Designation: D 6871 – 03

Standard Specification for Natural (Vegetable Oil) Ester Fluids Used in Electrical Apparatus[1]

This standard is issued under the fixed designation D 6871; 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 a high fire point natural vegetable oil ester insulating fluid for use as a dielectric and cooling medium in new and existing power and distribution electrical apparatus such as transformers and attendant equipment.

1.2 Natural vegetable oil ester insulating fluid differs from conventional mineral oil and other high fire point (or "less-flammable") fluids in that it is an agricultural product derived from vegetable oils rather than refined from petroleum base stocks or synthesized from organic precursors.

1.3 This specification is intended to define a natural vegetable oil ester electrical insulating fluid that is compatible with typical materials 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 some synthetic electrical insulating liquids. The user should contact the manufacturer of the natural ester insulating fluid for guidance in this respect.

1.4 This specification applies only to new insulating fluid as received prior to any processing. The user should contact the manufacturer of the equipment or fluid if questions of recommended characteristics or maintenance procedures arise.

1.5 *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 requirements prior to use.*

2. Referenced Documents

2.1 *ASTM Standards:*

D 88 Test Method for Saybolt Viscosity[2]

D 92 Test Method for Flash and Fire Points by Cleveland Open Cup[3]

D 97 Test Method for Pour Point of Petroleum Products[3]

D 117 Guide for Sampling, Test Methods, and Specifications for Electrical Insulating Oils of Petroleum Origin[4]

D 445 Test Method for Kinematic Viscosity of Transparent and Opaque Liquids (the Calculation of Dynamic Viscosity)[3]

D 877 Test Method for Dielectric Breakdown Voltage of Insulating Liquids Using Disk Electrodes[4]

D 923 Practices for Sampling Electrical Insulating Liquids[4]

D 924 Test Method for Dissipation Factor (or Power Factor) and Relative Permittivity (Dielectric Constant) of Electrical Insulating Liquids[4]

D 974 Test Method for Acid and Base Number by Color-Indicator Titration[3]

D 1275 Test Method for Corrosive Sulfur in Electrical Insulating Oils[4]

D 1298 Practice for Density, Relative Density (Specific Gravity), or API Gravity of Crude Petroleum and Liquid Petroleum Products by Hydrometer Method[3]

D 1500 Test Method for ASTM Color of Petroleum Products (ASTM Color Scale)[3]

D 1524 Test Method for Visual Examination of Used Electrical Insulating Oils of Petroleum Origin in the Field[4]

D 1533 Test Methods for Water in Insulating Liquids by Coulometric Karl Fischer Titration[4]

D 1816 Test Method for Dielectric Breakdown Voltage of Insulating Oils of Petroleum Origin Using VDE Electrodes[4]

D 1903 Test Method for Coefficient of Thermal Expansion of Electrical Insulating Liquids of Petroleum Origin, and Askarels[4]

D 2300 Test Method for Gassing of Insulating Liquids Under Electrical Stress and Ionization (Modified Pirelli Method)[4]

D 2717 Test Method for Thermal Conductivity of Liquids[3]

D 2766 Test Method for Specific Heat of Liquids and Solids[3]

D 2864 Terminology Relating to Electrical Insulating Liquids and Gases[4]

D 3300 Test Method for Dielectric Breakdown Voltage of Insulating Oils of Petroleum Origin Under Impulse Conditions[4]

[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 Synthetic Liquids.

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[2] *Annual Book of ASTM Standards*, Vol 04.04.

[3] *Annual Book of ASTM Standards*, Vol 05.01.

[4] *Annual Book of ASTM Standards*, Vol 10.03.