Designation: ~~F2873 – 18~~ F2873 – 19

Standard Practice for the Installation of Self-Leveling Underlayment and the Preparation of Surface to Receive Resilient Flooring[1]

This standard is issued under the fixed designation F2873; 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 of self-leveling underlayments, which may include a priming system, over solid wood, wood structural panel subfloors, over concrete, and over certain solidly bonded existing flooring systems such as epoxy floors, ceramic and natural stone tiles, terrazzo, metal subfloors and foils such as steel, copper and lead, solidly bonded patching and other leveling materials as well as properly prepared non water-soluble adhesive residues as recommended by the underlayment manufacturer. This practice also covers the preparation of the self-leveling underlayment's surface prior to the installation of resilient flooring.

1.2 This practice points out the factors that are required to be controlled while installing a self-leveling underlayment to be used as a substrate for resilient flooring.

1.3 This practice does not cover the structural adequacy of the subfloor. The structural integrity of assemblies is governed by local building codes and may be superseded by the resilient flooring manufacturer's and the self-leveling underlayment manufacturer's requirements.

1.4 This practice does not supersede the self-leveling underlayment manufacturer's, adhesive manufacturer's or resilient flooring manufacturer's written instructions. Consult the individual manufacturer for specific recommendations.

1.5 Some self-leveling underlayments are not suitable for use on concrete slabs on or below grade due to potential moisture problems arising from moisture intrusion. However, most of the self-leveling underlayments may be suitable for use on and below grade if an adequate and effective vapor retarder or vapor barrier is present directly beneath the concrete slab or an effective moisture remediation system has been installed beneath the surface of the self-leveling underlayment. Consult the manufacturer of the self-leveling underlayment and flooring system for specific recommendations.

1.6 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.

1.7 This practice does purport to address the necessity for or the safe or correct removal of asbestos containing materials. Breathing of asbestos dust is hazardous. Asbestos and asbestos products present demonstrated health risks for users and for those with whom they come into contact. In addition to other precautions, when working with asbestos-cement products, minimize the dust that results. For information on the safe use of chrysoltile asbestos, refer to "Safe Use of Chrysotile Asbestos: A Manual on Preventive and Control Measures."[2]

1.8 *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.*

1.9 *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.*

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[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.
Current edition approved ~~July 15, 2018~~Dec. 1, 2019. Published ~~August 2018~~March 2019. Originally approved in 2013. Last previous edition approved in ~~2013~~2018 as ~~F2873-13.~~F2873-18. DOI: ~~10.1520/F2873-18.~~10.1520/F2873-19.

[2] Available from http://www.chrysotile.com

2. Referenced Documents

2.1 *ASTM Standards:*[3]

C219 Terminology Relating to Hydraulic and Other Inorganic Cements
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)
C1708 Test Methods for Self-leveling Mortars Containing Hydraulic Cements
F141 Terminology Relating to Resilient Floor Coverings
F710 Practice for Preparing Concrete Floors to Receive Resilient Flooring
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
F1482 Practice for Installation and Preparation of Panel Type Underlayments to Receive Resilient Flooring
C109/C109M Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2-in. or [50-mm] Cube Specimens)

2.2 *OSHA Standard*[4]

29 CFR OSHA §1926.1153 Respirable crystalline silica

3. Terminology

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

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.

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.

3.2.3 *self-leveling underlayment system, n*—a non-structural, hydraulic cement-based, poured mortar composed primarily of hydraulic cements, fillers or fine aggregate, and water, which may require the use of a primer to enhance bond strength and inhibit pin hole development, and which is intended to provide a flat, smooth surface for the finished floor covering.

3.2.4 *subfloor, n*—a structurally sound layer intended to provide support for design loads, which may receive resilient floor coverings directly if the surface is suitable to the flooring manufacturer.

3.2.5 *wood structural panel, n*—a panel manufactured 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 such that they are considered to be Type 1 for exterior exposure. Lauaun plywood is not recommended to receive self-leveling underlayments represented in this practice.

4. Significance and Use

4.1 This practice provides minimum recommendations for the installation of self-leveling underlayments suitable to receive resilient floor coverings. This practice establishes the proper preparation of the subfloor, and installation methods and quality control requirements for self-leveling underlayments. This practice addresses any necessary preparation of the self-leveling underlayment's surface prior to the installation of floor coverings.

4.2 Actual requirements for self-leveling underlayments are generally included as part of project plans or specifications and may vary from the recommendations set forth in this practice. Provisions in the project documents at variance with this practice shall take precedence.

5. Product Requirements

5.1 For the purpose of this practice, self-leveling underlayment shall be hydraulic cement based compounds, as defined in 3.2.4 in accordance with Terminology C219.

5.2 Self-leveling underlayments shall be tested for compressive strength in accordance with Test Method C109/C109M modified (air-cured only as detailed in Test Methods C1708). Specified psi at 28 days shall be a minimum of 3000 psi (20.7 MPa).

