



# Standard Terminology of Building Constructions<sup>1</sup>

This standard is issued under the fixed designation E 631; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon ( $\epsilon$ ) indicates an editorial change since the last revision or reapproval.

## 1. Scope

1.1 This standard consists of terms and definitions pertaining to the field of buildings, and in particular, terms related to the standards generated by ASTM Committee E06 on Performance of Buildings.

1.2 The purpose of this Terminology is to provide meanings and explanations of technical terms in the buildings field, written for both the non-expert and the expert user.

1.3 This comprehensive Terminology standard contains all ASTM standardized definitions generated in ASTM Committee E06. There are also subsidiary terminology standards. These special classes of terminology are grouped for convenient use (see Section 2). Some subsidiary terminology standards appear in this comprehensive standard.

1.4 Terms are listed in alphabetical sequence. Compound terms appear in the natural spoken order. To show the relationships in certain families of concepts, groups of narrower terms and their definitions are grouped under the definition of the broader term. Each such sub-entry is listed also (*in italics*) with a cross-reference to the special class.

1.5 Certain standard definitions herein are adopted from other sources. Each is an exact copy. The source is identified at the right margin following the definition, and is listed in Section 2.

## 2. Referenced Documents

### 2.1 ASTM Standards:<sup>2</sup>

- C 274 Terminology of Structural Sandwich Constructions
- C 168 Terminology Relating to Thermal Insulation
- C 460 Terminology for Asbestos-Cement<sup>3</sup>

- C 582 Specification for Contact-Molded Reinforced Thermosetting Plastic (RTP) Laminates for Corrosion-Resistant Equipment
- C 755 Practice for Selection of Water Vapor Retarders for Thermal Insulation
- D 123 Terminology Relating to Textiles
- D 907 Terminology of Adhesives
- E 73 Practice for Static Load Testing of Truss Assemblies
- E 135 Terminology Relating to Analytical Chemistry for Metals, Ores, and Related Materials
- E 148 Specification for Apparatus for Microdetermination of Nitrogen by the Dumas Method<sup>3</sup>
- E 344 Terminology Relating to Thermometry and Hydrometry
- E 456 Terminology Relating to Quality and Statistics
- E 489 Test Method for Tensile Strength Properties of Metal Connector Plates<sup>3</sup>
- E 564 Practice for Static Load Test for Shear Resistance of Framed Walls for Buildings
- E 774 Specification for the Classification of the Durability of Sealed Insulating Glass Units<sup>3</sup>
- E 779 Test Method for Determining Air Leakage Rate by Fan Pressurization
- E 833 Terminology of Building Economics
- E 859 Test Method for Air Erosion of Sprayed Fire-Resistive Materials (SFRMs) Applied to Structural Members
- E 985 Specification for Permanent Metal Railing Systems and Rails for Buildings
- E 998 Test Method for Structural Performance of Glass in Windows, Curtain Walls, and Doors Under the Influence of Uniform Static Loads by Nondestructive Method
- E 1065 Guide for Evaluating Characteristics of Ultrasonic Search Units
- E 1186 Practices for Air Leakage Site Detection in Building Envelopes and Air Barrier Systems
- E 1334 Practice for Rating the Serviceability of a Building or Building-Related Facility
- E 1480 Terminology of Facility Management (Building-Related)
- E 1481 Terminology of Railing Systems and Rails for Buildings

<sup>1</sup> This terminology is under the jurisdiction of ASTM Committee E06 on Performance of Buildings and is the direct responsibility of Subcommittee E06.94 on Terminology and Editorial.

Current edition approved June 1, 2006. Published June 2006. Originally approved in 1978. Last previous edition approved in 1998 as E 631 – 93a (1998)<sup>1</sup>.

Those terms formerly contained in Definitions E 540 – 77 are now contained in this terminology.

<sup>2</sup> For referenced ASTM standards, visit the ASTM website, [www.astm.org](http://www.astm.org), or contact ASTM Customer Service at [service@astm.org](mailto:service@astm.org). For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

<sup>3</sup> Withdrawn.

