Designation: E176 – 15a$^{\varepsilon 1}$

An American National Standard

Standard Terminology of Fire Standards[1]

This standard is issued under the fixed designation E176; 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.

ε[1] NOTE—Terms were editorially added from approved ballot actions for the year in December 2015.

1. Scope

1.1 This terminology covers terms, related definitions, and descriptions of terms used or likely to be used in fire-test-response standards, fire-hazard-assessment standards, and fire-risk-assessment standards. Definitions of terms are special-purpose definitions that are consistent with the standard definitions but are written to ensure that a specific fire-test-response standard, fire-hazard-assessment standard, or fire-risk-assessment standard is properly understood and precisely interpreted.

NOTE 1—For additional information, refer to ASTM Policy on Fire Standards.[2]

1.2 *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.*

1.3 This fire standard cannot be used to provide quantitative measures.

2. Referenced Documents

2.1 *ASTM Standards:*[3]

C1224 Specification for Reflective Insulation for Building Applications

C1313 Specification for Sheet Radiant Barriers for Building Construction Applications

D3675 Test Method for Surface Flammability of Flexible Cellular Materials Using a Radiant Heat Energy Source

D5865 Test Method for Gross Calorific Value of Coal and Coke

E108 Test Methods for Fire Tests of Roof Coverings

E84 Test Method for Surface Burning Characteristics of Building Materials

E136 Test Method for Behavior of Materials in a Vertical Tube Furnace at 750°C

E119 Test Methods for Fire Tests of Building Construction and Materials

E152 Test Method for Fire Tests Of Door Assemblies (Withdrawn 1995)[4]

E162 Test Method for Surface Flammability of Materials Using a Radiant Heat Energy Source

E535 Practice for Preparation of Fire-Test-Response Standards

E603 Guide for Room Fire Experiments

E163 Test Method for Fire Tests Of Window Assemblies (Withdrawn 1999)[4]

E603 Guide for Room Fire Experiments

E648 Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source

E800 Guide for Measurement of Gases Present or Generated During Fires

E814 Test Method for Fire Tests of Penetration Firestop Systems

E906/E906M Test Method for Heat and Visible Smoke Release Rates for Materials and Products Using a Thermopile Method

E970 Test Method for Critical Radiant Flux of Exposed Attic Floor Insulation Using a Radiant Heat Energy Source

E1317 Test Method for Flammability of Marine Surface Finishes

E1321 Test Method for Determining Material Ignition and Flame Spread Properties

E1352 Test Method for Cigarette Ignition Resistance of Mock-Up Upholstered Furniture Assemblies

E1353 Test Methods for Cigarette Ignition Resistance of Components of Upholstered Furniture

E1354 Test Method for Heat and Visible Smoke Release Rates for Materials and Products Using an Oxygen Consumption Calorimeter

[1] This terminology is under the jurisdiction of ASTM Committee E05 on Fire Standards and is the responsibility of Subcommittee E05.31 on Terminology and Editorial.

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[2] Available from ASTM Headquarters, 100 Barr Harbor Drive, West Conshohocken, PA 19428.

[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] The last approved version of this historical standard is referenced on www.astm.org.

E1355 Guide for Evaluating the Predictive Capability of Deterministic Fire Models
E1474 Test Method for Determining the Heat Release Rate of Upholstered Furniture and Mattress Components or Composites Using a Bench Scale Oxygen Consumption Calorimeter
E1509 Specification for Room Heaters, Pellet Fuel-Burning Type
E1513 Practice for Application of Sprayed Fire-Resistive Materials (SFRMs)
E1529 Test Methods for Determining Effects of Large Hydrocarbon Pool Fires on Structural Members and Assemblies
E1537 Test Method for Fire Testing of Upholstered Furniture
E1546 Guide for Development of Fire-Hazard-Assessment Standards
E1590 Test Method for Fire Testing of Mattresses
E1623 Test Method for Determination of Fire and Thermal Parameters of Materials, Products, and Systems Using an Intermediate Scale Calorimeter (ICAL)
E1678 Test Method for Measuring Smoke Toxicity for Use in Fire Hazard Analysis
E1740 Test Method for Determining the Heat Release Rate and Other Fire-Test-Response Characteristics of Wall Covering or Ceiling Covering Composites Using a Cone Calorimeter
E1822 Test Method for Fire Testing of Stacked Chairs
E1995 Test Method for Measurement of Smoke Obscuration Using a Conical Radiant Source in a Single Closed Chamber, With the Test Specimen Oriented Horizontally
E2032 Guide for Extension of Data From Fire Resistance Tests Conducted in Accordance with ASTM E 119
E2058 Test Methods for Measurement of Material Flammability Using a Fire Propagation Apparatus (FPA)
E2061 Guide for Fire Hazard Assessment of Rail Transportation Vehicles
E2067 Practice for Full-Scale Oxygen Consumption Calorimetry Fire Tests
E2102 Test Method for Measurement of Mass Loss and Ignitability for Screening Purposes Using a Conical Radiant Heater
E2187 Test Method for Measuring the Ignition Strength of Cigarettes
E2226 Practice for Application of Hose Stream
E2307 Test Method for Determining Fire Resistance of Perimeter Fire Barriers Using Intermediate-Scale, Multi-story Test Apparatus
E2230 Practice for Thermal Qualification of Type B Packages for Radioactive Material
E2231 Practice for Specimen Preparation and Mounting of Pipe and Duct Insulation Materials to Assess Surface Burning Characteristics
E2257 Test Method for Room Fire Test of Wall and Ceiling Materials and Assemblies
E2280 Guide for Fire Hazard Assessment of the Effect of Upholstered Seating Furniture Within Patient Rooms of Health Care Facilities
E2335 Guide for Laboratory Monitors
E2404 Practice for Specimen Preparation and Mounting of Textile, Paper or Polymeric (Including Vinyl) and Wood Wall or Ceiling Coverings, Facings and Veneers, to Assess Surface Burning Characteristics
E2405 Test Method for Determination of Fire and Thermal Parameters of Materials Using an Intermediate Scale Test with Vertically Oriented Specimen (Withdrawn 2011)[4]
E2536 Guide for Assessment of Measurement Uncertainty in Fire Tests
E2573 Practice for Specimen Preparation and Mounting of Site-Fabricated Stretch Systems to Assess Surface Burning Characteristics
E2574/E2574M Test Method for Fire Testing of School Bus Seat Assemblies
E2599 Practice for Specimen Preparation and Mounting of Reflective Insulation, Radiant Barrier and Vinyl Stretch Ceiling Materials for Building Applications to Assess Surface Burning Characteristics
E2632/E2632M Test Method for Evaluating the Under-Deck Fire Test Response of Deck Materials
E2652 Test Method for Behavior of Materials in a Tube Furnace with a Cone-shaped Airflow Stabilizer, at 750°C
E2653 Practice for Conducting an Interlaboratory Study to Determine Precision Estimates for a Fire Test Method with Fewer Than Six Participating Laboratories
E2688 Practice for Specimen Preparation and Mounting of Tapes to Assess Surface Burning Characteristics
E2690 Practice for Specimen Preparation and Mounting of Caulks and Sealants to Assess Surface Burning Characteristics
E2707 Test Method for Determining Fire Penetration of Exterior Wall Assemblies Using a Direct Flame Impingement Exposure
E2726/E2726M Test Method for Evaluating the Fire-Test-Response of Deck Structures to Burning Brands
E2749 Practice for Measuring the Uniformity of Furnace Exposure on Test Specimens
E2816 Test Methods for Fire Resistive Metallic HVAC Duct Systems
E2837 Test Method for Determining the Fire Resistance of Continuity Head-of-Wall Joint Systems Installed Between Rated Wall Assemblies and Nonrated Horizontal Assemblies
E2886/E2886M Test Method for Evaluating the Ability of Exterior Vents to Resist the Entry of Embers and Direct Flame Impingement
E2912 Test Method for Fire Test of Non-Mechanical Fire Dampers Used in Vented Construction
E2957 Test Method for Resistance to Wildfire Penetration of Eaves, Soffits and Other Projections

2.2 *ISO Standards*[5]:
ISO 1182, Fire Tests-Building Materials-Non-Combustibility Test

[5] Available from International Standardization Organization, ISO Central Secretariat 1, rue de Varembé, Case postale 56, CH-1211, Geneva 20, Switzerland or American National Standards Institute, 11 West 42nd Street, New York, NY, 10046.

ISO 13943, Fire Safety-Vocabulary

3. Significance and Use

3.1 *Definitions*—Terms and related definitions given in Section 4 are intended for use uniformly and consistently in all fire test standards and in all fire-test-response standards, fire-hazard-assessment standards, and fire-risk-assessment standards in which they appear.

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 As indicated in Section 4, terms and their definitions are intended to provide a precise understanding and interpretation of fire-test-response standards, fire-hazard-assessment standards, and fire-risk-assessment standards in which they appear.

3.2.2 A specific definition of a given term is applicable to the standard or standards in which the term is described and used.

3.2.3 Different definitions of the same term, appearing respectively in two or more standards, are acceptable provided each one is consistent with and not in conflict with the standard definition for the same term, that is, concept.

3.2.4 Each standard in which a term is used in a manner specially defined (see 1.1 and Section 5) shall list the term and its description under the subheading, Definitions of Terms.

3.3 Definitions for some terms associated with fire issues and not included in Terminology E176 are found in ISO 13943. When discrepancies exist, the definition in Terminology E176 shall prevail.

4. Terminology

4.1 Terms and their standard definitions within the scope of this standard are given in Section 4 in alphabetical order. Annex A1 contains the definitions of terms from the section on "Definitions of Terms Specific to This Standard" from ASTM E05 standards.

4.2 Discussions associated with definitions are printed directly under the appropriate definition. The date following each definition or discussion indicates the year of introduction or of latest revision of that particular definition or discussion.

4.3 *Definitions:*

afterglow, *n*—persistence of glowing combustion after both removal of the ignition source and the cessation of any flaming. (2005)[6]

assembly, *n*—a unit or structure composed of a combination of materials or products, or both. (1990)

burn, *v*—to undergo combustion. (1989)

char, *v*—to form carbonaceous residue during pyrolysis or during incomplete combustion. (1979)

char, *n*—a carbonaceous residue formed by pyrolysis or incomplete combustion. (1979)

chimney effect—upward movement of hot fire effluent caused by convection currents confined within an essentially vertical enclosure. (2006)

DISCUSSION—This usually draws more air into the fire. (2006)

combustible, *adj*—capable of undergoing combustion. (1985)

DISCUSSION—The term combustible is often delimited to specific fire-exposure conditions. For example, building materials are considered combustible if they are capable of undergoing combustion in air at pressures and temperatures that might occur during a fire in a building. Similarly, some materials that are not combustible under such conditions may be combustible when exposed to higher temperatures and pressures or to an oxygen-enriched environment. Materials that are not combustible in bulk form may be combustible in finely divided form. (1985)

combustion, *n*—a chemical process of oxidation that occurs at a rate fast enough to produce temperature rise and usually light either as a glow or flame. (See also **glow** and **smoldering.**) (1989)

combustion products, *n*—effluent produced when a material undergoes combustion (see also **smoke**; see also **combustion**). (2001)

DISCUSSION—The combustion process releases effluents that have mass, in gaseous, liquid, or solid form, and generates radiant energy, as heat or light, and sometimes sound. However, the common usage of the term *combustion products* in ASTM E05 standards is only for those which have mass. (2001)

composite, *n*—structured combination of two or more discrete materials. (2008)

continuous, *adj—in data collection*, conducted at intervals of 5 s or less. (2008)

effective heat of combustion, *n*—the amount of heat generated per unit mass lost by a material, product or assembly, when exposed to specific fire test conditions (contrast **gross heat of combustion**) (2003).

