Cold Filter
Plugging Point Tester

Cold Filter Plugging Point

The Cold Filter Plugging Point (CFPP) method is used to determine the low-temperature operability of diesel fuel, biodiesel, blends and gas oils. The CFPP is a critical property used to forecast the lowest temperature at which a fuel will freely flow through filters in a diesel engine system.

All diesel fuels contain wax. When the temperature of the fuel decreases, wax crystals will begin to precipitate at some point. If a certain amount of wax precipitates, the crystals can block fuel flow through filters and other restricted passages in the fuel system.

The Callisto 100 is a fully automated and compact CFPP tester operated by a touchscreen. It contains all required components according to the standard method. Testing and results are in full compliance with ASTM D6371, EN 116, EN 16329, JIS K 2288 and IP 309.

Additionally, the Callisto 100 can be used for manual cloud and pour point measurements. With the optional kit, measurements can be performed according to the standard methods ASTM D2500, ISO 3015, EN 23015, JIS K 2601, IP 219 (cloud point) and ASTM D97, ASTM D5853, ISO 3016, JIS K 2269, IP 15, IP 441 (pour point).
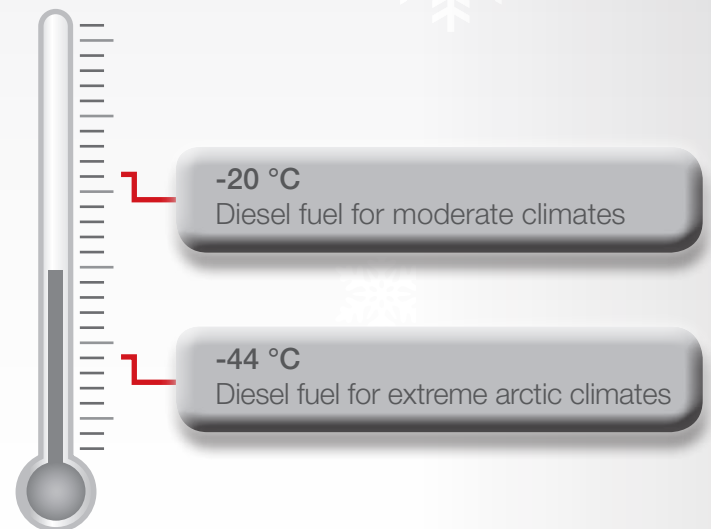
To cool the sample in the cooling jacket an external cooling system is required. Based on more than 30 years of Anton Paar's experience in Peltier element technology, the Callisto 100 comes with a newly developed, state-of-the-art Peltier element technology which allows the connection of a methanol-free cooling system.
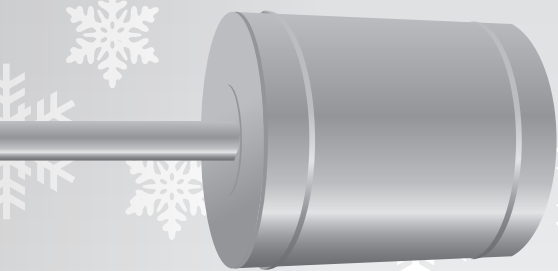
Low-temperature operability

Pump   Filter
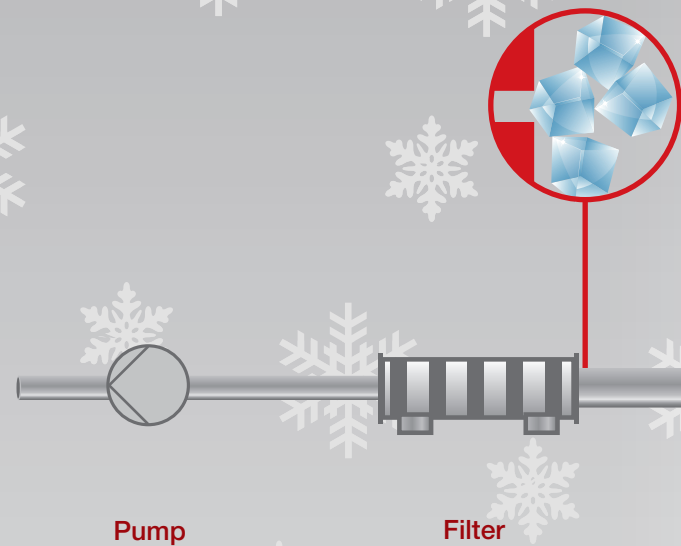
Low-temperature operability is an issue with diesel fuels because they contain paraffin waxes that become solid at ambient winter temperatures.

