



Designation: D3874 – 20

## Standard Test Method for Ignition of Materials by Hot Wire Sources<sup>1</sup>

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 ( $\epsilon$ ) 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.<sup>2</sup>

1.2 This test method applies to molded or sheet materials available in thicknesses up to and including 13.0 mm (0.51 in.).

1.3 This test method applies to materials that are rigid or flexible at normal room temperatures. It is important to minimize deformation during preparation, especially during the wire-wrapping step described in 10.1, by following the method outlined under Clause 10, Sample Preparation. Examples of deformation include bowing, in either a transverse or a longitudinal direction, twisting of the specimen, and indentation of the wire into the specimen during the wire-wrapping step, to a degree visible to the eye.

1.4 The values stated in SI units are to be regarded as standard. The values given in parentheses after SI units are provided for information only and are not considered standard. (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.*

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

<sup>1</sup> 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 March 1, 2020. Published March 2020. Originally approved in 1988. Last previous edition approved in 2018 as D3874 – 18. DOI: 10.1520/D3874-20.

<sup>2</sup> Mathes, K. N., "Surface Failure Measurements," *Engineering Dielectrics, Vol IIB, Electrical Properties of Solid Insulating Materials: Measurement Techniques*, ASTM STP 926, Chapter 4, ASTM International, 1987.

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:<sup>3</sup>

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:<sup>4</sup>

IEC TS 60695-2-20:2004 Fire Hazard Testing—Section 20: Glowing/Hot-wire Based Test Methods, Hot-wire Coil Ignitability Test on Materials (withdrawn)  
IEC 60695-4 Fire Hazard Testing—Part 4: Terminology Concerning Fire Tests for Electrotechnical Products

#### 2.3 ISO Standard:<sup>5</sup>

ISO 13943 Fire Safety—Vocabulary

### 3. Terminology

#### 3.1 Definitions:

3.1.1 Use Terminology E176, ISO 13943, and IEC 60695-4 for definitions of terms used in this test method and associated with fire issues. Where differences exist in definitions, those contained in Terminology E176 shall be used. Use Terminology D1711 for definitions of terms used in this test method and associated with electrical insulation materials.

<sup>3</sup> For referenced ASTM standards, visit the ASTM website, [www.astm.org](http://www.astm.org), or contact ASTM Customer Service at [service@astm.org](mailto:service@astm.org). For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

<sup>4</sup> Available from International Electrotechnical Commission (IEC), 3, rue de Varembe, 1st floor, P.O. Box 131, CH-1211, Geneva 20, Switzerland, <http://www.iec.ch>.

<sup>5</sup> Available from International Organization for Standardization (ISO), ISO Central Secretariat, BIBC II, Chemin de Blandonnet 8, CP 401, 1214 Vernier, Geneva, Switzerland, <http://www.iso.org>.

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