



Designation: E759/E759M – 92 (Reapproved 2023)

Standard Test Method for Effect of Deflection on Sprayed Fire-Resistive Material Applied to Structural Members¹

This standard is issued under the fixed designation E759/E759M; 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.

This standard has been approved for use by agencies of the U.S. Department of Defense.

1. Scope

1.1 This test method covers a procedure for determining the effect of deflection on sprayed fire-resistive material (SFRM) applied to steel deck. These materials include sprayed fibrous and cementitious materials applied directly in contact with the structural members. The test method is applicable only to laboratory procedures.

1.2 The values stated in either SI units or inch-pound units are to be regarded separately as standard. The values stated in each system are not necessarily exact equivalents; therefore, to ensure conformance with the standard, each system shall be used independently of the other, and values from the two systems shall not be combined.

1.3 *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.*

1.4 *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

¹ This test method is under the jurisdiction of ASTM Committee E06 on Performance of Buildings and is the direct responsibility of Subcommittee E06.21 on Serviceability.

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

E605/E605M Test Methods for Thickness and Density of Sprayed Fire-Resistive Material (SFRM) Applied to Structural Members

3. Summary of Test Method

3.1 In this test method, a cellular steel deck panel sprayed with fire-resistive material is subjected to bending by a vertical center load while supported horizontally at its ends.

4. Significance and Use

4.1 The intent of this test method is to determine properties of direct-applied SFRM that may be used to provide an indication of serviceability. Satisfactory performance of fire-resistive material applied to structural members and assemblies depends upon its ability while in place to withstand the various influences that may occur during the life of the structure, as well as upon its satisfactory performance under fire tests.

4.2 This test method measures the behavior of SFRM when subjected to deflection and evaluates such phenomena as spalling and delamination under bending stress. It is an indication of the ability of SFRM to remain in place and resist removal during anticipated service conditions.

5. Apparatus

5.1 *Supports*—Rigid base to provide at least 50 mm [2 in.] bearing and a clear span between supports of 3 m [10 ft].

5.2 *Bearing Block*—Approximately 50 mm [2 in.] wide, minimum 600 mm [24 in.] long bearing surface designed to distribute the load across the width of the specimen.

5.3 *Load*—Any form of weights or testing machine capable of applying a load normal to the test surface and of developing a deflection of $\frac{1}{120}$ of the clear span of the specimen.

5.4 *Deflection Gage*—A dial or digital micrometer graduated to 0.01 mm [0.001 in.].

6. Materials and Manufacture

6.1 The specimen shall consist of cellular steel deck nominal 40 mm [1½ in.] deep, 600 mm [24 in.] wide, by 3600 mm [12 ft] long, consisting of a 1.5 mm [0.060 in. (18 ga.)] thick galvanized steel fluted top section and a 1.2 mm [0.048 in.]