



# Standard Practice for Two-Component Resin Based Membrane-Forming Moisture Mitigation Systems for Use Under Resilient Floor Coverings<sup>1</sup>

This standard is issued under the fixed designation F3010; 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 practice covers the properties, application, and performance of a two-component resin based membrane-forming moisture mitigation system to high moisture concrete substrates prior to the installation of resilient flooring.

1.2 This practice includes recommendations for the preparation of the concrete surface to receive a two-component resin based membrane-forming moisture mitigation system.

1.3 This practice does not supersede written instructions of the two-component resin based membrane-forming moisture mitigation system manufacturer, the resilient flooring manufacturer, underlayment manufacturer, the adhesive manufacturer, or other components of the finish flooring system, or combinations thereof. Users of this practice shall review manufacturer's technical data sheets and installation instructions for compatibility of system components.

1.4 The following membrane-forming or non membrane-forming moisture mitigation systems are not included in the scope of this practice:

1.4.1 Moisture mitigation systems that chemically react with any constituent of the concrete to form a gel or crystalline substance within the concrete.

1.4.2 Penetrating, water- or solvent-based compounds that do not form a continuous membrane on the concrete surface.

1.4.3 Water-based membrane-forming moisture mitigation systems are not included in the scope of this document.

1.5 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.

1.6 *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 appro-*

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

## 2. Referenced Documents

### 2.1 ASTM Standards:<sup>2</sup>

**C109/C109M** Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2-in. or [50-mm] Cube Specimens)

**C1583** Test Method for Tensile Strength of Concrete Surfaces and the Bond Strength or Tensile Strength of Concrete Repair and Overlay Materials by Direct Tension (Pull-off Method)

**D7234** Test Method for Pull-Off Adhesion Strength of Coatings on Concrete Using Portable Pull-Off Adhesion Testers

**E96** Test Methods for Water Vapor Transmission of Materials

**F141** Terminology Relating to Resilient Floor Coverings

**F1869** Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride

**F2170** Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes

**F2420** Test Method for Determining Relative Humidity on the Surface of Concrete Floor Slabs Using Relative Humidity Probe Measurement and Insulated Hood

**2.2 Resilient Floor Covering Institute (RFCI) Standards:<sup>3</sup>**  
**Recommended Work Practices for the Removal of Resilient Floor Coverings**

## 3. Terminology

### 3.1 Definitions:

3.1.1 For definitions of terms used in this practice, see Terminology **F141**.

<sup>1</sup> This test method is under the jurisdiction of ASTM Committee **F06** on Resilient Floor Coverings and is the direct responsibility of Subcommittee **F06.40** on Practices.

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<sup>2</sup> For referenced ASTM standards, visit the ASTM website, [www.astm.org](http://www.astm.org), or contact ASTM Customer Service at [service@astm.org](mailto:service@astm.org). For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

<sup>3</sup> Available from Resilient Floor Covering Institute, 115 Broad Street, Suite 201, La Grange, GA 30240.

#### 4. Significance and Use

4.1 Moisture permeating from concrete substrates can detrimentally affect the performance of resilient floor covering systems. All resilient flooring and adhesive manufacturers have a maximum acceptable level of moisture in which their products can perform satisfactorily. If pre-installation moisture tests indicate that the moisture level is unacceptable for the specified floor covering to be installed, one option is to apply a topical treatment to the concrete substrate surface to mitigate the moisture condition. Experience has shown that certain types of membrane-forming moisture mitigation systems have more desirable properties and successful performance than others. Requirements for membrane-forming moisture mitigation systems to be used, and other related details, are generally included as part of the project plans, or specification details, and may vary from the minimum recommendations set forth in this practice.

4.2 This practice is intended for use after it has been determined that a floor moisture condition exceeds the resilient floor covering or adhesive manufacturer's requirements, or both, as tested according to Test Methods **F1869**, **F2170**, and **F2420**.

4.3 Membrane-forming moisture mitigation systems are not intended for use over gypsum-based substrates or other moisture sensitive substrates.

#### 5. Product Requirements

5.1 The membrane-forming moisture mitigation system shall be a two-component resin based product.

5.2 Membrane-forming moisture mitigation systems to be qualified under this practice shall have a vapor permeance no greater than 0.1 grains/h/ft<sup>2</sup>/in. Hg, (perm) when tested in accordance with Test Method **E96** when applied at the recommended thickness designated by its manufacturer.

