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Standard Practice for Determining the A-D Dimension of Aerosol Valve Dip Tubes¹

This standard is issued under the fixed designation D3089; 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 practice covers the rapid determination of the A-D dimension defined as the centerline dimension from the top plane of the valve mounting cup curl to the far end of the dip tube.² See Fig. 1.

1.2 This practice is limited to valves with 1-in. (25.4-mm) mounting cups.

1.3 The values stated in inch-pound units are to be regarded as standard. The values given in parentheses are mathematical conversions to SI units that are provided for information only and are not considered standard.

2. Significance and Use

2.1 Using dip tubes of the correct length is helpful by enabling the user to discharge essentially all the product from the dispenser, preventing the tube from becoming jammed into an incorrect position as a result of gassing, preventing the (non-dimpled) valve cup from excessively protruding from the can plug and perhaps causing production problems at the crimper or gasser/crimper, and preventing the tube from bottoming on the flat base of some aluminum cans in such a way that a seal is made that will act to limit or stop the entry of product into the tube when the valve is actuated.

2.2 Dip tubes that extend fully to the bottom of the dispenser, without excessive distortion, can also aid in retaining their connection to the valve body tailpiece, which may be important if the aerosol content exerts a very significant swelling action upon the dip tube plastic.

2.3 The choice of A-D dimension is influenced by a number of factors. These factors include:

2.3.1 Tube curvature, which may vary considerably between tubes.

2.3.2 Variation of valve cup and valve cup gasket thickness.

2.3.3 Elevation or suppression of the valve pedestal (thus top end of the dip tube) upon crimping.

2.3.4 Elevation of valve pedestal during hot-tanking, only partly diminished upon subsequent cooling.

2.3.5 Swelling (or shrinking) action of the product on the dip tube.

3. Apparatus

3.1 *Gage for Measuring AD dimension*, or equivalent—This device consists of three machined parts. In addition, a scale graduated in $\frac{1}{32}$ in. (ruler) is glued to the scale block, and a foam pad base may be added to achieve nonslip characteristics.

4. Calibration and Standardization

4.1 Ensure that the reference plane against which the top of the valve cup rests is at zero on the scale.

5. Procedure³

5.1 Hold the gage of Figs. 2-6 in the hand or on a flat surface, and insert the valve, placing the actuator/stem end to the higher end of the device. The slide bar is then pushed firmly to the left to seat the mounting cup against the base end.

5.2 The reading is then taken off the scale at the end of the dip tube, giving the “A-D Dimension.”

6. Report

6.1 Report the following information:

6.1.1 All details concerning the valve being tested, such as lot number, date received, supplier, and product for which it is intended.

6.1.2 The A-D dimension specification.

6.1.3 Measurement to the nearest $\frac{1}{32}$ in. (0.80 mm).

7. Precision

7.1 Results may vary due to the subjectiveness of the operator touch and technique, gage type and gage accuracy, as shown by limited repeatability and reproducibility studies.

7.2 Attempts to develop a precision statement have not been successful. For this reason, data on precision cannot be given.

¹ This practice is under the jurisdiction of ASTM Committee D10 on Packaging and is the direct responsibility of Subcommittee D10.33 on Mechanical Dispensers. Current edition approved Oct. 1, 2008. Published November 2008. Originally approved in 1972. Last previous edition approved in 2003 as D3089 – 97(2003). DOI: 10.1520/D3089-97R08.

² This practice was originally developed by the Chemical Specialties Manufacturers Assn. and is described in *The Aerosol Handbook* (Second Edition), Montford A. Johnson, 167 and 182, Mendham, N.J., Wayne E. Dorland & Co., 1982.

³ This procedure has been approved by the CSMA, Aerosol Division Commercial Standards Committee, Subcommittee “C.”