PAC | solid partners proven solutions

OptiMVD™

The Fastest, Most Versatile Combination Viscometer and Density Meter on the Market

- Fully automatic self-cleaning
- Small footprint saves valuable lab bench space
- Optimal temperature range for most diesels/lubricants (+15°C to +100°C)
- Single or dual viscometers/density meters for increased sample throughput
- Unique Smart Sampling Ordering automatically optimizes performance and decreases total test time
- Instrument Models: Single Sample Injection Port, 1x24 position carousel, or 2x24 position carousels

OptiMVD™

FAST AND RELIABLE VISCOSITY MEASUREMENT

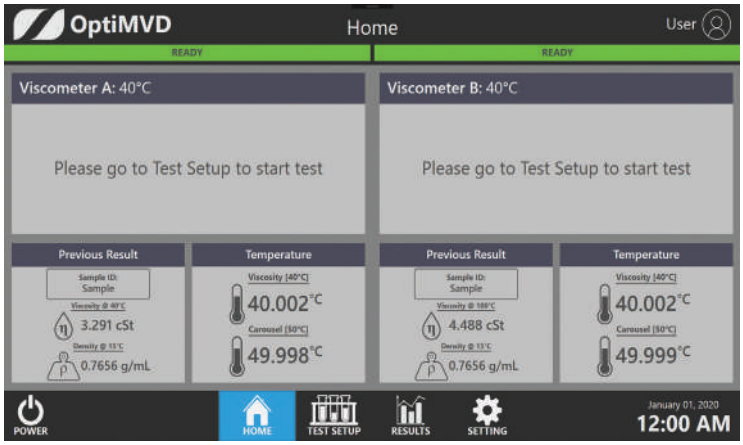
OptiMVD measures viscosity according to ASTM D7945. This method is based upon the Hagen-Poiseuille principle of capillary flow. To determine viscosity with OptiMVD, a sample is drawn from a capped sample vial and then introduced into the measuring cell at a controlled, specified temperature. The measuring cell contains a horizontal capillary tube with optical sensors. A thermal block surrounds the measuring cell.

Density is determined by ASTM D7777 method. The OptiMVD measures density at multiple temperatures yielding precision that is much better than other D7777 density meters.

SIMPLE, EASY OPERATION

OptiMVD operation begins by simply loading a sample vial onto the sample injection port or into a carousel, then starting the test using the 13.3” color touchscreen. Heating, cleaning, and drying are automatically controlled. Up to two solvents can be used. The supplied waste container can accommodate over 50 tests with complete two-solvent cleaning.

A “Favorites” list can be created, then touch-selected and dragged to any open position on a carousel. Users can pre-fill carousel positions from the “Favorites” list. Alternatively, users can add individual samples by touching the carousel location. Once the carousel is loaded, press “START RUN” to begin the test. Users can prioritize specific samples regardless of the loading queue.



OPTIMIZE YOUR COMMUNICATION RATE

The user interface is intuitive and easy to understand, with minimum interactions needed to enter data, save favorites, configure the autosampler, or start the run. Even the ability to update, download data and calibrate the OptiMVD are simple processes and quickly achieved.

QUICK ANALYSIS CYCLE TIME

OptiMVD determines dynamic viscosity and density in a single test run, using only 5 ml of sample. The dual viscometer/density meter model can test dynamic viscosity and density at two different temperatures in a single test run, completing the tests in as fast as ten minutes. The dynamic viscosity is converted to kinematic viscosity using the formula,

$$\nu = \frac{\eta}{\rho}$$

where

ν is kinematic viscosity (mm^2/sec),
η is dynamic viscosity (mPa·s), and
ρ is density (g/cm^3)

All three results, ν, η and ρ are output on the screen.

BIG PERFORMANCE IN A SMALL PACKAGE

OptiMVD is a mini viscometer and density meter designed for today's modern laboratory. Available in three different configurations, all models load the sample, perform viscosity and density measurement, and clean the system automatically. The dual carousel model allows programming up to 48 samples at a time. All models can measure samples with a viscosity range from 1 mm^2/sec to 2,000 mm^2/sec at 40°C.

Safe and cost-effective to own and operate, the constant pressure viscometer has a precision that meets or exceeds ASTM D445 or its equivalents.

APPLICATION RANGE

- Viscosity measurement from 1 to 2,000 mm^2/sec @ 40°C
- Density from 0.5 g/cm^3 to 2 g/cm^3

INDUSTRIES

- Refineries
- Pipelines & Terminals
- Contract Laboratories
- Mobile Labs
- Chemical Plants

STANDARD METHODS

Complies to:

ASTM D7945
ASTM D7777

Correlates to:

ASTM D445
ASTM D4052
ISO 3104
IP 71
GOST 33
GB/T 265

HIGH PRECISION AND THROUGHPUT

OptiMVD maximizes the power of automation to increase test productivity with significant repeatability and reproducibility improvement. The dual viscometer/density meter model features two integrated, 24-position autosampler carousels, giving users the ability to program up to 48 tests. The analyzer's flexibility features allow users to test sample from the same vial at two different temperatures, as well as test sample from either carousel in any chosen order.

SMART SAMPLE ORDERING

"Smart Sample Ordering" is a unique, time-saving feature only available on the OptiMVD. This feature enables the analyzer to intelligently evaluate the number of samples, the sample order, the testing temperatures, and any user-defined priority selections to determine the most efficient testing order. Depending on the type and number of samples, this feature can reduce the total testing time from 20% to 50% or more for full carousels running multiple temperatures.

