



## Standard Test Method for Air Erosion of Sprayed Fire-Resistive Materials (SFRMs) Applied to Structural Members<sup>1</sup>

This standard is issued under the fixed designation E 859; 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 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.

### 2. Referenced Documents

#### 2.1 ASTM Standards:

D 123 Terminology Relating to Textiles<sup>2</sup>

E 84 Test Method for Surface Burning Characteristics of Building Materials<sup>3</sup>

E 119 Test Methods for Fire Tests of Building Construction and Materials<sup>3</sup>

E 605 Test Methods for Thickness and Density of Sprayed Fire-Resistive Material (SFRM) Applied to Structural Members<sup>4</sup>

2.2 ASHRAE Handbook, Fundamentals<sup>5</sup>

### 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.

5.2 Air erosion tests on SFRMs are conducted to evaluate the behavior of the SFRM when subjected to plenum air streams during normal service conditions. Such tests evaluate the resistance to dusting, flaking, spalling, and delamination of the SFRM.

### 6. Apparatus

6.1 *Duct System*, made of galvanized steel, horizontally positioned, with one rectangular opening 0.37 m<sup>2</sup> (4 ft<sup>2</sup>) in the center of the top of the duct and 50 mm (2 in.) from each vertical side.

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

Current edition approved March 15, 1993. Published May 1993. Originally published as E 859 – 82. Last previous edition E 859 – 82.

<sup>2</sup> Annual Book of ASTM Standards, Vol 07.01.

<sup>3</sup> Annual Book of ASTM Standards, Vol 04.07.

<sup>4</sup> Annual Book of ASTM Standards, Vol 04.11.

<sup>5</sup> Available from American Society for Heating, Refrigerating and Air-Conditioning Engineers, 1791 Tullie Circle NE, Atlanta, GA 30329.