Climate requirements for diesel fuel

-20 °C
Diesel fuel for moderate climates

-44 °C
Diesel fuel for extreme arctic climates

Test principle

According to the strict guidelines described in the applicable standards, a given portion of a fuel is cooled under specified conditions and is drawn into a pipette under a controlled vacuum through a standardized wire mesh filter. The test is repeated when the sample has cooled by every additional 1 °C.
The temperature at which the sample can no longer be filled into the pipette within 60 seconds is when the test is finished. The temperature displayed is the CFPP test result.

Benefits at a glance

▶ Error-free detection

▶ Easy and intuitive operation

▶ High sample throughput

▶ Convenient cleaning routines

▶ Peltier elements for high homogeneity of the cooling jacket supported by an external methanol-free cooling system

Tank

These wax crystals may plug the fuel filter, making it impossible for the fuel system to deliver fuel to the engine.

There are a number of procedures in refineries to improve a fuel's low-temperature operability such as treating a fuel with additives or manufacturing it from crude oils with lower wax content.

The Callisto 100 is the first choice for evaluating the quality and drivability of diesel fuels at low temperatures or even under extreme arctic climate conditions.

Callisto 100
Easy and Precise CFPP Testing

Error-free detection

Thanks to contact-free infrared detection technology, the complete filtration unit is easily accessible and has the same detection position in each test. This ensures high accuracy and repeatability.

Easy and intuitive operation

Start your tests immediately: The Callisto 100 comes with pre-programmed standard test methods to select from. If you want to customize your test routines, you can create and store up to 90 individual user programs.

Testing accuracy is enhanced by user-friendly calibration procedures for the temperature and vacuum – a standard delivery feature of the Callisto 100.

The large color display indicates the sample and jacket temperature in real time and provides additional graphical information about the aspiration and flow back times to observe the temperature behavior of the sample during the test.

For statistics, the Callisto 100 offers a result history for 1000 tests as well as the statistical evaluation of those test results according to the test method.