DISCUSSION—The effective heat of combustion depends on the test method and is determined by dividing the measured heat release by the mass loss during a specified period of time under the specified test conditions. Typically, the specified fire test conditions are provided by the specifications of the fire test standard that cites effective heat of combustion as a quantity to be measured. For certain fire test conditions, involving very high heat and high oxygen concentrations under high pressure, the effective heat of combustion will approximate the gross heat of combustion. More often, the fire test conditions will represent or approximate certain real fire exposure conditions, and the effective heat of combustion is the appropriate measure. Typical units are kJ/g or MJ/kg. (2001)

environment, *n*—*as related to fire,* the conditions and surroundings that may influence the behavior of a material, product, or assembly when it is exposed to ignition sources or fire. (1989)

fire, *n*—destructive burning as manifested by any or all of the following: light, flame, heat, smoke. (1988)

fire-characteristic profile, *n*—an array of fire-test-response characteristics, all measured using tests relevant to the same fire scenario, for a material, product, or assembly to address, collectively, the corresponding fire hazard. (See also **fire hazard, fire risk,** and **fire-test-response characteristic.**) (1993)

DISCUSSION—An array of fire-test-response characteristics in a set of data relevant to the assessment of fire hazard in a particular fire

[6] Date indicates year of introduction or latest review or revision.

scenario. In other words, all the fire tests used would have a demonstrated validity for the fire scenario in question, for example by having comparable fire intensities. The fire-characteristic profile is intended as a collective guide to the potential fire hazard from a material, product, or assembly involved in a fire that could be represented by the laboratory test conditions. (1993)

fire-door assembly, *n*—a fire door, combined with the corresponding frame, hardware, and other accessories, that has a fire protection rating. (2014)

fire exposure, *n*—process by which or extent to which humans, animals, materials, products, or assemblies are subjected to the conditions created by fire. (1991)

fire gases, *n*—the airborne products emitted by a material, product, or assembly undergoing pyrolysis or combustion, that exist in the gas phase at the relevant temperature. (1979)

fire hazard, *n*—the potential for harm associated with fire. (1989)

DISCUSSION—A fire may pose one or more types of hazard to people, animals, or property. These hazards are associated with the environment and with a number of fire-test-response characteristics of materials, products, or assemblies including, but not limited to, ease of ignition, flame spread, rate of heat release, smoke generation and obscuration, toxicity of combustion products, and ease of extinguishment. (1989)

fire model, *n*—a physical representation or set of mathematical equations that approximately simulate the dynamics of burning and associated processes. (1992)

fire performance, *n*—response of a material, product, or assembly in a particular fire, other than in a fire test involving controlled conditions (different from **fire-test-response characteristic**). (1993)

DISCUSSION—The ASTM Policy on Fire Standards distinguishes between the response of materials, products, or assemblies to heat and flame under controlled conditions, which is fire-test-response characteristic, and under actual fire conditions, which is fire performance. Fire performance depends on the occasion or environment and may not be measurable. In view of the limited availability of fire-performance data, the response to one or more fire tests, appropriately recognized as representing end-use conditions, is generally used as a predictor of the fire performance of a material, product, or assembly. (1993)

fire performance characteristic, *n*—this term is deprecated. (See **fire-test-response characteristic** and **fire performance** (q.v.).) (1990)

fire performance test, *n*—this term is deprecated. (See **fire-test-response characteristic** and **fire performance** (q.v.).) (1990).

fireproof, *adj*—an inappropriate and misleading term. Do not use. (See commentary in X1.)

DISCUSSION—This term was originally used to describe buildings having all noncombustible structural elements and some degree of fire resistance. However, the term has been misunderstood to mean an absolute or unconditional property, and therefore the use of the term, fireproof, is inappropriate and misleading. (1990)

fire protection rating, *n*—a measure of the elapsed time during which a fire door assembly or a fire window assembly continues to exhibit fire resistance under specified exposure conditions. (2014)

DISCUSSION—In some jurisdictions the term fire protection rating may also be applied to other elements of building construction. (2014)

fire resistance, *n*—the ability of a material, product, or assembly to withstand fire or give protection from it for a period of time. (Contrast **fire resistance rating**.) (2004)

DISCUSSION—As applied to elements of buildings, fire resistance is characterized by the ability to confine a fire or to continue to perform a given structural function, or both. More specific examples of this ability include retention of stability (loadbearing capacity), integrity or thermal insulation. Once a measure of time is defined for fire resistance, and exposure conditions specified for that measure, the result is a fire resistance rating. (2004)

fire resistance rating, *n*—a measure of the elapsed time during which a material, product, or assembly continues to exhibit fire resistance under specified exposure conditions. (Contrast **fire resistance**.) (2004)

DISCUSSION—This term is defined because it is used in codes. As applied to elements of buildings, it is commonly measured by the methods and to the criteria defined in Test Methods E119 or Specification E1509. Fire protection rating is the term used for fire resistance ratings of fire door assemblies and fire window assemblies. (2014)

fire resistant, adj—See **fire resistive**, the preferred term. (1983)

fire resistive, *adj*—having fire resistance (TCG-01). (1983)

fire retardant, *n*—a substance which, when added to a combustible material, inhibits combustion of the resulting substance or material when exposed to fire. (2015)

fire retardant, adj—not a defined term. Use as a modifier only with defined compound terms: **fire-retardant barrier, fire-retardant chemical, fire-retardant coating,** and **fire-retardant treatment.** (1986)

fire-retardant barrier, *n*—a layer of material which, when secured to a combustible material or otherwise interposed between the material and a potential fire source, delays ignition and combustion of the material when the barrier is exposed to fire. (1986)

fire-retardant chemical, *n*—a chemical, which when added to a combustible material, delays ignition and combustion of the resulting material when exposed to fire. (1986)

DISCUSSION—A fire-retardant chemical can be a part of the molecular structure, an admixture, or an impregnant. (1986)

fire-retardant coating, *n*—a fluid-applied surface covering on a combustible material which delays ignition and combustion of the material when the coating is exposed to fire. (See also **flame-retardant coating.** Compare **fire-retardant barrier.**) (1986)

fire-retardant treatment, *n*—the use of a fire-retardant chemical or a fire-retardant coating. (See also **flame-retardant treatment.**) (1986)

fire risk, *n*—an estimation of expected fire loss that combines the potential for harm in various fire scenarios that can occur with the probabilities of occurrence of those scenarios. (1993)

DISCUSSION—Risk may be defined as the probability of having a certain type of fire, where the type of fire may be defined in whole or in part by the degree of potential harm associated with it, or as potential

for harm weighted by associated probabilities. However it is defined, no risk scale implies a single value of acceptable risk. Different individuals presented with the same risk situation may have different opinions on its acceptability. (1993)

fire scenario, *n*—a detailed description of conditions, including environmental, of one or more of the stages from before ignition to the completion of combustion in an actual fire, or in a full scale simulation. (1998)

DISCUSSION—The conditions describing a fire scenario, or a group of fire scenarios, are those required for the testing, analysis, or assessment that is of interest. Typically they are those conditions that can create significant variation in the results. The degree of detail necessary will depend upon the intended use of the fire scenario. Environmental conditions may be included in a scenario definition but are not required in all cases. Fire scenarios often define conditions in the early stages of a fire while allowing analysis to calculate conditions in later stages. (1998)

fire test exposure severity, *n*—a measure of the degree of fire exposure; specifically in connection with Test Methods E119, E152, and E163, the ratio of the area under the curve of average furnace temperature to the area under the standard time/temperature curve, each from the start of the test to the end or time of failure, and above the base temperatures 68°F (20°C). (1976)

fire-test-response characteristic, *n*—a response characteristic of a material, product, or assembly, to a prescribed source of heat or flame, under controlled fire conditions; such response characteristics may include, but are not limited to, ease of ignition, flame spread, heat release, mass loss, smoke generation, fire resistance, and toxic potency of smoke. (1992)

DISCUSSION—A fire-test-response characteristic can be influenced by variable characteristics of the heat source, such as its intensity, or of the burning environment, such as ventilation, geometry of item or enclosure, humidity, or oxygen concentration. It is not an intrinsic property such as specific heat, thermal conductivity, or heat of combustion, where the value is independent of test variables. A fire-test-response characteristic may be described in one of several terms. Smoke generation, for example, may be described as smoke opacity, change of opacity with time, or smoke weight. No quantitative correlation need exist between values of a fire-test-response characteristic for different materials, products, or assemblies, as measured by different methods or tested under different sets of conditions for a given method. (2005)

fire window assembly, *n*—a window or glass block assembly which has a fire protection rating. (2015)

flame, *n*—a hot, usually luminous zone of gas produced by combustion. (2012)

DISCUSSION—The luminosity of a flame can be caused by the presence of suspended glowing particulate matter or radical species in the zone of hot gases. (2012)

flame front, *n*—the leading edge of a flame propagating through a gaseous mixture or across the surface of a liquid or solid. (1983)

flameproof, *adj*—an inappropriate and misleading term. Do not use. (1983)

DISCUSSION—This term was originally used to describe the treatment of textile fabrics or other organic products to make them resistant to ignition. However, the term has been misunderstood to mean an absolute or unconditional property, and therefore the use of the term, flameproof, is inappropriate and misleading. (1983)

flame resistance, *n*—the ability to withstand flame impingement or give protection from it. (1983)

flame resistant, *adj*—having flame resistance. (1983)

flame resistive, n—See **flame resistant,** the preferred term. (1983)

flame retardant, *n*—a substance which, when added to a combustible material, inhibits flame spread of the resulting substance or material when exposed to flame impingement. (2015)

flame retardant, *adj* —not a defined term. Use only as a modifier with defined compound terms: **flame-retardant chemical, flame-retardant coating,** and **flame-retardant treatment.** (1986)

flame-retardant chemical, *n*—a chemical, which when added to a combustible material, delays ignition and reduces flame spread of the resulting material when exposed to flame impingement. (See also **fire-retardant chemical.**) (1986)

flame-retardant coating, *n*—a fluid-applied surface covering on a combustible material which delays ignition and reduces flame spread when the covering is exposed to flame impingement. (See also **fire-retardant coating.**) (1986)

flame-retardant treatment, *n*—the use of a flame-retardant chemical or a flame-retardant coating. (See also **fire-retardant treatment.**) (1986)

flame speed, *n*—the velocity of propagation of a flame front through a gaseous mixture (fuel and oxidizer) relative to a reference point. (1982)

flame spread, *n*—propragation of a flame front (see **surface flame spread, volumetric flame spread**). (2005)

flame spread index, *n*—a comparative measure expressed as a dimensionless number, derived from visual measurements of the spread of flame versus time in Test Method E84. (2001)

DISCUSSION—Classifications have been developed using these values. This index is different from that derived in Test Methods E162 or D3675. (2001)

flammable, *adj*—(*1*) capable of burning with a flame under specified conditions, or (*2*) when used to designate high hazard, subject to easy ignition and rapid flaming combustion. (1995)

DISCUSSION—The first definition is needed as it is the definition recognized by the principal international standardization bodies, the International Electrotechnical Commission (IEC) and the International Organization for Standardization (ISO). The second definition has been the ASTM Terminology E176 definition and is the principal definition recognized by the lay public. The terms in the second definition "easy ignition" and "rapid flaming combustion," may seem insufficiently precise but are made precise in standards that use the terms in that way, such as standards on the fire hazards of materials (for example, NFPA 704; NFPA 321, on flammable liquids; and NFPA 55, on flammable gases). (1995)

flashover, *n*—the rapid transition to a state of total surface involvement in a fire of combustible materials within an enclosure. (1997)

DISCUSSION—Flashover is a fluid–mechanical combustion instability within an enclosure that occurs when the surface temperatures of an enclosure and its contents rise rapidly, producing combustible gases and vapors, and the enclosure heat flux becomes sufficient to heat these gases and vapors to their ignition temperatures. At flashover, the volume occupied by hot combustion gases rapidly increases and ends up comprising more than 50% of the enclosure's volume. Experimentally it is found that flashover occurs when the upper gas layer temperature surpasses 600°C or when the radiant heat flux at the floor surpasses 20 kW/m^2. Visually, flashover often corresponds to a transition from flaming on a few surfaces to flames throughout the volume of the enclosure. (2002)

gasification, *n*—transformation of a solid and/or liquid material into a gaseous state. (2001)

glow, *n*—*as related to fire*, visible light emitted by a solid undergoing combustion. (See also **combustion** and **flame**.)

