



Designation: D 3076 – 00

Standard Test Methods for Effective Crimping on Outside Crimped Valves of Aerosol Containers¹

This standard is issued under the fixed designation D 3076; 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 effective crimping on outside crimped valves within the wide parameters of containers and valves available.

1.2 The test methods appear in the following order:

Optical Comparator Test Method	Sections 4 to 7
Caliper Test Method	8 to 12

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.*

2. Referenced Documents

2.1 *ASTM Standards:*

D 996 Terminology of Packaging and Distribution Environments²

D 3064 Terminology Relating to Aerosol Products²

3. Terminology

3.1 General definitions for packaging and distribution environments are found in Terminology D 996.

3.2 General definitions of terms relating to aerosol products are found in D3064.

OPTICAL COMPARATOR TEST METHOD

4. Summary of Test Method

4.1 This test method involves drawing a projected, enlarged profile of the container and valve, then removing the valve and drawing the projected profile of the container finish. Measuring the resultant void and subtracting the dimensions of the essentially noncompressed components from this value results in the value representing the compressed thickness of the valve sealing gasket.

¹ These test methods are under the jurisdiction of ASTM Committee D10 on Packaging and are the direct responsibility of Subcommittee D 10.33 on Mechanical Dispensers. These test methods were originally developed by the Chemical Specialties Manufacturers Assn.

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

5. Significance and Use

5.1 This test method provides information for the establishment of quality control procedures on filling lines.

6. Apparatus

6.1 *Optical Comparator.*

6.2 *Clamping Jig*, fastened to the comparator bench.

6.3 *Grinder*, electric, small enough to be hand held.

7. Procedure

7.1 Crimp a valve on an empty bottle with the line crimper set at normal operation, and clamp the bottle in the jig on the comparator bench.

7.2 Draw the projected, enlarged image on tracing paper.

NOTE 1—Grid ruled tracing paper makes the tracing much easier.

7.3 Without disturbing the paper or bottle, cut a wedge out of the valve with the electric grinder, and remove the valve.

7.4 Trace the projected image of the container alone on the same paper.

7.5 Measure the void between the two silhouettes (Fig. 1 and Fig. 2). Subtract the dimensions (multiplied by the enlargement factor of the essentially uncompressed components of the valve) from this value to obtain the thickness of the compressed gasket multiplied by the enlargement factor, and convert this reading into percent compression.

CALIPER TEST METHOD

8. Summary of Test Method

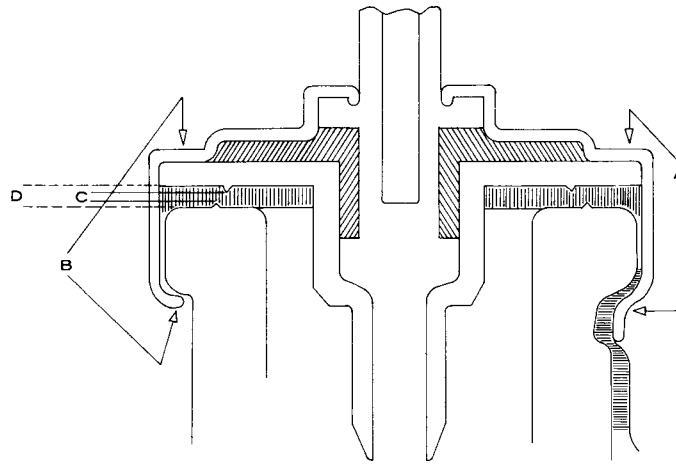
8.1 This test method involves a measurement of the height of the uncrimped portion of the valve. The points between which the measurement is made are self-determining when the calipers are held parallel to the side of the valve. Mean dimensions are used in calculating the effective crimp height.

9. Significance and Use

9.1 This test method provides information for the establishment of quality control procedures on filling lines.

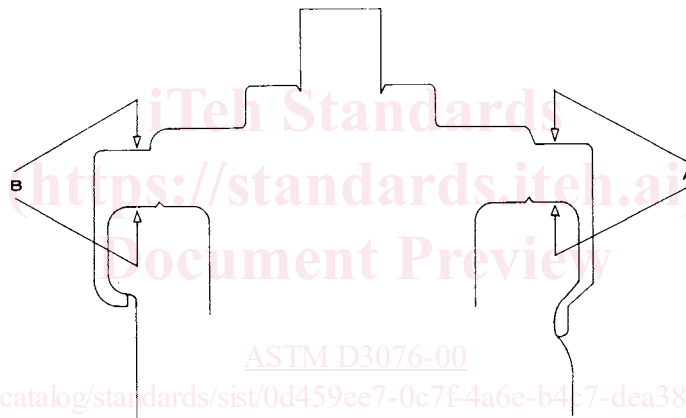
10. Apparatus

10.1 *Calipers*, vernier or dial.



A—points between which effective crimp height measurement should be made (these points are self-determining when the calipers are held parallel to the side of the valve).
 B—points between which a relative measurement may be established for nondestructive quality control use from optical comparator data.
 C—effective compression.
 D—flat compression.

FIG. 1 Effective Crimp Height



A—representation of a plastic-coated bottle.
 B—representation of an uncoated bottle.

NOTE 1—A and B represent points between which measurements should be made after drawing the projected profiles.

FIG. 2 Optical Comparator Profile

11. Procedure

11.1 Select a filled bottle from the filling line at random.

11.2 Mark off three points, 120° apart, on the valve ferrule, carefully avoiding areas where stake marks occur.

11.3 Holding the calipers parallel to the side of the valve, place the inner jaw on the top of the valve.

11.4 Slide the outer jaw up the valve skirt until it stops, due to the abrupt directional change in the skirt.

11.4.1 In collect-crimped bottles a line appears at the top of the crimped skirt area. This is made by the top of the collect segment, and is the point at which direction changes abruptly and the caliper will hang up.

11.4.2 Roll-capped bottles will also produce this horizontal line at the top of the crimped area. Depending upon the facial contour of the rollers, this line may be above or at the point of

abrupt direction change. Letting the caliper find the point of direction change naturally, will eliminate doubt about this measurement.

11.5 Repeat this process at the other locations marked on the ferrule.

11.6 Record a reasonable agreement between any two readings as the effective crimp height (Fig. 1).

11.7 Measure the diameter of the uncrimped portion of the valve. Subtract the diameter of the crimped valve skirt from the diameter of the uncrimped portion of the valve. Record this value as the crimp diameter.

12. Calculation

12.1 Calculate the maximum crimp height for effective crimping, M (which needs to be determined only once for any bottle and valve combination), as follows: