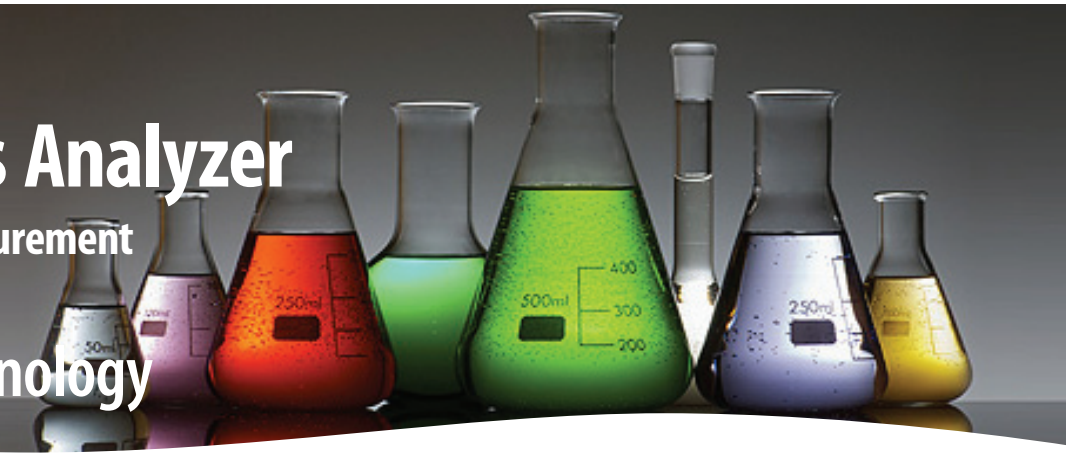
70X*i* Series Surfactants Analyzer

for Cloud Point Measurement

from Phase Technology



Scientifically Designed for Workflow Optimization

- SUPER FAST SPEED
  Test results in less than 10 minutes.
- SUPERIOR PRECISION
  Repeatability of < 0.5°C
- ONE-TOUCH PRESET FAVORITES
  Frequently-used test settings can be stored in the analyzer for quick access.
- INTUITIVE, EASY-TO-USE INTERFACE
  Full-color, touch-sensitive, 15" high resolution screen is easy to read and view. Multitasking capability eliminates need to flip between multiple windows.
- OPTIMIZED FOR QUALITY CONTROL
  Automatic QC runs with instantaneous control charts. Retest sample option increases confidence in test result.
- USB & ETHERNET CONNECTIVITY
  Quickly export analyzer data to a portable USB flash drive. Ethernet port available for connecting to LIMS or computer network. Connect any HP (or PCL compatible) printer.
- CUSTOMIZABLE REPORTING
  Test history, plot data and self-diagnostics can be displayed on-screen, printed, or transferred to computer for statistical analysis, presentations, email sharing, archival storage

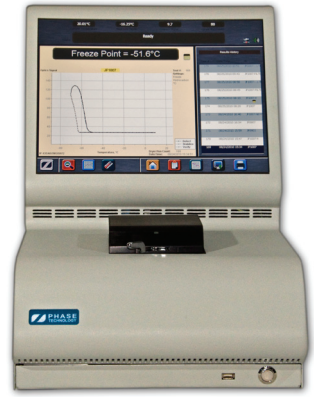
Cloud Point of Surfactants

Speed, Precision and User-Friendly Design

Surfactants are used in household detergents, personal care products, industrial cleaners, paints and coatings. One particular type, the nonionic surfactants, is subject to a formation of a new surfactant-rich phase usually at an elevated temperature called the cloud point. The cloud point is the temperature at which a surfactant becomes insoluble in water as the sample is warmed.

Knowing the cloud point is important for determining stability during storage. If stored at temperatures significantly higher than the cloud point, phase separation and instability may occur. Characteristics like wetting, cleaning and foaming may be different above and below the cloud point.

Until now, determining cloud point has relied on a laborious, manual process of visual detection.



70Xi screen displays real-time test results and phase plot, showing temperature change and signal strength as test progresses. The graphic visual information helps users better understand anomalous behavior.