DISCUSSION—A solid undergoing combustion may itself glow or may produce a luminous flame consisting of hot gas with suspended glowing particulate matter. (2010)

gross heat of combustion, *n*—the maximum amount of heat per unit mass that theoretically can be released by the combustion of a material, product, or assembly; it can be determined experimentally only under conditions of high pressure and in pure oxygen (contrast **effective heat of combustion**). (2003)

heat flux, *n*—heat transfer to a surface per unit area, per unit time (see also **initial test heat flux**).(2008)

DISCUSSION—The heat flux from an energy source, such as a radiant heater, can be measured at the initiation of a test (such as Test Method E1354 or Test Method E906/E906M) and then reported as the initial test heat flux, with the understanding that the burning of the test specimen can generate additional heat flux to the specimen surface. The heat flux can also be measured at any time during a fire test, for example as described in Guide E603, on any surface, and with measurement devices responding to radiative and convective fluxes. Typical units are kW/m^2, W/cm^2, or BTU/(s ft^2). (2009)

heat release rate, *n*—the thermal energy released per unit time by an item during combustion under specified conditions. (2006)

heat stress, *n*—(physiological) adverse condition caused by exposure to elevated temperature, radiant heat flux, or combinations of these factors. (1988)

ignition, *n*—the initiation of combustion. (1989)

DISCUSSION—The combustion may be evidenced by glow, flame, detonation, or explosion. The combustion may be sustained or transient. (1989)

ignition temperature, *n*—the lowest temperature at which sustained combustion of a material can be initiated under specified test conditions. (1990)

DISCUSSION—While the phenomenon of combustion may be transient or sustained, in fire testing practice, the ignition temperature is reached when combustion continues after the pilot source is removed. (1990)

incandescence, *n*—emission of light produced by a material when intensely heated; it can be produced with or without combustion. (1997)

initial test heat flux, *n*—the heat flux set on the test apparatus at the initiation of the test (see also **heat flux**). (2007)

DISCUSSION—The initial test heat flux is the heat flux value commonly used when describing or setting test conditions. (2007)

integrity, *n*—*in fire resistance testing*, the ability of a test assembly, when exposed to fire from one side, to prevent the passage of flame or hot gases through it or the occurrence of flames on its unexposed side. (2013)

mass burning rate, *n*—mass loss per unit time by materials burning under specified conditions. (1989)

non-combustible, *adj*—not capable of undergoing combustion under specified conditions. (Contrast **combustible**.) (2004)

DISCUSSION—In fire testing, non-combustibility is often assessed by means of Test Method E136, Test Method E2652, or ISO 1182. (2014)

optical density of smoke, *D, n*—a measure of the attenuation of a light beam passing through smoke, expressed as the common logarithm of the ratio of the incident flux, I_o, to the transmitted flux, I. ($D = \log_{10} (I_o/I)$). (1989)

orientation, *n*—the plane in which the exposed face of the specimen is located during testing. (1977)

DISCUSSION—The orientation may be vertical, horizontal or at an angle. In the latter two cases, the specimen may be facing up or down. (1977)

oxygen consumption principle, *n*—the expression of the relationship between the mass of oxygen consumed during combustion and the heat released. (1998)

oxygen depletion, *n*—*in a fire,* reduction of oxygen (O_2) content of an atmosphere as a result of combustion. (1988)

oxygen index, *n*—minimum concentration of oxygen in a mixture of oxygen and nitrogen that will just support flaming combustion of a material under specified conditions. (2000)

piloted ignition, *n*—ignition of combustible gases or vapors by a pilot source of ignition (compare **spontaneous ignition, unpiloted ignition**). (1991)

pilot source of ignition, *n*—a discrete source of energy, such as, for example, a flame, spark, electrical arc, or glowing wire (compare **piloted ignition, unpiloted ignition**). (1991)

pyrolysis, *n*—process of simultaneous phase and chemical species change caused by heat (compare **smoldering**). (1991)

reaction to fire, *n*—response of a material in contributing by its own decomposition to a fire to which it is exposed, under specified conditions. (2002)

DISCUSSION—In fire testing, it is usual to distinguish between two types of fire-test-response characteristics: those associated with "reaction to fire" and those associated with "fire resistance." (2012)

screening test, *n*—*as related to fire,* a fire-response test performed to determine whether a material, product, or assembly (*a*) exhibits any unusual fire-related characteristics, (*b*) has certain expected fire-related characteristics, or (*c*) is capable of being preliminarily categorized according to the fire characteristic in question. (1993)

self heating, *n*—a rise in the temperature of a material, assemblage, or product caused by internal, exothermic chemical reaction. (1985)

self ignition, n—See **spontaneous ignition,** the preferred term. (1985)

self-propagation of flame, *n*—propagation of a flame front after the removal of any applied energy source. (2001)

smoke, *n*—the airborne solid and liquid particulates and gases evolved when a material undergoes pyrolysis or combustion. (1989)

DISCUSSION—So-called chemical smokes are excluded from this definition. (1989)

smoke developed index, *n*—a comparative measure expressed as a dimensionless number, derived from measurements of smoke obscuration versus time in Test Method E84. (2001)

DISCUSSION—Classifications have been developed using these values. (2001)

smoke obscuration, *n*—reduction of light transmission by smoke, as measured by light attenuation. (2001)

smoke toxicity, *n*—the propensity of smoke to produce adverse biochemical or physiological effects. (See **smoke.**) (1988)

smoldering, *n*—combustion of a solid without flame, often evidenced by visible smoke. (1979)

DISCUSSION—Smoldering can be initiated by small sources of ignition, especially in dusts or fibrous or porous materials, and may persist for an extended period of time after which a flame may be produced. (1979)

spontaneous ignition, *n*—unpiloted ignition caused by an internal exothermic reaction (compare **piloted ignition**). (1991)

standard temperature/time curve (standard time/temperature curve), *n*—*in fire testing,* a graphical representation derived from prescribed time-temperature relationships and used to control furnace temperature with progressing time. (1989)

DISCUSSION—One example is found in Test Methods E119. (1989)

superimposed load, *n*—force applied to a specimen or structure other than that associated with its own mass. (1979)

surface flame spread, *n*—propagation of flame away from the source of ignition across a surface (see **flame spread** and compare **volumetric flame spread**). (2010)

sustained flaming, *n*—flame on or over the surface of a test specimen that lasts longer than a defined period of time (contrast **transitory flaming**). (2009)

DISCUSSION—Typically, the same defined period is used to define " transitory flaming." See the specific standard test method for applicable defined period of time. (2009)

thermal decomposition, *n*—process whereby the action of heat or elevated temperature on an item causes changes to the chemical composition (different from **thermal degradation**, q.v.; compare **pyrolysis**). (2006)

thermal degradation, *n*—process whereby the action of heat or elevated temperature on a material, product, or assembly causes an adverse change in one or more properties (contrast **thermal decomposition,** q.v.). (2007)

DISCUSSION—Examples of properties that can be affected are physical, mechanical and electrical properties. Adverse change typically involves a loss in property. (2007)

time to sustained flaming, *n*—period of time from start of test to commencement of the first period of flaming lasting long enough to qualify as sustained flaming (see **sustained flaming**). (2009)

time to transitory flaming, *n*—period of time from start of test to commencement of the first period of flaming lasting long enough to qualify as transitory flaming but occurring before any period of flaming lasting long enough to qualify as sustained flaming (see **transitory flaming**). (2009)

total heat released, *n*—integrated value of the rate of heat release, for a specified time period.(2010)

toxicity, *n*—the propensity of a substance to produce adverse biochemical or physiological effects. (1988)

toxic hazard, *n*—*as related to fire,* the potential for physiological harm from toxic products of combustion. (1995)

DISCUSSION—Toxic hazard reflects both the quantity of toxic products and the quality of those products, which is given by toxic potency. Toxic hazard is not the only hazard associated with fire. Toxic hazard is not an intrinsic characteristic of a material or product but will depend upon the fire scenario, the condition of use of the material or product, and possibly other factors. (1995)

toxic potency, *n*—*as applied to inhalation of smoke or its component gases,* a quantitative expression relating concentration and exposure time to a particular degree of adverse physiological response, for example, death, on exposure of humans or animals. (1991)

DISCUSSION—The toxic potency of the smoke from any material, product, or assembly is related to the composition of that smoke which, in turn, is dependent upon the conditions under which the smoke is generated. (1991)

transitory flaming, *n*—flame on or over the surface of a test specimen that does not last longer than a defined period of time (contrast **sustained flaming**). (2009)

DISCUSSION—Typically, the same defined period of time is used to define "sustained flaming." See the specific standard test method for applicable defined period of time. (2009)

unpiloted ignition, *n*—ignition caused by one or more sources of energy without the presence of a pilot source of ignition (compare **piloted ignition, spontaneous ignition**). (1991)

upholstered, *adj*—covered with material (as fabric or padding) to provide a soft surface. (1999)

volumetric flame spread, *n*—flame propagation through the volume of a gaseous mixture. (1989)

ANNEX

(Mandatory Information)

A1. DEFINITIONS OF TERMS FROM E05 STANDARDS

A1.1.1 *Definitions:* Terms from the section on "Definitions of Terms Specific to This Standard" from ASTM E05 standards, their definitions, and the standard(s) to which they apply are given below in alphabetical order:

accuracy of measurement, *n*—closeness of the agreement between the result of a measurement and the true value of the measurand. (2009) **E2536**

acoustical ceiling panel, *n*—a form of a prefabricated sound absorbing ceiling element used with exposed suspension systems (see Specification E1264). (1999) **E2032**

acoustical ceiling tile, *n*—a form of a prefabricated sound absorbing ceiling element used with concealed or semi-exposed suspension systems, stapling, or adhesive bonding (see Specification E1264). (1999) **E2032**

assembly, *n*—a unit or structure composed of a combination of materials or products, or both. (2000) **E1995, E2102**

backing board, *n*—a noncombustible insulating board, mounted behind the specimen during actual testing to satisfy the theoretical analysis assumption of no heat loss through the specimen. It shall be roughly 25 ± 5 mm thick with a density no greater than 200 ± 50 kg/m^3. (1997) **E1321**

batch sampling—sampling over some time period in such a way as to produce a single test sample for analysis. (1981) **E800**

bead, *n—in building construction*, a strip of applied sealant, glazing compound or putty. (2010) **E2690**

beams, *n*—all horizontally oriented structural members employed in building construction and known variously as beams, joists, or girders. (1999) **E2032**

blackbody temperature, *n*—the temperature of a perfect radiator—a surface with an emissivity of unity and, therefore, a reflectivity of zero. (1997) **E648**

blockout, *n*—a recess formed in the floor assembly to accommodate the installation of the perimeter joint protection, flush with the wearing surface of the floor assembly. (2010) **E2307**

bolster, *n*—pillow or similarly shaped unit containing upholstery material covered by upholstery cover material that may or may not be attached to the upholstered furniture item but is sold and delivered with it. (1994) **E1352**

building element, *n*—a component or assembly of materials using products manufactured as independent units capable of being joined with or placed within other components or assemblies to create a structure. (2002) **E2226**

building envelope, *n*—the boundary or barrier separating different environmental conditions within a building and from the outside environment. (2015) **E2957**

carboxyhemoglobin saturation, *n*—the percent of blood hemoglobin predominately converted to carboxyhemoglobin from reaction with inhaled carbon monoxide. (1996)

DISCUSSION—The chemical reaction between carbon monoxide and hemoglobin in blood is reversible. The effect of carbon monoxide on the exposed person may not be reversible. **E1678**

ceiling protective membrane, *n*—a ceiling membrane attached to or suspended from the structural members of the floor or ceiling assembly, usually by hanger wire or threaded rods, consisting of a grid suspension system with lay-in ceiling panels or a grid of steel furring channels to which the ceiling membrane is directly attached, intended to provide fire protection, acoustical and or aesthetic enhancements, or both. (1999) **E2032**

closed state, *n*—the sealed or closed condition of an opening in vented construction. (2013) **E2912**

combined standard uncertainty, *n*—standard uncertainty of the result of a measurement when that result is obtained from the values of a number of other quantities, equal to the positive square root of a sum of terms, the terms being the variances or covariances of these other quantities weighted according to how the measurement result varies with changes in these quantities. (2009) **E2536**

combustion products—airborne effluent from a material undergoing combustion; this may also include pyrolysates. (1981) **E800**

compensating thermocouple, *n*—a thermocouple for the purpose of generating an electrical signal representing long-term changes in the stack metal temperatures wherein a fraction of the signal generated is subtracted from the signal developed by the stack-gas thermocouples. (1997) **E1317**

composite, *n—as applied to loadbearing elements*, an interaction between structural components which is to be taken into account in the evaluation of load capacity. (1999) **E2032**

composite, *n—as related to a pipe or duct insulation*, see **duct insulation system** or **pipe insulation system**. (2002) **E2231**

concentration-time curve, *n*—a plot of the concentration of a gaseous toxicant as a function of time. (1996)

DISCUSSION—The concentration-time curve can also be used to represent the sum total of all combustion products instead of just a single one. **E1678**

continuity, *n*—maintaining the fire resistance rating of the *rated wall assembly* and the protected *joint opening* to the underside of the *nonrated horizontal assembly* by use of a *continutiy head-of-wall joint system*, which achieves the same or greater fire resistance rating as the *rate wall assembly*. (2011)

