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Standard Specification for Vinyl Sheet Floor Covering Without Backing[1]

This standard is issued under the fixed designation F1913; 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 sheet floor covering having a vinyl wear layer without backing. Products also may contain a clear specialty performance top layer(s).

1.2 This type of floor covering is intended for use in commercial and light commercial buildings. General information and performance characteristics, which determine serviceability and recommended use, are included in this specification.

1.3 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.

1.4 *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 limitations prior to use.*

2. Referenced Documents

2.1 *ASTM Standards:*[2]

F137 Test Method for Flexibility of Resilient Flooring Materials with Cylindrical Mandrel Apparatus

F141 Terminology Relating to 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

F925 Test Method for Resistance to Chemicals of Resilient Flooring

F970 Test Method for Static Load Limit

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

F1515 Test Method for Measuring Light Stability of Resilient Flooring by Color Change

F1914 Test Methods for Short-Term Indentation and Residual Indentation of Resilient Floor Covering

2.2 *ANSI/ASQC Standard:*

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

3. Terminology

3.1 *Definitions*— Terms used in this specification are defined in accordance with Terminology F141.

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *wear layer, n*—the portion of a resilient floor covering that contains the pattern effect.

3.2.1.1 *Discussion*—The wear layer thickness and total thickness of through pattern unbacked sheet vinyl flooring are the same. A clear specialty performance top layer may be used to enhance specific properties and to protect the pattern effect and shall be counted as part of the wear layer. The wear layer does not include temporary finishes or maintenance coatings.

4. Significance and Use

4.1 The information in this specification is for use by specifiers as a reference when selecting unbacked resilient sheet vinyl flooring for areas within commercial and light commercial buildings.

5. Classification

5.1 Sheet Vinyl floor covering shall conform to the following.

5.1.1 The binder content of the PVC-pattern portion of the wear layer (vinyl resins, plasticizers, and stabilizers) shall be a minimum of 50 %. A clear specialty performance layer(s) used as the top layer is not described by binder limits.

PVC Binder Content Minimum %	PVC Wear Layer Description
50 %	The material shall be a vinyl compound consisting of a blended composition of pigments stabilized against heat and light deterioration. The design, color and pattern extends throughout the thickness of the wear layer.

[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.

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[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.

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

5.1.1.1 All flooring may have a clear specialty performance top layer(s) with an average minimum total thickness of 0.0004 in. The specialty performance top layer(s) may consist of a single layer or multiple layers, which do not delaminate under normal use. Top layer(s) thinner than 0.0004 in. may be used but cannot be counted as part of the clear specialty performance top layer.

5.1.2 The total thickness is the sum of the PVC wear layer and the clear specialty top layer(s). The total thickness average minimum is 0.075 in. (1.9 mm).

6. Ordering Information

6.1 Sheet vinyl floor covering without backing shall be ordered according to characteristics important to the purchaser for the intended use as indicated by Table 1.

6.2 *Intended Use*— The following is a partial list providing generic guidance on typical applications of product use. For specific applications, refer to the manufacturers product recommendations.

6.2.1 *LC (Light Commercial):*
6.2.1.1 Multi-family Dwelling—Common Areas.
6.2.1.2 Hotel/Motel Guest Rooms.
6.2.2 *C (Commercial):*
6.2.2.1 Educational/Institutional.
6.2.2.2 Hospital/Health Care.
6.2.2.3 Retail/Mercantile.
6.2.2.4 Office
6.2.2.5 Hospitality.

6.3 The purchaser may wish to specify the following items:
6.3.1 Manufacturer,
6.3.2 Style name and number,
6.3.3 Minimum roll width (see 9.1),
6.3.4 Surface texture (see 7.1.3), and
6.3.5 Variation in list of chemicals used to demonstrate chemical resistance (see 12.7).

7. Material

7.1 *Wear Layer:*

7.1.1 The wear layer shall have a vinyl plastic binder and may include pigments, fillers, extenders, and other ingredients; and shall be stabilized against heat and light deterioration (see 12.8 and 12.9).

7.1.2 The binder of the wear layer shall consist of one or more vinyl resins, platicizers, and stabilizers. Each resin shall be polyvinyl chloride or a copolymer of vinyl chloride not less than 85 % of which is vinyl chloride. The vinyl resin(s) shall be not less than 60 % by weight of the binder.

