



Designation: D1621 – 16 (Reapproved 2023)

Standard Test Method for Compressive Properties of Rigid Cellular Plastics¹

This standard is issued under the fixed designation D1621; 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.

This standard has been approved for use by agencies of the U.S. Department of Defense.

1. Scope

1.1 This test method describes a procedure for determining the compressive properties of rigid cellular materials, particularly expanded plastics.

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

1.3 *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 1—This test method and ISO 844 are technically equivalent.

1.4 *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.*

2. Referenced Documents

2.1 ASTM Standards:²

- D618 Practice for Conditioning Plastics for Testing
- E4 Practices for Force Calibration and Verification of Testing Machines
- E83 Practice for Verification and Classification of Extensometer Systems
- E691 Practice for Conducting an Interlaboratory Study to Determine the Precision of a Test Method

¹ This test method is under the jurisdiction of ASTM Committee D20 on Plastics and is the direct responsibility of Subcommittee D20.22 on Cellular Materials - Plastics and Elastomers.

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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.

2.2 ISO Standard:

ISO 844 Cellular Plastics—Compression Test of Rigid Materials³

3. Terminology

3.1 Definitions:

3.1.1 *compliance*—the displacement difference between test machine drive system displacement values and actual specimen displacement.

3.1.2 *compliance correction*—an analytical method of modifying test instrument displacement values to eliminate the amount of that measurement attributed to test instrument compliance.

3.1.3 *compressive deformation*—the decrease in length produced in the gage length of the test specimen by a compressive load expressed in units of length.

3.1.4 *compressive strain*—the dimensionless ratio of compressive deformation to the gage length of the test specimen or the change in length per unit of original length along the longitudinal axis.

3.1.5 *compressive strength*—the stress at the yield point if a yield point occurs before 10 % deformation (as in Fig. 1a) or, in the absence of such a yield point, the stress at 10 % deformation (as in Fig. 1b).

3.1.6 *compressive stress (nominal)*—the compressive load per unit area of minimum original cross section within the gage boundaries, carried by the test specimen at any given moment, expressed in force per unit area.

3.1.7 *compressive stress-strain diagram*—a diagram in which values of compressive stress are plotted as ordinates against corresponding values of compressive strain as abscissas.

3.1.8 *compressive yield point*—the first point on the stress-strain diagram at which an increase in strain occurs without an increase in stress.

³ Available from American National Standards Institute (ANSI), 25 W. 43rd St., 4th Floor, New York, NY 10036, <http://www.ansi.org>.

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