



Designation: D4652 – 20

Standard Specification for Silicone Liquid Used for Electrical Insulation¹

This standard is issued under the fixed designation D4652; 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 reappraisal. A superscript epsilon (ϵ) indicates an editorial change since the last revision or reappraisal.

1. Scope

1.1 This specification covers silicone liquid for use in transformers, capacitors, and electronic assemblies as an insulating or cooling medium, or both.

1.2 Silicone liquid covered by this specification is polydimethylsiloxane having a nominal viscosity of 50 mm²/s at 25°C and a fire point of 340°C or greater. This specification applies only to new silicone liquid. Information on in-service maintenance testing is available in appropriate guides.²

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 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:³

- D92 Test Method for Flash and Fire Points by Cleveland Open Cup Tester
- D97 Test Method for Pour Point of Petroleum Products
- D445 Test Method for Kinematic Viscosity of Transparent and Opaque Liquids (and Calculation of Dynamic Viscosity)
- D664 Test Method for Acid Number of Petroleum Products by Potentiometric Titration
- D877 Test Method for Dielectric Breakdown Voltage of Insulating Liquids Using Disk Electrodes

¹ This specification is under the jurisdiction of ASTM Committee D27 on Electrical Insulating Liquids and Gases and is the direct responsibility of Subcommittee D27.02 on Gases and Non-Mineral Oil Liquids.

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² IEEE C57.111, IEEE Guide for Acceptance of Silicone Insulating Fluid and its Maintenance in Transformers is published by the Insulating Fluids Subcommittee of the IEEE Power Engineering Society Transformers Committee.

³ 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.

- D923 Practices for Sampling Electrical Insulating Liquids
- D924 Test Method for Dissipation Factor (or Power Factor) and Relative Permittivity (Dielectric Constant) of Electrical Insulating Liquids
- D974 Test Method for Acid and Base Number by Color-Indicator Titration
- D1169 Test Method for Specific Resistance (Resistivity) of Electrical Insulating Liquids
- D1298 Test Method for Density, Relative Density, or API Gravity of Crude Petroleum and Liquid Petroleum Products by Hydrometer Method
- D1481 Test Method for Density and Relative Density (Specific Gravity) of Viscous Materials by Lipkin Bicapillary Pycnometer
- D1533 Test Method for Water in Insulating Liquids by Coulometric Karl Fischer Titration
- D1807 Test Methods for Refractive Index and Specific Optical Dispersion of Electrical Insulating Liquids (Withdrawn 2014)⁴
- D1816 Test Method for Dielectric Breakdown Voltage of Insulating Liquids Using VDE Electrodes
- D2129 Test Method for Color of Clear Electrical Insulating Liquids (Platinum-Cobalt Scale)
- D2225 Test Methods for Silicone Fluids Used for Electrical Insulation
- D2864 Terminology Relating to Electrical Insulating Liquids and Gases
- D4052 Test Method for Density, Relative Density, and API Gravity of Liquids by Digital Density Meter
- D4059 Test Method for Analysis of Polychlorinated Biphenyls in Insulating Liquids by Gas Chromatography
- D4559 Test Method for Volatile Matter in Silicone Fluid

3. Terminology

3.1 Definitions and descriptions of terms specific to this specification are given in Test Methods D2225 and Terminology D2864.

4. Sampling and Testing

4.1 Take all samples in accordance with practices listed in D923.

⁴ The last approved version of this historical standard is referenced on www.astm.org.