



Standard Test Method for Determination of Fire and Thermal Parameters of Materials Using an Intermediate Scale Test with Vertically Oriented Specimen¹

This standard is issued under the fixed designation E 2405; 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 fire-test-response standard determines fire properties related to piloted ignition of a vertically oriented specimen exposed to an external graduated radiant heat flux as shown in Fig. 1. This test method provides data suitable for comparing the performance of materials, which are used as the exposed surfaces of walls or other vertically orientated products in construction applications.

NOTE 1—This test method has been prepared to closely follow the test procedure of ISO 5658-4, however with additional provisions for heat release and smoke development measurements that are optional.

1.2 The fire characteristics determined by this test method include time-to-ignition, vertical flame spread rate and lateral flame spread rate. Optional measurements include heat release rates and visible smoke development rates.

1.3 The optional heat release rate is determined by the principle of oxygen consumption calorimetry, via measurement of the oxygen consumption as determined by the oxygen concentration and flow rate in the exhaust product stream (exhaust duct).

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

1.5 *This standard is used to measure and describe 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 *Fire testing of products and materials is inherently hazardous, and adequate safeguards for personnel and property shall be employed in conducting these tests. This test method may involve hazardous materials, operations, and equipment. Specific information about hazard is given in Section 7.*

1.7 *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

E 176 Terminology of Fire Standards

E 2257 Test Method for Room Fire Test of Wall and Ceiling Materials and Assemblies

2.2 *ISO Standards:*

ISO 5658-4 Reaction to Fire Tests—Spread of Flame—Part 4: Intermediate Scale Test with Vertically-orientated Specimen³

ISO/TR 14697 Fire Tests—Guidance Rules for the Choice of Substrates for Building Products³

3. Terminology

3.1 *Definitions*—For definitions of terms used in this test method, refer to Terminology E 176.

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *backing board, n*—a board with the same dimensions as the specimen and used to back the specimen so as to represent end-use conditions.

3.2.2 *flashing, n*—existence of flame on or over the surface of the specimen for periods of less than 1 s.

3.2.3 *irradiance, n*—quotient of the radiant flux incident on an infinitesimal element of surface containing the point, by the area of that element.

3.2.4 *product, n*—material, composite or assembly about which information is required.

3.2.5 *specimen, n*—representative piece of the product which is to be tested together with any substrate or treatment. The specimen may include an air gap. The specimen may also be tested as a stand-alone product without substrates if this is representative of end-use conditions.

¹ This test method is under the jurisdiction of ASTM Committee E05 on Fire Standards and is the direct responsibility of Subcommittee E05.21 on Smoke and Combustion Products.

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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 American National Standards Institute (ANSI), 25 W. 43rd St., 4th Floor, New York, NY 10036.