLINDER (HPP SERIES)

The HPP series sample cylinder is a double end floating piston type cylinder designed for the storage and transportation of reservoir fluid samples. The latter is isolated from the hydraulic driving fluid by a floating piston that, by virtue of its design minimizes friction and reduces pressure load. Cylinders are fitted with a single inlet needle valve for the hydraulic driving fluid and a double inlet needle valve for the fluid sample. On the sample side, the piston incorporates a hemispherical groove to accommodate a spherical ball for agitation and optimize the dead volume. An evacuation port nipple and plug enable cylinder evacuation prior to fluid transfer. Valves are protected by end-caps from handling and transportation related damage. A carrying case can be provided to facilitate transportation.

FEATURES

Model	Volume ml	Pressure psi	Temp. °C	Weight Kg	Length mm	Diameter mm	Material	Thread connection
HPP 700-10	700	10,000	150	17	705	88	SS	1/8" FLP
HPP 1000-10	1,000	10,000	150	19	800	88	SS	1/8" FLP
HPP 700-15	700	15,000	150	23	825	88	SS / Ti	14" FMP
HPP 1000-15	1,000	15,000	150	27	970	88	SS / Ti	1/4" FMP
HPP 700-20	700	20,000	150	29	945	88	SS / Ti	¼" FHP
HPP 1000-20	1,000	20,000	150	36	1150	88	SS / Ti	¼" FHP

BENEFITS

- H_2S resistant
- Sample agitation ball mixer
- Safe operation
- Minimum dead volume
- Mercury free

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FLUID ANALYSIS

MICRO HIGH PRESSURE PISTON SAMPLE CYLINDER (MHP SERIES)

The MHP series sample cylinder is a small, floating piston type cylinder designed for the storage and transportation of reservoir fluid samples. The latter is isolated from the hydraulic driving fluid by a floating piston that, by virtue of its design minimizes friction and reduces pressure load. Cylinders are fitted with a single inlet needle valve for the hydraulic driving fluid and a single inlet needle valve for the fluid sample. On the sample side, the piston incorporates a cylindrical groove to accommodate a mixing ring for agitation and optimize the dead volume. Valves are protected by end-caps from handling and transportation related damage. A carrying case can be provided to facilitate transportation.

FEATURES

Model	Volume ml	Pressure psi	Temp. °C	Weight Kg	Length mm	Diameter mm	Material	Thread connection
MHP 50	50	15,000	150	2	300	50	Stainless Steel	1/8" FLP
MHP 100	100	15,000	150	3	350	50	Stainless Steel	1/8" FLP
MHP 250	250	15,000	150	4	400	50	Stainless Steel	1/8" FLP

BENEFITS

- H_2S resistant
- Sample agitation ring mixer
- Safe operation
- Minimum dead volume
- Mercury free

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LIGHT WEIGHT PISTON SAMPLE CYLINDER (CYLIGHT SERIES)

The cylight series sample cylinder is an incredibly light weight titanium double end floating piston type cylinder designed for the storage and transportation of reservoir fluid samples. The latter is isolated from the hydraulic driving fluid by a floating piston that, by virtue of its design minimizes friction and reduces pressure load. Cylinders are fitted with a single inlet needle valve for the hydraulic driving fluid and a double inlet needle valve for the fluid sample. On the sample side, the piston incorporates a hemispherical groove to accommodate a spherical mixing ball for agitation and optimize the dead volume. A carrying case can be provided to facilitate transportation.

FEATURES

Model	Volume ml	Pressure psi	Temp. °C	Weight Kg	Length mm	Diameter mm	Material	Thread connection
CYLIGHT 300	300	10,000	150	5	300	70	Titanium	1/8'' FLP
CYLIGHT 650	650	10,000	150	6	450	70	Titanium	1/8'' FLP
CYLIGHT 1000	1000	10,000	150	7	600	70	Titanium	1/8'' FLP

BENEFITS

- Very light and compact
- H_2S resistant
- Sample agitation ball mixer
- Safe operation
- Minimum dead volume
- Mercury free

