



Designation: F2678 – 16 (Reapproved 2021)

Standard Practice for Preparing Panel Underlayments, Thick Poured Gypsum Concrete Underlayments, Thick Poured Lightweight Cellular Concrete Underlayments, and Concrete Subfloors with Underlayment Patching Compounds to Receive Resilient Flooring¹

This standard is issued under the fixed designation F2678; 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.

1. Scope

1.1 This practice includes recommendations for preparing and smoothing panel underlayments, gypsum concrete and concrete subfloors with patching compounds upon which resilient flooring may be installed.

1.2 This practice does not cover the adequacy of the subfloor assembly to perform its structural requirements, which is governed by local building codes.

1.3 This practice does not supersede in any manner the resilient flooring, underlayment or adhesive manufacturer's written instructions. Consult the individual resilient flooring, underlayment or adhesive manufacturer for specific recommendations.

1.4 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.

1.5 *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.*

1.6 *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.*

¹ This practice 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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2. Referenced Documents

2.1 ASTM Standards:²

- C109/C109M Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2-in. or [50 mm] Cube Specimens)
- C472 Test Methods for Physical Testing of Gypsum, Gypsum Plasters, and Gypsum Concrete
- F141 Terminology Relating to Resilient Floor Coverings
- F710 Practice for Preparing Concrete Floors to Receive Resilient Flooring
- F1482 Practice for Installation and Preparation of Panel Type Underlayments to Receive Resilient Flooring
- F2419 Practice for Installation of Thick Poured Gypsum Concrete Underlayments and Preparation of the Surface to Receive Resilient Flooring
- F2471 Practice for Installation of Thick Poured Lightweight Cellular Concrete Underlayments and Preparation of the Surface to Receive Resilient Flooring

3. Terminology

3.1 Definitions used in this practice shall be in accordance with Terminology F141.

4. Significance and Use

4.1 This practice provides minimum recommendations for preparing and smoothing panel underlayments, thick poured gypsum concrete underlayments, thick poured lightweight cellular concrete underlayments and concrete subfloors with patching compounds. Actual requirements for materials to be used, mixtures, and other 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.

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.

5. Product Requirements

5.1 The patching compound shall be able to be applied from featheredge up to the manufacturer's specified thickness over large areas.

5.2 The patching compound may require the addition of an additive other than water.

5.3 The patching compound shall be able to be covered by resilient floorings as soon as the patching hardens and dries sufficiently.

5.4 The dried patching compound shall be moisture-free, mildew-resistant and alkali-resistant.

5.5 For commercial installations, the patching compound shall develop a minimum of 3000 psi compressive strength after 28 days when tested in accordance with Test Method **C109/C109M** (air-cured only) or with Test Methods **C472**.

6. Material Acceptance

6.1 All patching compounds shall be delivered in their original, factory packaging.

7. Material Storage, Conditioning and Protection

7.1 All patching compounds shall be kept dry 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 100°F (38°C). Refer to the patching compound manufacturer's recommendation for more specific instruction.

7.2 All patching compounds shall be kept off the ground and away from damp and cold surfaces.

7.3 Protect the applied patching compound from excessive heat and drafty conditions while curing.

7.4 Protect the applied patching compound and the entire subfloor from traffic, dirt or dust or other contaminants such as sweeping compounds until final installation of the resilient floor covering.

8. General Guidelines

8.1 General Specifications:

8.1.1 The patching compound shall not be applied to a subfloor containing frost. The subfloor surface temperature shall not be below 50 °F (10 °C) or above 95 °F (35 °C). The temperature conditions for installing resilient flooring products and the patching compound is typically 65 to 85°F (18 to 30 °C) for 48 h before, during and after the installation. The complete installation shall remain within the range of 55 to 95 °F (13 to 35 °C) thereafter.

8.1.2 All subfloors shall be clean and free of dust, oil, grease, paint, tar, wax, curing compounds, sealers, from release agents, primers, free alkali, loosely bonded toppings, loose particles, old adhesive residues and any other substance that may prevent or reduce adhesion of the patching compound.

8.1.3 Any substance that may reduce or prevent the adhesion from the subfloor shall be completely removed by mechanical means only. Refer to supplementary requirement section.

8.1.4 Structural lightweight concretes having a minimum density of 115 lb/ft³ (1842 kg/m³) and a minimum compressive strength of 3000 psi can be suitable substrates to receive patching compounds.

8.1.5 The temperature of a heated subfloor must not exceed 85 °F (30 °C).

8.1.6 All moving joints such as expansion joints, isolation joints and any cracks exhibiting movement shall not be filled with patching compound or covered with resilient flooring. Consult the resilient flooring manufacturer regarding the use of an expansion joint covering system.

