



Standard Test Method for Determining the Fire Resistance of Continuity Head-of-Wall Joint Systems Installed Between Rated Wall Assemblies and Nonrated Horizontal Assemblies¹

This standard is issued under the fixed designation E2837; 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.

INTRODUCTION

Wall continuity is required by various model codes at *joint openings*, which are linear voids, gaps, openings, or other discontinuities between or bounded by a *rated wall assembly* and *nonrated horizontal assemblies*, to ensure that the protected *joint opening* has the same fire resistance rating as the *rated wall assembly*. The *joint opening* at the termination at the top of the *rated wall assembly* below the *nonrated horizontal assembly* must be protected by a *continuity head-of-wall joint system*, which has a fire resistance rating, in order to maintain continuity established by the *rated wall assembly*. This test method is not required when the *rated wall assembly* contacts *nonrated horizontal assemblies* when there is no *joint opening*. Normally such joint openings are denoted as “linear” because the length is normally greater than their width, which is defined by a typical ratio of at least 10:1 as in practice. *Joint openings* are present in buildings as a result of: (1) Design to accommodate various movements induced by thermal differentials, seismicity, and wind loads and exists as a clearance separation. (2) Acceptable dimensional tolerances between two or more building elements, for example, between non-loadbearing walls and roofs. (3) Inadequate design, inaccurate assembly, repairs or damage to the building. There are many unique applications for joint systems in buildings. To address this issue there are different types of *continuity head-of-wall joint systems*. It is not possible to test all fire-resistive joints systems using the same test apparatus or method of test, for example, Test Method E2307 employs the ISMA test apparatus. A *continuity head-of-wall joint system* is a particular type of fire-resistive joint system that provides fire resistance to prevent passage of fire from compartment to compartment within the building at the *joint opening* between a *rated wall assembly* and a *nonrated horizontal assembly*. A *continuity head-of-wall joint system* is a unique building construction detail not addressed by other fire test methods such as Test Method E1966 that tests joint systems installed between two assemblies that are fire resistance rated.

1. Scope

1.1 This fire-test-response test method measures the performance of a unique fire resistive joint system called a *continuity head-of-wall joint system*, which is designed to be used between a *rated wall assembly* and a *nonrated horizontal assembly* during a fire resistance test.

1.2 This fire-test-response standard does not measure the performance of the *rated wall assembly* or the *nonrated horizontal assembly*.

NOTE 1—Typically, rated wall assemblies obtain a fire resistance rating after being tested to Test Method E119, UL 263, CAN/ULC-S101, or other similar fire resistance test methods.

1.3 This fire-test-response standard is not intended to evaluate the connections between *rated wall assemblies* and *nonrated horizontal assemblies* unless part of the continuity head-of-wall joint system.

1.4 The fire resistive test end point is the period of time elapsing before the first performance criteria is reached when the *continuity head-of-wall joint system* is subjected to one of two time-temperature fire exposures.

1.5 The fire exposure conditions used are either those specified by Test Method E119 for testing assemblies to standard time-temperature exposures or Test Method E1529 for testing assemblies to rapid-temperature rise fires.

¹ This test method is under the jurisdiction of ASTM Committee E05 on Fire Standards and is the direct responsibility of Subcommittee E05.11 on Fire Resistance.

Current edition approved Dec. 1, 2023. Published December 2023. Originally approved in 2011. Last previous edition approved in 2023 as E2837 – 23. DOI: 10.1520/E2837-23A.

1.6 This test method specifies the heating conditions, methods of test, and criteria to establish a fire resistance rating only for a *continuity head-of-wall joint system*.

1.7 Test results establish the performance of *continuity head-of-wall joint systems* to maintain continuity of fire resistance of the *rated wall assembly* where the *continuity head-of-wall joint system* interfaces with a *nonrated horizontal assembly* during the fire-exposure period.

1.8 Test results shall not be construed as having determined the *continuity head-of-wall joint system*, *nonrated horizontal assembly* and the *rated wall assembly's* suitability for use after that fire exposure.

1.9 This test method does not provide quantitative information about the *continuity head-of-wall joint system* relative to the rate of leakage of smoke or gases or both. However, it requires that such phenomena be documented and reported when describing the general behavior of *continuity head-of-wall joint systems* during the fire resistive test but is not part of the conditions of compliance.

1.10 Potentially important factors and fire characteristics not addressed by this test method include, but are not limited to:

1.10.1 The performance of the *continuity head-of-wall joint system* constructed with components other than those tested.

1.10.2 The cyclic movement capabilities of *continuity head-of-wall joint systems* other than the cycling conditions tested.

1.11 The values stated in inch-pound units are to be regarded as standard. The values given in parentheses are mathematical conversions to SI units that are provided for information only and are not considered standard.

1.12 The text of this standard references notes and footnotes which provide explanatory material. These notes and footnotes (excluding those in tables and figures) shall not be considered as requirements of the standard.

1.13 *This standard is used to measure and describe the response of materials, products, or assemblies to heat and flame under controlled conditions, but does not by itself incorporate all factors required for fire hazard or fire risk assessment of the materials, products, or assemblies under actual fire conditions.*

1.14 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

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

1.16 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 ASTM Standards:²

E84 Test Method for Surface Burning Characteristics of Building Materials

E119 Test Methods for Fire Tests of Building Construction and Materials

E176 Terminology of Fire Standards

E631 Terminology of Building Constructions

E814 Test Method for Fire Tests of Penetration Firestop Systems

E1399 Test Method for Cyclic Movement and Measuring the Minimum and Maximum Joint Widths of Architectural Joint Systems

E1529 Test Methods for Determining Effects of Large Hydrocarbon Pool Fires on Structural Members and Assemblies

E1966 Test Method for Fire-Resistive Joint Systems

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

2.2 ISO Standards:³

ISO 834 Fire resistance tests – Elements of building construction

ISO 10295-1 Fire tests for building elements and components – Fire testing of service installations – Part 1: Penetration seals

ISO 10295-2 Fire tests for building elements and components – Fire testing of service installations – Part 2: Linear joint (gap) seals

2.3 Underwriters Laboratories Standards:⁴

UL 263 Fire Tests of Building Construction and Materials

UL 2079 Standard for Tests for fire Resistance of Building Joint Systems

UL 1479 Standard for Fire Tests of Through-Penetration Firestops

CAN/ULC-S101 Standard Methods of Fire Endurance Tests of Building Construction and Materials

CAN/ULC-S115 Standard Method of Fire Tests of Firestop Systems

3. Terminology

3.1 For definitions of terms used in this test method and associated with fire issues, refer to the definitions contained in Terminology **E176**.

3.2 For definitions of term used in this test method and associated with building issues, refer to the definitions contained in Terminology **E631**.

² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

³ Available from American National Standards Institute (ANSI), 25 W. 43rd St., 4th Floor, New York, NY 10036, <http://www.ansi.org>.

⁴ Available from Underwriters Laboratories (UL), 2600 N.W. Lake Rd., Camas, WA 98607-8542, <http://www.ul.com>.