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SINGLE PHASE SAMPLE CYLINDER (SPS SERIES)

The SPS series ensures monophasic petroleum sample transportation, by always maintaining an above bubble point internal pressure. The cylinder makes use of a nitrogen filled chamber to pressurize the sample and compensate for temperature variations. The fluid sample is isolated from the hydraulic driving fluid by a floating piston that, by virtue of its design minimizes friction and reduces pressure load. Cylinders are fitted with a single inlet needle valve for the hydraulic driving fluid, a single inlet needle valve for the nitrogen gas cap and a double inlet needle valve for the fluid sample. On the sample side, the piston incorporates a hemispherical groove to accommodate a spherical ball for agitation and optimize the dead volume. An evacuation port nipple and plug enable cylinder evacuation prior to fluid transfer. Valves are protected by end-caps from handling and transportation related damage. A carrying case can be provided to facilitate transportation.

FEATURES

Model	Volume ml	Pressure psi	Temp. °C	Weight Kg	Length mm	Diameter mm	Material	Thread connection
SPS 700-10	700	10,000	150	27	850	88	Stainless Steel	1/8" FLP
SPS 700-15	700	15,000	150	33	1020	88	Stainless Steel	¼" FMP
SPS 700-20	700	20,000	150	39	1300	88	Stainless Steel	¼" FHP

BENEFITS

- H_2S resistant
- Single phase sample sample transportation
- Sample agitation ring mixer
- Minimum dead volume
- Safe operation

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LOW PRESSURE PISTON SAMPLE CYLINDER (LPP SERIES)

The LPP series sample cylinder is a double end floating piston type cylinder designed for the storage and transportation of reservoir fluid samples. The fluid sample is isolated from the hydraulic driving fluid by a floating piston that, by virtue of its design minimizes friction and reduces pressure load. Cylinders are fitted with a single inlet needle valve for the hydraulic driving fluid and a single inlet needle valve for the fluid sample. The valves are equipped with safety burst disks and manometers and an external magnetic volume tracker allows precise volume monitoring. On the sample side, the piston incorporates a hemispherical groove to accommodate a spherical ball for agitation and optimize the dead volume. A carrying case can be provided to facilitate transportation.

FEATURES

Model	Volume ml	Pressure psi	Temp. °C	Weight Kg	Length mm	Diameter mm	Material	Thread connection
LPP 500	500	3,000	120	7	690	50	Stainless Steel	¼ " FNPT
LPP 1000	1000	3,000	120	9	890	50	Stainless Steel	¼ " FNPT

BENEFITS

- H_2S resistant
- Sample agitation ball mixer
- Volume indicator
- Safe operation
- Minimum dead volume
- Mercury free

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FLOW THROUGH SAMPLE CYLINDER (FTS SERIES)

The FTS series are flow through cylinders designed for low pressure hydrocarbon storage and transportation. The cylinders are equipped with two needle valves, a manometer and a safety burst disc. A carrying case can be provided to facilitate transportation.

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FEATURES

Model	Volume ml	Pressure psi	Temp. °C	Weight Kg	Length mm	Diameter mm	Material	Thread connection
FTS 150 SS	150	2,800	200	2	300	50	Stainless steel	¼ " FNPT
FTS 150 T	150	2,800	200	2	300	50	Teflon coated	¼ " FNPT
FTS 300 SS	300	2,800	200	3	450	50	Stainless steel	¼ " FNPT
FTS 300 T	300	2,800	200	3	450	50	Teflon coated	¼ " FNPT
FTS 500 SS	500	2,800	200	6	700	50	Stainless steel	¼ " FNPT
FTS 500 T	500	2,800	200	6	700	50	Teflon coated	¼ " FNPT

BENEFITS

- H_2S resistant
- Safe operation

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GAS SAMPLE CYLINDER (GS SERIES)

The gas shipping bottle is designed for the storage and transportation of pressurized gas samples (air, Helium, gaseous hydrocarbons…). The standard aluminum bottle has a 20 liter capacity and a 3000 psi maximum internal pressure. All standard bottles are fitted with an angle needle valve at each end. The latter are protected by end-caps from handling and transportation related damage.

