



Standard Specification for Electrical Insulating Varnishes¹

This standard is issued under the fixed designation D 3955; 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 the tests and values for electrical insulating varnishes, as supplied, which are suitable for the impregnation and treatment of electrical coils and windings applied by dip process.

1.2 Varnishes, flexible or rigid, included in this specification are:

Grade DA—Air-dry

Grade DO—Organic solvent containing, baking,

Grade DM—Reactive diluent containing,

Grade DS—Silicone,

Grade DW—Water containing, and

Grade DT—Thixotropic.

1.3 The values stated in inch-pound units are to be regarded as the standard. The values given in parentheses are for information only.

NOTE 1—This specification resembles IEC 60455 in title only. The content is significantly different.

2. Referenced Documents

2.1 ASTM Standards:²

D 93 Test Methods for Flash-Point by Pensky-Martens Closed Cup Tester

D 115 Test Methods for Testing Solvent Containing Varnishes Used for Electrical Insulation

D 1711 Terminology Relating to Electrical Insulation

D 2519 Test Method for Bond Strength of Electrical Insulating Varnishes by the Helical Coil Test

D 3056 Test Method for Gel Time of Solventless Varnishes

D 3145 Test Method for Thermal Endurance of Electrical Insulating Varnishes by the Helical Coil Method

D 3251 Test Method for Thermal Endurance Characteristics

¹ This specification is under the jurisdiction of ASTM Committee D09 on Electrical and Electronic Insulating Materials and is the direct responsibility of Subcommittee D09.01 on Electrical Insulating Varnishes, Powders, and Encapsulating Compounds.

Current edition approved March 1, 2004. Published March 2004. Originally approved in 1980. Last previous edition approved in 1999 as D 3955-99.

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.

of Electrical Insulating Varnishes Applied over Film-Insulated Magnet Wire

D 3278 Test Methods for Flash Point of Liquids by Small Scale Closed-Cup Apparatus

D 4733 Test Methods for Solventless Electrical Insulating Varnishes

D 4880 Test Method for Salt Water Proofness of Insulating Varnishes Over Enamelled Magnet Wire

D 5637 Test Method for Moisture Resistance of Electrical Insulating Varnishes

D 5638 Test Method for Chemical Resistance of Electrical Insulation Varnishes

2.2 Military Specifications:³

MIL-PRF-17672 Hydraulic Fluid, Petroleum, Inhibited

MIL-PRF-17331 Lubricating Oil, Synthetic Base P-D-680, Dry Cleaning Solvent

MIL-D-16791 Detergent, General Purpose, (Liquid, Non-Ionic)

2.3 Other Standards:³

NEMA MW1000 Magnet Wire

IEC 60455 Resin Based Reactive Compounds Used for Electrical Insulation

3. Terminology

3.1 *Definitions*—For definitions of terms used in this specification refer to Terminology D 1711.

4. Flexible or Rigid Classification

4.1 This specification covers both flexible and rigid, solvent (including water) and solventless insulating varnishes.

5. Thermal Classification

5.1 The thermal classification of insulating varnishes covered by this specification is determined by using Test Methods D 3145 and D 3251 in conjunction with 18 AWG magnet wire conforming to MW 35-C and MW 16-C in accordance with NEMA MW1000. Determine the temperature index at 20 000 h.

³ Available from Global Engineering Documents, 15 Inverness Way, East Englewood, CO 80112.