Cambridge Viscosity®

VISCOlab PVT™

The Gold Standard for High-Pressure Viscosity Analysis

VISCOlab PVT

Delivering the highest levels of accuracy, speed, and reliability

For oil, gas, and supercritical fluids, VISCOlab PVT delivers the highest levels of accuracy, speed, and reliability.

In high-pressure environments, correctly analyzing precious samples is as challenging as it is critical. With potentially millions of dollars on the line, "close enough" can never be good enough, and "soon enough" can never be fast enough. And because viscosity is a particularly important factor in the quality and marketability of the substances, measurements have to be accurate and reliable time after time.

Cambridge Viscosity's VISCOlab PVT (Pressure–Volume–Temperature) high-pressure viscometer is designed for viscosity temperature testing in oil exploration, research, and recovery; core analysis; phase behavior; supercritical fluids; and other complex applications. Safe and cost-effective to own and operate, the system is mercury-free and requires only 5 ml of sample. It also provides statistical certainty that ensures sample conditions are stable, accurate, and repeatable. The VISCOlab PVT also measures gas and gas condensates in addition to fluid samples.

The VISCOlab PVT's extraordinary capabilities make it an ideal choice for the most critical and challenging applications :

- Accuracy   +/- 1%
- Test time   4 hours
- Stabilization   45 minutes
- Sample size   5 ml
- Max pressure   1379 bar/20,000 psi (pressures up to 40,000 psi also available)

The System At a Glance

Designed for ease of use and accuracy in both field and fixed-based labs, the complete VISCOlab PVT system includes an advanced sensor with valves and tubing mounted on a frame that is temperature conditioned by an external water bath. An internal temperature sensor provides sample fluid temperature data.

A portable computer integrates time-stamped viscosity, pressure, and temperature data into a graphical format for easy analysis and storage. All data can be exported to LIMS or other computers via serial communications. An accessory kit is included with each system to facilitate sample loading, system cleaning, and calibration verification.

How It Works

The VISCOlab PVT combines a VISCOpro processor with an advanced Cambridge Viscosity SPL440 sensor. The system employs an integrated recirculating bath that controls temperatures from -30 to 190º C with minimal warm-up time. Sample flow is controlled with a simple three-valve plumbing configuration, and the standard test set-up includes horizontal, 45-degree, and vertical configurations for ease of operation.

VISCOlab PVT software features an intuitive graphical user interface that makes it easy to configure test settings and view results.

Superior sensor

Cambridge Viscosity sensors feature an innovative electromagnetic principal that drives an oscillating piston within a precise measurement chamber. Tracking the piston location and travel time gives a direct measure of the test sample viscosity. The piston motion also serves to continually scrub the sampling area and keeps the samples fresh. There is no need for frequent calibration and very little maintenance is required.

Small sample size

In high-pressure applications such as oil drilling, samples are hard to come by and very expensive to produce. The more you have to use for each test, the more it costs. The VISCOlab PVT requires only 5 ml of sample to enable highly accurate measurements, saving you time and money.