DISCUSSION—This maintenance is achieved using materials or devices, or both, installed to extend and continue the fire resistance rating of the wall assembly to the underside of the *nonrated horizontal assembly* above. (2011) **E2837**

continuity head-of-wall joint system, *n*—materials or devices, or both, installed to resist the spread of fire for a prescribed period of time through the joint opening between a fire-resistance *rated wall assembly* below and *nonrated horizontal assembly* above. (2011) **E2837**

continuous (as related to data acquisition)**,** *adj*—conducted at data collection intervals of 5 s or less. (2000) **E906/E906M, E1995, E2102**

continuous *(as related to data acquisition)***,** *adj*—conducted at data collection intervals of 6 s or less. (2000) **E2067**

corridor, *n*—an enclosed space connecting a room or compartment with an exit. The corridor includes normal extensions, such as lobbies and other enlarged spaces, where present. (1997) **E648**

coverage factor, *n*—numerical factor used as a multiplier of the combined standard uncertainty in order to obtain an expanded uncertainty. (2009) **E2536**

critical flux at extinguishment, *n*—a flux level at the specimen surface corresponding to the distance of farthest advance and subsequent self-extinguishment of the flame on the centerline of a specimen. (1997)

DISCUSSION—The flux reported is based on calibration tests with a special calibration dummy specimen. (1997) **E1317**

critical heat flux for ignition, *n*—the midpoint within the range of heat fluxes between the maximum (highest) heat flux that produces no ignition and the minimum (lowest) heat flux that produces ignition, for a specified exposure time. (2015) **E2102**

critical radiant flux, *n*—the level of incident radiant heat energy on the floor covering system at the most distant flame-out point. It is reported as W/cm^2 (Btu/ft^2 · s). (1997) **E648**

critical radiant flux, *n*—the level of incident radiant heat energy on the attic floor insulation system at the most distant flame-out point. It is reported as W/cm^2 (or Btu/ft^2 · s). (1996) **E970**

Ct product, *n*—the concentration-time product in (µL/L) · min obtained by integration of the area under a concentration-time curve. (1996)

DISCUSSION—Values expressed using this unit are numerically equal to those using the previously cited unit, ppm, a term whose use is discouraged. **E1678**

curtain wall assembly, *n*—either a rated or non-rated, non-bearing exterior wall assembly secured to and supported by the structural members of the building. (2010) **E2307**

deck, *n—in upholstered furniture,* the upholstered support under the seat cushion in a loose-seat construction. (1994) **E1352, E1353**

deck structure, *n*—exterior structures comprised of deck boards or panels, stair treads, risers, and landings of decks, porches, and balconies. (2012) **E2726/E2726M**

deck surface area, *n*—the test specimen area defined by the overall specimen length and width after assembly. (2013) **E2632/E2632M**

design load, *n*—the intended maximum design load condition allowed by design under appropriate nationally recognized structural design criteria. (1999) **E2032**

directly applied fire resistive coating, *n*—materials that are normally sprayed onto substrates to provide fire-resistive protection of the substrates. (1999)

DISCUSSION—These coatings are called sprayed fire-resistive materials in Practice E1513 and related standards. **E2032**

duct, *n—as related to heating ventilating, air conditioning or exhaust systems*, a passageway made of sheet metal or other suitable material used for conveying air or other gases. (2002) **E2231**

duct insulation system, *n—as related to fire testing*, system intended to insulate and cover, continuously for an extended length, the outside surface of a duct; the system shall have an insulation core, with or without a covering or vapor retarder facing which includes longitudinal closure systems (if used) and perhaps other duct insulation supplementary materials such as adhesives, fasteners, or tapes (if used). (2002)

DISCUSSION—Duct system components, including tapes, sealants, and fitting covers, that do not cover the duct continuously for an extended length, but which are associated with the duct insulation system are considered separately (see duct insulation supplementary materials). An extended length is not intended to imply a length of 25 ft, but a length of at least 3 ft. (2002) **E2231**

duct insulation supplementary materials, *n—as related to fire testing*, components, including tapes and sealants used for transverse joints as well as fitting covers that are intermittently spaced, as needed, within the duct insulation system, as well as adhesives used to bond the insulation to the duct substrate and that do not cover the duct continuously for an extended length. (2002) **E2231**

duct lining, *n*—material such as an insulation, coating or film, including adhesive, used to line the inside surface of a duct. (2002) **E2231**

dummy specimen, *n*—a noncombustible (as defined by 46 CFR 164.009) insulating board used for standardizing the operating condition of the equipment, roughly 20 ± 5 mm in thickness with a density of 750 ± 100 kg/m^3. (1997)

DISCUSSION—The dummy specimen is mounted in the apparatus in the position of the test specimen and removed only when a test specimen is to be inserted. The term incombustible is used in a manner consistent with 46 CFR 164.009. **E1317**

dummy specimen, *n*—a noncombustible insulating board used for stabilizing the operating condition of the equipment, roughly 20 ± 5 mm in thickness with a density of 750 ± 100 kg/m^3. (1997)

DISCUSSION—The dummy specimen is mounted in the apparatus in the position of the test specimen and removed only when the test

specimen is to be inserted. For the ignition tests, the dummy specimen board shall have a hole at the 50-mm position for mounting the fluxmeter. (1997) **E1321**

eave, *n*—a projecting edge of a roof that extends beyond the building envelope. (2015) **E2957**

effective area of the furnace opening—furnace opening within the boundaries of the monitoring instrumentation. (2010) **E2749**

effective heat of combustion, *n*—the amount of heat generated per unit mass lost by a material, product, or assembly, when exposed to specific fire test conditions (see *gross heat of combustion*). (2007) **E1354**

DISCUSSION—The effective heat of combustion depends on the test method and is determined by dividing the measured heat release by the mass loss during a specified period of time under the specified test conditions. Typically, the specified fire test conditions are provided by the specifications of the fire test standard that cites effective heat of combustion as a quantity to be measured. For certain fire test conditions, involving very high heat and high oxygen concentrations under high pressure, the effective heat of combustion will approximate the gross heat of combustion. More often, the fire test conditions will represent or approximate certain real fire exposure conditions, and the effective heat of combustion is the appropriate measure. Typical units are kJ/g or MJ/kg. (2007) **E1354**

effective thermal property, *n*—thermal properties derived from heat-conduction theory applied to ignition/flame-spread data treating the material as homogenous in structure. (1997) **E1321**

ember, *n*—small burning or glowing pieces of vegetation or other cellulosic-based material. (2014) **E2886/E2886M**

emissivity, *n*—the ratio of the power per unit area radiated from a material's surface to that radiated from a black body at the same temperature. (1994) **E1623**

equivalent thickness, *n*—the calculated solid thickness of concrete or masonry for purposes of determining fire resistance ratings of barrier elements on the basis of heat transmission end-point criteria. (1999) **E2032**

error (of measurement), *n*—result of a measurement minus the true value of the measurand; error consists of two components: random error and systematic error. (2009) **E2536**

essentially flat surface, *n*—surface where the irregularity from a plane does not exceed ±1 mm. (2000) **E1995, E2102**

expanded uncertainty, *n*—quantity defining an interval about the result of a measurement that may be expected to encompass a large fraction of the distribution of values that could reasonably be attributed to the measurand. (2009) **E2536**

expanded vinyl wall or ceiling covering, *n*—a wall or ceiling covering consisting of a woven textile backing, an expanded vinyl base coat layer (which is a homogeneous vinyl layer that contains a blowing agent), and a nonexpanded vinyl skin coat. (2010) **E2404**

exposed area—the total surface area of the test assembly that is subjected to the fire-resistance test including, when required, the supporting construction. (2010) **E2226**

exposed surface, *n*—that surface of the specimen subjected to the incident heat. (2000) **E906/E906M, E1995, E2102**

exterior wall assembly, *n*—a curtain wall or a loadbearing exterior wall that is either fire resistance rated or one that is not. (2010) **E2307**

fire characteristic index, *n*—a single quantitative measure that combines two or more fire-test-response characteristics for a material, product, or assembly, all developed under test conditions compatible with a common fire scenario, addressing, collectively, the corresponding threat. See also **fire-characteristics profile**, **fire hazard**, **fire-test-response characteristic**. (2015) **E1546**

fire hazard assessment, *n*—a process for measuring or calculating the potential for harm created by the presence of a material, product, or assembly in the relevant fire scenarios. (2015) **E1546**

fire propagation, *n*—increase in the exposed surface area of the specimen that is actively involved in flaming combustion. (2003) **E2058**

fire resistive material, *n*—the product applied to or a part of the HVAC duct to provide fire resistance. (2011) **E2816**

fire risk assessment, *n*—a means for computing the probability of fire loss within a specified period in a defined occupancy or situation. (2015) **E1546**

fire-separating element, *n*—floors, walls, and partitions having a period of fire resistance determined in accordance with Test Methods E119. (2011) **E2816**

fire side, *adj*—the surface of the test assembly or test specimen exposed to the heat or flame, or both, of the test apparatus. (2011) **E2816**

firestop system, *n*—a specific combination of penetrating item or items, the specific construction that is penetrated, and the materials or devices, or both, that seal the opening provided to accommodate one or more items that penetrate into or through a fire-resistance rated assembly. (2010)

DISCUSSION—The materials and devices used to seal the opening around penetrating items are sometimes referred to as "firestops." Note that it is not "firestops" that are tested by this standard, but rather "firestop systems." Due to the complex interaction during a fire between the penetrant, the penetrated assembly, the materials and/or devices used to seal the penetration, and the specific size and shape of the opening, it is not possible to simply test the "firestop" to develop fire resistance data. (2010) **E814**

fire test, *n*—a procedure, not necessarily a standard test method, in which the response of materials to heat or flame, or both, under controlled conditions is measured or otherwise described. (1981) **E800**

flame-out, *n*—the time at which the last vestige of flame or glow disappears from the surface of the test specimen,

frequently accompanied by a final puff of smoke. (1997) **E648**

flaming combustion, *n*—ignition of combustible material that results in flaming combustion. (2014) **E2886/E2886M**

flaming mode, *n*—the mode of testing that uses a pilot flame. (1998) **E1995**

flashing, *n*—flame fronts of 3 seconds or less in duration. (1999)

DISCUSSION—All flame fronts, however temporary, are to be taken into account. (1999) **E162**

flashing, *n*—existence of flame on or over the surface of the specimen for periods of less than 1 s. (2000) **E2102**

floor assembly, *n*—a fire resistance rated loadbearing horizontal separating element adjacent to and separate from the floor of the observation room.

DISCUSSION—Floor assemblies tested in accordance with Test Methods E119 are required to be loadbearing. (2010) **E2307**

floor covering, *n*—an essentially planar material having a relatively small thickness in comparison to its length or width, which is laid on a floor to enhance the beauty, comfort, and utility of the floor. (1999) **E648**

floor covering system, *n*—a single material, composite or assembly comprised of the floor covering and related installation components (adhesive, cushion, etc.) if any. (1999) **E648**

flux profile, *n*—the curve relating incident radiant heat energy on the specimen plane to distance from the point of initiation of flaming ignition, that is, 0 cm. (1997) **E648**

fractional exposure dose (FED), *n*—the ratio of the integrated area under the concentration-time curve for a gaseous toxicant or the sum of all combustion products produced in a given test to that integrated C(t) area which has been determined statistically from independent experimental data to produce lethality in 50 % of test animals within a specified exposure and postexposure time.