8.2 Panel Underlayment:

8.2.1 All panel underlayment used shall be recommended by either the panel underlayment manufacturer or the resilient flooring manufacturer.

8.2.2 All panel underlayment shall be installed in accordance with the Standard Practice **F1482**.

8.2.3 All wood structural floor assemblies shall be double-layered (a combination of the wood subfloor and panel underlayment). The subfloor panel shall be 5/8 in. (16 mm) thick minimum wood structural panels (usually Exterior Grade Plywood) over joist 16 in. (41 cm), typically on center. Joist center spacing shall comply with local building codes. The panel underlayment shall be a minimum 1/4 in. (6.4 mm) thick, and sufficiently smooth to receive resilient flooring (thicker boards may be required for commercial applications). The adjacent edges of the underlayment panels shall not be more than 1/32 in. (1.6 mm) above or below each other. End joints of panel underlayment shall be offset from subfloor panel joints by at least one joist spacing. Panel underlayment edge joints shall be offset from subfloor panel edge joints by at least 2 in.

8.3 Concrete Subfloors:

8.3.1 All concrete subfloors shall meet the requirements outlined in Practice **F710**.

8.3.2 All concrete subfloors shall have a minimum density of 115 lb/ft³ (1842 kg/m³).

8.3.3 Due to the varying porosity of concrete subfloors, we recommend that a bond test be performed to ensure adequate bond. If an adequate bond is not achieved, abrasively prepare the concrete subfloor surface according to the patching compound manufacturer's recommendation. Methods such as grinding or shot blasting are appropriate.

8.3.4 Porous concrete substrate may require being primed. Refer to the patching compound manufacturer's recommendation.

8.4 Gypsum Concrete Subfloors:

8.4.1 All gypsum concrete subfloors shall meet the requirements outlined in Practice **F2419**.

8.4.2 All gypsum concrete subfloors shall have a minimum density of 105 lb/ft³ (1460 kg/m³).

8.4.3 Porous gypsum concrete substrates may require being primed. Refer to the patching compound manufacturer's recommendation.

8.4.4 Due to the varying porosity of gypsum concrete subfloors, we recommend that a bond test be performed to ensure adequate bond. If an adequate bond is not achieved, refer to the patching compound manufacturer's recommendation.

8.5 *Poured Lightweight Cellular Concrete Subfloors:*

8.5.1 All poured lightweight cellular concrete subfloors shall meet the requirements outlined in Practice **F2471**.

8.5.2 All poured lightweight cellular concrete subfloors shall have a minimum density of 110 lb/ft³ (1762 kg/m³).

8.5.3 Porous poured lightweight cellular concrete substrate may require being primed. Refer to the patching compound manufacturer's recommendation.

8.5.4 Due to the varying porosity of poured lightweight cellular concrete subfloors, we recommend that a bond test be performed to ensure adequate bond. If an adequate bond is not achieved, refer to the patching compound manufacturer's recommendation.

9. Installation of Patching Compounds

9.1 *Materials:*

9.1.1 Trowelable patching compound.

9.1.2 Water shall be potable and cool. Water temperature shall not exceed 73°F (23°C).

9.1.3 Clean mixing container.

9.1.4 Mechanical mixer and mixing paddle recommended by the patching compound manufacturer.

9.2 *Mixing and Application:*

9.2.1 In a clean container, pour the required amount of water or liquid additive, and then gradually add the required amount of the patching compound while slowly mixing with the mechanical mixer. Mix thoroughly until a smooth and lump-free consistency is obtained.

9.2.2 Apply the patching compound mix to the subfloor using a flat-edge steel trowel to fill surface cracks, grooves, depressions and other irregularities in order to meet the floor covering manufacturer recommendations.

9.2.3 Protrusions should be ground off, driven flush, sanded smooth or driven below the surface, then patched and sanded in order to meet the floor covering manufacturer recommendations.

10. Field Quality Control

10.1 To determine representative compressive strengths, specimens of the patching compounds shall be taken at the job site from an unopened package. The compressive strength tests shall be done in accordance with Test Method **C109/C109M**, (air-cured only) or with Test Methods **C472**.

11. Protection

11.1 Protect the subfloor from traffic, dirt or dust from other trades until final installation of resilient floor covering.

11.2 The surface of the subfloor shall be cleaned of all loose material by scraping, brushing, vacuuming, other methods, or a combination thereof, recommended by the resilient flooring manufacturer, immediately before commencing installation of resilient flooring.

12. Keywords

12.1 concrete subfloors; gypsum concrete subfloors; panel underlayment; patching compounds; poured lightweight cellular concrete subfloors

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, beadblast, 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,” should 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