



Designation: D 6633 – 01

## Standard Test Method for Basic Functional Stability of a Mechanical Pump Dispenser<sup>1</sup>

This standard is issued under the fixed designation D 6633; 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 reappraisal. A superscript epsilon ( $\epsilon$ ) indicates an editorial change since the last revision or reappraisal.

### 1. Scope

1.1 This test method covers the determination of the basic functional stability of a mechanical pump dispenser with a consumer-type product.

1.2 This test method covers accelerated usage evaluations of mechanical pump dispensers (spray or flow types) with a consumer-type product.

1.3 *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.* Specific precautions are given in Section 5.

### 2. Referenced Documents

#### 2.1 ASTM Standards:

D 2063 Test Methods for Measurement of Torque Retention for Packages with Continuous Thread Closures<sup>2</sup>

D 3890 Test Method for Number of Strokes to Prime a Mechanical Pump Dispenser<sup>3</sup>

D 4332 Practice for Conditioning Containers, Packages, or Packaging Components for Testing<sup>2</sup>

D 4336 Test Method for Determination of Output per Stroke of a Mechanical Pump Dispenser<sup>3</sup>

E 122 Practice for Calculating Sample Size to Estimate with a Specified Tolerable Error the Average for a Characteristic of a Lot or Process<sup>4</sup>

### 3. Significance and Use

3.1 This test method is used for determining the accelerated usage of a mechanical pump dispenser for consumer usage.

### 4. Apparatus

4.1 *Containers*, that will allow the mechanical pump dispenser to be affixed to them (Note 1) and also be capable of containing product for a period of time at various environmental conditions (Note 2). A minimum of 12 is recommended.

NOTE 1—If possible, the actual container to be marketed should be used.

NOTE 2—The number of containers is arbitrary and can be changed according to need.

4.2 *Mechanical Pump Dispensers*, a minimum of 12 units or a minimum of 6 units per environmental variable selected from 4.5.

4.3 *Product*, a sufficient amount to fill the number of containers in accordance with 4.1.

4.4 *Stereo/Zoom Microscope*, capable of magnification up through 30 $\times$ , and preferably with a camera attached for permanent record keeping.

4.5 *Environments*, where the mechanical pump dispenser and product will be kept during the test period.

4.5.1 *Ambient Area*, maintained at  $23 \pm 3^\circ\text{C}$  ( $73 \pm 5.4^\circ\text{F}$ ).

4.5.2 *Oven* ( $45^\circ\text{C}$ ), maintained at  $45 \pm 3^\circ\text{C}$  ( $113 \pm 5.4^\circ\text{F}$ ).

4.5.3 *Optional: Cycle Chamber*, alternating 5 to  $50^\circ\text{C}$  (41 to  $122^\circ\text{F}$ ) every 24 h.

### 5. Precautions

5.1 Appropriate handling considerations should be given to flammable, toxic, caustic, or other potentially hazardous material used. When testing at any temperature, safety should be the number one consideration and special attention should be used on the flash points of the products tested.

### 6. Sampling

6.1 Based upon the desired precision, sampling shall be performed in accordance with Practice E 122.

6.2 In the absence of any special sampling plan, performance shall be based on not less than the number of representative specimens exposed to any of the environmental conditions as specified in Section 9.

### 7. Test Specimen

7.1 Test specimens shall be clean, dry and previously unused mechanical pump dispensers.

### 8. Conditioning

8.1 If possible, condition the test specimens at  $23 \pm 3^\circ\text{C}$  ( $73 \pm 5.4^\circ\text{F}$ ) and  $50 \pm 5\%$  relative humidity of not less than 24 h prior to test shall be in accordance with the procedures of Practice D 4332. If the test specimens are not conditioned at

<sup>1</sup> This test method is under the jurisdiction of ASTM Committee D10 on Packaging and is the direct responsibility of Subcommittee D10.33 on Mechanical Dispensers.

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<sup>2</sup> *Annual Book of ASTM Standards*, Vol 15.09.

<sup>3</sup> Discontinued 1995, see *1995 Annual Book of ASTM Standards*, Vol 15.09.

<sup>4</sup> *Annual Book of ASTM Standards*, Vol 14.02.