



Designation: D3874 – 18

Standard Test Method for Ignition of Materials by Hot Wire Sources¹

This standard is issued under the fixed designation D3874; 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 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 from 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, especially during the wire-wrapping step described in 10.1. 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. (See SI10 for further details.)

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, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

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 D09.17 on Fire and Thermal Properties.

Current edition approved Nov. 1, 2018. Published November 2018. Originally approved in 1988. Last previous edition approved in 2013 as D3874 – 13. DOI: 10.1520/D3874-18.

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.

1.7 *Fire testing is inherently hazardous. Adequate safeguards for personnel and property shall be employed in conducting these tests.*

NOTE 1—Although this test method and IEC TS 60695-2-20 (withdrawn), differ in approach and in detail, data obtained using either are technically equivalent.

1.8 *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:³

D1711 Terminology Relating to Electrical Insulation
D6194 Test Method for Glow-Wire Ignition of Materials
E176 Terminology of Fire Standards
E3020 Practice for Ignition Sources
IEEE/ASTM SI-10 American National Standard for Metric Practice

2.2 IEC Standards:

IEC TS 60695-2-20 Fire Hazard Testing—Section 20: Glowing/Hot-wire Based Test Methods, Hot-wire Coil Ignitability Test on Materials (withdrawn)⁴
IEC 60695-4 Fire Hazard Testing—Part 4: Terminology Concerning Fire Tests for Electrotechnical Products⁴

2.3 ISO Standards

ISO 13943 Fire Safety—Vocabulary⁵

3. Terminology

3.1 Definitions:

3.1.1 Use Terminology E176 and ISO 13943 and IEC 60695-4 for definitions of terms used in this test method and associated with fire issues. Where differences exist in

³ 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.

⁴ Available from International Electrotechnical Commission (IEC), 3 rue de Varembe, Case postale 131, CH-1211, Geneva 20, Switzerland, http://www.iec.ch.

⁵ Available from International Organization for Standardization (ISO), 1, ch. de la Voie-Creuse, Case postale 56, CH-1211, Geneva 20, Switzerland, http://www.iso.ch.

*A Summary of Changes section appears at the end of this standard