



Standard Test Method for Heat Release, Flame Spread, Smoke Obscuration, and Mass Loss Testing of Insulating Materials Contained in Electrical or Optical Fiber Cables When Burning in a Vertical Cable Tray Configuration¹

This standard is issued under the fixed designation D 5537; 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 approval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This is a fire-test-response standard.

1.2 This test method provides a means to measure the heat released and smoke obscuration by burning the electrical insulating materials contained in electrical or optical fiber cables when the cable specimens, excluding accessories, are subjected to a specified flaming ignition source and burn freely under well ventilated conditions. Flame propagation cable damage, by char length, and mass loss are also measured.

1.3 This test method provides two different protocols for exposing the materials, when made into cable specimens, to an ignition source (approximately 20 kW), for a 20 min test duration. Use it to determine the heat release, smoke release, flame propagation and mass loss characteristics of the materials contained in single and multiconductor electrical or optical fiber cables.

1.4 This test method does not provide information on the fire performance of materials insulating electrical or optical fiber cables in fire conditions other than the ones specifically used in this test method nor does it measure the contribution of the materials in those cables to a developing fire condition.

1.5 Data describing the burning behavior from ignition to the end of the test are obtained.

1.6 This test equipment is suitable for measuring the concentrations of certain toxic gas species in the combustion gases (see Appendix X4).

1.7 The values stated in SI units are the standard (see IEEE/ASTM SI 10); the values stated in parentheses are for information only.

1.8 *This standard 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..*

1.9 Fire testing of products and materials is inherently hazardous. Employ adequate safeguards for personnel and property in conducting these tests.

1.10 *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:²

- D 1711 Terminology Relating to Electrical Insulation
- D 5424 Test Method for Smoke Obscuration of Insulating Materials Contained in Electrical or Optical Fiber Cables When Burning in a Vertical Cable Tray Configuration
- E 84 Test Method for Surface Burning Characteristics of Building Materials
- E 176 Terminology of Fire Standards
- E 603 Guide for Room Fire Experiments
- E 800 Guide for Measurement of Gases Present or Generated During Fires
- E 1354 Test Method for Heat and Visible Smoke Release Rates for Materials and Products Using an Oxygen Consumption Calorimeter
- E 1537 Test Method for Fire Testing of Upholstered Furniture
- E 2067 Practice for Full-Scale Oxygen Consumption Calorimetry Fire Tests
- IEEE/ASTM SI 10 Standard for Use of the International System of Units (SI): The Modern Metric System

2.2 NFPA Standards:

- ANSI/NFPA 70, National Electrical Code, National Fire Protection Association³
- NFPA 265, Standard Methods of Fire Tests for Evaluating

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 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.

³ Available from National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.

