



Designation: D5947 – 18

Standard Test Methods for Physical Dimensions of Solid Plastics Specimens¹

This standard is issued under the fixed designation D5947; 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 determination of the physical dimensions of solid plastic specimens where the dimensions are used directly in determining the results of tests for various properties. Use these test methods except as otherwise required in material specifications.

1.2 The values stated in SI units are to be regarded as standard.

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, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

NOTE 1—This standard and ISO 16012 address the same subject matter, but differ in technical content.

1.4 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 ASTM Standards:²

[A1073/A1073M Practice for Using Hand Micrometers to Measure the Thickness of Uncoated Steel Sheet and Nonmetallic and Metallic-Coated Steel Sheet](#)

[D618 Practice for Conditioning Plastics for Testing](#)

[D638 Test Method for Tensile Properties of Plastics](#)

[D790 Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials](#)

[D883 Terminology Relating to Plastics](#)

[D2240 Test Method for Rubber Property—Durometer Hardness](#)

[2.2 ISO Standards:³](#)

[ISO 472 Plastics—Vocabulary](#)

[ISO 16012 Plastics—Determination of Linear Dimensions of Test Specimens](#)

3. Terminology

3.1 *Definitions*—See Terminology [D883](#) and ISO 472 for definitions pertinent to these test methods.

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *absolute uncertainty (of a measurement)*, n —the smallest division that may be read directly on the instrument used for measurement.

3.2.2 *calibration*—the set of operations that establishes, under specified conditions, the relationship between values measured or indicated by an instrument or system, and the corresponding reference standard or known values derived from the appropriate reference standards.

3.2.3 *micrometer*, n —an instrument for measuring any dimension within absolute uncertainty of 25 μm or smaller.

3.2.4 *verification*—proof, with the use of calibrated standards or standard reference materials, that the calibrated instrument is operating within specified requirements.

3.2.5 *1 mil*, n —a dimension equivalent to 25 μm (0.0010 in.).

4. Summary of Test Methods

4.1 These test methods provide five different test methods for the measurement of physical dimensions of solid plastic specimens. The test methods (identified as Test Methods A through D, and H) use different micrometers that exert various pressures for varying times upon specimens of different geometries. [Tables 1 and 2](#) display the basic differences of each test method and identify methods applicable for use on various plastics materials.

5. Significance and Use

5.1 These test methods shall be used where precise dimensions are necessary for the calculation of properties expressed

¹ These test methods are under the jurisdiction of ASTM Committee [D20](#) on Plastics and are the direct responsibility of Subcommittee [D20.10](#) on Mechanical Properties.

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² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

³ Available from American National Standards Institute (ANSI), 25 W. 43rd St., 4th Floor, New York, NY 10036, <http://www.ansi.org>.

*A Summary of Changes section appears at the end of this standard