



Standard Test Method for Measuring Shrinkage from Mold Dimensions of Molded Thermosetting Plastics¹

This standard is issued under the fixed designation D 6289; 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 intended to measure shrinkage from mold cavity to molded dimensions of thermosetting plastics when molded by compression, injection, or transfer under specified conditions.

1.2 This test method provides for the measurement of shrinkage of thermosetting plastics from their molds both initially (within 16 to 72 h of molding) and as they age (post-shrinkage at elevated temperatures).

1.3 This method will give comparable data based on standard specimens and can not predict absolute values in actual molded parts with varying flow paths, wall thicknesses, pressure gradients and process conditions. Differences in mold shrinkage generally is observed between the specimen geometries described in this test method.

1.4 Knowledge of the initial shrinkage of plastics is important for the construction of molds and knowledge of post molding shrinkage is important for determining the suitability of the molding material for manufacturing thermosetting plastic components with accurate dimensions.

1.5 The values stated in SI units are to be regarded as the standard. The values given in brackets are for information only.

1.6 *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—This test method and ISO 2577-1984 are equivalent when bars of 120 mm length, 15 mm width, and 10 mm thickness are used for compression molding; or flat, square plaques approximately 120 by 120 by 4 mm are used for injection molding.

2. Referenced Documents

2.1 ASTM Standards:²

¹ This test method is under the jurisdiction of ASTM Committee D20 on Plastics and is the direct responsibility of Subcommittee D20.09 on Specimen Preparation. Current edition approved November 1, 2003. Published January 2004. Originally approved in 1998. Last previous edition approved in 1998 as D 6289 - 98.

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.

D 618 Practice for Conditioning Plastics and Electrical Insulating Materials for Testing

D 796 Practice for Compression Molding Test Specimens of Phenolic Molding Compounds

D 883 Terminology Relating to Plastics

D 1896 Practice for Transfer Molding Test Specimens of Thermosetting Compounds

D 3419 Practice for In-line Screw-Injection Molding of Test Specimens from Thermosetting Compounds

D 5224 Practice for Compression Molding Test Specimens of Thermosetting Molding Compounds

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

2.2 ISO Standards:³

ISO 291 Plastics—Standard Atmospheres for Conditioning and Testing

ISO 295 Plastics—Compression Molding Test Specimens of Thermosetting Materials

ISO 10724 Plastics—Thermosetting Molding Materials—Injection Molding of Multipurpose Test Specimens

ISO 2577-1984 Plastics—Thermosetting Moulding Materials—Determination of Shrinkage

3. Terminology

3.1 *General*—Definitions of terms applying to this test method appear in Terminology D 883.

3.2 *Definitions*—For the purpose of this test method, the following definitions apply:

3.2.1 *molding shrinkage*—the difference in dimensions between a molding and the mold cavity in which it was molded, both the mold and the molding being at $23 \pm 2^\circ\text{C}$ when measured.

3.2.2 *post-shrinkage*—shrinkage of a plastic product after molding, during post-treatment, storage or use.

4. Significance and Use

4.1 *Compression Molding*—In compression molding, the difference between the dimensions of a mold and of the molded article produced therein from a given material vary according

³ Available from American National Standards Institute (ANSI), 25 W. 43rd St., 4th Floor, New York, NY 10036.

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