Automated Cloud Point, Pour Point, Cold Filter Plugging Point, and Freezing Point of Petroleum Products

test method

For Petroleum Products, cloud point and pour point of a petroleum product is an index of the lowest temperature of its utility for certain applications. The specimen is cooled at a specified rate and examined periodically. The highest temperature at which a cloud is first observed at the bottom of the test jar is recorded as the cloud point. The lowest temperature at which movement of the specimen is observed is recorded as the pour point.

The freezing point of an aviation fuel is the lowest temperature at which the fuel remains free of solid hydrocarbon crystals that can restrict the flow of fuel through filters if present in the fuel system of the aircraft. The temperature of the fuel in the aircraft tank normally decreases during flight depending on aircraft speed, altitude, and flight duration. The freezing point of the fuel must always be lower than the minimum operational fuel temperature.

The Cold Filter Plugging Point (CFPP) of a fuel is suitable for estimating the lowest temperature at which a fuel will give trouble-free flow in certain fuel systems. The CFPP test determines the highest temperature at which a given volume of diesel, biodiesel or heating fuel fails to pass through a standardized wire mesh filtration device in a specified time when cooled under specified conditions.

Integrated Panel PC and Software Package – The KLA Series of analyzers are complete standalone systems featuring an integrated panel PC with an advanced software package. The 12" TFT/LCD touch screen display has a resolution of 1024x768 with a 16.2 M color scheme. All analytical parameters are graphed and displayed in real time as well as recorded in Microsoft® Excel compatible file format. The software monitors the operation and performance of all the analyzer components for proper data measurement, including the solenoid valves, cooling system, pressure sensors, and the Platinum resistance PT100 Class A temperature probe.

Vacuum System – The automated cold filter plugging point analyzer includes an internal vacuum generator. The internal vacuum generator provides a smaller footprint for the complete CFPP system and consists of a 350 mBar micro-pump and an electronic pressure/vacuum regulator composed of a proportional valve, pressure/vacuum control sensor, regulator for reference vacuum generation at 20 mBar and a vacuum stabilizer.

Safety Features

- Audible alarm and displayed messages (at the end of the analysis and in case of errors and/or malfunctions)
- Pressure controller for 1st and 2nd stage motor compressor
- Thermostat for 2nd stage activation
- Thermo-switch for each cooling / heating jacket
- Motor compressors equipped with internal overload devices

Included Acessories

Calibrated Aspiration Pipette complete with Filter Kit for CFPP
Cord Cable without plug
Calibrated Test Jar User Manual
Operating Software Spacer

KLA-24-TS – Automatic Two-Unit configuration for Pour Point and CFPP Analyzers with Integrated Touch Screen PC

specifications

Conforms to the specifications of:

Cloud ASTM D2500, D7551, D5772, D5773; DIN 51597; IP 219, IP 444, IP 445, IP 446; ISO 3015

Pour ASTM D97, D5853, D5950; IP 15, IP441; ISO 3016

Cloud & Pour ASTM D97, D2500, D5771, D5772, D5773, D5853, D5950; DIN 51597; IP 15, IP 219, IP441, IP 444, IP 445, IP 446; ISO 3015, ISO 3016 CFPP ASTM D6371; IP 309, 419; EN 116

Freezing ASTM D1177, D1655, D2386, D5901 (Withdrawn 2010); IP 16; ISO 3013

Temperature Range:
One-Stage: +30 to -45°C
Two-Stage: +30 to -80°C
Resolution: 0.06°C
Accuracy: ±0.1°C
Repeatability / Reproducibility: as per standard test methods or better
Data Storage: > 60,000 analyses

Electrical Requirements:
115V ± 15% / 60Hz
220V ± 15% / 50 to 60Hz

Multiple Configuration System

These automated sample cooling and physical property measurement systems can be configured with two, three, four and six test positions with one of five possible analytical heads at each position: cloud point, pour point, cloud & pour point, cold filter plugging point and freezing point. Standard and customized multiple configuration systems are readily available. Please refer to the provided ordering information for details.