6. Storage and Handling of Self-Leveling Underlayments

6.1 Self-leveling underlayments included in this practice shall be delivered to the jobsites in original, unopened, undamaged bags with identification labels intact. Bags and the enclosed material should not be damaged and shall be protected from the elements after delivery to the jobsite.

[3] 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.

[4] Available from Occupational Safety and Health Administration (OSHA), 200 Constitution Ave., NW, Washington, DC 20210, http://www.osha.gov.

6.2 All products shall be kept off the ground and protected from moisture and excessive heat or cold in accordance with the manufacturer's recommendations.

7. General Guidelines

7.1 The subfloor shall support design loads as required by the prevailing building code but no greater than L/360. Use the strictest criteria applicable.

7.2 Subfloors shall be structurally sound and dimensionally stable so as to support both the uniform design live and dead loads in compliance with the local building code and the self-leveling underlayment manufacturer as well as the resilient flooring manufacturer's installation requirements.

7.3 Concrete subfloors shall be as described in Practice F710, or meet the requirements of the manufacturer of the self-leveling underlayment and the manufacturer of the resilient floor covering, or both.

7.3.1 Some self-leveling underlayments are recommended by their manufacturers for use over concrete that is less than 28 days old and may be part of a moisture remediation system.

7.3.1.1 The suitability of such materials to receive resilient floor coverings remains the sole responsibility of the self-leveling manufacturer.

7.3.2 Wood subfloors shall be installed and prepared in accordance with Practice F1482.

7.4 The HVAC system shall be operational for the minimum specified time period recommended in the moisture test(s) being performed prior to test commencement and shall remain on throughout the test to ensure accurate moisture testing. Otherwise, condition a test area to "in service condition" before testing.

7.5 Concrete subfloors that exceed the floor covering manufacturer's requirements for moisture in 7.4 shall either be made to dry out until the moisture requirements are within the flooring manufacturer's limits or shall be remediated using products that are suitable to receive underlayments represented in this practice.

7.6 Forty eight hours before, during and 72 h after installation of the self-leveling underlayment is completed, the general contractor shall be responsible for ensuring that the building and substrate shall be ventilated and heated to a minimum of 50°F (10°C) and a maximum of 90°F (32.2°C) and with a maximum relative humidity of 60 % until subfloor and ambient conditions have stabilized. Consult the manufacturer of the self-leveling underlayment for specific recommendations.

7.7 Installation of the self-leveling underlayment shall not begin until the building is enclosed, including roof, windows, doors and other openings, unless the underlayment being installed is totally water resistant, or is otherwise unaffected by casual water. It is recommended that all overhead work be completed prior to underlayment installation, to minimize surface damage.

7.8 Before installation of self-leveling 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, as being suitable to receive the self-leveling underlayment to meet the flooring manufacturer's requirements.

7.9 Self-leveling underlayment installation shall be performed by an applicator trained to do this type of installation by the manufacturer of the self-leveling underlayment system, or one that can verify experience in performing the work of this practice.

7.10 The general contractor shall protect the self-leveling underlayment, once installed, from drafts, direct sunlight, excessive heat, and direct exposure construction and trade traffic.

7.10.1 Failure to adequately protect the surface of the self-leveling underlayment from the above conditions will result in a need for additional surface preparation on the self-leveling underlayment prior to installation of the resilient flooring.

8. Preparation of Subfloor/Underlayment Panels

8.1 The wood subfloor shall be of solid wood or structural wood panel construction installed in accordance with Practice F1482, clean, permanently dry, and free of any oil, grease, dirt, and other contaminating substances that could affect the performance or act as a bond breaker. Loose boards shall be mechanically fastened. Badly cupped or warped board subfloors shall be replaced before installation of underlayment. Any loose sections shall be fastened and any weak or delaminated sections shall be removed and replaced.

8.2 The surfaces of the concrete structural subfloor shall be dry, clean, and free of construction wastes such as acoustic and wall texture, dry wall compound, paint, dirt, laitance, solvents, oil, grease, loosely bonded toppings, dust, tar, wax, residual adhesives, adhesive removers, curing and sealing compounds and other foreign materials as recommended by the manufacturer of the self-leveling underlayment. To ensure maximum bonding of the self-leveling underlayment to the concrete subfloor, mechanical profiling may be recommended. Consult the manufacturer of self-leveling underlayment for specific requirements. All warnings shall be adhered to in accordance with Practice F710. (Refer to Supplemental Requirements Section S1.) Steel troweled concrete, concrete sealed with curing compounds and any substance that could reduce and prevent adhesion shall mechanically removed by shot blasting, grinding or using similar mechanical means. The surface removal must be sufficient to eliminate penetrated contaminants. Acid washing or etching and the use of sweeping compounds and solvent adhesive removers shall not be an acceptable surface preparation method.