- E 1553** Practice for Collection of Airborne Particulate Lead During Abatement and Construction Activities<sup>3</sup>
- E 1554** Test Methods for Determining External Air Leakage of Air Distribution Systems by Fan Pressurization
- E 1566** Guide for Handling Hazardous Biological Materials in Liquid Nitrogen
- E 1605** Terminology Relating to Lead in Buildings
- E 1613** Test Method for Determination of Lead by Inductively Coupled Plasma Atomic Emission Spectrometry (ICP-AES), Flame Atomic Absorption Spectrometry (FAAS), or Graphite Furnace Atomic Absorption Spectrometry (GFAAS) Techniques
- E 1644** Practice for Hot Plate Digestion of Dust Wipe Samples for the Determination of Lead
- E 1677** Specification for an Air Barrier (AB) Material or System for Low-Rise Framed Building Walls
- E 1679** Practice for Setting the Requirements for the Serviceability of a Building or Building-Related Facility
- E 1726** Practice for Preparation of Soil Samples by Hotplate Digestion for Subsequent Lead Analysis
- E 1749** Terminology Relating to Rigid Wall Relocatable Shelters
- E 1753** Practice for Use of Qualitative Chemical Spot Test Kits for Detection of Lead in Dry Paint Films
- E 1775** Guide for Evaluating Performance of On-Site Extraction and Field-Portable Electrochemical or Spectrophotometric Analysis for Lead
- E 1783** Specification for Preformed Architectural Strip Seals for Buildings and Parking Structures
- E 1792** Specification for Wipe Sampling Materials for Lead in Surface Dust
- E 1796** Guide for Selection and Use of Liquid Coating Encapsulation Products for Leaded Paint in Buildings
- E 1807** Terminology Pertaining to Metal Connector Plates<sup>3</sup>
- E 1827** Test Methods for Determining Airtightness of Buildings Using an Orifice Blower Door
- E 1828** Practice for Evaluating the Performance Characteristics of Qualitative Chemical Spot Test Kits for Lead in Paint
- E 1918** Test Method for Measuring Solar Reflectance of Horizontal and Low-Sloped Surfaces in the Field<sup>3</sup>
- F 221** Terminology Relating to Carbon Paper and Inked Ribbon Products and Images Made Therefrom
- F 412** Terminology Relating to Plastic Piping Systems

### 3. Terminology

#### 3.1 Symbols:

- a**—height of cantilevered shear wall, in metres (feet).
- b**—length of cantilevered shear wall, in metres (feet).
- C**—initial length of the diagonal  $\sqrt{a^2 + b^2}$ , in metres (feet).
- δ**—diagonal elongation, in millimetres (inches).
- Δ**—total horizontal displacement of the top of the wall measured with respect to the test apparatus, in millimetres (inches). This value includes effects due to panel rotation, translation, and shear.
- E**—modulus of elasticity of flange or web material, depending upon which material is held constant in a transformed section analysis, psi (or MPa)

- G**—shear modulus of the web material, psi (or MPa)
- G'**—shear stiffness of the diaphragm obtained from test (includes shear deformation factor for the connection system), lbf/in. (or N/mm)
- G**—shear stiffness obtained from test, in newtons per metre (pound-force per inch).
- G'**—global shear stiffness, includes rotation and translational displacements as well as diaphragm shear displacement.
- G'<sub>int</sub>**—internal shear stiffness, includes only the shear displacement of the wall in calculation.
- I**—moment of inertia of the transformed section of the diaphragm based on webs or flanges, in.<sup>4</sup> (or mm<sup>4</sup>)
- L**—total span of a simply supported diaphragm, in. (or mm)
- P**—concentrated load, lbf (or N)
- P**—concentrated load applied at the top edge of the wall at the selected reference displacement, in newtons (pound-force).
- P<sub>u</sub>**—highest load level held long enough to record gage measurements, in newtons (pound-force).
- R<sub>u</sub>**—maximum diaphragm reaction, lbf (or N)
- S<sub>u</sub>**—ultimate shear strength of the diaphragm, lbf/ft (or N/m)
- a**—span length of cantilever diaphragm, in. (or mm)
- b**—depth of diaphragm, in. (or mm)
- t**—thickness of web material, in. (or mm)
- w**—uniform load, lbf/in. (or N/mm)
- Δ<sub>b</sub>**—bending deflection of diaphragm, in. (or mm)
- Δ<sub>k</sub>**—empirical expression for that portion of the diaphragm deflection contributed by the shear deformation of the connection system, in. (or mm)
- Δ<sub>s</sub>**—pure shear deformation of diaphragm, in. (or mm)
- Δ<sub>s'</sub>**—apparent total shear deformation of the diaphragm based on test (see 8.1.2.2), in. (or mm). This factor includes both the pure shear deformation and that contributed by distortion of the connection system.
- Δ<sub>t</sub>**—total deflection of diaphragm, in. (or mm)
- Δ<sub>1,2</sub>**—deformation measured at Point 1, 2, - - -, in. (or mm)

#### 3.2 Terms and Their Definitions:

- absolute sealing**—a level of sealing that requires all seams, slots, holes, and fasteners passing through the seal plane to be sealed. **E 1749**
- abrasion resistance (coatings)**—ability of a coating to resist being worn away and to maintain its original appearance, integrity, and structure when subjected to rubbing, scraping, or wear. **E 1605**
- accelerated test**—See **test, accelerated**. **E 1749**
- accessible surface**—interior or exterior surface (usually up to 5 ft (1.5 m) from floor or ground) that is accessible for young child to mouth or chew. See also **chewable surface**. **E 1605**
- accreditation, n**—official authorization, approval, or recognition accorded an individual or organization based upon specific qualification.
- DISCUSSION**—In specific use, it is necessary to include an identification of the type, scope, and limitations of the accreditation, and by whom granted.
- accuracy, n**—degree of conformity of a measured or calculated value to some recognized standard or specified value. **E 1605**

DISCUSSION—This concept involves the systematic error of an operation, which is usually measurable. Compare **precision**.

