



# Standard Specification for Rubber Floor Tile<sup>1</sup>

This standard is issued under the fixed designation F1344; 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 reappraisal. A superscript epsilon ( $\epsilon$ ) indicates an editorial change since the last revision or reappraisal.

*This standard has been approved for use by agencies of the U.S. Department of Defense.*

## 1. Scope

1.1 This specification covers requirements for the compound and physical characteristics of rubber floor tile.

1.2 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.

1.3 *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.*

## 2. Referenced Documents

2.1 The following documents of the issue in effect on the date of this material purchase form a part of this specification to the extent referenced herein:

2.2 *ASTM Standards:*<sup>2</sup>

D883 Terminology Relating to Plastics

D1566 Terminology Relating to Rubber

D2240 Test Method for Rubber Property—Durometer Hardness

D3389 Test Method for Coated Fabrics Abrasion Resistance (Rotary Platform Abrader)

F141 Terminology Relating to Resilient Floor Coverings

F373 Test Method for Embossed Depth of Resilient Floor Coverings

F386 Test Method for Thickness of Resilient Flooring Materials Having Flat Surfaces

F410 Test Method for Wear Layer Thickness of Resilient Floor Coverings by Optical Measurement

F710 Practice for Preparing Concrete Floors to Receive Resilient Flooring

F925 Test Method for Resistance to Chemicals of Resilient Flooring

F970 Test Method for Static Load Limit

F1482 Practice for Installation and Preparation of Panel Type Underlayments to Receive Resilient Flooring

F1514 Test Method for Measuring Heat Stability of Resilient Flooring by Color Change

F2055 Test Method for Size and Squareness of Resilient Floor Tile by Dial Gage Method

F2199 Test Method for Determining Dimensional Stability of Resilient Floor Tile after Exposure to Heat

2.3 *American National Standards:*

ANSI/ASQC Z1.4 Sampling Procedures and Tables for Inspection by Attributes<sup>3</sup>

## 3. Terminology

3.1 *Definitions*—For definitions of other terms used in this standard, see Terminology F141.

## 4. Classification

4.1 Rubber floor tile covered by this specification shall be classified as:

Type I—Homogeneous Rubber Floor Tile

A. Solid Color

B. Through Mottled

Type II—Heterogeneous (Laminated) Rubber Floor Tile

A. Solid Color Wear Layer

B. Mottled Wear Layer

Grade—Based on Shore A durometer hardness

Grade 1  $\geq$  85

Grade 2  $\geq$  70 but less than 85

4.2 The tile in 4.1 may have either smooth, embossed, or molded pattern wearing surfaces.

4.3 These products shall not contain asbestos.

## 5. Ordering Information

5.1 Purchaser shall state whether this specification is to be used, select the preferred options permitted herein, and include the following information in the invitation to bid or purchase order:

<sup>3</sup> Available from American National Standards Institute (ANSI), 25 W. 43rd St., 4th Floor, New York, NY 10036, <http://www.ansi.org>.

<sup>1</sup> 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.

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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.

- 5.1.1 Title, number, and date of this specification.
- 5.1.2 Class, color, pattern, and wearing surface (see Section 4).
- 5.1.3 Quantity, in square feet, square metres, or cartons.
- 5.1.4 Size required (see 8.4).
- 5.1.5 Thickness required (see 8.3).
- 5.1.6 Overall thickness, if molded pattern tile is specified (see 8.1).
- 5.1.7 Base thickness, if molded pattern tile is specified (see 8.2).
- 5.1.8 Resistance to chemicals (see 7.4).
- 5.1.9 Lot formation, if other than as specified in ANSI/ASQC Z1.4 (see Sections 10 and 11).
- 5.1.10 Sampling, if other than as specified in ANSI/ASQC Z1.4 (see Sections 10 and 11).
- 5.1.11 Statement requesting certification, if certification of compliance is required (see Section 12).
- 5.1.12 Packing requirements, if other than as specified (see Section 14).
- 5.1.13 Palletization, if required.
- 5.1.14 Marking required, if other than specified (see Section 13).
- 5.1.15 Other requirements.

## 6. Materials and Manufacture

6.1 *Material*—The polymeric binder of the rubber floor tile shall (1) satisfy the definition of rubber in Terminology D1566, and (2) have been vulcanized, as defined in Terminology D1566 (under vulcanization), such that it becomes thermoset as defined in Terminology D883. The rubber floor tile made from this compound shall be resistant to neutral pH cleaners.

6.2 *Color, Pattern, and Wear Layer Surface*—The color, pattern, and wear layer surface, as applicable, shall be as specified in the contract or order (see 5.1).

NOTE 1—The colors and patterns that are available are indicated in individual manufacturer's current catalogs. As manufactured, colors may vary somewhat in hue or shade from the catalog.

NOTE 2—Where color match is a concern, samples from the manufacturer shall be obtained to verify color acceptability.

6.3 *Homogeneous Rubber Floor Tile*—The surface coloring or mottling shall be uniform throughout the entire thickness of the rubber floor tile.