FEATURES

Capacity:	20 litres
Working temperature:	−10 to 100 °C
Filling pressure:	200 bar (2,900 psi) @ 60°C
	170 bar (2,465 psi) @ 100°C
Construction:	Cylinder: Aluminium
	Valves: Stainless steel
Thread Connection:	¼" FNPT
Dimensions OD x L:	25 x 99 cm
Weight:	26 Kg

BENEFITS

- Transportation casing easy to stack
- Light weight
- Compliant with international regulation
- H_2S resistant

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FLOATING PISTON ACCUMULATOR (FPA SERIES)

The floating piston accumulator's purpose is to store and transfer high pressure fluids via hydraulic displacement. The process fluid is isolated from the driving fluid via a floating piston that by virtue of its design minimizes friction and reduces pressure load. A robust handle facilitates handling.

FEATURES

Pressure	10,000 psi or 15,000 psi
Temperature	Ambient to 150°C (300 °F)
Cell volume	100 cc, 300 cc, 500 cc, 1,000cc, 2,000 cc, 5000 cc
Material	stainless steel or hastelloy

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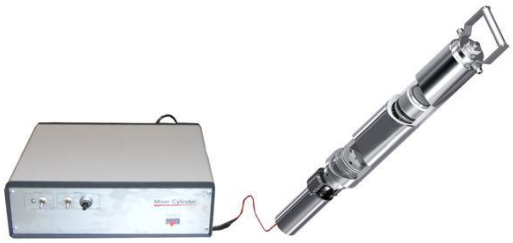
MIXER CYLINDER (MC SERIES)

The MC series are dual end piston type cylinders capable of storing and mixing a great variety of fluids over a vast range of pressures and temperatures. The sample fluid is isolated from the hydraulic driving fluid via a floating piston while a magnetically driven mixer located in the sample fluid chamber assures proper agitation. The mixer is magnetically coupled through the accumulator end cap, to a drive system which incorporates a permanent magnet driven by a variable speed DC motor. An electronic controller allows mixer activation and speed regulation. The cylinder can be operated in either the upright or inverted position. Both end caps are fitted with an inlet/outlet port for fluid introduction or fluid sampling. A robust handle facilitates handling.



FEATURES

Model	Volume ml	Pressure psi	Temp. °C	Weight Kg	Length mm	Diameter mm	Material (1)	Thread connection
MC 500-10	500	10,000	150	21	700	120	Stainless steel	¼" FNPT
MC 1000-10	1,000	10,000	150	25	750	120	Stainless steel	¼" FNPT
MC 2000-10	2,000	10,000	150	35	900	150	Stainless steel	¼" FNPT
MC 500-15	500	15,000	200	21	700	120	Stainless steel	1/8" FLP
MC 1000-15	1,000	15,000	200	25	750	120	Stainless steel	1/8" FLP
MC 2000-15	2,000	15,000	200	35	900	150	Stainless steel	1/8" FLP

(1) Titanium material available.

Mixer controller

Power requirement…… 230 VAC, 50 Hz, 100 W

BENEFITS

- H_2S resistant
- The impeller provides a minimum dead volume
- Provide rigorous agitation of entire fluid sample
- Capable of mixing high viscosity samples up to 1,000 cp
- High speed, allows equilibrium to be reached in minimum time
- Reduces operating time for establishing phase equilibrium on sample.

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RECOMBINATION CELL APPARATUS (RCA 1000)

This RCA 1000 recombines at reservoir-representative conditions, the right proportions of gaseous and liquid hydrocarbons sampled from separators to yield a hydrocarbon mixture closely resembling that of the reservoir. The apparatus comes with a recombination cell jacketed in an insulated heating jacket for temperature control, a rocking system, a mixing ring inside the cell, a magnetically-driven stirrer for proper agitation, a bull's eye window to observe the process, a temperature & pressure display panel and a moveable chassis.