7.1.3 The composition shall be uniform and extend throughout the full thickness of the pattern portion of the wear layer.

7.2 *Specialty Performance Top Layer*—A clear specialty performance top layer(s) of a product can be a PVC or non PVC layer(s), which may constitute part of the total thickness up to a maximum 0.005 in. and is not removable by normal maintenance procedures.

TABLE 1 Total Thickness

Average Minimum in. (mm)	Intended Use
0.075 (1.9)	LC/C

8. Physical Requirements

8.1 Sheet vinyl floor covering shall meet the requirements in Table 2.

9. Dimensions

9.1 Common roll widths are 49-in. (1.25-m), 59-in. (1.5-m), 72-in. (1.83-m), and 78-in. (2-m) widths (minus 0 in.). Other widths may be available.

9.2 The floor covering shall be furnished in a minimum average overall thickness of 0.075 in. (1.9 mm).

10. Workmanship, Finish, and Appearance

10.1 Materials furnished under this specification shall be an acceptable match to an approved sample(s) in pattern, color, and surface appearance. The product shall be free of defects, which would adversely affect performance or appearance.

11. Sampling

11.1 Sampling for testing physical characteristics listed in Table 2 shall be done in accordance with the provisions set forth in ANSI/ASQC Z1.4. The inspection level shall be special inspection level S-1 as noted in Table 1 and the acceptable quality level (AQL) shall be 6.5 defects/100 units as noted in Table II-A or as otherwise specified in 11.3. The lot size shall be expressed in units. A unit represents a single, manufactured, inventoried, finished roll.

11.2 Samples shall be obtained in the required length from the outside end of the roll and shall encompass the total width of the material.

11.3 Sampling for testing physical characteristics listed in Table 2 shall be agreed upon by the purchaser and the manufacturer as part of the procurement documents.

12. Test Methods

12.1 *Wear Layer Binder Content*—The wear layer binder content shall be determined by statement of formula (manufacturer's certificate of compliance).

12.2 *Clear Specialty Performance Top Layer Thickness*—The specialty performance top layer thickness shall be determined in accordance with Test Method F410 except the thickness of the sample shall be the average of the measurements on three specimens taken 12 in. (305 mm) in from each edge and the center of the sample.

12.3 *Overall Thickness*—The overall thickness shall be determined in accordance with Test Method F386 except that the presser foot shall exert a total force of 1 ± 0.1 oz (28.3 ± 2.8 g) on the specimen. The thickness of the sample should be the average of the measurements on three specimens taken 12 in. (305 mm) in from each edge and the center of the sample.

12.4 *Residual Indentation*—Residual indentation shall be determined in accordance with Test Method F1914 as follows: 1 h after 75-lb load/0.250 in. diameter flat tip/15 min (34-kg load/6.4 mm diameter flat tip/15 min.).

TABLE 2 Testing Physical Characteristics

Characteristics	Requirement	Test Method	Section
Composition	50 % minimum binder content	Manufacturer's certificate of compliance	12.1
Clear specialty top layer	0.0004 in. (0.01 mm) min 0.005 in. (0.137 mm) max	Test Method F410	12.2
Total thickness	min 0.075 in. (1.9 mm)	Test Method F386	12.3
Residual indentation	≤0.007 in. (0.18 mm)	Test Method F1914	12.4
Static load resistance	≤0.005 in. (0.13 mm) at 250 lb (113.4 kg)	Test Method F970	12.5
Flexibility	Mandrel diameter 1 1/2 in. (38 mm) no crack/break	Test Method F137	12.6
Resistance to chemicals	No more than a slight change in surface dulling, surface attack, or staining	Test Method F925	12.7
Resistance to heat	ΔE ≤8	Test Method F1514	12.8
Resistance to light	ΔE ≤8	Test Method F1515	12.9

12.5 *Static Load Resistance*—The static load resistance shall be determined in accordance with Test Method F970 using an applied load of 250 lb (113.4 kg).

12.6 *Flexibility*— The flexibility shall be determined in accordance with Test Method F137. The flexibility shall be such that the wear surface will not crack or break when bent face out and face in over a 1½ in. (3.81 cm) diameter mandrel.

