



Standard Test Method for Apparent Viscosity of Petroleum Waxes Compounded with Additives (Hot Melts)¹

This standard is issued under the fixed designation D2669; 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 apparent viscosity of petroleum waxes compounded with additives (hot melts). It applies to fluid hot melts having apparent viscosities up to about 20 Pa·s at temperatures up to 175 °C (347 °F).

NOTE 1—For petroleum waxes and their blends having low apparent viscosities, below about 15 mPa·s, Test Method D445, is especially applicable.

1.2 The values stated in SI units shall be regarded as the standard.

1.2.1 *Exception*—Alternative units in parentheses are for information purposes only.

NOTE 2—One Pascal second (Pa·s) = 1000 centipoises (cP). One milli-Pascal second (mPa·s) = 1 centipoise (cgs units).

1.3 **WARNING**—Mercury has been designated by many regulatory 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 and/or mercury containing products into your state or country may be prohibited by 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.*

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 D02.10.0A on Physical/Chemical Properties.

Current edition approved June 1, 2016. Published July 2016. Originally approved in 1967. Last previous edition approved in 2012 as D2669 – 06 (2012)^{ε1}. DOI: 10.1520/D2669-16.

2. Referenced Documents

2.1 *ASTM Standards*:²

D445 Test Method for Kinematic Viscosity of Transparent and Opaque Liquids (and Calculation of Dynamic Viscosity)

3. Terminology

3.1 *Definitions*:

3.1.1 *viscosity, n* —the ratio of shear stress to shear rate. Viscosity of a liquid is a measure of the internal friction of the liquid in motion. The unit of dynamic viscosity is the Pascal second. For a Newtonian liquid, the viscosity is constant at all shear rates. For a non-Newtonian liquid, viscosity will vary depending on shear rate.

3.1.2 *viscosity, apparent, n* —the viscosity determined by this method, expressed in Pascal seconds. Its value may vary with the spindle and rotational speed selected because many hot melts are non-Newtonian.

4. Summary of Test Method

4.1 Approximately 800 g of sample are melted on a hot plate or in an oven. An 800 mL glass container is filled with the melted sample to a level of about 25 mm (1 in.) from its top and placed in a temperature bath. The viscometer, with attached spindle and guard, is positioned in the test specimen. Stirring is begun and continued while the temperature of the sample is brought to slightly above the highest desired test temperature. Heating is discontinued and stirring is maintained until the sample cools to the chosen temperature. At this time, stirring is stopped and the apparent viscosity is determined. Additional determinations are made over a range of temperatures as the sample cools. Results of temperature and apparent

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.