APPLICATION HIGHLIGHT:

OptiCPP: Pour Point Testing of Waste Plastic Pyrolysis Oil (WPPO)

Introduction:

PAC Powered by ISL provides a state-of-the-art analytical equipment for the analysis of pour point coming with 40 years of experience in automated measurements.

OptiCPP is designed to perfectly meet today's expectations on user convenience, quality, and safety. The OptiCPP accurately detects the pour & cloud Point for petroleum products, lube oils, gear oils, food & beverages, chemicals.

PAC's Next-Gen Cloud and Pour Point Analyzer has some of the following key advantages:

- Proven technology per ASTM D5950 / IP 15 (Pour Point) and ASTM D5771 / IP 219 (Cloud Point)
- Jacket temp: -105ºC to +55ºC
- Sample temp: -92ºC to +35ºC
- High accuracy & precision
- Internal cooling
- Fast & compact solution

Highly Efficient Internal Cooling System:

The OptiCPP instrument has a perfectly efficient internal cooling system. Thanks to its creative design, the jacket temperature can approximately reach down to -105°C & sample temperature down to -92°C. It does not require any extra maintenance resulting in less operating cost & high throughput.

Plasyic Circularity and Increaded Use of WPPO:

Due to increased world population, higher standards of living, longer lifetime, increasing amounts of plastic packaging especially from food industry, growing concerns on environment, and new legal regulations, the rates of collections and recycling of waste plastics are soaring globally.

In addition to mechanical recycling, advanced recycling methods such as chemical recycling of waste plastics by pyrolysis are integral & complementary methods for achieving the sustainability targets worldwide. However, the nature of the WPPO is very different than the traditional hydrocarbons necessitating to develop new applications and equipment's to reveal its chemical & physical properties. OptiCPP is a strong analytical instrument to determine the cloud & pour points of WPPO samples.

Instrument Design, Distinct Features, and Test Results:

OptiCPP provides several distinct advantages to its users. To name a few, being a self-contained system, having no external cooling baths, working liquid-free under low noise, having cable-free heads eliminating the necessity of the broken cable replacement are among the valuable features it provides.

More advantageous features would include but not limited to the elimination of tangling thanks to its tilt mechanism, reduced learning curve provided by common MMI across the product line, and familiarity increasing task ergonomics.

OptiCPP has two test heads; a separate test head for pour point testing and another test head for Cloud point testing. The instrument automatically recognizes these heads when mounted. As shown in Figure 1 below, OptiCPP test head on the left side is for pour point and the one on the right side is for cloud point determination. There is no extra cable in the test head and the data communicates with the bus system.

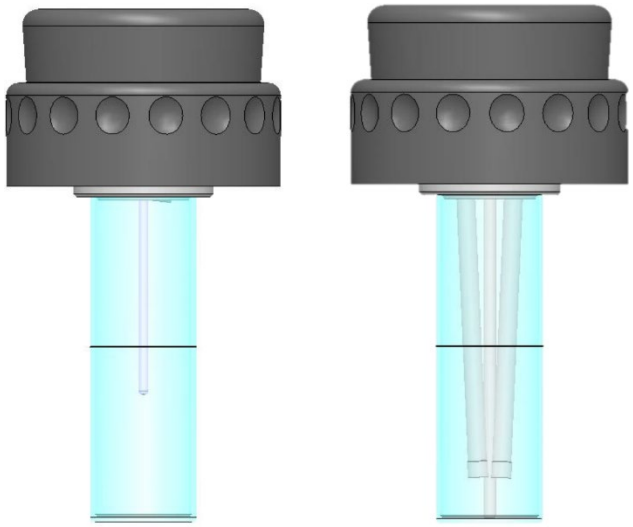

Figure 1: Two heads option of OptiCPP for pour point and cloud point tests.

OptiCPP is recognized in reference standards as an individual instrument, namely D5771(CP), D5950(PP), IP 444(CP). It complies to manual methods D2500(CP), D97(PP), IP 219(CP), IP 15(PP) and is called out in reference standards, D975, K7467, D396, D6751, EN 590, EN 14214.

The test results of the WPPO sample according to the method ASTM D97 are shown in Table 1 below. OptiCPP provides a very stable and precise sets of results with very high repeatability (all results are in °C).

Table 1: Pour point analysis results of WPPO samples.

Sample	Test Method	Pour Point	Description
WPPO #1	ASTM D97	3.0	OptiCPP Pour Point Testing
WPPO #1	ASTM D97	3.0	
WPPO #2	ASTM D97	9.0	OptiCPP Pour Point Testing
WPPO #2	ASTM D97	9.0	
WPPO #3	ASTM D97	0.0	OptiCPP Pour Point Testing
WPPO #3	ASTM D97	0.0	

Conclusion:

OptiCPP Pour&Cloud Point analyzer is in full Complies to manual methods D2500(CP), D97(PP), IP 219(CP), IP 15(PP). It is a suitable automated solution for the testing of challenging pastes and waxy samples including WPPO. Its highly efficient internal cooling system significantly fastens the cooling of the instrument. It provides an efficient analysis with decreased costs and improved throughput.

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