



Standard Test Method for Cloud Point of Petroleum Products (Miniaturized Optical Method)¹

This standard is issued under the fixed designation D7397; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ϵ) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This test method covers the determination of the cloud point of petroleum products and biodiesel fuels that are transparent in layers 40 mm in thickness by an automatic instrument.

1.2 This test method covers the range of temperatures from -60°C to $+20^{\circ}\text{C}$ with temperature resolution of 0.1°C ; however, the range of temperatures included in the 2006 interlaboratory cooperative test program only covered the temperature range of -35°C to $+12^{\circ}\text{C}$. See Section 13.

1.3 The values stated in SI units are to be regarded as standard. No other units of measurement are included in this standard.

1.4 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 ASTM Standards:²

D2500 Test Method for Cloud Point of Petroleum Products

D4057 Practice for Manual Sampling of Petroleum and Petroleum Products

D4177 Practice for Automatic Sampling of Petroleum and Petroleum Products

D5773 Test Method for Cloud Point of Petroleum Products (Constant Cooling Rate Method)

2.2 Energy Institute Standards:³

IP 219 Test Method for Cloud Point of Petroleum Products

IP 446 Test Method for Cloud Point of Petroleum Products

¹ This test method is under the jurisdiction of ASTM Committee D02 on Petroleum Products, Liquid Fuels, and Lubricants and is the direct responsibility of Subcommittee D02.07 on Flow Properties.

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² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

³ Available from Energy Institute, 61 New Cavendish St., London, W1G 7AR, U.K., <http://www.energyinst.org.uk>.

3. Terminology

3.1 Definitions:

3.1.1 *biodiesel*, *n*—fuel comprising mono-alkyl esters of long-chain fatty acids derived from vegetable oils or animal fats, designated B100.

3.1.1.1 *Discussion*—Biodiesel is typically produced by a reaction of vegetable oil or animal fat with an alcohol such as methanol or ethanol in the presence of a catalyst to yield mono-esters and glycerin. The fuel typically may contain up to 14 different types of fatty acids that are chemically transformed into fatty acid methyl esters (FAME).

3.1.2 *biodiesel blend (BXX)*, *n*—blend of biodiesel fuel with petroleum-based diesel fuel designated BXX, where XX is the volume percentage (as a whole number without the percentage sign) of biodiesel.

3.1.3 *cloud point*, *n*—in petroleum products and biodiesel fuels, the temperature of a liquid specimen when the smallest observable cluster of hydrocarbon crystals first occurs upon cooling under prescribed conditions.

3.1.3.1 *Discussion*—The cloud point occurs when the temperature of the specimen is low enough to cause hydrocarbon crystals to precipitate. In a homogeneous liquid, the cloud is always noted first at the location in the specimen where the specimen temperature is the lowest. The cloud point is the temperature at which the crystals first occur, regardless of their location in the specimen, and not after extensive crystallization has taken place. The hydrocarbon crystals that precipitate at lower temperatures are typically, but not excluded to, straight chain hydrocarbons commonly called “wax crystals.”

3.2 Definitions of Terms Specific to This Standard:

3.2.1 *D2500/IP 219 equivalent cloud point*, *n*—temperature of a specimen, in integers, calculated by applying a bias and rounding the result to the next lower integer (see 12.2).

3.2.1.1 *Discussion*—This test method produces results with 0.1°C resolution. Should the user wish to provide results with a similar format to Test Method D2500, then this calculation can be performed (see 12.2). Some apparatus can perform this calculation automatically.

3.2.2 *automatic cloud point*, *n*—temperature of a specimen, when the appearance of the cloud is determined under the conditions of this test method.