FEATURES

Cell Volume: 2,000 cc
Pressure: 15,000 Psi (1,000 bar)
Max working temperature: Ambient to 175°C (350 °F)
Wetted material: Stainless steel, viton
Mixing:
Pressure accuracy: 0.1 % FS
Temperature accuracy: ± 0.5 °C
Power supply: 220 VAC 50 Hz

BENEFITS

- Very fast recombination operation due to the magnetic driven stirrer
- The motorized rocking system used in conjunction with the mixing ring enables an efficient agitation of the heavy oil sample.
- Bull's eye window for dew point and bubble point detection
- Versatile as it can be used for oil and gas condensates thanks to its rocking system

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MOBILE RECOMBINATION AND RESTORATION APPARATUS (MRR 1000)

This apparatus recombines at reservoir-representative conditions, the right proportions of gaseous and liquid hydrocarbons sampled from separators to yield a hydrocarbon mixture closely resembling that of the reservoir. The apparatus can be also used as a restoration unit by simply replacing the recombination cell with a shipping cylinder. Ideal for field applications, the device is supplied with a dedicated container to facilitate transport and handling. The sample cylinder is wrapped with the heating jacket and then mounted on the motorized rocking system to provide the means to agitate the fluid under pressure and temperature.

FEATURES

Cell Volume:	1,000 cc
Pressure:	15,000 psi (1,000 bar)
Max working temperature:	Ambient to 200°C (400 °F)
Wetted material:	Stainless steel, viton
Pressure accuracy:	0.1 % FS
Temperature accuracy:	± 0.5 °C
Power supply:	220 VAC 50 Hz

BENEFITS

- Fast sample recombination
- Versatile, can be used as recombination and restoration unit
- The cell can be set in upright and inverted position by means of a motorized rocking system

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SAMPLE RESTORATION APPARATUS

Samples collected from the reservoir are transferred into sample cylinders. Prior to transportation, the pressure in the cylinder is reduced below the bubble point so that a gas cap may form; the purpose being to compensate for potential temperature-related pressure build-ups. Therefore, the sample must be restored to its original, reservoir conditions upon arrival to the laboratory. The restoration apparatus does just that: heating with an external heating jacket, pressurization with an external high pressure pump and a thorough agitation assured by an efficient rocking mechanism. The chassis is equipped with four heavy duty casters to facilitate displacement. The model can simultaneously process up to one, two or six samples.

FEATURES

Temperature: Ambient to 200°C
Temperature accuracy: ± 5°C
Diameter of sample cylinder: 80 mm to 100 mm (other upon request)
Length of sample cylinder: 500 mm to 750 mm (other upon request)
Power supply: 220 VAC, 50 Hz

BENEFITS

- Efficient agitation
- Fast heating
- Very accurate temperature regulation
- Easy to move
- Easy cylinder mounting

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GAS SAMPLE RESTORATION APPARATUS

Very useful during the restoration of gas sample, the apparatus enables to heat and agitate the sample to the reservoir temperature. One gas sample cylinder can be processed by the rocker. The sample cylinder is wrapped with a heating mantle and then mounted on the motorized rocking system to provide the mean to rock the fluid under pressure and temperature for several days, if required. The chassis is equipped with four heavy duty casters which enable to move the apparatus very easily anywhere in the laboratory room.

FEATURES

Temperature:.....Ambient to 100°C
Temperature accuracy:.....± 5°C
Diameter of accumulator:.....200 mm to 250 mm
Length of the accumulator:....up to 800 mm
Power supply:.....220 VAC,50 Hz

BENEFITS

- Efficient agitation
- Fast heating
- Very accurate temperature regulation
- Easy to move
- Easy cylinder mounting

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CYLINDER HEATING MANTLE

The heating mantle offers a convenient, cost-effective way of heating and maintaining a constant temperature in the cylinder. Equipped with a temperature regulator, it provides clean heat, eliminates hot or cold spots and is easy to install or remove. Low maintenance and labor cost, energy efficiency, clean room compatibility, durability, multiple heating zones, chemical and moisture resistance, and easy adaptability to different diameter cylinders are the strong suits of the heating mantle.