PRINCIPLE OF OPERATION

The System At a Glance

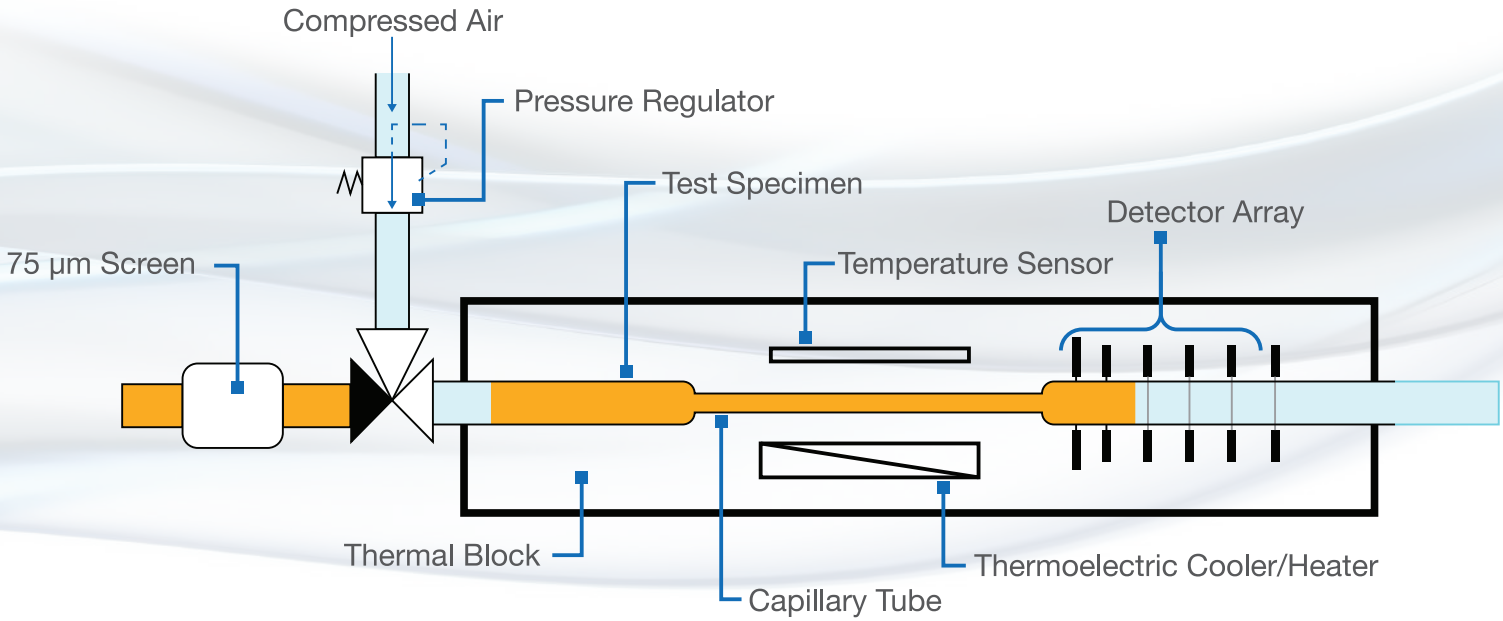
OptiMVD uses ASTM D7945 to measure viscosity. This method is based upon the Hagen-Poiseuille principle of capillary flow. To determine viscosity with the OptiMVD, the sample is drawn from a capped sample vial and then introduced into the measuring cell at a controlled, specified temperature. The measuring cell contains a horizontal capillary tube with optical sensors. A thermal block surrounds the measuring cell.

SPECIFICATIONS

Viscosity Range	1 mm^2/sec to 2000 mm^2/sec at 40^0C
Density Range	0.5 g/cm^3 to 2 g/cm^3
Viscosity Repeatability	< 0.75% (D7945)
Viscosity Reproducibility	< 1.38% (D7945)
Density Reproducibility	< 0.0024 g/cm^3 (ASTM D7777)
Temperature Range and Repeatabiity	$+15^0C$ to $+100^0C$, ± 0.005°C

How It Works

Dynamic viscosity is determined from the flow time of the sample through the capillary under a constant pressure of compressed air. Along the path, light is emitted as sensors measure the transit time. The U-tube densitometer's oscillating frequency is used to determine density. The sample's kinematic viscosity is calculated by dividing the dynamic viscosity by the density measurement.



PHASE TECHNOLOGY by PAC

ABOUT PAC

PAC develops advanced instrumentation for lab and process applications based on strong Analytical Expertise that ensures Optimal Performance for our customers. Our analyzers help our customers meet complex industry challenges by providing a low cost of ownership, safe operation, high performance with fast, accurate, and actionable results, high uptime through reliable instrumentation, and compliance with standard methods.

Our solutions are from industry-leading brands: AC Analytical Controls, Advanced Sensors, Alcor, Antek, Herzog, ISL, Cambridge Viscosity, Phase Technology, PSPI, and PetroSpec. We are committed to delivering superior and local customer service worldwide with 16 office locations and a network of over 50 distributors. PAC operates as a unit of Roper Technologies, Inc., a diversified technology company and a constituent of S&P 500, Fortune 1000, and Russell 1000 indices.

HEADQUARTERS

PAC LP | 8824 Fallbrook Drive | Houston, Texas 77064 | USA
T: +1 800.444.8378 | F: +1 281.580.0719

Contact us for more details.
Visit our website to find the PAC representative closest to you.