



Designation: D4682 – 18 (Reapproved 2024)

Standard Specification for Miscibility with Gasoline and Fluidity of Two-Stroke-Cycle Gasoline Engine Lubricants¹

This standard is issued under the fixed designation D4682; 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 specification covers four categories of lubricants intended for use in two-stroke-cycle spark-ignition gasoline engines based on their miscibility with gasoline and their low-temperature fluidity.

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 The following safety hazards caveat pertains only to the test methods described in this specification. *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, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.4 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 *ASTM Standards:*²

D97 Test Method for Pour Point of Petroleum Products

D439 Specification for Automotive Gasoline (Withdrawn 1990)³

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

¹ This specification is under the jurisdiction of ASTM Committee D02 on Petroleum Products, Liquid Fuels, and Lubricants and is the direct responsibility of Subcommittee D02.B0.07 on Development and Surveillance of Bench Tests Methods.

Current edition approved Oct. 1, 2024. Published October 2024. Originally approved in 1987. Last previous edition approved in 2018 as D4682 – 18. DOI: 10.1520/D4682-18R24.

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

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

D874 Test Method for Sulfated Ash from Lubricating Oils and Additives

D2983 Test Method for Low-Temperature Viscosity of Automatic Transmission Fluids, Hydraulic Fluids, and Lubricants using a Rotational Viscometer

3. Terminology

3.1 *Definitions of Terms Specific to This Standard:*

3.1.1 *fluidity, n—of two-stroke-cycle gasoline engine lubricants*, following industry practice, this term is used to designate the absolute viscosity in millipascal-seconds (centipoises) of the lubricant under test. In general usage, fluidity is the reciprocal of absolute viscosity.

3.1.2 *miscibility, n—of two-stroke-cycle gasoline engine lubricants*, an inverse function of the time required for a fuel and lubricant introduced into the apparatus as separate phases to produce a single-phase mixture by agitation under controlled conditions.

4. Classification

4.1 The candidate oils are classified into Categories 1 through 4 according to the temperature at which the tests are conducted; respectively, 0 °C, –10 °C, –25 °C, and –40 °C. Each category has its own reference oil that is the same for both the miscibility and fluidity tests.

5. Qualification Requirements

5.1 *Miscibility*—When tested in accordance with Section 6, candidate oils that mix with the gasoline in not more than 110 % of the number of inversions of the apparatus required to mix the reference oil, and that do not separate on standing, qualify as miscible.

5.2 *Fluidity*—When tested in accordance with Section 7, candidate oils meet the requirements for fluidity if their viscosity is not more than 10 % higher than that of the reference oil.

TEST METHODS

6. Miscibility Test Method

6.1 *Summary of Test Method*—The candidate oil and gasoline are placed as separate phases in a stoppered-glass cylinder