



Designation: D 6289 – 98

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

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1. Scope

1.1 This test method is intended to measure batch-to-batch uniformity in initial shrinkage from mold to molded dimensions of thermosetting materials 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 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.

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

1.5 *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:

- D 618 Practice for Conditioning Plastics and Electrical Insulating Materials for Testing²
- D 796 Practice for Compression Molding Test Specimens of Phenolic Molding Compounds²
- D 883 Terminology Relating to Plastics²
- D 956 Practice for Compression Molding Specimens of Amino Molding Compounds³
- D 1896 Practice for Transfer Molding Test Specimens of Thermosetting Compounds²

¹ This test method is under the jurisdiction of ASTM Committee D-20 on Plastics and is the direct responsibility of Subcommittee D20.09 on Specimen Preparation. Current edition approved July 10, 1998. Published February 1999.

² *Annual Book of ASTM Standards*, Vol 08.01.

³ Discontinued. Replaced by Practice D 5224.

D 1898 Practice for Sampling of Plastics²

D 3419 Practice for In-line Screw-Injection Molding of Test Specimens from Thermosetting Compounds⁴

E 691 Practice for Conducting an Interlaboratory Study to Determine the Precision of a Test Method⁵

2.2 ISO Standards:⁶

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 may vary according to the design and operation of the mold. It is probable that shrinkage will approach a minimum where design and operation are such that a maximum of material is forced solidly into the mold cavity or some part of it, or where the molded article is hardened to a maximum while still under pressure, particularly by cooling. In contrast, shrinkages may be much higher where the charge must flow in the mold cavity but does not receive and transmit enough pressure to be forced

⁴ *Annual Book of ASTM Standards*, Vol 08.02.

⁵ *Annual Book of ASTM Standards*, Vol 14.02.

⁶ Available from American National Standards Institute, 11 West 42nd Street, 13th Floor, New York, NY 10036.