



Designation: E859 – 93 (Reapproved 2011)

Standard Test Method for Air Erosion of Sprayed Fire-Resistive Materials (SFRMs) Applied to Structural Members¹

This standard is issued under the fixed designation E859; 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 Department of Defense.

1. Scope

1.1 This test method covers a procedure for determining the effect of an air stream upon sprayed fire-resistive materials (SFRMs). These SFRMs include sprayed fibrous and cementitious materials. The test method is applicable only to laboratory procedures.

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

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 and health practices and determine the applicability of regulatory limitations prior to use.*

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

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

2.2 Other Documents:

ASHRAE Handbook, Fundamentals³

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.

³ Available from American Society of Heating, Refrigerating, and Air-Conditioning Engineers, Inc. (ASHRAE), 1791 Tullie Circle, NE, Atlanta, GA 30329, <http://www.ashrae.org>.

3. Terminology

3.1 Definitions:

3.1.1 *denier, n*—the number of grams per 9000 m.

3.1.2 *end (fabric), n*—an individual warp yarn (single or ply) cord.

3.1.3 *pick, n*—an individual filling yarn.

3.2 Definitions of Terms Specific to This Standard:

3.2.1 *air erosion*—the action or process of being eroded by an air stream.

3.2.2 *sprayed cementitious material*—consisting of one or more binders, aggregate, and fibers, the material is mixed with water to form a slurry and is conveyed through a hose to a nozzle where compressed air is typically used to disperse the material into a spray pattern and air directed to the substrate requiring protection.

3.2.3 *sprayed fibrous material*—consisting of one or more binders, fibers, and aggregates, the material is conveyed by low pressure air through a hose to a nozzle where it is mixed with atomized water and directed to the substrate requiring protection.

3.2.4 *sprayed fire-resistive materials*—materials that are sprayed onto substrates to provide fire-resistive protection of the substrates.

4. Summary of Test Method

4.1 This test method covers a procedure for determining the effect of an air stream upon SFRM in plenums. In this test method, the SFRM is subjected to a tangential air stream for a minimum of 24 h. Collection filters downstream from the sample are weighed at frequent intervals to determine the amount of material removed from the sample.

5. Significance and Use

5.1 It is the intent of this test method to determine properties of SFRM that may be used to provide an indication of serviceability. Satisfactory performance of SFRM applied to structural members and assemblies depends upon its ability to withstand the various influences that may occur during construction and during the life of the structure, as well as upon its performance under fire conditions.