DISCUSSION—When C is nearly constant over time, the time values in this ratio numerically cancel, and the FED is simply the ratio of the average concentration of a gaseous toxicant to its LC_{50} value for the same exposure time. When only a single measurement of C is made during a test, the accuracy of this simplification is not known. When not used with reference to a specific toxicant, the term FED represents the summation of FEDs for individual toxicants in a combustion atmosphere. (2010) **E1678**

frame, *n*—an item (plastic extrusion, wood, metal or other material) that is mounted to an existing substrate via mechanical fasteners or adhesive, that has a mechanism for holding an outer layer (fabric or vinyl) by tension. (2010) **E2573**

full length burn, *n*—the outcome of a determination in which the cigarette burns to or past the front plane of the tipping paper, which covers the filter and perhaps a short section of the tobacco column in a filter tip cigarette, or past the tips of the metal pins if the cigarette has no filter. (2002) **E2187**

full scale test, *n*—a test in which the product(s) to be tested is utilized in the same size as its end use. (1998)

DISCUSSION—In practical applications, this term is usually applied to tests where the item to be tested is larger than would fit in a bench-scale test. (1998) **E603**

fully developed stream—a coherent, forceful projection of water similar in shape and intensity to the stream being applied to the exposed side of the test assembly from the nozzle. (2002) **E2226**

fume stack, *n*—a box-like duct with thermocouples and baffles through which flames and hot fumes from a burning specimen pass whose purpose is to permit measurement of the heat release from the burning specimen. (1997) **E1317**

furniture mock-up or assembly, *n*—a representation of production furniture that uses the same upholstery cover material and upholstery material, constructed in the same manner as in production furniture, but with straight, vertical sides. (1994) **E1352**

gas phase ignition, *n*—ignition of pyrolysis products leaving a heated surface by a pilot flame or other ignition source that does not impinge on, nor significantly affect, for example, by re-radiation, the heated surface. (1997) **E906/E906M**

glow, *n*—visible light emitted by a solid undergoing combustion. (2015) **E2957**

gross heat of combustion, *n*—the maximum amount of heat per unit mass that theoretically can be released by the combustion of a material, product, or assembly; it can be determined experimentally only under conditions of high pressure and in pure oxygen (contrast *effective heat of combustion*). (2010) **E1354**

heat flux, *n*—heat transfer to a surface per unit area, per unit time (see also *initial test heat flux*). (2010) **E1354**

DISCUSSION—The heat flux from an energy source, such as a radiant heater, can be measured at the initiation of a test (such as Test Method E1354 or Test Method E906/E906M) and then reported as the incident heat flux, with the understanding that the burning of the test specimen can generate additional heat flux to the specimen surface. The heat flux can also be measured at any time during a fire test, for example as described in Guide E603, on any surface, and with measurement devices responding to radiative and convective fluxes. Typical units are kW/m^2, kJ/(m^2), W/cm^2, or BTU/(s ft^2).(2010) **E1354**

heat for ignition, *n*—the product of time from initial specimen exposure until the flame front reaches the 150-mm position and the flux level at this position, the latter obtained in prior calibration of the apparatus. (1997) **E1317**

heat for sustained burning, *n*—the product of time from initial specimen exposure until the arrival of the flame front, and the incident flux level at that same location as measured with a dummy specimen during calibration. (1997) **E1317**

heat release rate, *n*—the heat evolved from the specimen, per unit of time. (2001) **E2061**

heat release rate, *n*—the heat evolved from the specimen, expressed per unit area of exposed specimen area per unit of time. (2000) **E1474, E1740**

heat release rate, *n*—the heat evolved from the specimen, per unit of time. (2000) **E1354**

heat release rate, *n*—the heat evolved from the specimen per unit of time and area. (1994)

DISCUSSION—Heat release is measured in this test method both as a quantity per unit time and as a quantity per unit time and unit area. **E1623**

holding fixture—apparatus designed to hold the test specimen and a wall assembly, described in Section 7.3. (2015) **E2957**

homogeneous product, *n*—a product with nominally uniform density and composition. (2009) **E2652**

HVAC duct—a tube or conduit utilized for conveying air without combustible materials, flammable vapors, and combustible gases. (2011) **E2816**

HVAC duct system—consists of the HVAC duct, a fire-resistive material(s), a support system, the through-penetration firestops(s) and fastening system(s). (2011) **E2816**

hypothetical accident conditions, *n*—a series of accident environments, defined by regulation, that a Type B package must survive without significant loss of contents. (2002) **E2230**

ignitability, *n*—the propensity to ignition, as measured by the time to sustained flaming, in seconds, at a specified heating flux. (1997) **E1354, E1623**

ignitability, *n*—the propensity for ignition, as measured by the time to sustained flaming at a specified heating flux. (1996) **E1474, E1740**

ignition, *n*—the initiation of combustion. (2000)

DISCUSSION—The combustion may be evidenced by glow, flame, detonation, or explosion. The combustion may be sustained or transient. (2000) **E1995**

initial test heat flux, *n*—the heat flux set on the test apparatus at the initiation of the test (see also *heat flux*). (2010) **E1354**

DISCUSSION—The initial test heat flux is the heat flux value commonly used when describing or setting test conditions. (2010) **E1354**

insolation, *n*—solar energy incident on the surface of a package. (2002) **E2230**

insulation, *n*—a material that is normally added to an assembly to provide resistance to heat flow for purpose of energy conservation. (1999)

DISCUSSION—Insulation materials are also used to improve sound control or improve fire resistance. (1999) **E2032**

insulation, *n*—ability of a test assembly, when exposed to fire on one side, to restrict the temperature rise to below specified levels on its unexposed side. (2013) **E2912**

insulation blanket, *n*—a relatively flat and flexible insulation in coherent sheet form furnished in units of substantial area. (2002) **E2231**

integrity, *n*—the ability of a perimeter fire barrier, when exposed to fire from two sides, to prevent the passage of flame and hot gases through it and the occurrence of flames on its unexposed sides as determined by using a cotton pad. (2010) **E2307**

integrity, *n*—the absence of cracks, holes or openings that appear outside the furnace on the fire-resistive material or firestop, or both, or through which flames or hot gases pass as determined by the cotton pad test. (2011) **E2816**

integrity, *n*—the ability of a test assembly, when exposed to fire from one side, to prevent the passage of flame or hot gases through it or the occurrence of flames on its unexposed side. (2013) **E2912**

irradiance (at a point of a surface)**,** *n*—ratio of the radiant flux incident on a small but measurable element of surface containing the point, by the area of that element. (2000)

DISCUSSION—Convective heating is negligible in the horizontal specimen orientation. In the vertical presentation, it is small, but not negligible. Despite this contribution from convective heating, the term "irradiance" is used instead of "heat flux" throughout this test method as it best indicates the essentially relative mode of heat transfer. **E2102**

joining material, *n*—the frame piece used to join two or more site fabricated stretch panels together, to create a midseam. (2010) **E2573**

joint opening, *n*—the space between a *rated wall assembly* and the *nonrated horizontal assembly* above, which is either a void space or gap, or which is filled either partially or completely by a material, other than the wall material. (2011) **E2837**

laboratory monitor, *n*—a representative of a subcommittee who is appointed to determine if the qualifications, equipment, personnel, and level of skill at a test facility meet the criteria necessary to participate in an interlaboratory test protocol. (2004) **E2335**

LC_{50}, *n*—a measure of lethal toxic potency; the concentration of gas or smoke calculated statistically from concentration-response data to produce lethality in 50 % of test animals within a specified exposure and postexposure time, expressed in μL/L. (1996)

DISCUSSION—Values expressed using this unit are numerically equal to those using the previously cited unit, ppm, a term whose use is discouraged. **E1678**

lightweight aggregate concrete, *n*—concrete made with aggregates of expanded clay, shale, slag, or slate or sintered fly ash, and weighing 1360 to 1840 kg/m^3 (85 to 115 pcf). (1999) **E2032**

longitudinal midseam, *n*—a seam made from the joining material used in the stretch system, which is centered on the test specimen and runs the entire length of the test specimen. (2010) **E2573**

marine board, *n*—an insulation board of 750 ± 100 kg/m^3 density that meets the noncombustibility criteria of 46 CFR 164.009. (1997) **E1317**

mass loss concentration, *n*—the mass loss of a test specimen per unit exposure chamber volume in $g \cdot m^{-3}$. (1996) **E1678**

mass optical density, *n*—the ratio of the optical density of smoke and the mass loss of the test specimen, multiplied by the volume of the test chamber and divided by the length of the light path. (1998)

DISCUSSION—The mass optical density as determined in this test method is not an intrinsic material property; it is a function of the test procedure and conditions used. **E1995**

material, *n*—single substance, or uniformly dispersed mixture, for example metal, stone, timber, concrete, mineral fiber, or polymer. (2000) **E2102**

material, generic, *n*—is one for which a nationally recognized Standard Specification exists. (1999) **E2032**

material proprietary, *n*—is one whose fire performance characteristics are determined in consideration of a formulation or process of production that is proprietary. (1999) **E2032**

mattress, *n*—a mattress is a ticking (outermost layer of fabric or related material) filled with a resilient material, used alone or in combination with other products, intended or promoted for sleeping upon. (1996) **E1474**

maximum joint width, *n*—the widest opening of the perimeter joint as defined by the test sponsor. (2010) **E2307**

maximum joint width, *n*—the greatest width, size, or distance to which the *continuity head-of-wall* joint system is specified to open. (2011)

DISCUSSION—The *maximum joint width* equals the *nominal joint width* plus the extension of the *continuity head-of-wall joint system* from the *nominal joint width position*. (2011) **E2837**

measurand, *n*—quantity subject to measurement. (2009) **E2536, E535**

measured heat release of specimen, *n*—the observed heat release under the variable flux field imposed on the specimen and measured as defined by this test method. (1997) **E1317**

membrane-penetration firestop system, *n*—a firestop system that seals the opening provided to accommodate one or more items that penetrate the membrane on only one side of a fire-resistance rated assembly. (2010)

DISCUSSION—Examples of penetrating items include cables, conduits, ducts, pipes, and electrical boxes. (2010) **E814**

minimum joint width, *n*—the narrowest opening of the perimeter joint as defined by the test sponsor. (2010) **E2307**

minimum joint width, *n*—the narrowest width, size, or distance to which the *continuity head-of-wall joint system* is specified to close. (2011)

DISCUSSION—The *minimum joint width* equals the *nominal joint width* minus the compression of the *continuity head-of-wall joint system* from the *nominal joint width* position. (2011) **E2837**

mirror assembly, *n*—a mirror, marked and aligned with the viewing rakes, used as an aid in quickly identifying and tracking the flame front progress. (1997) **E1317, E1321**

model evaluation, *n*—the process of quantifying the accuracy of chosen results from a model when applied for a specific use. (1997) **E1355**

model validation, *n*—the process of determining the degree to which a calculation method is an accurate representation of the real world from the perspective of the intended uses of the calculation method. (1997)

DISCUSSION—The fundamental strategy of validation is the identification and quantification of error and uncertainty in the conceptual and computational models with respect to intended uses. (1997) **E1355**

model verification, *n*—the process of determining that the implementation of a calculation method accurately represents the developer's conceptual description of the calculation method and the solution to the calculation method. (1997)

DISCUSSION—The fundamental strategy of verification of computational models is the identification and quantification of error in the computational model and its solution. (1997) **E1355**

movement cycle, *n*—the change between the minimum and the maximum joint widths. (2010) **E2307**

movement cycle, *n*—the change between the *minimum joint width* and the *maximum joint width* of a continuity head-of-wall joint system. (2011) **E2837**

net heat of combustion, *n*—the oxygen bomb (see Test Method D5865) value for the heat of combustion, corrected for gaseous state of product water. (1997) **E1354, E1474, E1623,E1740**

DISCUSSION—The net heat of combustion differs from the gross heat of combustion in that the former assesses the heat per unit mass generated from a combustion process that ends with water in the gaseous state while the latter ends with water in the liquid state. **E1354,E1474,E1740**

newspaper, *n—as related to this test method*, standard size double sheets of newsprint, with black print and no colored ink or surface treatment. (2012) **E2574/E2574M**

nominal joint width, *n*—the specified opening of the perimeter joint as defined by the test sponsor that is selected for test purposes. (2010) **E2307**

nominal joint width, *n*—the specified opening width, size or distance of a *joint opening* that is selected for test purposes. (2011)

DISCUSSION—The *nominal joint width* is typically the joint width that exists in the building at the time the *continuity head-of-wall joint system* is installed. (2011) **E2837**

non-composite, *n—as applied to loadbearing elements*, structural interaction between contiguous elements is assumed not to exist in the evaluation of load capacity. (1999) **E2032**

nonflaming mode, *n*—the mode of testing that does not use a pilot flame. (1998) **E1995**

non-homogeneous product, *n*—a product that does not satisfy the requirements of a homogeneous product.