5.3 The membrane moisture control systems shall not contribute to unacceptable indentations in some types of resilient flooring under some conditions of use. Refer to membrane-forming moisture mitigation systems manufacturer's recommendations and floor covering manufacturer's specifications.

#### 6. Material Acceptance

6.1 Membrane-forming moisture mitigation systems shall be delivered in their original factory packaging.

6.2 Membrane-forming moisture mitigation systems shall be used before any specified expiration date.

#### 7. Material Conditioning

7.1 The membrane-forming moisture mitigation system shall be kept in a temperature controlled environment on site and protected from the weather at least 48 h prior to use. The temperature shall not be below 65°F (18°C) or above 85°F (29.4°C).

#### 8. General Guidelines

8.1 Concrete substrate surfaces intended to receive membrane-forming moisture mitigation systems shall be clean,

smooth, and structurally sound. They shall be free of dust, solvent, paint, wax, oil, grease, residual adhesive, adhesive removers, film-forming curing compounds, silicate penetrating curing compounds, sealing, hardening, or parting compounds, salts, efflorescence, laitance, mold, mildew, and other foreign materials that affect the adhesion of the membrane-forming moisture mitigation system to concrete.

8.2 Consult membrane-forming moisture mitigation system manufacturers for appropriate temperature and humidity range for the products to be installed and the geographic area where the job site is located. Unless instructed otherwise by the membrane-forming moisture mitigation system manufacturer, the concrete substrate, the installation area and materials shall be maintained at 65°F (18.3°C) to 85°F (29.4°C) and 40 % to 60 % relative humidity for 48 h before, during and for 48 h after completion of the installation. If a system other than the permanent HVAC source is utilized, it must provide adequate control of both temperature and humidity to recommended or specific levels for the appropriate time duration.

8.3 Membrane-forming moisture mitigation systems must include manufacturer's instructions for treatment of isolation and expansion (moving) joints as well as nonmoving contraction joints and cracks.

8.4 Concrete substrates shall be smooth to prevent irregularities in the membrane-forming moisture mitigation system application thickness. Roughness or other defects that may inhibit the ability to achieve the recommended profile shall be ground flat prior to performing recommended surface preparation method as instructed by the membrane-forming moisture mitigation system manufacturer.

#### 9. Pre-Installation Testing

9.1 Conduct moisture testing of the concrete according to Test Methods **F1869**, **F2170**, or **F2420** as required by the moisture mitigation system manufacturer. If required, perform other types of tests as specified by the flooring manufacturer and the moisture mitigation system manufacturer. Follow moisture mitigation system manufacturer's instructions based on test results where applicable.

9.2 Following mechanical preparation of the concrete surface, test the tensile strength of the concrete surface according to Test Method **C1583**. Tensile strength of the prepared substrate surface must be at least 200 psi, tested in accordance with Test Method **C1583**. Areas of insufficient strength shall be ground to remove the weak material and abrasively prepared again using appropriately modified methods, and retested for tensile strength.

NOTE 1—Proper sampling or test intervals and locations shall be decided in consultation among project stakeholders.

9.3 *Mockup*—Install the moisture mitigation system in a minimum 100 ft<sup>2</sup> mockup area, using the same methods and equipment that will be used for the entire installation. Test tensile bond strength of the moisture mitigation system to the concrete substrate following Test Method **D7234**. The results must be equal to or greater than 200 psi with failure in the concrete before proceeding with installation of the moisture mitigation system.

## 10. Surface Preparation

10.1 Most membrane-forming moisture mitigation systems require proper surface preparation in order to ensure maximum performance and prevent delamination of the concrete surface. Surface preparation to a CSP #3 (Concrete Surface Profile per ICRI guidelines) shall be performed by mechanical means only. Acceptable methods include shot blasting, scarifying, or grinding. Grinding is only acceptable in areas where the shot blast or scarification equipment cannot reach. Grinding entire substrate area, acid etching, waterblasting, or sanding, are not acceptable methods of concrete surface preparation. Refer to membrane-forming moisture mitigation system manufacturer if one of the above nonrecommended methods is to be used.

NOTE 2—Inadequate surface preparation can result in leaving possible contaminants that will affect the performance of the membrane-forming moisture mitigation systems, resulting in pin holes, bubbles, fish eyes or other deficiencies leading to debonding and coating failure.

10.2 Unless instructed otherwise by the membrane-forming moisture mitigation system manufacturer, allow concrete substrate to dry undisturbed for 16 to 24 h following surface preparation process.

