



Designation: F 2251 – 03

Standard Test Method for Thickness Measurement of Flexible Packaging Material¹

This standard is issued under the fixed designation F 2251; 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 thickness of flexible packaging materials using contact micrometers.

1.2 The Precision and Bias statement for this test method was developed using both handheld and bench top micrometers with foot sizes ranging from 4.8 to 15.9 mm ($\frac{3}{16}$ to $\frac{5}{8}$ in.).

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 374 Test Methods for Thickness of Solid Electrical Insulation²

D 1898 Practice for Sampling of Plastics³

D 4332 Practice for Conditioning Containers, Packages or Packaging Components for Testing⁴

D 5947 Test Method for Physical Dimensions of Solid Plastics Specimens⁵

E 691 Practice for Conducting an Interlaboratory Study to Determine the Precision of a Test Method⁶

2.2 ANSI/ASQ Standards:⁷

ANSI/ASQC Z1.4 Sampling Procedures and Tables for Inspection by Attributes

ANSI/ASQC Z1.9 Sampling Procedures and Tables for Inspection by Variables

3. Terminology

3.1 Definitions:

3.1.1 *bench micrometer*—tabletop measurement system using a dead weight or spring.

3.1.2 *foot*—the moving component of the micrometer that comes in contact with the sample.

4. Significance and Use

4.1 This test method provides a means for measuring a thickness dimension. Accurate measurement of thickness can be critical to meeting specifications and characterizing process, product, and material performance.

4.2 This test method does not address acceptability criteria. These need to be jointly determined by the user and producer of the product. Repeatability and reproducibility of measurement is shown in the Precision and Bias section. Attention should be given to the inherent variability of materials being measured as this can affect measurement outcome.

5. Apparatus

5.1 Mechanical gage, suitable for measuring thickness:

5.1.1 The thickness gage may be either a bench or hand-held mechanical model.

5.1.2 The gage should be capable of accurately measuring in increments of 2.5 μm (0.0001 in.).

5.1.3 The foot size and foot pressure should be known and identified. Because of the compressibility of different materials it is important when comparing results between different laboratories that the size of the foot and pressure be the same.

¹ This test method is under the jurisdiction of ASTM Committee F02 on Flexible Barrier Materials and is the direct responsibility of Subcommittee F02.60 on Medical Device Packaging.

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² *Annual Book of ASTM Standards*, Vol 10.01.

³ Discontinued 1998. See 1997 *Annual Book of ASTM Standards*, Vol 08.01.

⁴ *Annual Book of ASTM Standards*, Vol 15.09.

⁵ *Annual Book of ASTM Standards*, Vol 08.03.

⁶ *Annual Book of ASTM Standards*, Vol 14.02.

⁷ Available from American National Standards Institute (ANSI) 25 W. 43rd St., 4th Floor, New York, NY 10036.