



Designation: D5251 – 05

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

This standard is issued under the fixed designation D5251; 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 ( $\epsilon$ ) 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:*<sup>2</sup>

[D123 Terminology Relating to Textiles](#)

[D1776 Practice for Conditioning and Testing Textiles](#)

[D5684 Terminology Relating to Pile Floor Coverings](#)

### 3. Terminology

3.1 For all terminology related to Pile Floor Coverings, see Terminology [D5684](#).

3.1.1 The following terms are relevant to this standard: carpet, finished, finished pile yarn floor covering, floor covering, lengthwise direction, pile, pile lay, pile yarn floor covering, pitch, practice, primary backing, secondary backing, textile floor covering, texture, tufted fabric.

<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.

Current edition approved March 1, 2005. Published April 2005. Originally approved in 1992. Last previous edition approved in 2003 as D5251 – 98a(2003). DOI: 10.1520/D5251-05.

<sup>2</sup> 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.

3.2 For all other terminology related to textiles, see Terminology [D123](#).

### 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>3</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 ( $109.5^\circ$ ). 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.

<sup>3</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.