Designation: F 2195 – 02

Standard Specification for Linoleum Floor Tile[1]

This standard is issued under the fixed designation F 2195; 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 specification covers floor tiles made of a homogeneous mixture of linoleum cement binder calendered or pressed onto a fibrous or suitable backing.

1.2 Four types of linoleum floor tile are covered. The floor covering is intended for use in commercial, light commercial, and residential buildings based on serviceability characteristics. General information and performance characteristics, which determine serviceability and recommended use, are included in this document.

1.3 The following safety hazards caveat pertains only to the test methods portion, Sections 7 and 8, of this specification.

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 requirements prior to use.*

1.5 The values stated in inch-pound units are to be regarded as the standard; the values in parentheses are provided for information only.

2. Referenced Documents

2.1 *ASTM Standards:*

F 137 Test Methods for Flexibility of Resilient Flooring Materials with Cylindrical Mandrel Apparatus[2]

F 141 Terminology Relating to Resilient Floor Coverings[2]

F 150 Test Method for Electrical Resistance of Conductive and Static Dissipative Resilient Flooring[2]

F 386 Test Method for Thickness of Resilient Flooring Materials Having Flat Surfaces[2]

F 410 Test Method for Wear Layer Thickness of Resilient Floor Covering by 0ptical Measurement[2]

F 925 Test Method for Resistance to Chemicals of Resilient Sheet Flooring[2]

F 970 Test Method for Static Load Limit[2]

F 1514 Test Method for Measuring Heat Stability of Resilient Floor Covering by Color Change[2]

F 1515 Test Method for Measuring Light Stability of Resilient Floor Covering by Color Change[2]

F 2055 Test Method for Size and Squareness of Resilient Floor Tile by Dial Gage Method[2]

2.2 *Other Standards:*

ANSI/ASQC Z1.4 Sampling Procedures and Tables for Inspection by Attributes[3]

EN 433 Determination of Residual Indentation after Static Loading[4]

EN 669 Determination of the Dimensional Changes of Tiles Caused by Atmospheric Humidity Changes[4]

EN 670 Identification and Composition of Linoleum—Determination of Cement and Ash Residue[4]

3. Terminology

3.1 *Definitions:*

3.1.1 *drying room yellowing*—a yellowish cast develops on the surface of the linoleum during the oxidation process, which will disappear when exposed to either natural or artificial light to give a stable color in service; it may reappear or not disappear in areas not exposed to light.

3.1.2 *linoleum*—a surfacing material composed of a solidified mixture of linseed oil, pine rosin, fossil or other resins or rosins, or an equivalent oxidized oleoresinous binder, ground cork and/or wood flour, mineral fillers, and pigments, bonded to a fibrous or other suitable backing.

3.1.3 *linoleum cement*—the binder in linoleum consisting of a mixture of linseed oil, pine rosin, fossil or other resins or rosins, or an equivalent oxidized oleoresinous binder.

3.1.4 *rosin*—a translucent amber to almost black brittle, friable resin that is obtained by chemical means from the oleoresin dead wood of pine trees or from tall oil.

3.2 For additional definitions, refer to Terminology F 141.

4. Classification

4.1 The floor coverings shall be of the following types:

4.1.1 *Type I*—Linoleum floor tile with fibrous backing.

4.1.2 *Type II*—Linoleum floor tile with special backing.

4.1.3 *Type III*—Linoleum floor tile without backing.

4.1.4 *Type IV*—Static dissipative linoleum floor tile with or without backing.

NOTE 1—If any of the above structures incorporate a stabilizing

[1] This specification is under the jurisdiction of ASTM Committee F06 on Resilient Floor Coverings and is the direct responsibility of Subcommittee F06.80 on Specifications.

Current edition approved July 10, 2002. Published September 2002.

[2] *Annual Book of ASTM Standards*, Vol 15.04.

[3] Available from American National Standards Institute (ANSI), 25 W. 43rd St., 4th Floor, New York, NY 10036.

[4] Available from CEN European Committee for Standardization—Central Secretariat: rue de Stassart, 36 B-1050 Brussels.

inner-layer mat or fabric between the top wear-layer and the back of the structure, the flooring type will include the hyphenated suffix of "-IL." (for example, Type II-IL, a linoleum floor tile with a special backing including an inner-layer mat or fabric).

5. Ordering Information

5.1 Linoleum floor tile shall be ordered by type, thickness, and other characteristics important to the purchaser for the intended use.

5.1.1 Title, number, and date of this specification,

5.1.2 Type and pattern number,

5.1.3 Quantity in square feet, square meters, pieces or cartons,

5.1.4 Size required (Section 7),

5.1.5 Thickness required (Section 7),

5.1.6 Sampling if other than as specified in ANSI/ASQC Z1.4, level 5-1 as noted in Table 1,

5.1.7 Packing requirement if other than as specified (Section 14),

5.1.8 Marking required if other than specified (Section 14), and

5.1.9 Specific Chemical Resistance (Section 8).

6. Materials and Manufacture

6.1 *Wear Surface*—The wear surface is the portion above the fibrous or suitable backing/bedding layer or base coat. The wear surface should have a minimum thickness of 0.04 in. (1 mm).

