



Designation: F 2471 – 05

Standard Practice for Installation of Thick Poured Lightweight Cellular Concrete Underlayments and Preparation of the Surface to Receive Resilient Flooring¹

This standard is issued under the fixed designation F 2471; 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 covers the installation and preparation of the thick poured lightweight cellular concrete underlayments over wood structural panel subfloors in commercial structures or over concrete floors in commercial structures and the preparation of the thick poured lightweight cellular concrete underlayment surface prior to the installation of resilient flooring in commercial buildings.

1.2 This practice points out the factors that are required to be controlled while installing thick poured lightweight cellular concrete underlayment as a base for resilient flooring.

1.3 This practice does not cover the structural adequacy of the wood structural panel subfloor or concrete subfloor. The structural integrity of assemblies is governed by local building codes.

1.4 This practice does not supercede the thick poured lightweight cellular concrete underlayment manufacturers', adhesive manufacturers' or resilient flooring manufacturers' written instructions. Consult the individual manufacturer for specific recommendations.

1.5 Thick poured lightweight cellular concrete underlayments are not suitable for use on concrete slabs on ground due to potential moisture problems arising from moisture intrusion, unless an adequate vapor retarder or vapor barrier is present directly beneath the concrete subfloor.

1.6 The values stated in inch-pound units are to be regarded as standard. The values stated in parentheses are mathematical conversions to SI Units, which are provided for information only.

1.7 *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.*

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

C 330 Specification for Lightweight Aggregates for Structural Concrete

F 141 Terminology Relating to Resilient Floor Coverings

F 710 Practice for Preparing Concrete Floors to Receive Resilient Floors

F 2170 Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes

F 1482 Practice for Installation and Preparation of Panel Type Underlayments to Receive Resilient Flooring

3. Terminology

3.1 Definitions used in this practice shall be in accordance with Terminology **F 141**.

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *fully adhered flooring, n*—resilient flooring which has adhesive under the entire product, bonding it to the underlayment surface (see Practice **F 1482**).

3.2.2 *non-fully adhered flooring, n*—resilient flooring that may be loose laid, in which no adhesive is utilized, or partially bonded to the surface of the underlayment, typically at seams and the surrounding perimeter of the product (see Practice **F 1482**).

3.2.3 *subfloor, n*—that wood structural panel or concrete layer intended to provide support for design loads, which may receive resilient floor coverings directly if the surface is appropriate or indirectly via an underlayment if its surface is not suitable or if underlayment is required by appropriate code authorities.

3.2.4 *thick poured lightweight cellular concrete underlayment, n*—that layer of material composed primarily of Portland cement (conforming to, Type I, II, or Block Cement) slurry, sand, water, pea gravel and foam that is mixed, pumped and

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.

poured at a minimum thickness of 1½ in. (38 mm) in a liquid state and installed on or over a subfloor to provide an underlayment.

3.2.5 *wood structural panel, n*—a panel manufactures from veneers, or wood strands or wafers, or a combination of veneer and wood strands, or wafers, bonded together with waterproof synthetic resins or other suitable, waterproof bonding systems.

4. Significance and Use

4.1 This practice provides minimum recommendations for the installation of thick poured lightweight cellular concrete floor underlayments suitable to receive resilient floor coverings. This practice establishes the proper preparation, installation and quality control for thick poured lightweight cellular concrete floor underlayments.

4.2 Actual requirements for thick poured lightweight cellular concrete underlayments are generally included as part of project plans or specifications and may vary from the recommendations set forth in this practice. Project plans or specifications, or both, shall supersede the recommendations set forth in this practice.

5. Product Requirements

5.1 For the purposes of this practice, thick poured lightweight cellular concrete underlayment shall be Portland cement based compounds.

5.2 Thick poured lightweight cellular concrete underlayment shall be tested for pH, measured in accordance with Practice **F 710**. PH shall not exceed 11.

