Designation: D 5252 – 98a

Standard Practice for the Operation of the Hexapod Tumble Drum Tester[1]

This standard is issued under the fixed designation D 5252; 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 describes the equipment and operation of the hexapod tumble drum tester for testing pile floor covering to produce changes in appearance and color due to changes in surface structure by mechanical action tester.

1.2 This practice is applicable for use in testing unused pile floor covering of all types. It is not applicable for use in testing used pile yarn floor coverings.

1.3 This practice may be used by mutual agreement between the purchaser and supplier to set purchasing specifications.

1.4 The values stated in either SI or inch-pound units are to be regarded separately as the standard. Within the text, the inch-pound units are shown in parentheses. The values in each system must be used independently of the other. Combining values from the two systems may result in nonconformance with this practice. In case of referee decisions, the SI units shall prevail.

1.5 *This practice 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 practice to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 *ASTM Standards:*

D 123 Terminology Relating to Textiles[2]

D 418 Methods of Testing Pile Yarn Floor Covering Construction[2]

D 1776 Practice for Conditioning Textiles for Testing[2]

D 5684 Terminology Relating to Pile Floor Covering[3]

3. Terminology

3.1 *Definitions*—For definitions of pile yarn floor covering related terms used in this practice, refer to Terminology D 5684. For definitions of other textile terms used in this practice, refer to Terminology D 123.

4. Summary of Practice

4.1 The specimen is secured to a backing sheet that is mounted inside the rotatable drum with the pile surface exposed. A metal hexapod, with six polyurethane studs, rolls randomly on the pile surface inside the rotating drum for a specified number of revolutions.

5. Significance and Use

5.1 This equipment may be used to bring about the changes in appearance and texture on the surface of pile floor covering caused by mechanical action.

6. Apparatus, Materials, and Reagent

6.1 *Hexapod Tumble Tester*

6.1.1 *Drum*—Constructed of polyvinyl chloride (PVC) and capped by a lid that is secured by a metal plate and wing nut. The drum base and lid have a locating groove to hold the specimen backing sheet flat to the inner wall of the drum. The drum dimensions are:

Internal Diameter	305 ± 1 mm	(12 ± 0.01 in.)
Wall Thickness	8 mm approx.	(0.3 in. approx.)
Internal Depth	200 ± 1 mm	(7.9 ± 0.01 in.)

6.1.2 *Driving System*, which cradles the drum on rollers and keeps the axis of the drum level, and rotates at 3.6 ± 0.2 rad/s (35 ± 2 rpm). The driving direction reverses every 15 min with approximately one-minute stationery time intervals.

6.1.3 *Hexapod Tumbler*—Compromised of a mild steel 50 ± 1 mm (1.97 ± 0.04 in.) cube with 25-mm (1-in.) thick plates welded to each side. The outside corners are welded such that when the studs are fitted and the hexapod placed on a flat surface, no metal touches the flat surface. A replaceable stud[4] is screwed centrally in each face. Tumbler parameters are:

Diameter of Stud	40 ± 1 mm	(1.6 ± 0.04 in.)
Height of Stud	15 ± 1 mm	(0.6 ± 0.04 in.)
Edge of Radius Stud	15± 1 mm	(0.6 ± 0.04 in.)
Steel Backing for Polyurethane		
Stud Hardness	80 ± 10 Type A Durometer	
Stud Thickness	3 ± 0.25 mm	(0.12 ± 0.01 in.)

Total mass of hexapod tumbler with six studs is 3.8 ± 0.1 kg. (8.4 ± 0.2 lb).

6.2 *Specimen Backing Sheet*, polyethylene approx. 950 × 215 × 2 mm (approx. 375 × 8.5 × 0.08 in.).

6.3 *Tape*, double-sided adhesive, 50 mm (2.0 in.) width.

6.4 *Vacuum Cleaner*—An upright type vacuum cleaner, with a rotating brush and beater bar, unless this type of apparatus is not recommended by the manufacturer of the pile floor covering under test, in which case the appropriate

[1] This practice is under the jurisdiction of ASTM Committee D-13 on Textiles and is the direct responsibility of Subcommittee D13.21 on Pile Floor Coverings.

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[2] *Annual Book of ASTM Standards*, Vol 07.01.

[3] *Annual Book of ASTM Standards*, Vol 07.02.