Designation: D 5417 – 99

Standard Practice for Operation of the Vettermann Drum Tester[1]

This standard is issued under the fixed designation D 5417; 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 Vettermann drum tester for testing pile yarn floor covering to produce changes in appearance and color due to changes in surface structure by mechanical action.

1.2 This practice is only 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 The values stated in inch-pound units are to be regarded as the standard for all measurements except mass. The SI (metric) units for all measurements except mass are provided for information only.

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:*

D 123 Terminology Relating to Textiles[2]

D 1776 Practice for Conditioning Textiles for Testing[3]

D 5684 Terminology Relating to Pile Floor Coverings[3]

3. Terminology

3.1 *Definitions:*

3.1.1 For definitions of pile yarn floor covering related terms used in this practice, refer to Terminology Relating to Pile Floor Coverings D 5684. For definitions of other textile terms used in this practice refer to Terminology Relating to Textiles.

4. Summary of Practice

4.1 The test specimen is mounted in the rotatable drum with the pile surface towards the center of the drum and the edges under the retaining segments. A steel ball, with 14 rubber studs rolls randomly inside the drum on the pile surface for a specified number of revolutions.

5. Significance and Use

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

5.2 The acceptance criteria of this practice shall be set by mutual agreement between the purchaser and the supplier.

6. Apparatus and Material

6.1 *Vettermann Drum Tester (See Fig. 1):*

6.1.1 *Drum,* incorporating a revolution counter and four adjustable retaining segments (thickness: 15 ± 1 mm (0.6 ± 0.03 in.) on each side wall of the drum. A free-running circular brush mounted in such a way that it lightly contacts the surface of specimens and loose fibers are continuously extracted by a vacuum cleaner. A vulcanized fiber backing sheet 2320 by 270 by 1.5 mm (93.3 by 10.6 by 0.06 in.) is loosely laid inside the drum. This sheet remains permanently in the drum.

6.1.2 The Vettermann drum dimensions are as follows:

Internal diameter	730 ± 10 mm	(28.7 ± 0.39 in.)
Internal depth	270 ± 5 mm	(10.6 ± 0.20 in.)
Effective depth	240 ± 7 mm	(9.4 ± 0.28 in.)
Thickness of curved surface	8 ± 0.5 mm	(0.31 ± 0.02 in.)

6.1.3 *Driving System,* with a speed of 1.65 rad/s (16 ± 1 rpm) and the direction of rotation is reversed every five minutes, stopping between reversals for approximately 1 s time intervals, with approximately one second stationary time.

6.1.4 *Protective Cage,* fits over the drum and must be in place prior to Vettermann drum rotation.

6.1.5 *Round Steel Ball,* fitted with fourteen cylindrical rubber studs located equally spaced on the ball surface. The studs are replaceable and are screwed into flat faces on the surface of the ball. (See Fig. 2.):

Diameter of ball	120 ± 0.2 mm	(4.7 ± 0.01 in.)
Distance between diametrically opposed flat stud-mounting faces	118 ± 0.1 mm	(4.6 ± 0.01 in.)
Mass without studs	6800 ± 100 g	(15.0 ± 0.2 lb)
Mass with studs	7600 ± 100 g	(16.8 ± 0.2 lb)

6.1.6 *Replaceable Rubber Studs,* are a composite rubber

[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.