



Designation: D4703 – 24

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

This standard is issued under the fixed designation D4703; 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 thermoplastics (for example, granules, pellets) and milled stock for the preparation of test specimens.²

NOTE 1—Certain ASTM standards require the use of Procedure C in [Annex A1](#) for compression molding of polyethylene test specimens.

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 *Units*—The values stated in SI units are to be regarded as standard.

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, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

NOTE 2—ISO 293:2023 has been updated and is no longer equivalent to ASTM D4703. The practice is considered technically similar to ISO 293:2023 but differs in detail.

Listed are the differences between ISO 293-1986 and ASTM D4703-16: The main body of D4703-16 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 in accordance with ISO Cooling Method B may not be equivalent to [Annex A1](#), Procedure C.

1.5 *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.*

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 D1928, D2292, D3010, and D3463.

2. Referenced Documents

2.1 ASTM Standards:³

[D618 Practice for Conditioning Plastics for Testing](#)
[D1248 Specification for Polyethylene Plastics Extrusion Materials for Wire and Cable](#)
[D3350 Specification for Polyethylene Plastics Pipe and Fittings Materials](#)
[D4976 Specification for Polyethylene Plastics Molding and Extrusion Materials](#)

2.2 ISO Standard:

[ISO 293 Plastics—Compression Moulding Test Specimens of Thermoplastic Materials](#)⁴

3. Terminology

3.1 Definitions of Terms Specific to This Standard:

3.1.1 *average cooling rate, non-linear* ($^{\circ}\text{C}/\text{min}$), 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, linear or controlled cooling rate* ($^{\circ}\text{C}/\text{min}$), n —constant cooling rate in a defined temperature range obtained by controlling the flow of the cooling fluid in such a way that over each defined time interval the deviation from the specified cooling rate does not exceed the specified tolerance. The rate is calculated by dividing each temperature data point by its corresponding time data point.

3.1.2.1 *Discussion*—[Annex A1](#), Procedure C used for the preparation of polyethylene specimens requires linear cooling rates of $15 \pm 2^{\circ}\text{C}/\text{min}$ over specified temperature ranges.

3.1.3 *cooling rate, n* —expressed in $^{\circ}\text{C}/\text{min}$ when cooling by fluid or $^{\circ}\text{C}/\text{h}$ when employing slow cooling in an oven and determined by measuring the temperature change during the cooling cycle over specified intervals.

³ For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at www.astm.org/contact. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

⁴ ISO/IEC Selected Standards for Testing Plastics, available from ASTM. Available from American National Standards Institute (ANSI), 1180 Avenue of the Americas, 10th Floor, New York, NY 10036, <http://www.ansi.org>.

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