6.4 *Heterogeneous (Layered) Rubber Floor Tile*—The surface color or mottling need not extend through the entire thickness of the rubber floor tile, but must extend throughout the entire thickness of the wear layer.

6.4.1 The wear layer must have a minimum thickness of 0.040 in. (1.0 mm) when measured in accordance with Test Method F410.

6.4.2 The appearance of the rubber floor tile, after removing 0.020 in. (0.51 mm) of the wear layer thickness, shall compare favorably in appearance with the rubber floor tile original appearance. The removal of the wear layer may be accomplished by any suitable method.

## 7. Performance Requirements

7.1 *Hardness*—The rubber floor tile shall have a durometer hardness as follows:

Grade 1  $\geq$  85

Grade 2  $\geq$  70 but less than 85 (Shore, Type A, instantaneous reading) when tested in accordance with Test Method D2240.

7.2 *Static Load Limit*—When tested in accordance with Test Method F970, with an applied load of 250 lb (113.4 kg), the residual indentation shall not be greater than 0.005 in. (0.127 mm).

7.3 *Resistance to Short-Term Chemical Exposure*—When tested in accordance with Test Method F925, the rubber floor tile shall have no more than a slight change in surface dulling, surface attack, or staining when exposed to the following chemicals:

- White vinegar (5% acetic acid)
- Rubbing alcohol (70% isopropyl alcohol)
- Sodium hydroxide solution (5% NaOH)
- Hydrochloric acid solution (5% HCl)
- Sulfuric acid solution (5% H<sub>2</sub>SO<sub>4</sub>)
- Household ammonia solution (5% NH<sub>4</sub>OH)
- Household bleach (5.25% NaOCl)

NOTE 3—These basic chemicals are representative of those likely to be found in domestic, commercial, and institutional use. Many proprietary compounds contain one or more of these basic chemicals. Should the rubber floor tile for an unusual application need to be resistant to a specific chemical, this additional requirement should become part of the procurement document (see 5.1.8).

NOTE 4—Since standard SBR rubber floor tiles are not recommended for installation where the product will be exposed to animal fats, vegetable oils, and petroleum-based reagents, mineral oil, olive oil, kerosene, and gasoline have been removed from the standard chemical list to eliminate any confusion regarding product selection.

7.4 *Resistance to Heat*—When tested in accordance with Test Method F1514, the color change of the rubber floor tile shall have an average  $\Delta E$  not greater than 8.0 after 7 days exposure to 158°F (70°C). The specimen surface shall be wiped with a clean, white cotton cloth prior to taking the initial and post test conditioned period color readings to remove any wax bloom or other contaminants which may affect the accuracy of the color readings.

7.5 *Abrasion Resistance*—When tested in accordance with Test Method D3389 and with the abrader equipped with H-18 wheels and a load of 500 g, the maximum material loss shall not exceed 1 gram after 1000 cycles.

7.6 *Dimensional Stability*—When tested in accordance with Test Method F2199, the dimensional change of the rubber floor tile in both the machine direction (MD) and the across machine direction (AMD) shall not exceed 0.15 %.

7.7 *Resistance to Light*—Existing Q-UV and Xenon-Arc test methods used to test rubber floor tiles resulted in extremely high failure rates which is not typical in everyday use of these products.

## 8. Dimensions and Permissible Variations

8.1 *Overall Thickness*—Unless otherwise specified (see 5.1), the molded pattern rubber floor tile shall have a minimum thickness of 0.080 in. (2 mm) and shall be measured for overall thickness at the thickest cross-sectional area of the tile. The thickness of the molded pattern shall be uniform throughout the tile.

8.2 *Base Thickness*—Molded pattern rubber floor tile base thickness shall be measured at the thinnest cross-sectional area of the tile. The thinnest cross-sectional area shall be uniform throughout the tile.

8.3 *Thickness Tolerances*—Thickness shall be as specified in the contract or order (see 5.1). A total tolerance of  $\pm 0.005$  in. ( $\pm 0.127$  mm) for smooth rubber floor tile or  $+0.015/-0.005$  in. ( $+0.381/-0.127$  mm) for molded and embossed pattern rubber floor tile, from the specified thickness shall be permitted in the base thickness alone or in combination with the overall thickness, when measured in accordance with Test Method F386 for smooth and molded pattern rubber floor tile and Test Method F373 for embossed pattern rubber floor tile. In case of molded and embossed pattern rubber floor tile, overall thickness and base thickness shall be reported (see Fig. 1).

8.4 *Size*—Rubber floor tiles are available in a variety of sizes and shall be specified (see 5.1). The following permissible tolerances shall be permitted per tile when measured in accordance with Test Method F2055.

Up to and including 12 by 12 in. =  $\pm 0.016$  in. ( $\pm 0.4$  mm).

Larger than 12 by 12 in. and up to and including 24 by 24 in. =  $\pm 0.018$  in. ( $\pm 0.45$  mm).

Larger than 24 by 24 in. =  $\pm 0.020$  in. ( $\pm 0.5$  mm).

8.5 *Squareness*—When tested in accordance with Test Method F2055, the out of squareness of the rubber floor tile shall not exceed 0.010 in. (0.254 mm).