FEATURES

Temperature accuracy: ± 5°C
Construction: Kevlar, Silicon, glass fiber
Power: 220 VAC, 50 Hz

Type 1: Mantle for CYLIGHT piston cylinders
Working temperature: up to 200 °C
Diameter range 60 mm to 80 mm
Length range 430 mm

Type 2: Mantle for HPP piston cylinders
Working temperature: up to 200 °C
Diameter range 80 mm to 100 mm
Length range 500 mm

Type 3: Mantle for gas cylinders
Temperature: Ambient to 100°C
Diameter of accumulator: 200 mm to 250 mm
Length of the accumulator: up to 800 mm
Power supply: 220 VAC, 50 Hz

BENEFITS

- Convenient
- Efficient
- Robust and reliable
- Low maintenance

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HEATING TROLLEY FOR LIQUID CYLINDER

The heating trolley is specially designed to heat and maintain at constant temperature, pressurized liquid contained in the floating piston accumulator. The trolley is equipped with two heavy duty casters which warrant easy fluid transport. A drum also permits winding of the 10 meter extension cord. The cylinder is wrapped in a heating mantle equipped with a temperature thermostat.

FEATURES

Temperature: Ambient to 200°C
Temperature accuracy: ± 5°C
Diameter of accumulator: 80 to 100 mm (other upon request)
Length of the accumulator: 500 mm to 750 mm (other upon request)
Power supply: 220 VAC, 50 Hz, 400 watts

BENEFITS

- ✓ Easy liquid cylinder mounting
- ✓ Effortless trolley displacement
- ✓ Accurate temperature regulation
- ✓ Fast heating
- ✓ Homogeneous temperature

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HEATING TROLLEY FOR GAS CYLINDER

The heating trolley is specially designed to heat and maintain at constant temperature, pressurized gas contained in the gas cylinder. The trolley is equipped with two heavy duty casters which warrant easy fluid transport. A drum also permits winding of the 10 meter extension cord. The cylinder is wrapped in a heating mantle equipped with a temperature thermostat.

FEATURES

Temperature: ..... Ambient to 100°C
Temperature accuracy: ..... ± 5°C
Diameter of gas cylinder: ..... 200 to 250 mm
Length of the gas cylinder: ..... up to 800 mm
Power supply: ..... 220 VAC, 50 Hz, 700 watts

BENEFITS

- ✓ Easy gas cylinder mounting
- ✓ Effortless trolley displacement
- ✓ Accurate temperature regulation
- ✓ Fast heating
- ✓ Homogeneous temperature

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GAS BOOSTER (GB – SERIES)

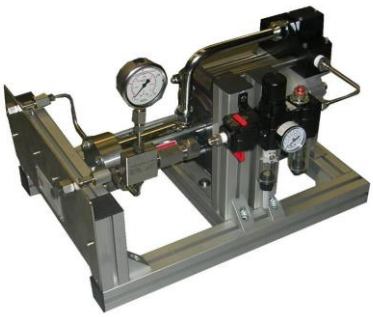
The gas booster compresses and transfers low pressure field gas samples into high pressure cylinders. The gas booster comes fully equipped. The only requirements are an air supply for the air-driven pump and a high pressure cylinder to store the gas. The device includes manometers, manual valves, an air regulator, filter, and high pressure tubing and fitting. To mitigate temperature increases due to compression, exhaust air is circulated around the compressed gas chamber.

GB 1000 MODEL:

Type: Double stage - double effect
Admission pressure: 15 bar to 200 bar (about 225 to 2,900psi).
Max outlet pressure: 700 bar (10,000 psi) or 1000 bar (15,000 psi).
Pressure increase ratio: 1:150
Working temperature: Ambient 25° - 50 °C
Air drive: 0.5 to 10 bar (7 to 145psi)
Process fluids: Dry HC gas

GB 700 MODEL:

Type: Single stage - single effect
Admission pressure: 15 bar to 200 bar (about 225 to 2,900psi).
Max outlet pressure: 700 bar (10,000 psi) or 1000 bar (15,000 psi).
Pressure increase ratio: 1:75
Working temperature: Ambient 25° - 50 °C
Air drive: 0.5 to 10 bar (7 to 145psi)
Process fluids: Dry HC gas



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SOLVENT CLEANER

The solvent cleaner is a mobile device designed to facilitate the cleaning of hydrocarbon residue in the PVT cell. The principle consists of filling half of the 20 litre cylinder with solvent and the other half, with compressed air. The device comes with two valves. One valve is used for filling the pre-evacuated cell with solvent and compressed air and the second one for injecting the pressurized solvent into the dirty cell.

