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Standard Test Method for Top-Load-to-Engage Removal Lugs on Type IA Child-Resistant Closures¹

This standard is issued under the fixed designation D 3471; 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 determination of the top load required to engage removal lugs on Type IA child-resistant closures.

1.2 *This standard may involve hazardous materials, operations, and equipment. This standard does not purport to address all of the safety problems 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 3474 Practice for Checking the Calibration of Torque Meters Used in Packaging Applications²

D 3475 Classification of Child-Resistant Packages²

3. Terminology

3.1 Definition:

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 necessary. See Classification D 3475.

3.2 Description of Term Specific to This Standard:

3.2.1 *lug engagement*—the point at which a sufficient amount of downward force has been applied to enable a specific predetermined torque to be reached when the outer shell of a Type IA closure is rotated in a counterclockwise direction. Torques of 5 to 10 lbf·in. (0.6 to 1.1 N·m) have been found to be generally appropriate. Smaller caps may require less than 5 lbf·in removal torque and larger caps may require more than 10 lbf·in. The predetermined torque should be consistent with normally expected removal torque for the closure size being evaluated.

4. Summary of Test Method

4.1 Representative specimens of the closure to be tested are affixed to a bottle having an appropriate finish which rests on a torque-measuring device. Weight is applied in increments to the top of the closure until sufficient weight has been applied to engage the removal lugs. The point at

which the removal lugs are engaged is determined by rotating the closure until a predetermined torque is reached on the torque indicator.

5. Significance and Use

5.1 The top-load-to-engage measurement may be used as a standard test to compare the characteristics of a given child-resistant closure against a standard or against closures that may differ in construction.

5.2 This test method may be used to establish performance specifications.

6. Apparatus

6.1 Testing Machine(s):

6.1.1 *Torque Tester*³—A table-top style torque viscometer, capable of recording torque reading with the anticipated range of torques to be tested. Generally a range from 0 to 25 lbf·in. (0 to 2.8 N·m) will be adequate for all needs within the scope of this test method. Means for positioning the tester under the closure chuck of the test stand should be provided.

6.2 Attachments, Fixtures, etc.:

6.2.1 *Test Stand*, to enable the proper application of weight to the closure (Fig. 1).

6.2.2 *Closure Chuck*, of the proper size, in accordance with the specifications in Fig. 2, to distribute weight properly to the closure being tested.

NOTE 1—The chuck should be of such surface as to prevent slippage between the closure and the chuck.

6.2.3 *Container*, with finish to fit the closures to be tested.

7. Sampling

7.1 The number of samples will depend on the desired purpose for which the test is being conducted. However, for a given set of samples, take sufficient measurements in accordance with established statistical sampling procedures in order to obtain consistent results.

7.2 Performance normally should be based on a test of not less than ten representative specimens of a given type selected at random.

8. Test Specimens

8.1 Use unused threaded closures complete with liner, if applicable.

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 The Owens Illinois Torque Meter, with captive recording device, is available from Secure-Pak, Inc., 4009 Beechway Blvd., Toledo, OH 43614, or the equivalent, has been found satisfactory for this purpose.