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AMERICAN SOCIETY FOR TESTING AND MATERIALS
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Standard Test Method for Reverse-Ratchet Torque of Type IA Child-Resistant Closures[1]

This standard is issued under the fixed designation D 3472; 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 test method covers the measurement of the torque developed when Type IA child-resistant closures are rotated in the counter-clockwise direction. Type IA closures are reclosable continuous threaded closures that use a random push down while turning; no orientation of the push down force is necessary.

1.2 *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 3198 Test Method for Application and Removal Torque of Threaded or Lug-Style Closures[2]

D 3474 Practice for The Calibration and Use of Torque Meters Used in Packaging Applications[2]

D 3475 Classification of Child-Resistant Packages[2]

D 3810 Test Method for Minimum Application Torque of Type IA Child-Resistant Closures[2]

E 105 Practice for Probability Sampling of Materials[3]

E 122 Practice for Choice of Sample Size to Estimate a Measure of Quality, for a Lot or Process[3]

3. Terminology

3.1 *Definition* (see Classification D 3475).

3.1.1 *Type IA child-resistant closure*—a two-piece continuous thread closure requiring a random push down while turning; no orientation of the push down force is necessary.

4. Summary of Test Method

4.1 Representative specimens of child-resistant threaded closures are applied to an appropriate container. A torque-measuring device is used to measure the amount of torque developed when the closure is rotated in the counter-clockwise direction without any vertical force applied. This is reverse-ratchet torque.

5. Significance and Use

5.1 These torque measurements are of value because the reverse-ratchet torque is a torque applied to the closure in the removal direction of the closure. For Type IA closures, it is essential that this torque be significantly lower than some defined level at which the closure might unscrew.

5.2 This test may be used to establish performance specification for this attribute.

6. Apparatus

6.1 *Torque Tester*[4,5]—The model used is determined by the anticipated range of torques to be measured. Reverse-ratchet torques usually fall below 10 lbf·in. (1.1 N·m). An appropriate torque tester range from 0 to 25 lbf·in. (0 to 2.8 N·m) or 0 to 10 lbf·in. (0 to 1.1 N·m) is suggested.

7. Sampling

7.1 The number of samples will depend on the purpose for which this test is being run. For a given set of samples, sufficient measurements should be taken in accordance with established statistical sampling procedures.

7.2 Refer to Practices E 105 and E 122 for more specific information on statistically valid procedures.

8. Test Specimens

8.1 Unused threaded closures complete with liner, if applicable, and containers with the proper corresponding finish should be used.

8.2 If appropriate care is taken to avoid build-up of lubricant or coating from liner facings, the same container may be used for multiple tests in a series.

8.3 If repeated removal and reapplication is being studied as a variable, a separate container should be used for each closure, and the same closure-container combinations used for the duration of the test.

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[1] This test method is under the jurisdiction of ASTM Committee D-10 on Packaging and is the direct responsibility of Subcommittee D10.31 on Child Resistant Packaging.

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[2] *Annual Book of ASTM Standards*, Vol 15.09.

[3] *Annual Book of ASTM Standards*, Vol 14.02.

[4] Owens-Illinois torque tester, or its equivalent, has been found satisfactory for this test method. Available from Secure-Pak, Inc., 4009 Beachway Blvd., Toledo, OH 43614.

[5] A digital or automated torque instrument, if used, will have an appropriate design and scale capacity for the container/closure system to be evaluated. Torque results will be available in either electronic display or printout format.