



Designation: D 5947 – 02

Standard Test Methods for Physical Dimensions of Solid Plastics Specimens¹

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

NOTE 1—There is no similar or equivalent ISO standard.

2. Referenced Documents

2.1 ASTM Standards:

D 618 Practice for Conditioning Plastics for Testing²

D 638 Test Method for Tensile Properties of Plastics²

D 790 Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials²

D 883 Terminology Relating to Plastics²

D 2240 Test Method for Rubber Property— Durometer Hardness³

D 4805 Terminology for Plastics Standards⁴

2.2 ISO Standard:

ISO 472 Plastics—Vocabulary⁵

3. Terminology

3.1 *Definitions*—See Terminologies D 883 and D 4805, 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 in physical units. They are not intended to replace practical thickness measurements based on commercial portable tools, nor is it implied that thickness measurements made by the procedures will agree exactly.

6. Apparatus

6.1 *Apparatus A—Machinist's Micrometer Caliper⁶ with Calibrated Ratchet or Friction Thimble:*

6.1.1 Apparatus A is a micrometer caliper without a locking device but that is equipped with either a calibrated ratchet or a friction thimble. The pressure exerted on the specimen is controllable by the use of a proper manipulative procedure and a calibrated spring (see Annex A1).

6.1.2 Use an instrument constructed with a vernier capable of measurement to the nearest 2.5 μm.

⁶ Hereinafter referred to as a machinist's micrometer.

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 Annual Book of ASTM Standards, Vol 08.01.

³ Annual Book of ASTM Standards, Vol 09.01.

⁴ Annual Book of ASTM Standards, Vol 08.03.

⁵ Available from American National Standards Institute, 25 W. 43rd St., 4th Floor, New York, NY 10036.