



Designation: D5222 – 23

Standard Specification for Less Flammable High Molecular Weight Hydrocarbon Mineral Electrical Insulating Liquids¹

This standard is issued under the fixed designation D5222; 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 describes a less flammable mineral electrical insulating liquid, for use as a dielectric and cooling medium in new and existing power and distribution electrical apparatus, such as transformers and switchgear.

1.2 Less flammable insulating liquid differs from conventional mineral insulating liquid by possessing a fire-point of at least 300 °C. This property is necessary in order to comply with certain application requirements of the National Electrical Code (Article 450-23) or other agencies. The material discussed in this specification is miscible with other petroleum based insulating liquids. Mixing less flammable liquids with lower fire point hydrocarbon insulating liquids (for example, Specification D3487 mineral liquid) may result in fire points of less than 300 °C.

1.3 This specification is intended to define a less flammable electrical mineral insulating liquid that is compatible with typical material of construction of existing apparatus and will satisfactorily maintain its functional characteristic in this application. The material described in this specification may not be miscible with electrical insulating liquids of non-petroleum origin. The user should contact the manufacturer of the less flammable insulating liquid for guidance in this respect.

1.4 This specification applies only to new electrical insulating liquid as received prior to any processing. Information on in-service maintenance testing is available in appropriate guides.² The user should contact the manufacturers of the equipment or liquid if questions of recommended characteristics or maintenance procedures arise.

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

¹ This specification is under the jurisdiction of ASTM Committee D27 on Electrical Insulating Liquids and Gases and is the direct responsibility of Subcommittee D27.01 on Mineral.

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² Refer to IEEE C57.121.

1.6 *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
- D117 Guide for Sampling, Test Methods, and Specifications for Electrical Insulating Liquids
- 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
- 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
- D971 Test Method for Interfacial Tension of Insulating Liquids Against Water by the Ring Method
- D974 Test Method for Acid and Base Number by Color-Indicator Titration
- D1275 Test Method for Corrosive Sulfur in Electrical Insulating Liquids
- D1298 Test Method for Density, Relative Density, or API Gravity of Crude Petroleum and Liquid Petroleum Products by Hydrometer Method
- D1500 Test Method for ASTM Color of Petroleum Products (ASTM Color Scale)
- D1524 Test Method for Visual Examination of Used Electrical Insulating Liquids in the Field
- D1533 Test Method for Water in Insulating Liquids by Coulometric Karl Fischer Titration

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.