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An American National Standard

Standard Test Method for Ignition of Materials by Hot Wire Sources¹

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1. Scope

1.1 This test method is intended to differentiate, in a preliminary fashion, among materials with respect to their resistance to ignition because of their proximity to electrically-heated wires and other heat sources.²

1.2 This test method applies to molded or sheet materials available in thicknesses ranging 0.25 to 6.4 mm (0.010 to 0.25 in.).

1.3 This test method applies to materials that are rigid at normal room temperatures. That is, it applies to materials for which the specimen does not deform during preparation, including especially during the wire-wrapping step described in 9.1. Examples of deformation that render this test method inapplicable include:

1.3.1 Bowing, in either a transverse or a longitudinal direction, or twisting of the specimen, during the wire-wrapping step, to a degree visible to the eye.

1.3.2 Visible indentation of the wrapped wire into the specimen.

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

1.5 This test method measures and describes the response of materials, products, or assemblies to heat and flame under controlled conditions, but does not by itself incorporate all factors required for fire hazard or fire risk assessment of the materials, products, or assemblies under actual fire conditions.

1.6 *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.*

NOTE 1—Although this test method and IEC 695-2-20, differ in approach and in detail, data obtained using either are technically equivalent.

2. Referenced Documents

2.1 ASTM Standards:

D 1711 Terminology Relating to Electrical Insulation³

E 176 Terminology of Fire Standards⁴

2.2 IEC Standards:

IEC 695-2-1 Fire Hazard Testing. Part 2: Test Methods, Section 20: Hot-Wire Coil Ignitability Test on Materials⁵

ISO/IEC Guide 52: Glossary of Fire Terms and Definitions⁵

3. Terminology

3.1 Definitions:

3.1.1 Use Terminology E 176 and ISO/IEC Guide 52 for definitions of terms used in this test method and associated with fire issues. Where differences exist in definitions, those contained in Terminology E 176 shall be used. Use Terminology D 1711 for definitions of terms used in this test method and associated with electrical insulation materials.

3.2 Definitions of Terms Specific to This Standard:

3.2.1 *ignition, n*—initiation of flaming produced by combustion in the gaseous phase that is accompanied by the emission of light.

4. Significance and Use

4.1 Under certain conditions of operation, or when malfunctions occur, it is possible that electrical equipment including, but not limited to, wires, resistors, or other conductors, become abnormally hot. When this happens, a possible result is ignition of the insulation material.

4.2 This test method assesses the relative resistance of electrical insulating materials to ignition by the effect of hot wire sources.

4.3 This test method determines the average time, in seconds, required for material specimens to ignite under the conditions of test.

4.4 Subject to limitations in precision and bias, this test method can be used to categorize materials.

¹ This test method is under the jurisdiction of ASTM Committee D09 on Electrical and Electronic Insulating Materials and is the direct responsibility of Subcommittee D09.21 on Fire Performance Standards.

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² K. N. Mathes, Chapter 4, "Surface Failure Measurements", *Engineering Dielectrics, Vol. IIB, Electrical Properties of Solid Insulating Materials, Measurement Techniques*, R. Bartnikas, Editor, ASTM STP 926, ASTM, Philadelphia, 1987.

³ *Annual Book of ASTM Standards*, Vol 10.01.

⁴ *Annual Book of ASTM Standards*, Vol 04.07.

⁵ Available from International Electrotechnical Commission (IEC), 3 Rue de Varembe, Geneva, Switzerland.