DISCUSSION—Non-homogeneous products are often composed of more than one component. (2009) **E2652**

non-mechanical fire damper, *n*—venting device used as part of vented construction intended to resist the transfer of hot gas, radiation, and flame. (2013) **E2912**

nonrated horizontal assembly, *n*—a ceiling, floor, or roof assembly that is not fire resistance rated such as determined in accordance with Test Methods E119 or E1529. **E2837**

normal conditions of transport, *n*—a range of conditions, defined by regulation, that a package must withstand during normal usage. **E2230**

observation room, *n*—the second-story room of the ISMA. (2010) **E2307**

obvious ignition, *n*—pronounced continuous and self-sustaining combustion of the test system accompanied by rapid generation of heat and smoke. It is a matter of operator judgment based upon experience in this type of operation. (1994) **E1353**

open state, *n*—the unsealed or unclosed condition of the mechanical fire damper prior to being closed or sealed. (2013) **E2912**

open state fire performance, *n*—the ability to limit the passage of hot gases, radiation, and flames produced during this test method's standardized sudden-flaming exposure. (2013) **E2912**

orientation, *n*—the plane in which the exposed face of the specimen is located during testing, either vertical or horizontal facing up. (1997) **E1354**

orientation, *n*—the plane in which the exposed face of the specimen is located during testing, which is horizontal facing up for this test. (2000) **E1740**

orientation, *n*—the plane in which the exposed face of the specimen is located during testing. (2000)

Discussion—For this standard, the specimen orientation may only be either vertical or horizontal. **E2102**

orientation, *n*—plane in which the exposed face of the specimen is located during testing, either vertical or horizonally face upwards. (1999) **E906/E906M**

orientation, *n*—the plane on which the exposed face of the specimen is located during testing, which is horizontal facing up for this test. (1996) **E1474**

orifice, *n*—the continuous hollow area or opening within the HVAC duct. (2011) **E2816**

orientation, *n*—the vertical plane in which the exposed face of the test specimen is located during testing. (2009) **E2707**

oxygen consumption principle, *n*—the expression of the relationship between the mass of oxygen consumed during combustion and the heat released. (2000) **E1354**

paper bag, *n—as related to this test method*, a bag constructed of unbleached (brown, #30) kraft paper having four sides and a bottom, with an open top, and held together with adhesive. (2012) **E2574/E2574M**

paper wall or ceiling covering, *n*—a wall or ceiling covering with a top layer consisting of polymeric-based material. (2010) **E2404**

perimeter fire barrier, *n*—the perimeter joint protection that provides fire resistance to prevent the passage of fire from floor to floor within the building at the opening between the exterior wall assembly and the floor assembly. The boundaries are the edge of the floor assembly and the interior face of the exterior wall assembly in contact with the perimeter joint protection. (2010)

Discussion—For the purpose of this standard, a knee wall is not to be considered as part of the exterior wall. (2010) **E2307**

perimeter joint, *n*—the linear void located between a juxtaposed exterior wall assembly and floor assembly to accommodate various movements induced by thermal differentials, seismicity, wind loads, and misalignments of the floor and wall during construction. (2010) **E2307**

perimeter joint protection, *n*—a fire-resistive joint system located between the exterior wall assembly and the floor assembly that fills the perimeter joint. (2010)

Discussion—Fire-resistive joint system is defined in Test Method E1966. (2010) **E2307**

pipe, *n—as related to heating, ventilating, or air conditioning systems*, a cylindrical conduit for the conveyance of liquids or semi-solids. (2002) **E2231**

pipe insulation system, *n—as related to fire testing*, system intended to insulate and cover, continuously for an extended length, the outside surface of a pipe; the system shall have an insulation core, with or without a covering or vapor retarder facing which includes longitudinal closure systems (if used) and perhaps other pipe insulation supplementary materials such as adhesives, fasteners, or tapes (if used). (2002)

Discussion—Pipe system components, including tapes, sealants, and fitting covers, that do not cover the pipe continuously for an extended length, but which are associated with the pipe insulation system are considered separately (see pipe insulation supplementary materials). An extended length is not intended to imply a length of 25 ft, but a length of at least 3 ft. (2002) **E2231**

pipe insulation supplementary materials, *n—as related to fire testing*, components, including tapes and sealants used for transverse joints as well as fitting covers that are intermittently spaced, as needed, within the pipe insulation system, as well as adhesives used to bond the insulation to the pipe substrate and that do not cover the pipe continuously for an extended length. (2002) **E2231**

polymeric wall or ceiling covering, *n*—a wall or ceiling covering with a top layer consisting of polymeric-based material. (2010) **E2404**

post-flashover, *n and adj.*—referring to the stage of a fire after flashover. (2010) **E1678**

precision, *n*—variability of test result measurements around reported test result value. (2009) **E2536**

product, *n*—the upholstered furniture for which information is required. (1996) **E1537**

product, *n*—material, composite or assembly about which information is required. (2005) **E2405**

product, *n*—mattress, or mattress with foundation, for which fire-test-response characteristics are to be measured. (1996) **E1590**

product, *n*—material, component, or complete end-use product, in use in rail transportation vehicles. (2003) **E2061**

projection, *n*—an exterior outcrop of the building, such as a cantilevered room, that protrudes from or overhangs the building envelope. (2015)

DISCUSSION—Examples include, but are not limited to, eaves, soffits, enclosed cantilevered balconies, and enclosed cantilevered room bump-outs. (2015) **E2957**

quilted, *n*—fused or stitched with thread through the upholstery cover material and one or more layers of upholstery material. (1994) **E1352**

radiant barrier, *n*—a low emittance (0.1 or less) surface used in the construction of a radiant barrier system. (2010) **E2599**

DISCUSSION—Radiant barrier materials are defined in Specification C1313. (2010) **E2599**

radiant flux profile, *n*—the graph relating incident radiant heat energy on the specimen plane to distance from the point of initiation of flaming ignition, that is, 0 mm. (1996) **E970**

radiant panel index, I_s, *n*—the radiant panel index is the product of the flame spread factor, F_s, and the heat evolution factor, Q. **E162**

rated wall assembly, *n*—an interior wall or partition having a period of fire resistance determined in accordance with Test Methods E119 or E1529. (2011) **E2837**

random error, *n*—result of a measurement minus the mean that would result from an infinite number of measurements of the same measurand carried out under repeatability conditions. (2009) **E2536**

regulatory hydrocarbon fire, *n*—a fire environment, one of the hypothetical accident conditions, defined by regulation, that a package shall survive for 30 min without significant release of contents. **E2230**

reflective insulation, *n*—thermal insulation consisting of one or more low emittance surfaces bounding one or more enclosed air spaces. (2010) **E2231,E2599**

DISCUSSION—Reflective insulation materials are defined in Specification C1224. (2010) **E2231,E2599**

reflective plastic core insulation, *n*—an insulation material packaged in rolls, that is less than 0.5 in. (12.7 mm) thick, with at least one exterior low emittance surface (0.1 or less) and a core material containing voids or cells. (2010) **E2231,E2599**

DISCUSSION—Reflective plastic core insulation materials are one specific type of reflective insulation materials. (2010) **E2231,E2599**

repeatability (of results of measurements), *n*—closeness of the agreement between the results of successive independent measurements of the same measurand carried out under repeatability conditions. (2009) **E2536**

repeatability (of results of measurements), *n*—quantitative expression of the random variability associated with successive measurements of the same measurand carried out subject to all of the following conditions: the same measurement procedure, the same observer, the same measuring instrument, used under the same conditions, the same location, and repetition over a short period of time. (2015)

DISCUSSION—Repeatability deals with results in a single laboratory while reproducibility deals with results obtained in different laboratories. (2015) **E2653**

repeatability and reproducibility—these terms deal with the variability of test results obtained under specified laboratory conditions. Repeatability concerns the variability between independent test results obtained within a single laboratory in the shortest practical period of time by a single operator with a specific set of test apparatus using test specimens (or test units) taken at random from a single quantity of homogeneous material obtained or prepared for the ILS. Reproducibility deals with the variability between single test results obtained in different laboratories, each of which has applied the test method to test specimens (or test units) taken at random from a single quantity of homogeneous material obtained or prepared for the ILS. (2009) **E2653**

repeatability conditions, *n*—on identical test material using the same measurement procedure, observer(s), and measuring instrument(s) and performed in the same laboratory during a short period of time. (2009) **E2536**

reproducibility (of results of measurements), *n*— closeness of the agreement between the results of measurements of the same measurand carried out under reproducibility conditions. (2009) **E2536**

reproducibility (of results of measurements), *n*—quantitative expression of the random variability associated with successive measurements of the same measurand carried out by operators working in different laboratories, each obtaining single results on identical test material when applying the same method. (2015)

DISCUSSION—Repeatability deals with results in a single laboratory while reproducibility deals with results obtained in different laboratories. (2015) **E2653**

reproducibility conditions, *n*—on identical test material using the same measurement procedure, but different observer(s) and measuring instrument(s) in different laboratories performed during a short period of time. (2009) **E2536**

reverberatory wires, *n*—a wire mesh located in front of, but close to, the radiating surface of the panel heat source which serves to enhance the combustion efficiency and increase the radiance of the panel. (1997) **E1317**

sample, *n*—an amount of the material, product, or assembly, to be tested, which is representative of the item as a whole. (1998) **E1995, E2067, E2102**

sample integrity—the unimpaired chemical composition of a test sample upon the extraction of said test sample for analysis. (1981) **E800**

sampling—a process whereby a test sample is extracted from a fire test environment. (1981) **E800**

sand-lightweight concrete, *n*—concrete made with a combination of expanded clay, shale, slag, or slate or sintered fly ash and natural sand and generally weighing between 1680 and 1920 kg/m^3 (105 to 120 pcf). (1999) **E2032**

sealant, *n—in building construction*, a material that has the adhesive and cohesive properties to form a seal. (2010) **E2690**

self-supporting specimen, *n*—a specimen that remains in place by its own structural characteristics both before and during the fire test. (2002) **E2231, E2404, E2688,E2690**

self-supporting specimen, *n*—a specimen that remains in place by its own structural characteristics both before and during the fire test or is burnt or pyrolyzed prior to falling away from its original position. (2010) **E2573**

separating element, *n*—a floor assembly or exterior wall assembly. (2010) **E2307**

sheathing, *n*—the material placed on an exterior wall beneath cladding or siding and directly attached to the wall system used over the wall framework and is attached directly to the wall framing members. Materials called sheathing that are not placed beneath cladding or siding shall be classified as cladding or siding. (2009) **E2707**

siding (cladding), *n*—any material that constitutes the exposed exterior covering of an exterior wall and such material is applied over sheathing or directly attached to the wall system. (2009) **E2707**

site-fabricated stretch system, *n*—a system, fabricated on site and intended for acoustical, tackable or aesthetic purposes, that is comprised of three elements: *(a)* a frame (constructed of plastic, wood, metal or other material) used to hold fabric in place, *(b)* a core material (infill, with the correct properties for the application), and *(c)* an outside layer, comprised of a textile, fabric or vinyl, that is stretched taut and held in place by tension or mechanical fasteners via the frame. (2010) **E2404, E2599**

smoke developed index, *n*—a number or classification indicating a comparative measure derived from smoke obscuration data collected during the test for surface burring characteristics. **E84**

smoke obscuration, *n*—reduction of light transmission by smoke, as measured by light attenuation. (2000) **E1354**

smoke obscuration, *n*—the reduction in visibility due to smoke (ISO Guide 52). (1998) **E1995**

SMOKE unit, *n*—the concentration of smoke particulates in a cubic metre of air that reduces the percent transmission of light through a 1-m path to 10 %. SMOKE = Standard Metric Optical Kinetic Emission. (1997) **E906/E906M**

smoldering combustion, *n*—ignition of combustible material where a transition to flaming combustion does not occur but a charred area indicating locations where embers landed can be observed. (2014) **E2886/E2886M**

soffit, *n*—the enclosed underside of any exterior overhanging section of a roof eave. (2015) **E2957**

special calibration board, *n*—a specially assembled noncombustible insulating board used for standardizing the operating condition of the equipment which is used only to measure the flux distribution at specified intervals along the specimen surface. It shall be roughly 20 ± 5 mm in thickness with a density of 750 ± 100 kg/m^3. (1997) **E1321**

special calibration dummy specimen, *n*—a dummy specimen as defined by Fig. 1, made of the same material as the dummy specimen, intended only for use in calibration of flux gradient along the specimen. (1997) **E1317**

specified load, *n—as applied to loadbearing elements*, the test load applied to the element in a Test Method E119 test. (1999)

DISCUSSION—In Test Method E119 testing, the specified load is generally the design load. **E2032**

specimen, *n*—representative piece of the product which is to be tested together with any substrate or treatment. (2000) **E2067, E2102, E2257**

DISCUSSION—This may include an air gap. **E2102**

specimen, *n*—the actual section of material, product, or assembly, to be placed in the test apparatus. (1998) **E1995**

specimen, *n*—manufactured item of the product, representative prototype of the product, or mock-up of the product. (1996) **E1537**

specimen, *n*—the manufactured item of the product, or representative prototype of the product. (1996) **E1590**

splice, *n*—the connection or junction within the length of a perimeter joint protection. (2010)