**ACH<sub>50, n</sub>**—the ratio of the air leakage rate at 50 Pa (0.2 in. H<sub>2</sub>O), corrected for a standard air density, to the volume of the test zone (1/h). **E 1827**

**acid rain**—rain having a pH of less than 5.65.

DISCUSSION—The pH of distilled water in equilibrium with carbon dioxide under laboratory conditions is 5.6.

**active hours**—See **hours of operation**. **E 1480**

**active solar energy system**—See **building subsystem**.<sup>4</sup>

**adapt**—See **building modification**.

**add**—See **building modification**.

**adhesive**—a substance capable of holding materials together by means of surface attachment. **E 1749**

**cold setting adhesive**—an adhesive which sets at temperatures below 20°C (68°F). **E 1749**

**contact pressure adhesive**—a resinous adhesive which is aggressively and permanently tacky at room temperature and adheres to a variety of surfaces upon contact with a minimum of pressure required. (Syn. **pressure-sensitive adhesives**.) **E 1749**

**core splice adhesive**—a film adhesive, capable of expansion of at least 175 % of its original thickness, used primarily to join or splice together two or more separate sections of core material in sandwich constructions. **E 1749**

**foamed adhesive**—an adhesive, the apparent density of which has been decreased substantially by the presence of numerous gaseous cells dispersed throughout its mass. **E 1749**

**supported film adhesive**—an adhesive material incorporating a carrier that remains in the bond when the adhesive is employed; carrier support material is usually composed of organic/inorganic fibers which may be in woven (knit) or nonwoven (mat) form. **E 1749**

**unsupported film adhesive**—an adhesive material in film form without a carrier support. **E 1749**

**adhesive, contact**—an adhesive that is apparently dry to the touch and that will adhere to itself instantaneously upon contact. **E 1749**

**adjusted internal rate-of-return (AIRR)**—the compound rate of interest that, when used to discount the terminal values of costs and benefits of a project over a given study period, will make the costs equal the benefits when cash flows are reinvested at a specified rate. (Syn. **financial management rate of return (FMRR)**) **E 833**

**adjusted serviceability score**—See **serviceability score**. **E 1480**

**administrative removal**—(*of workers*), temporary removal of workers from a job site prior to blood-lead levels reaching values requiring medical removal. **E 1605**

**aged insulation value**—thermal resistance (R-value) of a thermal insulation material as determined after standard conditioning to simulate service exposure.

**air-change rate**—air-leakage in volume units per hour divided by the building space volume with identical volume units

(normally expressed as air changes per hour, ACH or ACPH). **E 779**

**air exfiltration**—air leakage out of the building driven by negative pressure. **E 1677**

**negative pressure**—air pressure on the outdoor side of a building envelope lower than on the indoor side. **E 1677**

**air-handling unit**—the distribution-system fan and portion of the distribution system that is integral to the furnace, air-conditioner, or heat-pump. **E 1554**

**air infiltration**—air leakage into the building drive by positive pressure. **E 1677**

**positive pressure**—air pressure on the outdoor side of a building envelope higher than on the indoor side. **E 1677**

**air leakage, n—in buildings**, the passage of uncontrolled air through **cracks** or openings in the building envelope or its **components**, such as ducts, because of air pressure or temperature difference.

**air leakage**—the movement/flow of air through the building envelope, which is driven by either or both positive (infiltration) and negative (exfiltration) pressure differences across the envelope. **E 1677**

DISCUSSION—These pressure differences are caused by wind, mechanical systems, and temperature differences (stack effect).

**air-leakage graph**—the graph that shows the relationship of measured air flow rates to the corresponding measured pressure differences (usually plotted on a log-log scale). **E 779**

**air leakage rate, Q<sub>env, n</sub>**—the total volume of air passing through the test zone envelope per unit of time (m<sup>3</sup>/s, ft<sup>3</sup>/min). **E 1827**

**air-leakage rate**—the volume of air movement per unit time across the building envelope. **E 779**

NOTE 1—This movement includes flow through joints, cracks, and porous surfaces, or combination thereof. The driving force for such an air leakage in service can be either mechanical pressurization and depressurization, natural wind pressures, or air temperatures differentials between the building interior and the outdoors, or combination thereof.

**air leakage rate**—the time rate of air flow across the air retarder. Expressed as cubic feet per minute per square foot of AR surface at a stated pressure differential across the AR expressed in inches of H<sub>2</sub>O. (Cubic meters per second per square meter of AR surface at a pressure differential in Pascals.) **E 1677**

**air leakage rate**—the volume of air movement per unit time across the building envelope. This movement includes flow through joints, cracks, and porous surfaces or combinations thereof. The driving force for such air leakage in buildings can be either mechanical pressurization or evacuation, natural wind pressures, or air temperature differentials between the building interior and the outdoors, or combinations thereof. **E 1186**

**air-leakage rate**—the volume of air movement per unit time across the building envelope or the exterior envelope of the air distribution system. **E 1554**

DISCUSSION—This movement includes flow through joints, cracks, and porous surfaces, or combinations thereof. The driving forces for such air leakage in service can be mechanical pressurization and

<sup>4</sup> Boldface terms are defined in this terminology.