## 9. Workmanship, Finish, and Appearance

9.1 The rubber floor tile furnished in accordance with this specification shall be an acceptable match to approved samples in color, pattern, wearing surface, and appearance. The product shall be free of defects which adversely affect performance or appearance. Such defects include: blemishes, indentations, cracks, blisters, breaks in corners or edges, and delamination.

9.2 Unless otherwise specified in the contract or order (see 5.1), the back or bonding surface of the rubber floor tile shall be buffed, roughened, ribbed, grooved, or otherwise modified to improve the adhesive bond of the rubber floor tile, but in no case shall the thickness of the tile be decreased to the extent that any depression or groove on the bonding surface be perceptible, under any circumstances, on the exposed surface.

## 10. Sampling for Test

10.1 Sampling for testing physical characteristics listed in Table I shall be done in accordance with the provisions set forth in ANSI/ASQC Z1.4. The inspection level shall be

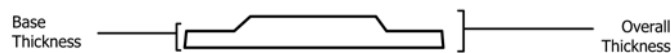


FIG. 1 Overall and Base Thickness

special inspection level S-1, as noted in Table I, and the acceptable quality level (AQL) shall be 6.5 defects per hundred units as noted in Table II-A or as otherwise specified in 10.2 herein. The lot size shall be expressed in units. A unit represents a single, manufactured, inventoried, finished tile.

10.2 Sampling for testing physical characteristics listed in Table I shall be agreed upon by the purchaser and the manufacturer as part of the procurement document.

## 11. Inspection

11.1 Sampling for inspection of the rubber floor tile for defects that would adversely affect performance (see 9.1) shall be done in accordance with the provisions set forth in ANSI/ASQC Z1.4. The inspection level shall be Level I as noted in Table I with an acceptable quality level (AQL) of 6.5 defects per hundred as noted in Table II-A or as otherwise specified in 11.2 herein. The lot size shall be expressed in units. A unit represents a single, manufactured, inventoried, finished tile.

11.2 Inspection of the rubber floor tile for defects that would adversely affect performance (see 9.1) shall be agreed upon by the purchaser and the manufacturer as part of the procurement documents.

## 12. Certification

12.1 When specified in the purchase order or contract (see 5.1.11), a manufacturer's certification and any other documents required to substantiate certification shall be furnished to the purchaser that the product was manufactured to meet this specification.

## 13. Product Marking

13.1 Unless otherwise specified in 5.1, shipping containers shall be marked with the name of the material as defined by the contract or order under which the shipment is made, the size, thickness, the pattern number, the quantity contained therein, and the name of the manufacturer.

13.2 When product sample sets, sample set cover cards, marketing and technical literature reference this specification, the complete product classification information relative to this specification shall be included.

## 14. Packaging and Packing

14.1 Unless otherwise specified in 5.1, the rubber floor tile shall be packaged in accordance with normal commercial practice and packed to ensure acceptance by common carrier and to provide protection against damage during normal shipping, handling, and storage.

## 15. Keywords

15.1 flooring; resilient; rubber; tile

**TABLE 1 Characteristics and Tests**

Characteristic	Requirement	ASTM Test Method	Reference
Composition of Material		Certificate of Compliance	6.1
Wear Layer Thickness	min, 0.040 in. (1.0 mm)	F410	6.4.1
Hardness	Grade 1 $\geq$ 85	D2240	7.1
	Grade 2 $\geq$ 70 but less than 85 Shore A		
Static Load Resistance	$\leq$ 0.005 in. (0.127 mm) at 250 lb (113.4 kg) load	F970	7.2
Resistance to Short-Term Chemical Exposure	No more than a slight change in surface dulling, surface attack, or staining	F925	7.3
Resistance to Heat	Avg. $\Delta$ E not greater than 8.0	F1514	7.4
Abrasion Resistance	Less than 1 g loss after 1000 cycles	D3389	7.5
Dimensional Stability	The dimensional change of the rubber floor tile in both the machine direction (MD) and the across machine (AMD) shall not exceed 0.15 %	F2199	7.6
	as specified		
Thickness			
Smooth Surface Tile	$\pm$ 0.005 in. ( $\pm$ 0.127 mm)	F386	8.3
Molded Pattern Tile	+0.015/-0.005 in. (+0.381 mm/-0.127 mm)	F386	8.3
Embossed Pattern Tile	+0.015/-0.005 in. (+0.381 mm/-0.127 mm)	F373	8.3
Size	Up to and including 12 by 12 in. = $\pm$ 0.016 in. ( $\pm$ 0.4 mm)	F2055	8.4
	Larger than 12 by 12 in. and up to and including 24 by 24 in. = $\pm$ 0.018 in. ( $\pm$ 0.45 mm)		
	Larger than 24 by 24 in. = $\pm$ 0.020 in. ( $\pm$ 0.5 mm)		
Squareness	max, 0.010 in. (0.254 mm)	F2055	8.5

## APPENDIX

### (Nonmandatory Information)

#### X1. ADDITIONAL INFORMATION

X1.1 The following sources can be consulted for additional information: Practice F710 and Guide F1482.

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