



Designation: D 3473 – 88 (Reapproved 1995)

AMERICAN SOCIETY FOR TESTING AND MATERIALS
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Standard Test Methods for Lifting Force Required to Remove Certain Child-Resistant Snap Caps¹

This standard is issued under the fixed designation D 3473; 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 These test methods cover the measurement of the force necessary to open child-resistant snap-engagement packages of the type that require alignment of two points, followed by upward pressure on a designated location on the closure.

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. Terminology

2.1 *Definitions of Terms Specific to This Standard:*

2.1.1 *lifting force*—the measurement of force applied to the lifting tab of a snap-engagement cap, which has been rotated to the opening position, so the locking tab can pass through the gap in the locking ring of the bottle neck finish.

3. Summary of Test Methods

3.1 The test package is held securely on the stage of a force-measuring instrument, and an upward force is applied at a predetermined rate to the proper closure location by means of a lifting foot. Either of two test methods can be used:

3.1.1 *Test Method A*, in which the package is held with its vertical axis perpendicular to the tester stage, or,

3.1.2 *Test Method B*, in which the package is held with its vertical axis canted to a specific angle.

4. Significance and Use

4.1 These test methods may be used in establishing and confirming quality control standards.

4.2 The test methods may be used to establish performance standards.

5. Apparatus

5.1 *Testing Machine*,² consisting of a force gage with a suitable lifting foot, and a supporting stand with provision for

either manual or motorized operation. To ensure maximum accuracy, a calibrated gage with the most appropriate range available should be used.

NOTE 1—The upward vertical force to remove certain Type II A Lug-Style Child-Resistant closures may be measured with this test method using a modified lifting foot.

5.2 The *lifting foot* transmits the force to the proper closure location. A design found satisfactory for many applications is shown in Figs. 1 and 2. In some cases, a special foot might be required.

6. Sampling

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

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

7. Calibration

7.1 Check the calibration of the force gage by using certified dead weights that will include the full scale range of the gage.

8. Conditioning

8.1 Force values may be influenced by:

8.1.1 Precise method of closure application, including ambient conditions and nature of contents,

8.1.2 Length of time the closure has been in place,

8.1.3 Temperature and humidity conditions during any storage period, and

8.1.4 Temperature and humidity at time of test.

8.2 The preceding variables should be controlled to a degree consistent with the objectives of the test (such as, research, quality assurance, and production monitoring) so that the data will be valid for lot-to-lot comparison.

8.3 Immediately prior to testing, the packages should be intact (with closures in place), and conditioned at $23 \pm 2^\circ\text{C}$

¹ These test methods are under the jurisdiction of ASTM Committee D-10 on Packaging and are the direct responsibility of Subcommittee D10.31 on Child Resistant Packaging.

Current edition approved Dec. 30, 1988. Published February 1989. Originally published as D 3473 – 76. Last previous edition D 3473 – 81.

² Chatillon Universal Test Stands LTC and LTCM, with series DPP force gages of appropriate range, and standard pressor feet, available from John Chatillon and Sons, Kew Gardens, NY 11415, have been found satisfactory for this method.

Similar equipment (Series CTM Universal Testing Machines, and Series L force gages) is also available from Hunter Spring, a Division of Ametek, Inc., Hatfield, PA 19440.