FEATURES

Max pressure	100 psi
Volume	20 liters
Air requirement	10 bar (150 psi), dry

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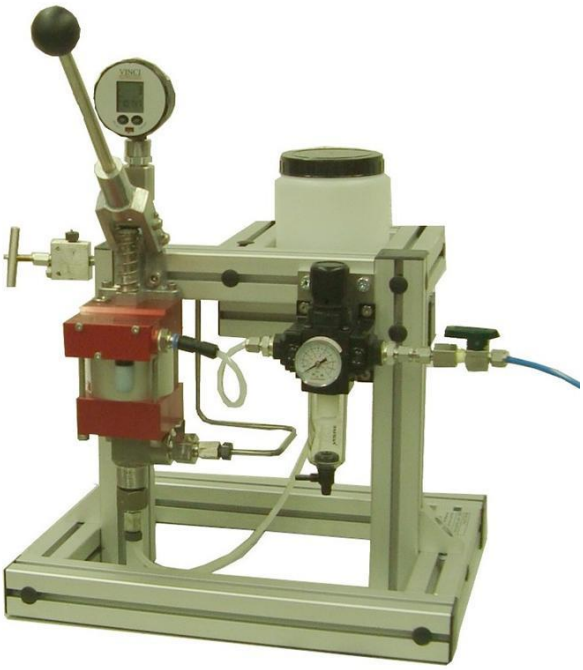
PRESSURE GENERATOR SYSTEM (PGS)

Designed to provide hydraulic pressure for a mercury-free fluid transfer from the sample cylinder into the PVT cell at the desired pressure. The pressure generator is provided with an air driven liquid pump, manometer and tank.



FEATURES

Max outlet pressure: 700 bar (10,000 psi)
Air inlet: 30 to 145 psi (10 bar)
Wetted parts: Stainless steel

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FLUID ANALYSIS

DEADWEIGHT GAUGE

Primary pressure standard designed for high pressure calibration applications. The device consists of a vertically mounted precision lapped piston and cylinder assembly. Accurately calibrated masses are loaded onto the piston, which rises freely within its cylinder. These weights balance the upward force created by the application of pressure within the system. Delivered with a carrying case.

FEATURES

Model: Dual piston
Operation: Oil operated
Pressure range: 1 bar (15 psi) to 1,100 bar (16,000 psi)
Accuracy: 0.015% RDG

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DIGITAL PRESSURE GAUGE (DPG SERIES)

The Digital Pressure Gauge series is designed for extremely accurate pressure measurement to meet your most demanding requirements for precision laboratory or field measurement instrumentation. The instrument includes a high precision analog pressure transducer, a rupture disc for over pressure protection, a five digit digital display and a data logging software for automatic data acquisition.

FEATURES

Model	DPG series
Pressure range	up to 10,000 psi (other range available)
Accuracy	0.1% FS
Port connection	1/8" autoclave type
Wetted part	stainless steel
Power supply	220 VAC 1 Ph, 50 Hz

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FLUID ANALYSIS

UNINTERRUPTIBLE POWER SUPPLY (UPS 16)

Back-up power protection used in most laboratories against electrical noise, sags, surges and brownouts which affect the sensitivity of the electrical components of the laboratory equipment.

FEATURES

Output power capacity:	12,800 Watts / 16,000 VA
Max configurable power:	12,800 Watts / 16,000 VA
Input voltage:	240 V +-1 %, single phase
Output voltage:	240 V +-1 %, single phase
Efficiency at full load:	90%
Back up time:	6 minutes at full load (12,800 watts)
	17 minutes at half load (6,400 Watts)

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