The Callisto 100 provides versatile connectivity via USB or LAN, to export test results as Excel® or PDF files, or to connect a bar code reader for sample identification.
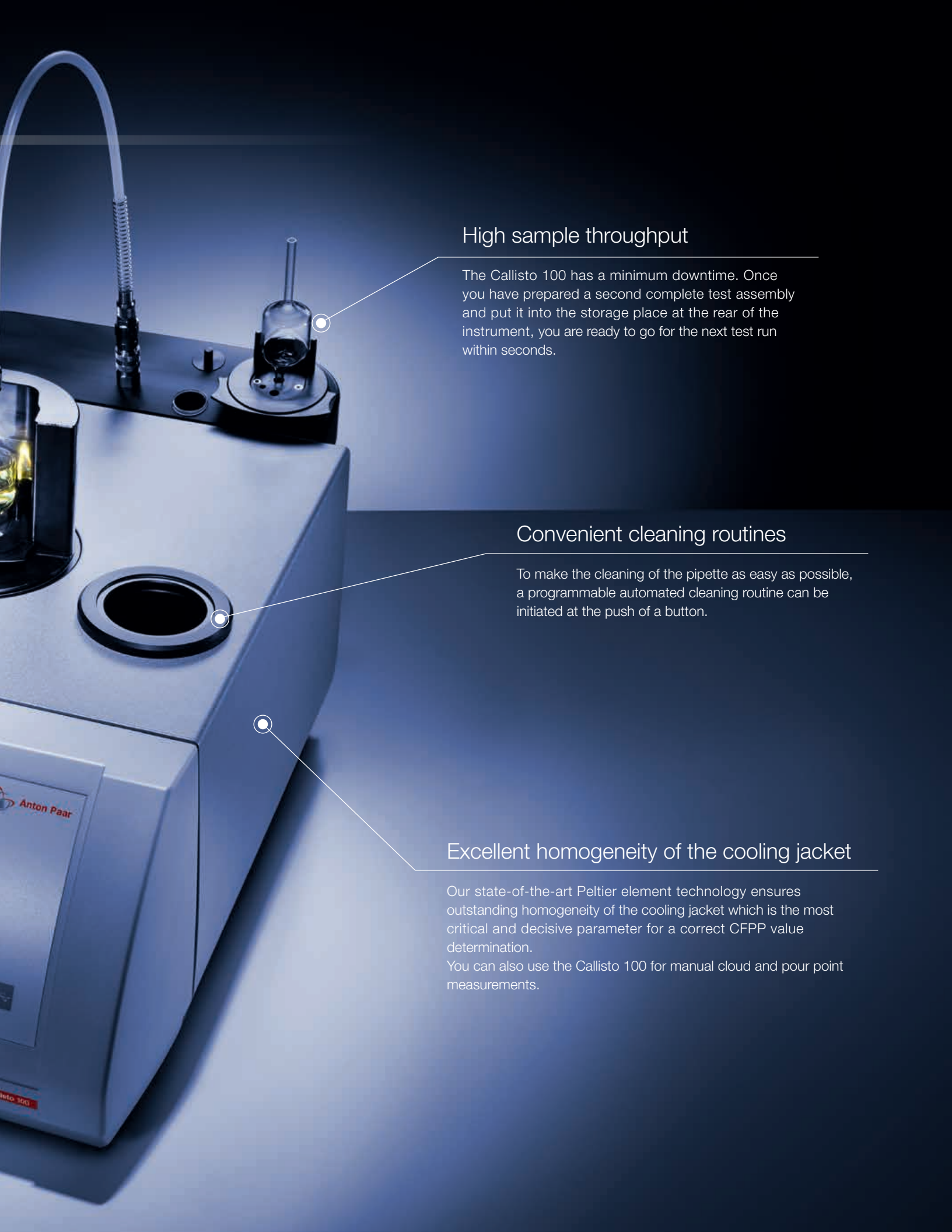
High sample throughput

The Callisto 100 has a minimum downtime. Once you have prepared a second complete test assembly and put it into the storage place at the rear of the instrument, you are ready to go for the next test run within seconds.

Convenient cleaning routines

To make the cleaning of the pipette as easy as possible, a programmable automated cleaning routine can be initiated at the push of a button.

Excellent homogeneity of the cooling jacket

Our state-of-the-art Peltier element technology ensures outstanding homogeneity of the cooling jacket which is the most critical and decisive parameter for a correct CFPP value determination.
You can also use the Callisto 100 for manual cloud and pour point measurements.
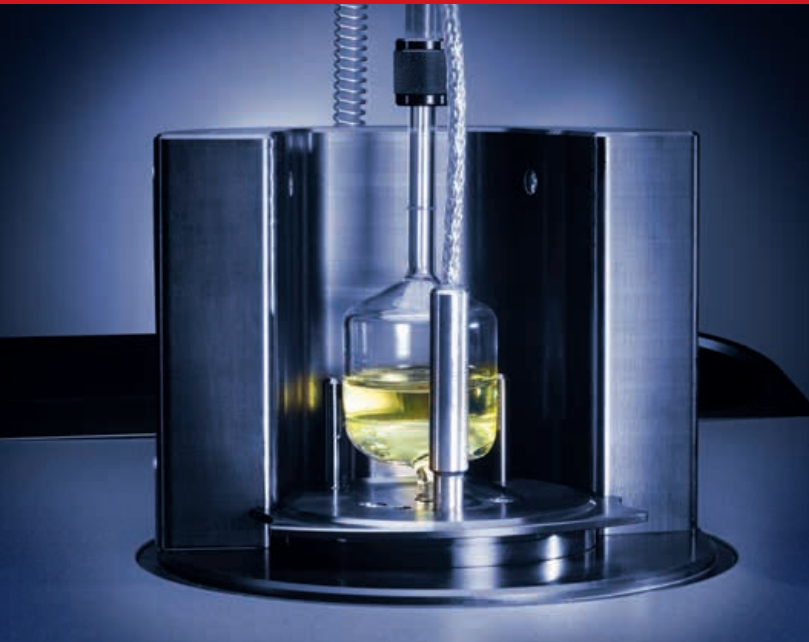
Accurate detection