DISCUSSION—A splice is a result of the device or method used to connect or join multiple lengths of the perimeter joint protection. (2010) **E2307**

splice, *n*—the connection or junction within the length of a *test specimen*. (2011) **E2837**

splice, *n*—a connection of parts of test specimens within the vented construction. (2013) **E2912**

stability, *n*—the ability of the HVAC duct, support and fastening system to fulfill their intended function. (2011) **E2816**

stacking chair, *n*—chair that is intended to be stacked when not in use. (1999) **E1822**

standard deviation, *n*—a quantity characterizing the dispersion of the results of a series of measurements of the same measurand; the standard deviation is proportional to the square root of the sum of the squared deviations of the measured values from the mean of all measurements. (2009) **E2536**

standard uncertainty, *n*—uncertainty of the result of a measurement expressed as a standard deviation. (2009) **E2536**

supporting construction, *n*—the arrangement of separating elements forming the intersection into which the perimeter joint protection is installed. (2010) **E2307**

support system, *n*—the vertical or horizontal devices used to sustain the HVAC duct and its fire-resistive materials and their fastening means. (2011) **E2816**

supporting construction, *n*—construction required for the testing of some building elements into which the test specimen is assembled, for example, the wall into which a door is fitted. (2002) **E2226**

supporting construction, *n*—the arrangement of building sections forming the fire-separating elements into which the HVAC duct system is installed. (2011) **E2816**

surface flame spread, *n*—the propagation of a flame away from the source of ignition across the surface of the specimen. (2000) **E84**

sustained flaming, *n*—the existence of flame on or over the surface of the specimen for periods of 4 s or more. (2000) **E1474, E1740, E2102**

sustained flaming, *n*—existence of flame on or over most of the specimen surface for periods of at least 4 s. (1997)

DISCUSSION—Flaming of less than 4 s duration is identified as flashing or transitory flaming. (1997) **E1354**

sustained flaming, *n*—existence of flame on or over the surface of the specimen for periods of 5 s. (1994)

DISCUSSION—Flaming of less than 5 s duration is identified as flashing or transitory flaming. (1994) **E1623**

sustained flaming—any flaming which continues uninterrupted for 5 seconds or more. **E108**

sustained flaming, *n*—existence of flame on or over the surface of the vent for continuous periods of at least 4 s. (2014) **E2886/E2886M**

sustained flaming, *n*—flame on or over the surface of a test specimen that lasts longer than a period of 4 s. (2015) **E2707,E2957**

sustained flaming (for testing at 750°C), *n*—sustained flaming for testing at 750°C (1382°F) is the persistence of a flame on or over any part of the visible part of the test specimen lasting 5 s or longer. (2009) **E2652**

systematic error (or bias), *n*—mean that would result from an infinite number of measurements of the same measurand carried out under repeatability conditions minus the true value of the measurand. (2009) **E2536**

tenability (of humans to fire-generated conditions), *n*—the capability of humans to occupy a room without becoming incapacitated or being killed as a result of a fire. (2003) **E2280**

tenability limit (of humans to fire-generated conditions) , *n*—limit at which a human being is rendered physically incapacitated or dies as a consequence of exposure to one or more factors (such as toxic gases, temperature, heat flux, or smoke obscuration) generated by a fire. (2003) **E2280**

test assembly, *n*—the building element or elements being tested and, if applicable, the supporting construction. (2002) **E2226**

test assembly—the wall or floor that is part of the firestop system being tested into which the test specimen(s) is (are) mounted or installed. (2010) **E814**

test assembly, *n*—the complete construction composed of a test specimen(s) together with its supporting construction. (2011) **E2816**

test assembly, *n*—the complete assembly of the test specimen together with the test apparatus. (2010) **E2307**

test assembly, *n*—the complete assembly of the test specimen together with its *rated wall assembly* and *nonrated horizontal assembly*. (2011) **E2837**

test assembly, *n*—the complete assembly of a test specimen(s) installed in the vented construction. (2013) **E2912**

test material, *n*—members that constitute the exposed surface of the deck structures. (2012) **E2726/E2726M**

test method and protocol—*in this practice,* the term "test method" is used both for the actual measurement process and for the written description of the process, while the term "protocol" is used for the directions given to the laboratories for conducting the ILS. (2009) **E2653**

test room, *n*—the first-story room of the ISMA. (2010) **E2307**

test sample—a representative part of the experimental environment (gases, liquids, or solids), for purposes of analysis. (1981) **E800**

test specimen, *n*—the specific construction assembly that was tested in accordance with Test Method E119. (1999) **E2032**

test specimen, *n***—**stack of five identical stacking chairs. (1999) **E1822**

test specimen—the penetrating item or items and the materials or devices, or both, that seal the opening in the firestop system being tested. (2010) **E814**

test specimen, *n*—the specific test details of the perimeter fire barrier. (2010) **E2307**

test specimen, *n*—a material, product, or assemblage of a specific design, composition, density, and dimension, for example, a HVAC duct protected with a fire-resistive material(s) that is secured by fastening system, which is suspended by a support system, and protected by a firestop(s). (2011)

DISCUSSION—The fire-resistive material or the HVAC duct system are examples of test specimens. (2011) **E2816**

test specimen, *n*—a fire-resistive wall *continuity head-of-wall joint system* of a specific material(s), design, and width. (2011) **E2837**

test specimen, *n*—a non-mechanical fire damper with specific attributes such as material(s), gaps, shapes, size and width. (2013) **E2912**

textile, *n*—originally a woven fabric, now generally applied to *(1)* staple fibers and filaments suitable for conversion to or use as yarns or for the preparation of nonwoven fabrics, *(2)* yarns made from natural or manufactured fibers, and *(3)* fabrics made from fibers as defined in *(1)* and *(2)* and from yarns. (2010) **E2404**

thermal operating level, *n*—the operating condition at which the radiance of the heat source produces a specified constant heat flux to some specified position at the specimen surface. (1997) **E1321**

thermal qualification, *n*—the portion of the certification process for a radioactive materials transportation package that includes the submittal, review, and approval of a Safety Analysis Report for Packages (SARP) through an appropriate regulatory authority, and which demonstrates that the package meets the thermal requirements stated in the regulations. (2002) **E2230**

thermally thick, *n*—the thickness of a medium that is large enough to have the predominate thermal (temperature) effects experienced within that distance, that is, negligible heat is lost from its unexposed side. (1997) **E1321**

through-penetration firestop system, *n*—a firestop system that seals the opening around penetrating items that pass through the entire fire-resistance rated assembly. (2010)

DISCUSSION—Examples of penetrating items include cables, cable trays, conduits, ducts, and pipes. (2010) **E814**

time to ignition, *n*—time between the start of the test and the presence of a flame on the specimen surface for a period of at least 4s. (1998) **E1995**

time to ignition, *n*—time between the start of the test and the presence of a flame on or over most of the specimen surface for a period of at least 4 s. (2000) **E2102**

time to sustained flaming, *n*—time to ignition. (2000) **E2102**

time to sustained flaming on the exposed side, *n*—time to ignition, in s. (2004) **E1623**

time to sustained flaming on the unexposed side, *n*—test duration, in s. (2004) **E1623**

time zero, *n*—the point in time when the chamber door is closed, which needs to occur within 3 s after the specimen has been moved into the chamber. (2010) **E648**

total cold wall heat flux, *n*—the heat flux that would be transferred to an object whose temperature is 70°F (21°C). (1993) **E1529**

total flux meter, *n*—the instrument used to measure the level of radiant heat energy incident on the specimen plane at any point. (1997) **E648, E970**

transfer, *n*—the process of substituting a loadbearing element from one test specimen for the loadbearing element in another test specimen, or utilizing a loadbearing element from one test specimen for use in another test specimen that does not include a loadbearing element. (1999) **E2032**

transitory flaming, *n*—the existence of flame on or over the surface of the specimen for periods of between 1 and 4 s. (2000) **E2102**

tufted, *n*—buttoned or laced through the upholstery cover material and upholstery material. (1999) **E1352**

type A evaluation (of uncertainty), *n*—method of evaluation of uncertainty by the statistical analysis of series of observations. (2009) **E2536**

type B evaluation (of uncertainty), *n*—method of evaluation of uncertainty by means other than the statistical analysis of series of observations. (2009) **E2536**

Type B package, *n*—a transportation package that is licensed to carry what the regulations define to be a Type B quantity of a specific radioactive material or materials. **E2230**

ultimate capacity, *n—as applied to loadbearing elements*, the actual maximum load carrying capacity of an element based on properties specific to the material constituting the element. (1999) **E2032**

uncertainty of measurement, *n*—parameter, associated with the result of a measurement, that characterizes the dispersion of the values that could reasonably be attributed to the measurand. (2009) **E2536, E535**

unexposed side, *n*—the surface not directly exposed to the heat or flame, or both, of the test apparatus. (2011) **E2816**

unexposed side, *n*—the face of the vent not directly exposed to the fire in the Flame Intrusion test. (2014) **E2886/E2886M**

unexposed surface thermocouple, *n*—temperature-measuring device placed on the unexposed surface. (2011) **E2816**

upholstered, *adj*—covered with material (as fabric or padding) to provide a soft surface. (1994) **E1353, E1474, E1537, E1822**

upholstered furniture, *n*—a unit of interior furnishing that *(1)* contains any surface that is covered, in whole or in part, with a fabric or related upholstery cover material, *(2)* contains upholstery material, and *(3)* is intended or promoted for sitting or reclining upon. (1994) **E1352, E1353**

upholstered seating furniture, *n*—a unit of interior furnishing that *(1)* contains any surface that is covered, in whole or in part, with a fabric or other upholstery cover material, *(2)* contains upholstery material, and *(3)* is intended or promoted for sitting upon. (1999) **E1537, E1822, E2280**

DISCUSSION—For the purpose of this guide, mattresses, bedding and other sleep products are excluded from the definition of upholstered seating furniture. **E2280**

upholstery cover material, *n*—the outermost layer of fabric or related material used to enclose the main support system or upholstery materials, or both, used in the furniture unit. (1999) **E1537, E1822**

upholstery cover material, *n*—the outermost layer of fabric or related material used to enclose the main support system or upholstery materials, or both, used in the furniture item. (1999) **E1352, E1353, E2280**

upholstery cover material, *n*—the outermost layer of fabric or related material used to enclose the main support system, or upholstery materials, or both, used in the furniture unit. (1994) **E1537, E1822**

upholstery material, *n*—the padding, stuffing, or filling material used in a furniture item, which may be either loose or attached, enclosed by an upholstery cover material, or located between the upholstery cover material and support system, if present. (2001)

DISCUSSION—This includes, but is not limited to, material such as foams, cotton batting, polyester fiberfill, bonded cellulose, or down. (2001) **E1352, E1353, E1474, E1537, E1822, E2280**

vent, *n*—a device or assembly placed in an exterior opening of a building (located in an eave, gable, wall, or foundation) that allows for aeration (free exchange of air). (2014) **E2886/E2886M**

vented construction, *n*—a building element or construction feature (such as a floor, roof, ceiling, joint, door or wall cavity, crawl space, air gap, etc.) that includes an opening(s) used for venting of spaces or as a part of ductless ventilation equipped with one or more non-mechanical fire dampers. (2013) **E2912**

viewing rakes, *n*—a set of bars with wires spaced at 50-mm intervals for the purpose of increasing the precision of timing the flame front progress along the specimen. (1997) **E1317, E1321**

vinyl stretch ceiling material, *n*—a vinyl material stretched and mechanically fastened to a noncombustible frame and intended to be used as a suspended ceiling without associated backing material. (2010) **E2573,E2599**

vinyl wall or ceiling covering, *n*—a wall or ceiling covering produced by applying a poly(vinyl chloride) (PVC, vinyl) based coating, or laminating a preformed vinyl film, onto a woven or nonwoven fabric substrate or paper. (2010) **E2404**

wall assembly, *n*—framed vertical section simulating the role of an exterior wall below an eave overhang or projection used in the evaluation of test specimen. (2015)

DISCUSSION—Section 7.2 described the wall assembly used in this test method. **E2957**

wall or ceiling covering, *n*—a textile-, paper- or polymeric (including vinyl) based product designed to be attached to a wall or ceiling surface for decorative or acoustical purposes. (2010) **E1740,E2404**

DISCUSSION—Wall or ceiling coverings with ink or topcoat layers added as part of the manufacturing process are included in this definition. (2010) **E1740,E2404**

wall or ceiling covering composite, *n*—wall or ceiling covering system. (2010) **E1740**

wall or ceiling covering system, *n*—an assembly of a textile wall or ceiling covering, a paper wall or ceiling covering or a polymeric (including vinyl) wall or ceiling covering, adhesive (if used), and substrate (if it is part of the assembly) used as a wall or ceiling treatment for decorative or acoustical purposes. (2010) **E1740,E2404**

DISCUSSION—The wall or ceiling covering material is usually intended to be directly attached to a substrate, via adhesives or mechanical fasteners. In some cases the wall or ceiling covering system will be supported by a frame system some distance away from the wall or ceiling covering material. (2010) **E2404**

welt, *n*—the piping effect produced when welt cord and cover fabrics are sewn together for ornamental purposes to finish the edges between intersecting surfaces of upholstered furniture cushions, pillows, arms, or backs. (1994) **E1352, E1353**

welt cord, *n*—the continuous small-diameter cylindrical material that is wrapped in fabric and sewn as part of the cover to make a welt edge on upholstered furniture. (1994) **E1352, E1353**

wide span system, *adj*—a system that employs a wide span fabric or vinyl, from 10 ft or more in width and minimizes the use of a midseam or "joining" material. (2010) **E2573**

APPENDIXES

(Nonmandatory Information)

X1. HISTORICAL COMMENTARY

X1.1 In the 1970s ASTM decided to develop a Policy on Fire Standards. At the same time, the ASTM Committee on Terminology (COT) created a Terminology Coordinating Group under its auspices. This Terminology Coordinating Group was designated TCG-01. It consisted of representatives of Committee E05 on Fire Standards, COT and other interested technical committees.