6.1.1 *Type I / Type II / Type III / Type IV*—For all types, the wear surface of the linoleum shall consist of a homogeneous mixture as described in 3.1.2. For Type IV, the linoleum shall have incorporated into the wearing surface additives, which will give the linoleum electrostatic discharge controlling properties.

6.2 *Backings*:

6.2.1 *Fibrous*—The fibrous backing shall be firmly bonded and keyed to the linoleum mix so as to be partially imbedded in the mix.

6.2.2 *Special Backing*—In some cases a special backing is added such as cork, foam, or other suitable backing.

6.3 *Composition*:

6.3.1 *Linoleum Cement Content*—The minimum amount of linoleum cement shall be 30 % when tested in accordance with European Norm 670.[4]

7. Physical Properties

7.1 *Wear Surface*—The thickness of the wear surface shall be determined in accordance with Test Method F 410. The minimum thickness of the wear surface/topcoat, shall be 0.040 in. (1.0 mm).

7.2 *Size*—Unless otherwise specified (see 5.1.4), the tile size shall be nominal 13 by 13 in. (333 by 333 mm), 20 by 20 in. (500 by 500 mm), 24 by 24 in. (610 by 610 mm). A tolerance of ±0.016 in. (0.4 mm) per linear ft (305 mm) shall be permitted when measured in accordance with Test Method F 2055. Other sizes may be available.

7.3 *Thickness*—Unless otherwise specified (see 5.1.5), the tile shall be furnished in 0.080 in. (2.0 mm), 0.100 in.(2.5 mm), 0.125 in. (3.2 mm), 0.160 in. (4.0 mm). The overall thickness when measured shall be determined in accordance with Test Method F 386.

7.4 *Squareness*—When tested in accordance with Test Method F 2055, the out-of-squareness of the tile shall not exceed 0.010 in. (0.25 mm) for tiles ≤16 in. (400 mm) or 0.014 in. (0.35 mm) for tiles >16 in. (400 mm).

8. Performance Requirements

8.1 *Residual Indentation*—When tested in accordance with Test Method EN 433 under 112 lb (50.8 kg) load, 0.445 in. (11.30 mm) diameter flat foot and 150 min indentation, the average residual indentation at the end of 150 min recovery shall not exceed 0.006 in. (0.15 mm) for tiles ≤0.100 in. (2.5 mm) thick or 0.008 in. (0.20 mm) for tiles >0.100 in. (2.5 mm) thick.

8.2 *Static Load Resistance*—When tested in accordance with Test Method F 970, the residual indentation shall not exceed 0.005 in. (0.12 mm) tested with a load of 150 lb (67.5 kg).

TABLE 1 Characteristics and Tests

Property	Requirement	Test Method	Reference
Wear Surface	Wear surface shall be a minimum thickness of 0.040 in. (1.0 mm).	ASTM F 410	7.1
Size, tolerance	±0.016 in. (0.4 mm) per linear ft (305 mm)	ASTM F 2055	7.2
Thickness	Average overall thickness shall be the nominal thickness with a tolerance of ±0.006 in. (0.15 mm)	ASTM F 386	7.3
Squareness	Shall not exceed 0.010 in. (0.25 mm) for tiles ≤16 in. (400 mm) or 0.014 in. (0.35 mm) for tiles >16 in. (400 mm).	ASTM F 2055	7.4
Residual Indentation	Shall not exceed 0.006 in. (0.15 mm) for tiles ≤0.100 in. (2.5 mm) thick or 0.008 in. (0.20 mm) for tiles > 0.100 in. (2.5 mm) thick, tested with a load of 112 lb (50.8 kg), 0.445 in. (11.3 mm) diameter flat foot, 150 min loading dwell time and measured after a 150 min recovery.	EN 433	8.1
Static Load	Residual indentation shall not exceed 0.005 in. (0.12 mm), tested with a load of 150 lb (67.5 kg)	ASTM F 970	8.2
Flexibility	The wear surface will not crack or break when bent face out. See Table 2.	ASTM F 137	8.3
Dimensional Stability	No more than 0.1 %	EN 669	8.4
Resistance to Chemicals	No more than a slight change in surface dulling, surface attack or staining	ASTM F 925	8.5
Resistance to Heat	ΔE not more than 8.0	ASTM F 1514	8.6
Resistance to Light	ΔE not more than 8.0	ASTM F 1515	8.7
Static Dissipation (Type IV)	Surface to ground resistance in the range of 1.0×10^6 to 1.0×10^9 Ohms tested at 100 or 500 V.	ASTM F 150	8.8