Designation: D7799 – 12a

Standard Specification for Tufted and Woven Broadloom Carpet Adhesives Without Homogenous PVC or Non-PVC Backings[1]

This standard is issued under the fixed designation D7799; 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 establishes minimum requirements for adhesives used for the installation of tufted or woven broadloom carpet, within a climate controlled structure, when adhered directly, and permanently, to a structurally sound and recommended substrate.

1.2 This specification will provide the means to determine adhesive bonding variation as a result of different carpet backing systems and their usage classifications based on the traffic conditions they are subjected to.

1.3 This specification is not applicable to specialty adhesives such as those necessary for PVC and Non-PVC backed carpet tile and broadloom where the backing would be considered homogenous in nature.

1.4 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.

1.5 *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]

D123 Terminology Relating to Textiles
D907 Terminology of Adhesives
D1084 Test Methods for Viscosity of Adhesives
D1337 Practice for Storage Life of Adhesives by Viscosity and Bond Strength
D2556 Test Method for Apparent Viscosity of Adhesives Having Shear-Rate-Dependent Flow Properties
D4783 Test Methods for Resistance of Adhesive Preparations in Container to Attack by Bacteria, Yeast, and Fungi
D6004 Test Method for Determining Adhesive Shear Strength of Carpet Adhesives
D6325 Test Method for Determining Open Assembly Time of Carpet Mastic Adhesives
D6862 Test Method for 90 Degree Peel Resistance of Adhesives
D6962 Practice for Operation of a Roller Chair Tester for Pile Yarn Floor Coverings
D7149 Practice for Determining the Freeze Thaw Stability of Adhesives
D7532 Practice for Determination of Re-tack Ability of Carpet Adhesives
E2471 Test Method for Using Seeded-Agar for the Screening Assessment of Antimicrobial Activity In Carpets
F2199 Test Method for Determining Dimensional Stability of Resilient Floor Tile after Exposure to Heat

2.2 *ISO Standard:*[3]

ISO 4918 Resilient, textile and laminate floor coverings — Castor chair test

2.3 *Other Document:*[4]

OSHA Regulations 29 CFR paragraphs 1910–1210
Section 313 of Title III Superfund Amendments and Reauthorization Act of 1986
40 CFR 372 Toxic Chemical Release Reporting: Community Right-to-Know

3. Terminology

3.1 *Definitions:*

3.2 *Backing Systems:*

3.2.1 *primary backing, n—for tufted pile yarn floor covering*, the fabric through which the pile yarn is carried by needles to form tufts; the backing fabric.

[1] This specification is under the jurisdiction of ASTM Committee D14 on Adhesives and is the direct responsibility of Subcommittee D14.70 on Construction Adhesives.

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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.

[4] Available from U.S. Government Printing Office Superintendent of Documents, 732 N. Capitol St., NW, Mail Stop: SDE, Washington, DC 20401, http://www.access.gpo.gov.

3.2.2 *secondary backing, n—for pile yarn floor covering*, a suitable material adhered to or adhered to the underside of the primary backing fabric.

3.2.3 *hotmelt backing, n*—the uppermost layer of carpet backing where carpet fiber bundles are physically attached at the base to the backing structure, a thermo-polymer; (that is, ethylene vinyl acetate hot-melt adhesive).

3.2.4 *unitary backing, n*—the uppermost layer of carpet backing where carpet fiber bundles are physically attached at the base to the backing structure without the use of a secondary backing; this layer is typically constructed of synthetic latex (ethylene vinyl acetate, styrene butadiene). **E2471**

4. Classification

4.1 *Class 1, Heavy Traffic,* commercial use, airports, convention centers, concentrated rolling loads, casinos, etc.; natural or synthetic fiber backing system; including unitary backing system, hotmelt backing system or similar.

4.2 *Class 2, Moderate Traffic,* commercial use, office areas, hotel/motel hallways, natural or synthetic fiber backed system.

4.3 *Class 3, Light Traffic,* residential or light commercial use acceptable, hotel/motel rooms, natural or synthetic fiber backed system.

5. Ordering Information

5.1 Ordering quantities, lot sizes minimum and maximum, along with packaging availability, container size, etc., shall be determined by the adhesive manufacturer and/or end user and may be subject to industry standards. Currently the floor covering industry has found the standard packaging as follows: one (1) quart, one (1) gallon, four (4) gallon containers.

6. Standard Conditioning

6.1 *Conditioning in Air*—Condition the specimens for physical tests in air maintained at 73.4 ± 3.6°F (23 ± 2°C) and 50 ± 5 % relative humidity for not less than 3 h before testing.

7. Chemical Composition

7.1 The adhesive shall contain no reportable quantities of hazardous ingredients as specified by OSHA Regulations 29 CFR 1910–1200.