X1.2 The responsibility of TCG-01 was to consider and recommend terms and definitions in the field of fire technology for the purpose of minimizing redundancies and eliminating conflicts in such terminology.

X1.3 That committee recommended several definitions, many of which have been amended over the years. Such definitions have included: afterglow, char (both as a noun and as a verb), fire exposure, fire gases, fire resistant (inappropriate and misleading), fire resistive, flame, flame front, flame resistance, flame resistant, flame resistive (as a less satisfactory alternative to flame resistant), flash point, glow, ignition, mass

burning rate, optical density of smoke, piloted ignition, smoke, spontaneous ignition, surface flame spread rate, temperature and unpiloted ignition. Not all of these terms are still included in Terminology E176 and some of the definitions have since been amended.

X2. KEYWORDS

X2.1 Scope

X2.1.1 This appendix of keywords is provided as a resource and a convenience to aid in providing index and keyword items for fire standards of Committee E05 as well as other ASTM Committees preparing fire standards. The list has been compiled from a list prepared by the Subcommittee at the time when mandatory keyword sections were first being added to most ASTM standards. Other appropriate keywords may apply.

X2.2 Guidelines

X2.2.1 Keywords should be selected on the basis of those that best represent the technical information presented in the standard.

X2.2.2 Select the keywords from the title and body of the standard and include general, vernacular and trade terms.

X2.2.3 Select three or more keywords that describe the names of tests, procedures, special materials, or the specific application(s) that will facilitate the identification and retrieval of the standard.

X2.2.4 All selected keywords should be stand-alone terms; the type of standard, incomplete phrases, unattached adjectives, and so forth should not be used.

X2.3 Resource List of Keywords

X2.3 acid gases

activation energy
acute toxicity
afterburner
afterburning
afterglow
air leakage
air mixtures
air ratio
air movement
air velocity
analyzer
anhydrous fuels
animal models atmospheric
animal atmosphere
anoxia
asphyxia
autoignition
autoignition temperature
autoxidation
axisymmetric
behavior models
bench scale tests
blackbody
blackbody temperature
building code
buoyant flumes
buoyant flow
burn room
burnout parameter
burnout
burn through
burner
burning
burning velocity
burning rate
burning brand test
cable insulation
cable jacket
cable trays
cable sheath
calibrate
calibration burner
calorimeter
calorimetry
candle
carbon monoxide
carbon balance method
carbon dioxide
carboxyhemoglobin
ceiling jet
cellulosic fuel
chamber
char
char depth characteristic
characteristic time
charring
chimney
cigarette ignition
cigarette test method
combustibility
combustible properties
combustible elements
combustible
combustion gases
combustion toxicity
combustion efficiency
combustion products
combustion rate
combustion theory
combustion temperature
combustion toxicology
combustion test
combustion
cumulative smoke release
compartment fire
compartment

conductive heat transfer
conduction
conductivity
cone calorimeter
cone corrosimeter
confined conical heater
conical heater
containment
convection
convective heat transfer
corner test
corridor test
corridor test, quarter scale
crib fire
crib test
crib
critical temperature
critical radiant flux
critical flux for spread
critical irradiance
critical temperature ignition
critical flux for ignition
damper
decomposition
deformation
degradation
deluge
detection systems
differential pressure
diffusion fire
diffusion flame
diffusivity
door assemblies
dosage
dosimeter
drape
dual lcso
dummy specimen
effective heat of combustion
effective thermal properties
egress
electrical cable
emission
emissivity
emittance
enclosure environment
enclosure fire
endothermic
energy balance
enthalpy
entrainment
entropy
evacuation
event
exhaust duct
exhaust gases
exhaust velocity
exit
exothermic
experimental animals
experimental design
explosion
exposure
extinction
extinction coefficient
extinction time
extinguish
extinguisher
fabric flammability
fabric flammability testing
false alarm
fatality
fault trees
field models
fire
fire area
fire behavior
fire brand
fire chemistry
fire code
fire containment
fire containment walls
fire characteristic index
fire characteristic profile
fire control
fire effect
fire effluent
fire endurance
fire endurance test
fire exposure
fire gases
fire hazard
fire hazard analysis
fire hazard assessment
fire incident
fire model
fire penetrations
fire performance
fire physics
fire point
fire prediction
fire prevention
fire propagation
fire propagation index
fire properties
fire protection
fire research
fire resistance
fire resistive
fire resistive material
fire retardant barrier
fire retardant chemical
fire retardant coating
fire retardant treatment
fire risk
fire risk analysis

fire risk assessment
fire risk assessment standard
fire safety
fire scenario
fire severity
fire simulation
fire size
fire spread
fire statistic
fire stop
fire test
fire test chamber
fire test response
fire test response standard
fire tube apparatus
fire tube assembly
fire test response
fire test response standard
fire wall
fireball
firebox
firestop
flame
flame emissivity
flame entrainment coefficient
flame extinction coefficient
flame front
flame heating parameter
flame heat transfer factor
flame propagation
flame radiation
flame region
flame resistance
flame resistant
flame retardant chemical
flame retardant coating
flame retardant treatment
flame speed
flame spread
flame spread rate
flame spread test
flame temperature
flame travel rate
flame spread classification
flame spread index
flame velocity
flameless
flameout
flameover
flameproofing
flaming
flaming combustion
flaming ignition
flammability
flammability apparatus
flammability limits
flammability measurements
flammability tests
flammable gases
flammable liquids
flammable materials
flammable solids
flashpoint
flashback
flashover
floor radiant panel tests
flue
flux
flux distribution
flux gage
flux profile
flux time products
flux uniformity
fluxmeter
flying brand test
forest fuels
fractional radiation
free burning fires
free convection
free radical
free ventilation
froude number
fuel
fuel-air
fuel-air ratio
fuel-contributed index
fuel load
full-scale fire tests
furnace
furniture calorimeter
gas air
gases
gas density
gas phase ignition
gas velocity
gasification
glow
gravimetric soot sampler
graybody radiation
halon
hazard
hazard analysis
hazard assessment
hazardous materials
hazardous vapors
heat
heat balance
heat capacity
heat feedback
heat flow
heat flux coefficient
heat loss
heat of activation
heat of combustion
heat of gasification
heat of pyrolysis

heat of reaction
heat of solution
heat of vaporization
heat release
heat release fraction
heat release rate
heat resistant coatings
heat resistant materials
heat resistant plastics
heat transfer
heat transfer coefficient
heat transport
heater
heating
heating flux
heating tests
homogeneous gas reactions
homogeneous mixtures
hose stream test
hydrant
hydrocarbon combustion
hydrocarbon fuel
hydrocarbon pool fires
hyperbaric
hyperoxia
hypoxemia
hypoxia
ic50
ideal gas law
ignitability
igniter
igniting burner
ignition burner
ignition
ignition circuit
ignition correlation parameter
ignition resistance
ignition source
ignition temperature
ignition tests
ignition time
incandescence
incendiary
incinerator
index
induction
inert
infrared
inhalation toxicity
input
intensity
interior finish
intermittent flame exposure
intumescence test
intumescent
intumescent coatings
irradiance
irradiation isothermal
jet entrainment
jet flames
kindling
kinetic
laminar burning
laminar burning velocity
laminar flame propagation
laminar flames
laminar flow
laminar heat transfer
laminar jet flames
laminar mixing
large scale tests
laser extinction beam
latent heat
lateral flame spread
lc50
lc (ct) 50
life hazards
life safety
lift apparatus
light
light absorption
light extinction beam
light intensity
light path
limiting oxygen index
liquid fuel
luminous flames
mass burning rate
mass flow
mass loss
mass loss rate
mass optical density
mass transfer
mass transfer rate
mathematical models
measurement methods
medium scale tests
melting point
methenamine pill
methodology
model
model validation
model verification
modeling
moisture
mortality
mounting methods
multiple lc50
multiroom fires
multiventilation
national fire incident
reporting system (nfirs)
net heat of combustion
noncombustibility
noncombustibles
nonconductor

nonflaming
nonflaming combustion
nonignition
non-load bearing
nonluminous
nonthermal damage
occupational hazards
occupancy
occupancy classification
offgassing
Ohio State University
Ohio State University model
opacity
optical calibration filters
optical density
optical path length
optical properties
output
oven
overheating
oxygen concentration
oxygen consumption
oxygen consumption calorimeter
oxygen consumption principle
oxygen index
oxygen index test
particulate mass concentration
party-wall
pathological effects
permeability
photochemical oxidation
photochemical reaction
photometer
physiological effects
pill test
pilot
pilot burner
pilot flame
pilot source of ignition
piloted ignition
plasma
plenum cable
plume
plume entrainment coefficient
pool fire
post-fire
post-flashover
post-ignition
postheating
potential heat
precombustion
prefire
preflashover
preignition
propagation
purposeful ignition
pyrolysis
pyrolysis front
pyrolysis temperature
pyrometer
radiant combustion apparatus
radiant energy
radiant flux
radiant flux profile
radiant heat
radiant heat fill
radiant heat furnace
radiant heat source
radiant heat transfer
radiant panel test method
radiation
radiation absorption
radiation exposure
radiometer
rate of heat release
rate of mass loss
rate of smoke release
refractory tube method
release rates
residence time
residual flame time
residue
response surface method
response time
restraint
reynolds number
risk
risk analysis
risk assessment
risk elements
risk rating factors
room burns
room fire tests
room fires
scale effect
scaling
scenario
scorching
screening test
self propagating flux
self extinguishment
self-heating
side wall sprinkler systems
skin burns
small scale fire test
smoke
smoke control
smoke corrosivity
smoke damage
smoke density
smoke density chamber (e 662)
smoke density index
smoke emission factor
smoke filling
smoke flow
smoke generations

smoke measurement
smoke movement
smoke obscuration
smoke opacity
smoke penetration
smoke release
smoke release rate
smoke toxicity
smoke unit
smoke yield
smoldering
smoldering combustion
smoldering ignition
solid fuels
solid propellant ignition
soot
soot formation
soot sampling
spark
specific extinction area
specific heat
specific optical density
specific smoke extinction area
spontaneous combustion
spontaneous ignition
sprinkler
sprinkler system
stack
stack action
stack effect
stagnation
standard fire tests
standard flammability apparatus
standard temperature time curve
steady state combustion
steady state gasification
steiner tunnel
stephan-boltzman constant
stoichiometric ratio
stove
stratification
stratified flow
sublimation
substrate
superimposed load
suppression
suppression devices
surface emissivity
surface flame spread
surface flame spread rate
sustained flaming
temperature
temperature effects
temperature gradients
temperature measurements
temperature rise
temperature tests
thermal analysis
thermal conductivity
thermal damage
thermal decomposition
thermal degradation
thermal draft coefficient
thermal effects
thermal equilibrium
thermal inertia
thermal operating level
thermal properties
thermally thick
thermally thin
thermochemistry
thermocouple
thermogravimetric analysis
thermometer
thermopile
through penetration fire stop
time to ignition
time to sustained burning
torch
total flux meter
total heat flux
total heat release
total smoke release
toxic fire hazard
toxic hazard
toxic potency
toxic potency test
toxicity
toxicity tests
tunnel furnace
tunnel tests
turbulent burning
turbulent burning velocity
turbulent combustion
turbulent flames
turbulent jet flames
two stage ignition
University of Pittsburgh
unpiloted ignition
unpiloted ignition toxicity
urban fires test (upitt)
urban fuels
van der waals effects
vertical furnace
visible smoke
volume flame spread
wall fires
weight loss rate
wood smoke
xp2 chamber test
zone models