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Designation: D5222 – 08

Standard Specification for High Fire-Point Mineral Electrical Insulating Oils[1]

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 high fire-point mineral oil based insulating fluid, for use as a dielectric and cooling medium in new and existing power and distribution electrical apparatus, such as transformers and switchgear.

1.2 High fire-point insulating oil differs from conventional mineral insulating oil by possessing a fire-point of at least 300°C. High fire-point mineral insulating oils are also referred to as "less flammable" mineral insulating oils.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 oils. Mixing high fire-point liquids with lower fire point hydrocarbon insulating oils (for example, Specification D3487 mineral oil) may result in fire points of less than 300°C.

1.3 This specification is intended to define a high fire-point electrical mineral insulating oil that is compatible with typical material of construction of existing apparatus and will satisfactorily maintain its functional characteristic in its application 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 high fire-point insulating oil for guidance in this respect.

1.4 This specification applies only to new insulating material oil 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 oil if questions of recommended characteristics or maintenance procedures arise.

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 Oils of Petroleum Origin

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

D611 Test Methods for Aniline Point and Mixed Aniline Point of Petroleum Products and Hydrocarbon Solvents

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

D878 Test Method for Inorganic Chlorides and Sulfates in Insulating Oils

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 Oil 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 Oils

D1298 Test Method for Density, Relative Density (Specific Gravity), 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 Oils of Petroleum Origin in the Field

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

Current edition approved Jan. 1, 2008. Published February 2008. Originally approved in 1992. Last previous edition approved in 2000 as D5222–00. DOI: 10.1520/D5222-08.

[2] Refer to American National Standard C57.121 IEEE Guide for Acceptance and Maintenance of Less Flammable Hydrocarbon Fluid in Transformers.

[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.

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