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An American National Standard

Standard Test Method for Weight Loss of Solventless Varnishes[1]

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1. Scope

1.1 This test method covers the determination of the percent weight loss of cured solventless electrical varnishes when exposed to elevated temperatures for prescribed periods of time.

1.2 Results of this test method are based on 6.4-mm (¼-in.) thick specimens and may not be applicable to specimens appreciably thinner or thicker than 6.4 mm.

1.3 The values stated in SI units are to be regarded as the standard.

1.4 *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 limitations prior to use.*

2. Referenced Documents

2.1 *ASTM Standards:*

D 5423 Specification for Forced-Convection Laboratory Ovens for Evaluation of Electrical Insulation[2]

3. Terminology

3.1 *Definition:*

3.1.1 *varnish, n—electrical insulating,* a liquid resin system that is applied to and cured on electrical components providing electrical, mechanical, and environmental protection.

3.1.1.1 *Discussion*—There are two types of electrical insulating varnish: solvent-containing and solventless. The solvent-containing varnish is a solution, dispersion, or emulsion of a polymer or mixture of polymers in a volatile, nonreactable liquid. The solventless type is a liquid resin system free of volatile, nonreactable solvents.

4. Significance and Use

4.1 The amount and composition of by-products produced by exposure of insulating varnishes to elevated temperatures can possibly:

4.1.1 Deteriorate other insulations in the system,

4.1.2 Cause cracking of insulation due to pressure, buildup in thick cross sections, or

4.1.3 Corrode other parts in the assembly.

4.2 Amount and rate of weight loss may affect the thermal rating of a varnish.

5. Apparatus

5.1 *Metal Mold*, consisting of two flat sheets 305 by 305 by 6.4 mm (12 by 12 by ¼ in.) separated by 6.4-mm (¼-in.) thick spacers along three sides. The spacers also seal the edges of the mold and the assembly is held together with "C" clamps or bolts. Aluminum or polished steel plates can be used.

5.2 *Laboratory Balance*, with accuracy of ±1 mg.

5.3 *Forced-Convection Laboratory Oven*, meeting requirements of Specification D 5423, Type II for each test temperature.

5.4 *Screening Platform*, 6.4-mm (¼-in.) mesh, with 51-mm (2-in.) legs.

5.5 *Mold Release.*

NOTE 1—Fluorocarbon-type release agents are satisfactory.

5.6 Desiccator.

6. Procedure

6.1 Apply a thin, uniform coating of release agent to the contact surfaces of the mold.

6.2 Assemble the mold, taking precautionary measures to avoid leaks.

6.3 Pour the sample into the open edge of the mold, using care to avoid bubbles.

NOTE 2—In some cases, it may be necessary to prevacuum the sample before pouring.

6.4 Cure the sample using the recommended cure cycle.

6.5 After curing, remove the mold and contents from the oven and allow to cool to room temperature.

6.6 Carefully disassemble the mold and remove the cast sheet.

6.7 From the cast sheet, cut at least three specimens approximately 51 by 51 mm (2 by 2 in.) for each test temperature.

6.8 Dry the specimens for 1 h ± 5 min at 110 ± 2°C to remove surface moisture.

6.9 Remove specimens from the oven and place them immediately into the desiccator.

[1] This test method is under the jurisdiction of ASTM Committee D-9 on Electrical and Electronic Insulating Materials and is direct responsibility of Subcommittee D09.01 on Electrical Insulating Varnishes, Powders, and Encapsulating Compounds.

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[2] *Annual Book of ASTM Standards*, Vol 10.02.