An Automatic Test Method from the World Leader in Cold Flow

Recognized as the world leader in providing test instruments for the petroleum sector, Phase Technology's expertise in cold flow properties extends into numerous other applications and industries.

Phase Technology's patented design principles and completely automatic test methods are easily adapted for testing a wide variety of liquid materials.

Innovative Design, Increased Productivity

For testing surfactants, Phase Technology's 70Xi lab analyzer significantly increases productivity and improves profitability by providing quick, precise test results.

The 70Xi features an easy-to-use, one-button interface and robust design for highly accurate cloud point testing.

This instrument has been a blessing, cutting our reporting time in half. We were using the manual method, so it's great that we no longer have to deal with dry ice and manual mixing. *Humberto Hill*, Lab Manager, Camin Cargo Control Lab

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Technical Specifications

70X*i* Series Surfactants Analyzer

CLOUD POINT TEST METHOD	To measure the cloud point of ionic surfactants or detergent systems, the same methodology as ASTM D2024 is applied	
STATED PRECISION: REPEATABILITY	typically < 0.5°C	
SAMPLE TEMPERATURE RANGE	-70 °C to 70 °C	
TEST RESOLUTION	0.1 °C	
TEST DURATION	< 10 minutes	
REQUIRED OPERATOR TIME	0.5 minutes	
SAMPLE SIZE	0.15 mL	
DETECTION METHOD	Patented Diffusive Light Scattering (DLS) technology	
COOLING SYSTEM	Integrated Peltier device cooling system	
DISPLAY	Full-color, touch-sensitive, 15" high resolution LCD touch screen	
OUTPUTS	(3) USB A ports for optional peripherals: flash drive, label printer, barcode scanner, keyboard, mouse; (1) USB B port (3) RS-232 serial ports for optional peripherals & networking: external computer, Phase Technology LTB diagnostic software; (1) dedicated Service port; (1) 10/100Base-T Ethernet (RJ45) port for networking: LIMS, local area network (LAN)	
TEMPERATURE MEASUREMENT	°C or °F (User selectable)	
ALERTS	Buzzer for alarms warnings and prompts (User selectable)	
INTERNAL MEMORY	Storage up to 5000 test runs	
AMBIENT OPERATING ROOM TEMPERATURE	10 to 30 °C (50 to 86 °F) Extremes not recommended	
DIMENSIONS (W x D x H)	Unit	Length x Width x Height 21.5 x 13.25 x 17.5 inches 54.6 x 33.7 x 44.5 cm
	Boxed	29 x 23 x 19 inches 74 x 58 x 48 cm
WEIGHT	Unit	53 lbs / 24 kg
	Boxed	62 lbs / 28 kg
UTILITY REQUIREMENTS	Electrical	90 – 260 VAC, 47 – 63 Hz 350 watts
	External Cooler Bath	NONE

About Phase Technology Surfactants Analyzers

To measure the cloud point of ionic surfactants or detergent systems, the same methodology as ASTM D2024 is applied:

- Warm the sample until it is cloudy
- Cool the sample and measure the temperature when it becomes clear

Cloud point phenomenon in water-surfactant solutions is an indicator of relative solubility, and plays a direct role in cleaning efficiency. Different formulations are used to adjust the cloud point to bring about the optimum balance in terms of detergency power, wash temperature and duration. It is generally assumed that maximal detergency power is achieved just below the cloud point (also called Krafft point in some situations). Frequently there are constraints on available temperature (e.g. cold water wash to preserve energy, or some upper temperature so not to damage pipes or other structures), therefore makers of surfactants aim to formulate their products to attain the cloud point to be just below this limit to have the maximally effective surfactant.

In addition to cloud point, the 70Xi analyzer can also determine the gel point, available as an added option. Gel point is the temperature at which the sample experiences an abrupt reduction in flow characteristics due to gelation. Phase Technology's proprietary method disturbs the sample with a precisely-defined force at 3°C intervals (or any other user programmable interval) until movement subsides suddenly.

Our Phase Technology analyzer is a real time-saver. The combination of automation and the easy-to-understand color touch-screen adds to our lab's overall efficiency.

Thomas C. Bell, Specialist – Manufacturing and Lab Support, Chevron