7.2 The adhesive shall contain no toxic chemical subject to reporting requirement of Section 313 of Title III of Superfund Amendments and Reauthorization Act of 1986 and of 40 CFR 372.

7.3 The adhesive shall not be reportable as a carcinogen as specified by IARC, OSHA, NTP.

IARC = International Agency for Research on Cancer
NTP = National Toxicology Program
OSHA = Occupational Safety and Health Administration

7.4 The adhesive shall identify if natural latex is utilized within the formulation.

8. Physical Properties

8.1 The adhesive shall be of a consistency free of lumps of a smooth homogeneous consistency when stirred or troweled, applied to surface.

TABLE 1 Performance Tests and Requirements

Test Method	Class 1	Class 2	Class 3
ASTM D6862 (90° Peel)	≥25 psi	≥20 psi	≥12 psi
ASTM D6004 (180° Shear)	≥30 psi	≥20 psi	≥12 psi
ASTM D6962 or ISO 4918 Castor Chair Test See A1.1	≥25 000 cycles	≥15 000 cycles	≥12 000 cycles

8.2 The initial viscosity of the adhesive shall be determined by Test Methods D1084 or D2556 as appropriate and recorded.

9. Performance Requirements

9.1 The adhesive shall be freeze thaw stable when tested in accordance with Practice D7149. The allowable change from the initial viscosity to the freeze cycling completion shall not exceed a ±10 % difference. The adhesive shall maintain its original integrity and exhibit a smooth consistency, free of clumps when stirred. The adhesive shall not exhibit a stringy condition. The test temperature and compliance statement shall be listed on the container label.

9.2 Table 1 identifies the minimum requirements for compliance with the specific usage class and the corresponding test methods.

9.3 When tested in accordance with Practice D7532 there shall be no more than a 10 % loss in peel strength after 24 h than from initial test result.

9.4 Accelerated aging after exposure to heat.

9.4.1 Prepare additional sets of test specimens as outlined in Test Methods D6004 and D6862.

9.4.2 Utilizing the equipment and protocol in Test Method F2199 condition then place the shear and peel specimens in the oven as described for a period of two weeks at 120°F. The Procedure Sections 8.3, 8.4, 8.5, and 8.8 of Test Method F2199 are not applicable since those sections are specific for the measurement of tile.

9.4.3 Sections 9 (Calculation) and 10 (Precautions) of Test Method F2199 are also to be ignored and replaced by shear and peel tests as outlined in their respective documents.

9.4.4 There shall be no more of a loss in adhesion of 10 % based on the initial results as obtained.

NOTE 1—An accelerated aging test through exposure to heat specific to adhesives is under development.

NOTE 2—There may be instances where duration of the test may be lengthened if felt necessary.

10. Sampling

10.1 Take a 2–qt (2–L) sample of adhesive that is representative of the lot to be tested. Place 1–qt (1–L) of the adhesive in a wide-mouth glass or stainless steel container and seal tightly. Use for all the tests with the exception of freeze-thaw stability, Practice D7149, and storage life, Practice D1337. For the initial test only, to provide samples for testing these two properties, divide the second 1–qt (1–L) equally and use half for the freeze-thaw stability and half for storage life. Refer to 9.1 for the acceptability criteria for freeze-thaw stability.

11. Certification

11.1 When specified in the purchase order or contract, a manufacturer's certification and any other documents required to substantiate certification shall be furnished to the purchaser. When specified in the purchase order or contract, a manufacturer's certification and any other documents required that the material meets this specification.

12. Packaging and Package Marking

12.1 Unless otherwise specified in the purchase order or contract, shipping containers shall be marked with the name of the material as defined by the contract or order under which the shipment is made with the quantity contained therein, and the name of the manufacturer and any precautionary statements required.

12.2 The adhesive 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 unless other requirements (agreement between the manufacturer and the purchaser) have been put into place.

13. Keywords

13.1 carpet backing; hotmelt backing; primary backing; secondary backing; unitary backing; woven

SUPPLEMENTARY REQUIREMENTS

Supplementary requirements shall be applied only when specified by the purchaser. Details of the supplementary requirements shall be agreed upon between the producer and purchaser.

S1.1 The adhesive shall be tested by Test Methods D4783 to ensure that the appropriate "in container" protection is provided from attack by bacteria, yeast or fungi.

S1.2 Using Test Method D6325 determine the open time of the adhesive and identify to the consumer through label or product information.

ANNEX

(Mandatory Information)

A1. CASTOR CHAIR TEST

A1.1 The castor chair test can be followed by the protocol as described in either document; however the applied weight shall be as described in ISO 4918. The adhesive shall be applied in accordance with the adhesive or carpet manufacturer's installation and trowel or other method of application.