



Designation: D 4703 – 02

Standard Practice for Compression Molding Thermoplastic Materials into Test Specimens, Plaques, or Sheets¹

This standard is issued under the fixed designation D 4703; 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 practice covers the compression molding of thermoplastic granules and milled stock for the preparation of test specimens.²

1.2 While conditions for certain materials are given, the primary source of specific conditions shall be the material specification standards for each type of material.

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

1.4 *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—The main body of this practice is equivalent to ISO 293-1986. Annex A1 and ISO 293-1986 differ in some details; however, specimens prepared using Annex A1, Procedure A should be equivalent to those prepared using ISO 293-1986, Cooling Method D. Specimens prepared using Annex A1, Procedure C should be equivalent to those prepared using ISO 293-1986, Cooling Method B. However, due to the greater cooling rate tolerances of the ISO standard, specimens prepared according to ISO Cooling Method B may not be equivalent to Annex A1, Procedure C.

2. Referenced Documents

2.1 ASTM Standards:

D 618 Practice for Conditioning Plastics for Testing³

D 1248 Specification for Polyethylene Plastics Extrusion Materials for Wire and Cable³

D 3350 Specification for Polyethylene Plastics Pipe and Fittings Materials⁴

D 4976 Specification for Polyethylene Plastics Molding and Extrusion Materials⁵

ISO 293-1986 Plastics—Compression Moulding Test

Specimens of Thermoplastic Materials⁶

3. Terminology

3.1 Definitions of Terms Specific to This Standard:

3.1.1 *average cooling rate* ($^{\circ}\text{C}/\text{min}$), n —the cooling rate calculated by dividing the difference between the molding and demolding temperatures by the time required to cool the mold to the demolding temperature.

3.1.2 *cooling rate* ($^{\circ}\text{C}/\text{h}$), n —the rate of cooling obtained by controlling the flow of the cooling fluid in such a way that during each 10-min interval, the deviation from this specified cooling rate shall not exceed the specified tolerance.

3.1.3 *demolding temperature*, n —the temperature of the mold or the press platens at the end of the cooling time, measured in the nearest vicinity to the molded material.

3.1.3.1 *Discussion*—For positive molds, holes are normally drilled in the mold for measuring the temperatures defined in 3.1.3 and 3.1.4.

3.1.4 *molding temperature*, n —the temperature of the mold or the press platens during the preheating and molding time, measured in the nearest vicinity to the molded material.

3.1.5 *molding time*, n —the time during which full pressure is applied while maintaining the molding temperature.

3.1.6 *picture frame mold*, n —a flat piece of metal, usually of brass or steel, that has a center portion removed to provide the specified shape and dimensions of the final molding. The thickness of the metal is dependent on the desired thickness of the finished molding, taking into consideration the shrinkage of the material to be molded. The picture frame mold is sometimes referred to as a chase.

3.1.7 *preheating time*, n —the time required to heat the material in the mold up to the molding temperature while maintaining the contact pressure.

4. Significance and Use

4.1 The methods by which sample materials are prepared and molded influence the mechanical properties of the specimen. Unlike injection molding, the objective of compression molding is to produce test specimens or sheets that are both

¹ This practice is under the jurisdiction of ASTM Committee D20 on Plastics and is the direct responsibility of Subcommittee D20.09 on Specimen Preparation.

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² This practice was created as a coalescence of and replacement for Practices D 1928, D 2292, D 3010, and D 3463.

³ *Annual Book of ASTM Standards*, Vol 08.01.

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

⁵ *Annual Book of ASTM Standards*, Vol 08.03.

⁶ ISO/IEC Selected Standards for Testing Plastics, available from ASTM. Also 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.