



Designation: D1042 – 06

# Standard Test Method for Linear Dimensional Changes of Plastics Under Accelerated Service Conditions<sup>1</sup>

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 ( $\epsilon$ ) 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 in plastic specimens the dimensional changes resulting from exposure to service conditions. In particular, this test method is suitable for measuring shrinkage or elongation developed under specific oven and water conditionings.

1.2 *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 known ISO equivalent to this standard.

## 2. Referenced Documents

2.1 *ASTM Standards:*<sup>2</sup>  
**D883 Terminology Relating to Plastics**

## 3. Terminology

3.1 *Definitions:* Definitions of terms applying to this test method appear in Terminology **D883**.

## 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  $100 \pm 0.2$  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,  $125 \pm 5$  mm in length. The needles' points shall extend  $6 \pm 2$  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 may be 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 should be used.

5.3 *Caliper, 6-in.*, with a readability of 0.01 mm and an illuminated desk magnifier, 1.75 $\times$  to 2.0 $\times$  to assist with the placement of the caliper points onto the scribed lines

5.4 *Beaker*, having a suitable size for the number of specimens to be evaluated and is constructed of a material that is stable under the test conditions.

5.5 *Room or Conditioning Chamber*, capable of being maintained at  $23 \pm 2^\circ\text{C}$  and  $50 \pm 5\%$  RH.

5.6 *Conditioning Oven*, full draft air-circulating oven, capable of being maintained within  $\pm 2^\circ\text{C}$  of the set temperature.

5.7 *Absorbent Material*, cloth or paper suitable for drying.

## 6. Test Specimens

6.1 Specimens shall not be less than 110 mm in length in the direction of test. The preferred specimen size is  $125 \pm 5$  mm in length by  $13 \pm 0.5$  mm wide by  $3.0 (-0.0 + 0.2)$  mm thick.

6.2 Three specimens shall be tested for each conditioning.

6.3 Individual specimens shall be positioned vertically in the specified environment.

NOTE 4—A wire hook inserted in a hole drilled in one end of the specimen has been found acceptable.

## 7. Conditioning and Exposure

7.1 *Preconditioning*

<sup>1</sup> 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.

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<sup>2</sup> 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.

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