10.3 Surface depressions or other irregularities shall be filled or smoothed with a patching or leveling material recommended by the membrane-forming moisture mitigation system manufacturer. Patching material shall be moisture-, mildew-, and alkali-resistant, and shall provide a minimum of 3000 psi compressive strength after 28 days, when tested in accordance with Test Method **C109/C109M**.

10.4 Surface cracks, grooves, control joints or other non-moving joints shall be filled with a compatible resin based material recommended by the membrane-forming moisture mitigation system manufacturer for sealing, crack repair, or both.

10.5 Expansion joints, isolation joints, or other moving joints in the concrete substrate must not be filled or sealed with rigid materials. All moving joints must be honored up through the moisture mitigation system, any patching and leveling products, and the resilient floor covering being installed.

## 11. Installation

11.1 Follow instructions of the membrane-forming moisture mitigation systems manufacturer. These instructions shall include specific instructions regarding mixing, application, and film thickness.

11.2 Apply membrane-forming moisture mitigation systems to form a continuous monolithic void free application. Refer to membrane-forming moisture mitigation systems manufacturer regarding treatment of surface deficiencies including but not limited to pinholes, fish eyes or other surface defects.

11.3 If specified in the manufacturer's installation instructions, provide sand broadcast into top surface of coating.

11.4 If a cementitious underlayment is required on top of the membrane-forming moisture mitigation system, install according to manufacturer's instructions. Allow to cure and dry before proceeding with floor covering installation.

11.5 Maintain environmental conditions required by the membrane-forming moisture mitigation system manufacturer during the curing period.

## 12. Field Quality Control

12.1 Verify that surfaces preparation meets ICRI CSP3 or manufacturer's requirements.

12.2 Verify that the membrane-forming moisture mitigation system film thickness meets the manufacturer's recommended thickness.

12.3 Verify that the repairs of the membrane-forming moisture mitigation system defective area are made according to the manufacturer's requirements.

## 13. Protection

13.1 Protect the membrane-forming moisture mitigation system and the entire subfloor from traffic, dirt, dust or other contaminates until final installation of the resilient floor covering.

## 14. Keywords

14.1 film thickness; high moisture concrete; moisture mitigation system; vapor permeance

## SUPPLEMENTARY REQUIREMENTS

### S1. RECOMMENDED WORK PRACTICES FOR REMOVAL OF RESILIENT FLOOR COVERINGS

The following supplementary requirements shall apply only when specified by the purchaser in the purchase order or contract.

**S1.1 Asbestos Warning**—Do not sand, dry sweep, dry scrape, drill, saw, bead blast, or mechanically chip or pulverize existing resilient flooring, backing, lining felt, paint, asphaltic “cutback” adhesives, or other adhesives. These products may contain asbestos fibers or crystalline silica. Avoid creating dust. Inhalation of such dust is a cancer and respiratory tract hazard. Smoking by individuals exposed to asbestos fibers greatly

increases the risk of serious bodily harm. Unless positively certain that the product is a non-asbestos-containing material, you must presume it contains asbestos. Regulations may require that the material be tested to determine asbestos content. The Resilient Floor Covering Institute (RFCI) document, “Recommended Work Practices for Removal of Resilient Floor Coverings,” shall be consulted for a defined set

of instructions addressed to the task of removing all resilient floor covering structures.

**S1.2 Lead Paint Caution**—Certain paints may contain lead. Exposure to excessive amounts of lead dust presents a health hazard. Refer to applicable federal, state, and local laws and, “Lead-Based Paint: Interim Guidelines for Hazard Identification and Abatement in Public and Indian Housing,” (September 1990) or subsequent editions published by the U.S. Department of Housing and Urban Development regarding: (1) Appropriate methods for identifying lead-based paint and removing such paint; and (2) any licensing, certification, and training requirements for persons performing lead abatement work.

**S1.3 Adhesive Remover Caution**—There are a number of commercial adhesive removers on the market that will properly remove adhesive residue from a subfloor, however, there are

concerns that these products can adversely affect the bonding of the new floor covering. The Resilient Floor Covering Institute (RFCI) “Recommended Work Practices for Removal of Resilient Floor Coverings” and the resilient flooring manufacturer’s written instructions shall be consulted for a defined set of instructions which shall be followed if existing adhesives must be removed (see S1.1).

**S1.4 Residue Asphalt Adhesive**—(see also S1.1 and S1.3). Many resilient floorings may not be installed when residual asphalt adhesive residue is present. Consult the resilient flooring manufacturer’s written recommendations concerning use of resilient flooring products in these situations.

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