5.3 Thick poured lightweight cellular concrete underlayments shall be tested for compressive strength. Specified psi shall be a minimum of 2000 psi (13.8 MPa) for use over wood subfloors and 3000 psi (20.7 MPa) for use over concrete subfloors.

5.4 Field density checks in accordance with Specification **C 330** shall be made periodically and variations greater than ±1 pcf (16 kg/m³) between the recommended density and the density at the point of discharge will require a modification to the mix. Weighing the material at the point of placement in a container of a known volume checks the cast density.

5.5 Thick poured lightweight cellular concrete underlayments shall be tested for the presence of chlorides. Thick poured lightweight cellular concrete underlayments shall not contain calcium chloride. Test method shall be provided by the manufacturer of the thick poured lightweight cellular concrete underlayment.

5.6 Thick poured lightweight cellular concrete underlayments shall be tested for density in accordance with Specification **C 330**. Specified density shall be a minimum of 110 pcf (1762 kg/m³).

6. Storage and Handling of Thick Poured Lightweight Cellular Concrete Underlayments

6.1 Factory-sealed containers of foaming agent shall be stored at room temperature. Materials shall be delivered to the jobsite by the manufacturer of the thick poured lightweight cellular concrete underlayment using approved methods.

7. General Guidelines

7.1 Recommended floor joist spacing is 16 in. (406 mm) on center maximum for panel assemblies. Subfloor shall support design loads with maximum L/360 deflection.

7.2 Wood and concrete subfloors shall be clean, dry, and structurally sound so as to support both the uniform design live and dead loads in compliance with the local building code and the resilient flooring manufacturers installation requirements.

7.3 The surfaces of the structural subfloor assemblies shall be clean, smooth, and free of construction wastes such as acoustic and wall texture, over spray, dirt, solvents, oil, grease, residual construction adhesives, adhesive removers, and other foreign materials. Concrete subfloors shall be 28 days or older and dry as tested by Test Method **F 2170**.

7.4 Before, during and after installation of thick poured lightweight cellular concrete underlayment, the General Contractor shall be responsible for ensuring that the building shall be ventilated and heated to a minimum of 50°F (10°C) until subfloor and ambient temperatures have stabilized. Temperature during and after installation shall be maintained until material has completely cured. The General Contractor shall provide heat and ventilation as necessary to dry the thick poured lightweight cellular concrete underlayments. In winter, inside temperature shall not exceed 60°F (15.6°C).³

7.5 Installation of thick poured lightweight cellular concrete underlayment shall not begin until the building is enclosed, including roof, windows, doors and other openings. General Contractor shall be responsible to provide continuous ventilation until the underlayment is dry. Ceilings shall be sprayed or stippled to avoid over spray.

7.6 Before installation of thick poured lightweight cellular concrete underlayment, the condition of the structural subfloor assemblies and any required elevations shall be inspected and approved by the general contractor or owner, or both. All required flooring and nailing inspections shall be completed.

7.7 Thick poured lightweight cellular concrete underlayment installation shall be by an Applicator approved to do this type of installation by the manufacturer, experienced in performing the work of this practice, who has been trained in installation of work similar to the project under construction.³

8. Preparation of Subfloor

8.1 The structural panel subfloor assemblies shall be of wood structural panel construction, dry, level, securely nailed, and reasonably clean, without projections. Loose boards in floors with board subfloors or panels shall be renailed. Badly cupped or warped board subfloors shall be replaced before installation of underlayment. Concrete subfloors shall be 28 days or older and dry as tested by Test Method **F 2170**.

8.2 All cracks and voids shall be covered or filled with a quick-setting taping or crack filler compound to prevent leakage.

³ Elastzell Product Information, International Conference of Building Officials, A subsidiary of the International Conference of Building Officials Evaluation Reports No. 1381, and International Conference of Building Officials, A subsidiary of the International Conference of Building Officials Evaluation Report No. 1347.