



Designation: D 5251 – 98a (Reapproved 2003)

## Standard Practice for the Operation of the Tetrapod Walker Drum Tester<sup>1</sup>

This standard is issued under the fixed designation D 5251; 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 approval. A superscript epsilon ( $\epsilon$ ) indicates an editorial change since the last revision or reapproval.

### 1. Scope

1.1 This practice describes the equipment and operation of the Tetrapod Walker for testing pile floor coverings with a thickness of 20 mm (0.8 in.) or less because thicker materials impede proper operation of the tumbler.

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 floor covering.

1.3 The values stated in either acceptable SI units or in other units shall be regarded separately as the standard. The values stated in each system may not be exact equivalents; therefore, each system must be used independently of the others, without combining values in any way. In case of referee decisions, the SI units shall prevail.

1.4 *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<sup>2</sup>

D 418 Methods of Testing Pile Yarn Floor Covering Construction<sup>2</sup>

D 1776 Practice for Conditioning Textiles for Testing<sup>2</sup>

D 5684 Terminology Relating to Pile Floor Coverings<sup>3</sup>

### 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 as the lining of a rotatable drum with the pile surface exposed. A four legged metal

casting (tetrapod) 'walks' on the pile surface of the specimen as it is tumbled in the drum. The drum is rotated about its longitudinal axis 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.

### 6. Apparatus, Material, and Reagent

#### 6.1 Tetrapod Tumbler Tester<sup>4</sup>

6.1.1 *Drum*—Constructed of a rigid material and capped by a lid that is firmly secured. Each drum is equipped with two springs to hold the test specimen in place during testing. The inner dimensions of the drum are as follows:

Diameter =  $205 \pm 5$  mm (8.0  $\pm$  0.2 in.)  
Height =  $190 \pm 5$  mm (7.6  $\pm$  0.2 in.)

6.1.2 *Tetrapod Walker*—A metal casting, tetrahedral in shape, with four legs placed equidistant from one another. For example, the outermost points correspond to the points on an equilateral tetrahedron and the large angle between any two legs is 2 rad (109.5°). Each leg shall have a replaceable plastic foot at the end. The free standing height of the tetrapod with 3 of the 4 plastic feet in one plane is  $125 \pm 2$  mm (5  $\pm$  0.1 in.). The total mass of the tetrapod including the feet is  $1000 \pm 2.5$  g (2.25  $\pm$  0.21 lb). The minimum hardness of the plastic feet supplied by the manufacturer shall be 75  $\pm$  5 Type A durometer.

6.1.3 *Driving System*—Cradles a drum on rollers and keeps the axis of the drum level, rotates at  $5.2 \pm 0.2$  rad/s (50  $\pm$  2 rpm) and has a counter that can be preset to stop the drum after any number of revolutions. Drive systems that do not reverse shall have the direction of rotation shown on the drum.

6.2 *Vacuum Cleaner*, upright-type with beater bar.

6.3 *Solvent*, either ethyl alcohol (CH<sub>3</sub>CH<sub>2</sub>CHOH), or isopropyl alcohol, [(CH<sub>3</sub>)<sub>2</sub>CHOH] technical grade.

<sup>1</sup> This practice is under the jurisdiction of ASTM Committee D13 on Textiles and is the direct responsibility of Subcommittee D13.21 on Pile Floor Coverings.

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<sup>2</sup> *Annual Book of ASTM Standards*, Vol 07.01.

<sup>3</sup> *Annual Book of ASTM Standards*, Vol 07.02.

<sup>4</sup> Suitable apparatus is available from the Wira Instrumentation, 3 Water Lane, Bradford BD1 2JL, England; Lawson Hemphill Sales, Inc., P.O. Box 6388, Spartanburg, SC; Williams Asselin, Inc., 7774 Perras Blvd., Montreal, Quebec, Canada H1E 5B2.