12.7 *Resistance to Chemicals*—The chemical resistance of sheet flooring shall be determined in accordance with Test Method F925 when exposed to the following chemicals.

12.7.1 *White Vinegar,* (5 % acetic acid).
12.7.2 *Rubbing Alcohol,* (70 % isopropyl alcohol).
12.7.3 *White Mineral Oil,* (medicinal grade).
12.7.4 *Sodium Hydroxide Solution,* 5 % NaOH.
12.7.5 *Hydrochloric Acid Solution,* 5 % HCl.
12.7.6 *Sulfuric Acid Solution,* 5 % H_2SO_4.
12.7.7 *Household Ammonia Solution,* 5 % NH_4OH.
12.7.8 *Household Bleach Solution,* 5.25 % NaOCl.
12.7.9 *Olive Oil,* light.
12.7.10 *Kerosene (Kl).*
12.7.11 *Unleaded Gasoline,* regular grade.

NOTE 1—These chemicals are representative of those likely to be found in domestic, commercial, and institutional use. Many proprietary compounds contain one or more of these chemicals. Should the flooring for an unusual application need to be resistant to a specific chemical, this following requirement should become part of the procurement document.

12.8 *Resistance to Heat*—The resistance of the sheet vinyl floor covering to color change from exposure to elevated temperature, 158°F (70°C), over a specified time, seven days, shall be determined in accordance with Test Method F1514.

12.9 *Resistance to Light*—The resistance of sheet vinyl floor covering to color change from exposure to light, simulated by a properly fitted xenon-arc radiant energy source, over time, 300 h, shall be determined in accordance with Test Method F1515.

13. Inspection

13.1 Inspection of the sheet vinyl floor covering for defects that would adversely affect performance (see 10.1) shall be done in accordance with the provisions set forth in ANS/ASQC Z1.4. The inspection level shall be Level I as noted in Table 1 and the acceptable quality level (AQL) of 6.5 defects/100 units as noted in Table IIA or as otherwise specified in 13.2. The lot size shall be expressed in units, one of which is represented as a single, manufactured, inventoried, finished roll.

13.2 For alternate AQL, the inspection of sheet vinyl floor covering for defects shall be done as agreed upon by the purchaser and the manufacturer, as part of the procurement documents.

14. Certification

14.1 When specified in the purchase order or contract, a manufacturer's certification shall be furnished to the purchaser that the material was manufactured, sampled, tested, inspected, and packaged in accordance with this specification and has been found to meet the requirements.

15. Product Marking

15.1 Unless otherwise specified in the purchase order or contract, shipping containers shall be marked with the name of the material, the size, the thickness (when the material is available in more than one thickness), the pattern number, the quantity contained therein and the name of the manufacturer.

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

16. Packaging and Package Marking

16.1 The sheet vinyl floor covering shall be packaged and marked in accordance with normal commercial practice and packed to ensure acceptance by common carrier and to provide product protection against damage during normal shipping, handling, and storage. Rolls shall be stored upright (on end) at all times prior to installation.

17. Keywords

17.1 resilient; sheet; vinyl; without backing

APPENDIX

(Nonmandatory Information)

X1. ADDITIONAL INFORMATION

X1.1 The following sources can be consulted for additional information.

X1.1.1 *ASTM Standards:*

F693 Practice for Sealing Seams of Resilient Sheet Flooring Products by Use of Liquid Seam Sealers[2]

F710 Practice for Preparing Concrete Floors and Other Monolithic Floors to Receive Resilient Flooring[2]

F1482 Guide to Wood Underlayment Products Available for Use Under Resilient Flooring[2]

F1516 Practice for Sealing Seams of Resilient Flooring Products by the Heat-Weld Method (When Recommended)[2]

X1.1.2 *Other Sources:* Recommended Work Practices for the Removal of Resilient Floor Coverings[4]

[4] The sole source of supply of the apparatus known to the committee at this time is Resilient Floor Covering Institute, 401 E. Jefferson St., Suite 102, Rockville, MD 20850. If you are aware of alternative suppliers, please provide this information to ASTM International Headquarters. Your comments will receive careful consideration at a meeting of the responsible technical committee,[1] which you may attend.