



Exceeding Expectations

P stands for **Pour Point**

The pour point is determined by a variety of techniques and is used for a wide range of petroleum products. To learn more about this line of testing, let's apply the **AmSpec** approach.

A = **Application**

The pour point of a liquid is the lowest temperature at which it becomes semi solid. This is where the liquid loses its flow characteristics. In crude oil a high pour point is generally associated with a high paraffin wax content, which is typically found in crude deriving from a large proportion of plant material.

Manual Method

The specimen is cooled inside a cooling bath to allow the formation of paraffin wax crystals. At about 9 °C above the expected pour point, and for every 3 °C after, the test jar is removed and tilted to check for surface movement. When the specimen does not flow when tilted, the jar is held horizontally for 5 seconds. If it does not flow, 3 °C is added to the corresponding temperature, since this is the last measurement when flow was observed, and the result is the pour point temperature.



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An approximate range of pour point can be observed from the specimen's upper and lower pour point. This is helpful with crude oil as it gives a temperature window depending on its thermal history. Within this temperature range, the sample may appear liquid or solid. This happens because wax crystals form more readily when it has been heated within the past 24 hrs and contributes to the lower pour point.

The upper pour point is measured by pouring the test sample directly into a test jar. The sample is then cooled and inspected for the pour point.

The lower pour point is measured by first pouring the sample into a stainless steel pressure vessel and heating to above 100 °C in an oil bath. After a specified time, the vessel is removed, cooled, and inspected for the pour point.

Automatic Method

ASTM D5949 is an alternative to the manual test procedures. It uses an automatic apparatus and yields pour point results in a format similar to the manual methods. This method determines the pour point in a shorter period of time than the manual method and therefore requires less operator time. Additionally, no external chiller bath or refrigeration unit is needed.

M = Methods

These are the most common methods that AmSpec uses to determine the pour point of a product:

D97 – Pour Point of Petroleum Products

D5853 – Pour Point of Crude Oils

D5949 – Pour Point of Petroleum Products (Automatic Pressure Pulsing Method)

S = Scope

Method	Products	Scope
D97	Petroleum Products	N/A
D5853	Crude Oil	Down to -36 °C
D5949	Petroleum Products	-57 to 51 °C

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**** Please note below, *Turnaround Time* is defined as the actual length of time, on average, it takes to perform a particular method once the sample has arrived in the lab, logged and prepared for testing .**

P = Procedure Notes

Method	Limitations	Instrumentation	Turnaround Time
D97	N/A	Manual	2 hours
D5853	Only for crude oil	Manual	2 hours
D5949	Not intended for crude oil and has not been verified for residual fuels	Automatic	30 minutes

E = Equivalents

ASTM	IP	ISO	DIN	JIS	AFNOR
D97	15	3016	51597	K2269	T60-105
D5853	441				
D5949					

C = Cause & Effect

The pour point of a petroleum product is an index of the lowest temperature it can be utilized for certain applications. The flow characteristics of a fuel, along with the pour point, are critical for the correct operation of lubricating oil systems, fuel systems, and pipeline operations. Petroleum blending operations require precise measurement of the pour point.

For any questions about these methods, please contact Jennifer Nesci at JNesci@amspecllc.com

Also, please download the new & improved AmSpec Smart Phone app for a number of useful conversion tools and information.

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