Unusually accurate and reliable

Incorporating independently verified pressure and temperature compensation, the VISCOlab PVT ensures accuracy and reliability by rapidly making multiple measurements on a single sample. There are special configurations for oil and gas analysis including options for off-gassing of live oil samples.
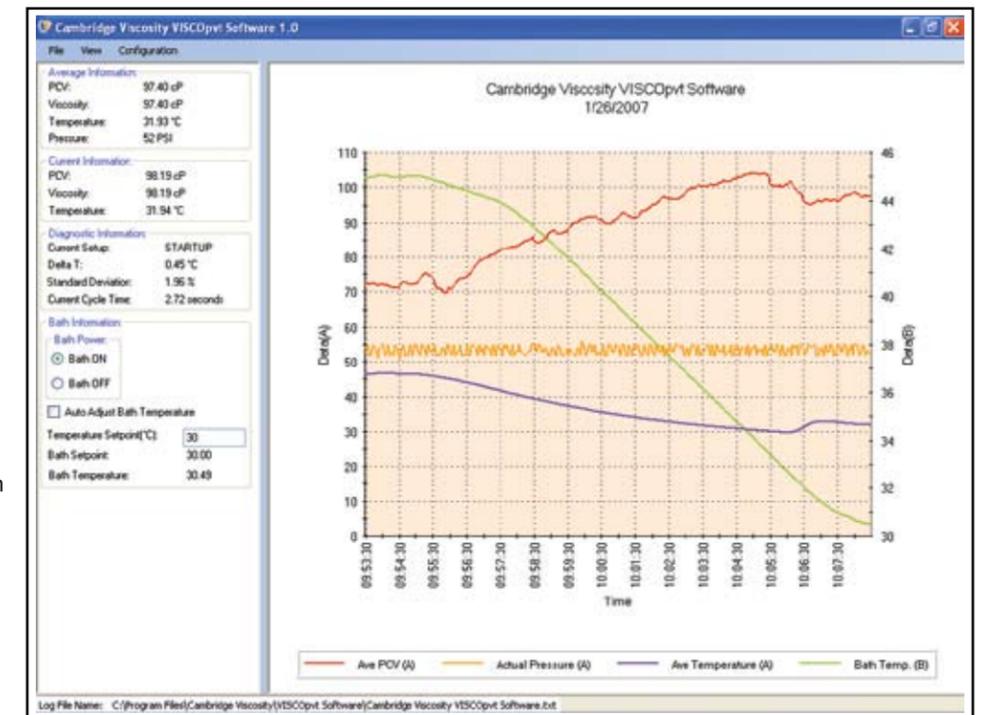
Powerful, easy-to-use software

The VISCOlab PVT system software is intuitive and easy to use, featuring a graphical user interface that includes a configurable dashboard. The software enables automatic storage and archiving of test data, and provides on-screen views of test conditions. Users can set temperatures with a single click.

Trouble-free operation

Sample handling occurs direct from the pressure canister or via pressure generator and is a much simpler method than the labor-intensive processes required by other high-pressure viscometers. Our special low-torque sealing system makes it easy to change sensor pistons to quickly accommodate different viscosity ranges. Specialized technical support is not necessary.

Fast, convenient, and cost-effective

The VISCOlab PVT system is a tightly integrated system with a small footprint for laboratory use. Samples reach stable temperature in only 45 minutes, and tests are completed in just four hours. Using no mercury, it is easy on your operations and on the environment.

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Technical specifications

Overall viscosity	0.02 to 10,000 centipoise (cP)
Viscosity ranges	0.02-0.2cP, 0.2-2cP, 0.25-5cP, 0.5-10cP, 1-20cP, 2.5-50cP, 5-100cP, 10-200cP, 25-500cP, 50-1,000cP, 100-2,000cP, 250-5,000cP, 500-10,000cP
Accuracy	± 1.0% of full scale
Repeatability	± 0.8% of reading
Temperature sensor	Internal platinum RTD
Wetted materials	Inconel 718 / 17-4 stainless steel / 316L stainless steel (Hastelloy optional)
Maximum particle size	25 - 360 microns
Maximum temperature	190°C (375°F)
Maximum pressure	1379 bar (20,000 psi) / 19,000 psi (CRN)
Power	Available in the following configurations: 100 VAC/60Hz, 120 VAC/60Hz, 230 VAC/50Hz, 230VAC/60Hz

The Technology Leader in Viscosity℠

Headquartered in Medford, Massachusetts, Cambridge Viscosity, Inc. is known for its innovative and highly accurate reliable hardware and software. With more than 80,000 installations worldwide, the company is the proven leader in viscosity management technology. Cambridge Viscosity has a demonstrated commitment to understanding and meeting the diverse requirements of customers who rely on viscosity measurement data to assure successful fluid management.

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