Designation: D3455 – 11 (Reapproved 2019)

Standard Test Methods for Compatibility of Construction Material with Electrical Insulating Oil of Petroleum Origin[1]

This standard is issued under the fixed designation D3455; 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 These test methods cover screening for the compatibility of materials of construction with electrical insulating oil for use in electrical equipment.

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 *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]

D877 Test Method for Dielectric Breakdown Voltage of Insulating Liquids Using Disk Electrodes

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

D1500 Test Method for ASTM Color of Petroleum Products (ASTM Color Scale)

D2413 Practice for Preparation of Insulating Paper and Board Impregnated with a Liquid Dielectric

D3487 Specification for Mineral Insulating Oil Used in Electrical Apparatus

3. Significance and Use

3.1 The magnitude of the changes in the electrical properties of the insulating oil are of importance in determining the contamination of the oil by the test specimen.

3.2 Physical and chemical changes in the oil such as color, interfacial tension and acidity, also indicate solubility or other adverse effects of the test specimen on the oil.

3.3 Physical changes of the test specimen such as hardness, swelling, and discoloration show the effect of the oil on the test specimen and are used to determine the suitability of the material for use in insulating oil.

3.4 A material meeting the criteria recommended does not necessarily indicate suitability for use in electrical equipment. Other properties must also be considered. Additionally, certain materials containing additives may meet the requirements of these test methods, yet be unsatisfactory when subjected to longer term evaluations. Examples of such materials are polyvinyl chloride (PVC) based compounds, nylon and elastomeric compounds.

4. Apparatus

4.1 *Sample-Handling Apparatus:*

4.1.1 *Oven,* forced-draft, adjustable to 100 ± 1 °C, and a drying oven, adjustable to 105 ± 5 °C.

4.1.2 *Glass Containers,* 1-L, fitted with glass or aluminum foil covers.

NOTE 1—Other materials have been found to be suitable as covers.

4.2 *Sample-Testing Apparatus:*

4.2.1 *Tensile Strength*—As specified in appropriate test method.

4.2.2 *Hardness*—As specified in appropriate test method.

4.2.3 *Dimensional Change*—Micrometer and caliper.

4.2.4 *Weight Change*—Analytical balance.

[1] These test methods are under the jurisdiction of ASTM Committee D27 on Electrical Insulating Liquids and Gases and are the direct responsibility of Subcommittee D27.06 on Chemical Test.

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[2] 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.