



Standard Test Method for Filterability of Diesel Fuels by Low-Temperature Flow Test (LTFT)¹

This standard is issued under the fixed designation D4539; 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 estimating the filterability of diesel fuels in some automotive equipment at low temperatures.

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

1.3 **Warning**—Mercury has been designated by EPA and many state agencies as a hazardous material that can cause central nervous system, kidney, and liver damage. Mercury, or its vapor, may be hazardous to health and corrosive to materials. Caution should be taken when handling mercury and mercury-containing products. See the applicable product Material Safety Data Sheet (MSDS) for details and EPA's website (<http://www.epa.gov/mercury/faq.htm>) for additional information. Users should be aware that selling mercury or mercury-containing products, or both, in your state may be prohibited by state law.

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.* For specific warning statements, see 1.3, 8.1, 8.2.1, 8.3, 8.5, and Annex A1.

2. Referenced Documents

2.1 ASTM Standards:²

- D97 Test Method for Pour Point of Petroleum Products
- D975 Specification for Diesel Fuel Oils
- D1655 Specification for Aviation Turbine Fuels
- D2500 Test Method for Cloud Point of Petroleum Products

¹ This test method is under the jurisdiction of Committee D02 on Petroleum Products 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.

D3117 Test Method for Wax Appearance Point of Distillate Fuels³

D3699 Specification for Kerosine

D4057 Practice for Manual Sampling of Petroleum and Petroleum Products

D4177 Practice for Automatic Sampling of Petroleum and Petroleum Products

E1 Specification for ASTM Liquid-in-Glass Thermometers

2.2 Coordinating Research Council, Inc.

CRC Report No. 528 Diesel Fuel Low-Temperature Operability Field Test⁴

2.3 Canadian General Standards Board:

CAN/CGSB-3.0, No. 14.01-M86, Low Temperature Flow Test (LTFT) for Diesel Fuels⁵

NOTE 1—CAN/CGSB-3.0, No. 14.01-M86 is essentially equivalent to Test Method D4539, but the differences in apparatus and procedures may or may not yield different results.

3. Summary of Test Method

3.1 The temperature of a series of test specimens of fuel is lowered at a prescribed cooling rate. Commencing at a desired test temperature and at each 1°C interval thereafter, a separate specimen from the series is filtered through a 17-μm screen until a minimum LTFT pass temperature is obtained. The minimum LTFT pass temperature is the lowest temperature, expressed as a multiple of 1°C, at which a test specimen can be filtered in 60 s or less.

3.2 Alternatively, a single specimen may be cooled as described under 3.1 and tested at a specified temperature to determine whether it passes or fails at that temperature.

4. Significance and Use

4.1 The Low Temperature Flow Test results are indicative of the low temperature flow performance of the test fuel in some diesel vehicles (according to CRC Report No. 528). The test

³ Withdrawn. The last approved version of this historical standard is referenced on www.astm.org.

⁴ Available from Coordinating Research Council, Inc., 219 Perimeter Center Parkway, Atlanta, GA 30346.

⁵ Available from CGSB Sales Centre, Ottawa, Canada K1A 1G6.

*A Summary of Changes section appears at the end of this standard.