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Cloud Point Detection – TThe cloud point detection system provides automated sample testing with the accuracy and repeatability in accordance with ASTM D2500, D5771, D5772, D5773 and related international test methods. The sophisticated dynamic measuring system emits a light pulse every 1°C from a coaxial fiber optic cable positioned above the test sample. The light pulse is then reflected off the silver bottom test jar to an optical sensor. The advanced software package analyzes the response of the light pulse. The initial appearance of crystallization is monitored by light scattering, signifying the cloud point of the sample. All clear and transparent oils are readily measured by the detection system, regardless of sample color.

Pour Point Detection – The pour point detection system provides automated sample testing with the accuracy and repeatability in accordance with ASTM D97, D5853, D5950 and related international test methods. The automated operation involves removing the sample from the cooling jacket at 3°C intervals and tilting it to a 90° angle as prescribed by the test method until no flow is observed. Contact of the cold sample with the two PT100 detection probes positioned just above the surface liquid level when the test jar is tilted identifies sample flow. The test jar is automatically returned to the cooling jacket and sampled again until no flow is detected for 5 seconds. The pour point result is then reported at 3°C higher than the temperature at which the sample ceased to flow in accordance with the test method.

Freezing Point Detection - The freezing point detection system provides automated sample testing with the accuracy and repeatability in accordance with ASTM D1177, D1655, D2386, D5901, D5972 and related international specification. The sample is cooled in the test chamber with constant stirring. The sophisticated dynamic measurement system emits a light pulse every 0.5°C from a coaxial fiber optic cable positioned above the test sample. The light pulse is then reflected off the mirror of the fiber optic to an optical sensor. The advanced software package analyzes the response of the light pulse. The initial appearance of crystallization is monitored by light scattering. The sample is then warmed up, and the temperature at which the hydrocarbon crystals disappear is recorded as the freezing point. All clear and transparent fuels are readily measured by the detection system, regardless of sample color.

CFPP Detection – The cold filter plugging point detection system provides automated sample testing with the accuracy and repeatability in accordance with ASTM D6371 and related international test methods. The sample is cooled according to the pre-selected temperature profile. A 20 mBar vacuum is applied to the sample at specific intervals across a 45 micron mesh filter into the aspiration glass cell assembly. If it takes more than 60 seconds for the sample to reach the upper barrier detector or more than 60 seconds to return below the detector upon release, then the test is complete and the cold filter plugging point has been reached.

ordering information

Koehler KLA units follow the following part number format: KLA-###-TS

For example, to order a two-unit configuration with 1 CFPP position and 1 pour point position, order the following:

catalog no.	description
KLA-**24**-TS	2 for Pour Point and 4 for CFPP, one-stage cooling
KLA-**24**-TS/**2**	2 for Pour Point and 4 for CFPP, two-stage cooling

Adding /2 after the "-TS" will convert your unit from a one-stage cooling system to a two-stage cooling system

Testing Head Configurations

1	Automatic Cloud Point Analyzer Test Position
2	Automatic Pour Point Analyzer Test Position
3	Automatic Cloud & Pour Point Analyzer Test Position
4	Automatic Cold Filter Plugging Point Analyzer Test Position
5	Automatic Freezing Point Analyzer Test Position

The Cold Filter Plugging Point and Freezing Point Analyzers (configurations 4 and 5) are both available as single-unit options within the KLA series.

ordering information

catalog no.	description
KLA-4-TS	Automatic Cold Filter Plugging Point Analyzer with Integrated Touch Screen, One-stage
KLA-4-TS/2	Automatic Cold Filter Plugging Point Analyzer with Integrated Touch Screen, Two-stage
KLA-5-TS	Automatic Freezing Point Analyzer with Integrated Touch Screen, One-stage
KLA-5-TS/2	Automatic Freezing Point Analyzer with Integrated Touch Screen, Two-stage

Please specify voltage requirements when ordering.

accessories for all KLA units

KLA-PT100-CAL	Calibration Decade Box - PT100 Simulator
KLA-DB-KIT	Set of Connectors and Cables

For single-unit Cloud Point, Pour Point, and Cloud & Pour Point Analyzers, please contact your Koehler Sales Representative about the K77000 and K77001 automatic analyzers.

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