



Designation: D1042 – 22

Standard Test Method for Linear Dimensional Changes of Plastics Caused by Exposure to Heat and Moisture¹

This standard is issued under the fixed designation D1042; 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 is designed to provide a means for measuring the dimensional changes of plastic specimens such as shrinkage or expansion, developed under specific heat and water conditionings.

1.2 The values stated in SI units are to be regarded as standard. The values given in parentheses are mathematical conversions to inch-pound units that are provided for information only and are not considered 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 2796 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

D883 Terminology Relating to Plastics

D5947 Test Methods for Physical Dimensions of Solid Plastics Specimens

E456 Terminology Relating to Quality and Statistics

E691 Practice for Conducting an Interlaboratory Study to Determine the Precision of a Test Method

E2935 Practice for Evaluating Equivalence of Two Testing Processes

2.2 ISO Standards:³

ISO 2796 Cellular plastics, rigid—Test for dimensional stability

3. Terminology

3.1 Definitions:

3.1.1 For definitions of terms that appear in this practice relating to plastics, refer to Terminology D883.

3.1.2 For definitions of terms that appear in this practice relating to quality and statistics (such as precision and bias), refer to Terminology E456.

4. Significance and Use

4.1 This test method is intended only as a convenient test method for measurement of linear dimensional changes in plastics subjected to defined conditions of test as outlined in Sections 7 and 8.

5. Apparatus

5.1 *Scriber*, so constructed that two sharp needle points are rigidly separated by 100 ± 0.2 mm. The scriber, as shown in Fig. 1, consists of two sharp steel needles, approximately 1.5 mm in diameter. The needles are to be inserted in drilled holes with their axes parallel to each other and perpendicular to and intersecting the long axis of a stainless steel rigid rod or bar stock, 125 ± 5 mm in length. The needles' points shall extend 6 ± 2 mm beyond the supporting rod and are held in position by setscrews inserted through the ends of the rod. The scriber shall be calibrated by scribing an arc onto an unconditioned sample and measuring this initial scribed distance with a calibrated caliper to the nearest 0.1 mm. Thickness of arc lines shall not exceed 0.02 mm.

NOTE 2—Phonograph needles have been used as a satisfactory scriber.

5.2 *Measuring Microscope*, having a magnification of at least 20 $\times$ and graduated to have a resolution of 0.01 mm.

NOTE 3—For more precise measurements, a micrometer microscope is preferred.

¹ This test method is under the jurisdiction of ASTM Committee D20 on Plastics and is the direct responsibility of Subcommittee D20.50 on Durability of Plastics. Current edition approved May 1, 2022. Published May 2022. Originally approved in 1949. Last previous edition approved in 2017 as D1042 – 12(2017). DOI: 10.1520/D1042-22.

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