



Designation: E1513 – 93 (Reapproved2011)

Standard Practice for Application of Sprayed Fire-Resistive Materials (SFRMs)¹

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1. Scope

1.1 This practice covers guidelines for application of sprayed fiber and cementitious fire-resistive materials.

1.2 This practice is general in nature. It is not intended to cover all requirements for application.

1.3 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.

1.4 *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.* Specific precautionary statements are given in Section 10 and 14.1.2.

2. Referenced Documents

2.1 *ASTM Standards:*²

[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](#)

[E631 Terminology of Building Constructions](#)

[E736 Test Method for Cohesion/Adhesion of Sprayed Fire-Resistive Materials Applied to Structural Members](#)

[E759 Test Method for Effect of Deflection on Sprayed Fire-Resistive Material Applied to Structural Members](#)

[E760 Test Method for Effect of Impact on Bonding of Sprayed Fire-Resistive Material Applied to Structural Members](#)

[E1368 Practice for Visual Inspection of Asbestos Abatement Projects](#)

¹ This practice 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. Terminology

3.1 *Definitions:*

3.1.1 Many items in this practice are defined in Terminology E631.

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *application, n*—an act of applying sprayed fire-resistive materials.

3.2.2 *sprayed cementitious material, n*—consisting of one or more binders, aggregates, 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 directed to the substrate requiring protection.

3.2.3 *sprayed fire-resistive materials (SFRM), n*—materials that are sprayed onto substrates to provide fire-resistive protection of the substrates.

3.2.4 *sprayed mineral fiber material, n*—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.

4. Summary of Practice

4.1 This practice describes the procedures for selecting, specifying, applying, and testing SFRM.

5. Significance and Use

5.1 This practice is intended for use by the material specifier, general contractor, applicator, or any individual group requiring information regarding the application of SFRM.

5.2 This practice is not intended to replace the manufacturers' application instructions.

6. Materials

6.1 The SFRM shall be either sprayed fiber or cementitious types. The material shall be manufactured in accordance with the manufacturer's specifications and quality control procedures. The material shall be free of any contamination that could impair its performance.

7. Storage and Handling

7.1 All materials shall be delivered to the job site in clearly labeled, unopened bags. Labels shall include the manufacturer, product name, surface burning characteristics of the product, and list of appropriate fire resistance classified assemblies in which the product is a component.

7.2 Materials with a shelf life shall be used within that period. Materials that have gone beyond their shelf life shall be removed from the job site, or manufacturer shall provide documentation attesting that the product is still usable for its original intended purpose.

7.3 Materials shall be kept dry until used and stored off the ground under cover.

8. Equipment and Utilities

8.1 Equipment used for application shall be of a type recommended by the SFRM manufacturer. Equipment shall include, but is not limited to: application machine, material mixer, material hoses, stand pipe, and spray nozzles.

8.2 The following utilities are typically provided by the general contractor: electricity, potable water, and lighting.

8.3 The following utilities may be needed depending upon job conditions and, if needed, shall be provided by the general contractor:

8.3.1 Heating (see 12.1.1), and

8.3.2 Forced ventilation (see 12.1.2).

9. Fire Resistance Classifications

9.1 *General*—Required fire resistance classifications are outlined by building codes such as those published by BOCA,³ SBCCI,⁴ ICBO⁵ and enforced by local authorities having jurisdiction. Required fire resistance classifications are determined by construction type, occupancy, and location.

9.2 Architects and material specifiers shall indicate on construction drawings and in specifications the required fire resistance classification(s) for a project. They shall also indicate what elements of that project are to be so protected. (See **Note 1**.)

NOTE 1—The architect and material specifier may indicate on construction drawings and in specifications a reference number for a fire resistance system capable of providing the required protection.

10. Safety

10.1 Current OSHA, applicable local ordinances, or code regulations shall be followed at all times.

10.1.1 Equipment shall have safety guards that meet applicable OSHA regulations in place. Grounded electrical connections shall be used.

³ Building Officials and Code Administrators International, available from International Code Council (ICC), 500 New Jersey Ave., NW, 6th Floor, Washington, DC 20001, <http://www.iccsafe.org>.

⁴ Southern Building Code Congress International, Inc., available from International Code Council (ICC), 500 New Jersey Ave., NW, 6th Floor, Washington, DC 20001, <http://www.iccsafe.org>.

⁵ International Conference of Building Officials, available from International Code Council (ICC), 500 New Jersey Ave., NW, 6th Floor, Washington, DC 20001, <http://www.iccsafe.org>.

10.1.2 *Protective Equipment*—All persons in the application area shall wear protective equipment as required. Examples of equipment that may be needed are: respirators, dust masks, coveralls, goggles or safety glasses, and hard hats.

10.1.3 Workmen shall not wear loose fitting clothing that could become caught in the machinery. However, that personnel actually spraying product may wear loose, long sleeve clothing for protection and comfort reasons.

10.1.4 *Scaffold*—When required, a strong, lightweight, stable, rolling scaffold shall be used. An open grate flooring will help prevent material build up on the scaffold floor. Safety railing meeting OSHA regulations shall surround the scaffold floor area.

10.1.5 *Floors*—The floors in the work area shall be kept free of obstructions, excessive moisture, waste material, or other unsafe conditions.

11. Substrate Preparation

11.1 Prior to the application of SFRM, all areas to be sprayed shall be inspected by the applicator to ensure a suitable surface for proper SFRM bonding. The following recommendations shall be followed:

11.1.1 All surfaces to be sprayed shall be free of dirt, grease, oil, mill scale, loose scale, loose rust, or any material that will impair proper adhesion.

11.1.2 *Cleaning*—The applicator shall bring to the general contractor's attention any surface that does not meet the requirements of 11.1.1. Responsibility for cleaning substrates shall be established prior to submittal of SFRM bid. Unacceptable surfaces shall be cleaned in accordance with substrate or SFRM manufacturers recommendations. (On asbestos removal projects it is necessary to coordinate substrate conditions and cleaning procedures to ensure the integrity of the post removal encapsulant coatings.)

11.1.3 *Masking*—Surfaces that are susceptible to damage and are not to be sprayed shall be masked, covered or otherwise protected from the overspray of SFRM.

11.1.4 *Painted Surfaces*—SFRM manufacturers generally do not recommend application to painted surfaces. If it has been established that a paint or primer is necessary, the primed substrate sprayed with SFRM shall be tested in accordance with Test Methods **E119**.

11.1.5 Post removal encapsulated surfaces (lockdown coatings) shall be inspected in accordance with Practice **E1368**. If it has been established that a lockdown coating is necessary, the coated substrate sprayed with the SFRM shall be tested in accordance with Test Methods **E119**.

11.1.6 Where UL fire resistance rating designs are utilized, unless specifically prohibited in a design, SFRM may be applied to primed or painted wide flange steel shapes provided: the beam flange width does not exceed 300 mm (12 in.); the column flange width does not exceed 400 mm (16 in.); the beam or column web depth does not exceed 400 mm (16 in.); and bond tests conducted in accordance with Test Method **E736** shall indicate a minimum average bond strength of 80 % and a minimum individual bond strength of 50 % when compared to the bond strength of the fire resistive coating as applied to clean uncoated 1/8 in. (3.2 mm) thick steel plate. The