Thanks to contact-free infrared detection technology, the complete filtration unit is easily mounted into and removed from the cooling jacket. This allows for the same accurate detection position for each test and guarantees excellent repeatability of test results.
The pipette is not shielded and has no thermal insulation.
The Callisto 100 delivers excellent detection, even when the pipette is frosted and there is no interference from daylight.

Extended cooling profiles

In addition to the well-established stepped cooling method, the Callisto 100 meets the requirements of the alternative standard method EN 16329 with linear cooling of the sample. The EN 16329 is now part of the EN 590 European Diesel specification as an alternative test method to EN 116.
The Callisto 100 requires an external cooling device which can be an inexpensive and methanol-free counter-cooling system with antifreeze. The cooling system is only used to support the Peltier elements in reaching the minimum jacket temperature of -70 °C and to measure samples with a CFPP value below -35 °C.

High flexibility and efficiency

For more flexibility and faster handling, the complete filtration unit is easily disassembled for cleaning and re-assembled for the next CFPP test. This cleaning procedure is required by the standard methods to verify the cleanliness and dryness of all elements in order to obtain precise test results.
An additional complete test assembly can be prepared while a test is in progress and stored at the rear of the instrument. This allows you to start the next test run within seconds, minimizing the downtime between subsequent tests and maximizing the throughput for optimized lab efficiency.

Technical Specifications

Operation	
Detection	2 infrared contactless detection barriers
Temperature range of measuring chamber	-70 °C to 48 °C (accuracy according to applied standard test method)
Measuring range	-60 °C to 45 °C
Vacuum	Electronically controlled
Cooling profiles	Programmable stepped or linear (from 6 °C/h to 100 °C/h)
Temperature measurement	°C or °F, Pt100
Cleaning	Programmable cleaning cycles
Password security	Multi-level password protection
Calibration	▸ Automatic calibration routine for sample and jacket temperature and vacuum measurement ▸ Temperature probe correction table
Languages	English, German, Spanish, French, Portuguese, Chinese
Documentation	
Data memory	▸ 1000 results ▸ 90 user-defined programs
Data export	▸ Export of measurement results to memory stick (PDF, XLS) ▸ Printout of data on a ticket printer or all supported Anton Paar printers
Interfaces	3x USB (back), 1x USB (front), 1x RS232, 1x LAN, 1x VGA
Data input options	Bar code reader, keyboard, mouse
Display	Color touchscreen
Requirements and dimensions	
Mains supply	AC 100 V to 240 V, 50/60 Hz, 290 VA
Ambient temperature	10 °C to 35 °C
Air humidity	Max. 80 % relative humidity
External cooling unit	▸ User-supplied or available from Anton Paar as an accessory ▸ Cooling power: 280 W at -20 °C
Cooling liquid connections	Hose nozzles with inner diameter 8 mm (0.3 inches)
Cooling liquid volume	Water or water-glycol mixture (ratio 3:2)
Flow volume of cooling liquid	3 L/min (at counter-cooling temperature)
Temperature of the coolant	-23 °C to 10 °C working range
Coolant	▸ -20 °C to -23 °C: jacket temperature down to -70 °C ▸ -10 °C or lower: jacket temperature down to -51 °C ▸ 10 °C or lower: jacket temperature down to -34 °C
Dimensions	340 mm x 580 mm x 310 mm (W x D x H)
Weight net	14 kg

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